Volume two

ORAL REHABILITATION PROBLEM CASES

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Treatment and evaluation

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PREFACE

It is the duty of man to remember and to communicate. Every effort has been made to do this in my two previous prosthetic textbooks, *Restorative Dentistry* and *Oral Rehabilitation*. It is well to keep in mind that there can be an appreciable difference between the proclamation of a concept and its practical application at the clinical level. During nearly half a century of dental practice, I have tried to observe, compare, reflect, and document. I am now recording my conclusions. No two patients and no two methods of treatment are similar, and while I have enjoyed a fair proportion of success in treatment planning and execution, I have also been confronted by failure. This has been due to a lack of knowledge on my part of the cause and effect relationships, or to the insufficiency of the available knowledge.

This will probably be my last textbook. The actual organization of the contents and arrangement of this material have taken the better part of four years. To collect the material has taken thirty-five years. While the will to do is still present, the body grows weary. There are too many distractions and too many curricular and extracurricular activities. As one ages, responsibilities increase, honors multiply, and professional and civic administrative duties occupy more and more of one's time. This is as it should be, but with these events it becomes impossible to continue to contribute in all areas, regardless of one's ability or desires. Most of us must finally be content with the faithful performance of these many and varied chores which gradually take the place of the more burning ambitions of our youth in the realm of research and clinical investigation.

My sincere thanks to my friend, Kenneth Carroad, Esq., for his help in dealing with the legal aspects of this book; to my son and associate, Dr. Jerome Schweitzer, for reproducing the roentgenograms in black and white prints; to my son and associate, Dr. Robert D. Schweitzer, for reviewing the text in general and making the index; to my daughter-in-law, Patricia de Waele Schweitzer, for her help; to my secretary, Delores Eisenberg, for her help; and above all to my wife, Dorothy, not alone for retouching the photographs and assisting in the organization of the manuscript, but for her patience, understanding, encouragement, and counsel in all matters.

Finally, I am grateful for the privilege of practicing in association with my sons, Jerome and Robert. What greater reward is there for a father!

Jerome M. Schweitzer

To those patients all over the world, whose trust in our integrity and ability makes it imperative that we continue to study throughout our professional lives in order to be able to successfully cope with, in a sympathetic and understanding manner, the many dental problems they present.

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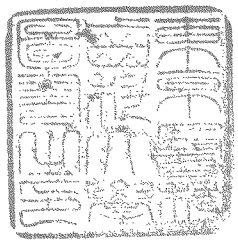


Chapter 9

DEEP OVERBITE (cont'd)

GNATHOLOGY

Many theories of occlusion have been investigated, among them, gnathology. This technique is carried out on the instrument known as the gnathoscope which was invented by the Gnathological Society headed by Beverly B. McCollum. In 1951 a case was presented in which this theory and the gnathoscope were used.* This report will be referred to in a later chapter.

Case 1

Another case will now be presented in which a deep vertical overbite was present. The gnathological concept of articulation and its technique were resorted to in the rehabilitation of this patient's mouth. Treatment was started at the age of 38 in May, 1950.

Past history

A lower six-unit anterior bridge that had been inserted ten years previously had been a constant source of annoyance. Her upper anterior teeth had been separating, and five years previous to her examination an upper bite plate had been inserted in an attempt to correct this nonstability. Although this bite plate had been worn constantly for a period of two years, the results had not been satisfactory.

Chief complaints

She complained of the way in which her teeth contacted and of drooling during the night. At times she had difficulty with her speech. The gums were constantly being irritated by the large amount of tartar which had always collected. Facial

*Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., pp. 1115-1138.

portraits taken eighteen years earlier disclosed upper incisors which were close together.

Present condition

An examination disclosed periodontal tissues that were below normal. The upper right first bicuspid had been replaced by a cantilever bridge which had been attached to the second bicuspid only. The abutment was mobile, and the dummy lacked a lingual cusp. This had permitted the lower right cuspid and first bicuspid to overerupt until both teeth almost touched the upper lingual gum tissue. When the mandible closed from rest to contact position, the temporomandibular roentgenograms showed a posterosuperior positioning of the condyles in their respective fossae. No pathological symptoms were present. The soft tissues surrounding the lower anterior bridge were sensitive, inflamed, and bled upon the slightest pressure. The third molars were mobile. The transverse curve of Wilson was uneven, being decidedly lower on the left side than on the right. The anteroposterior curve of Spee was also at a different level on both sides. The left upper and lower second bicuspids were in a cross-bite relationship.

Treatment

Considerable time was spent in preparing the natural teeth for the temporary castings. The removal of the lower anterior bridge exposed a severely inflamed ridge. This bridge was replaced by a slow-cured acrylic bridge. Four cast gold splints were constructed for the upper and lower posterior teeth. For this, a simple laboratory articulator was employed. The vertical dimension had not been altered. A removable orthodontic appliance was inserted which would aid in closing the space between the upper incisors.

For details in the treatment, the reader is referred to Chap. 14, p. 868 in which the concept and technique of gnathology is described in more detail. At present it will suffice to state that the patient's mandibular movements were captured by means of the gnathograph. The gnathoscope was then adjusted so that it was able to duplicate these movements. From that step until the completion of the work the reconstruction was carried out as it would have been had any semi-adjustable articulator been employed.

Completion

The completed prosthesis was inserted on Feb. 21, 1951. A new removable retainer was constructed to maintain the approximated position of the upper incisors. This was to be worn at night. After one year it was discarded with no further relapse. In the finished work the transverse curve and the anteroposterior curve were at the same level for both sides. The occlusal surfaces possessed normal anatomical detail, and the esthetics were pleasing.

Postinsertion

The postinsertion treatment was uneventful. The patient moved to . . . in 1957 and was not seen again until August, 1960. Routine prophylaxis had been

Text continued on p. 476.

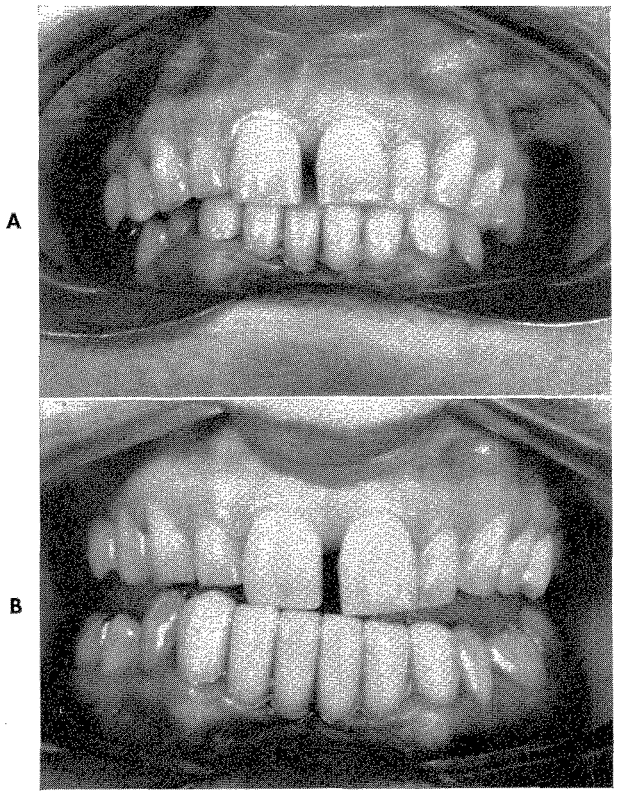


Fig. 1000. A, Mouth of a 38-year-old woman at the start of treatment in May, 1950. **B,** Teeth parted. The irregularity of the lower occlusal plane is evident. A porcelain coping bridge replaces the lower four incisors. (Figs. 1000 to 1025 are of the same case.)

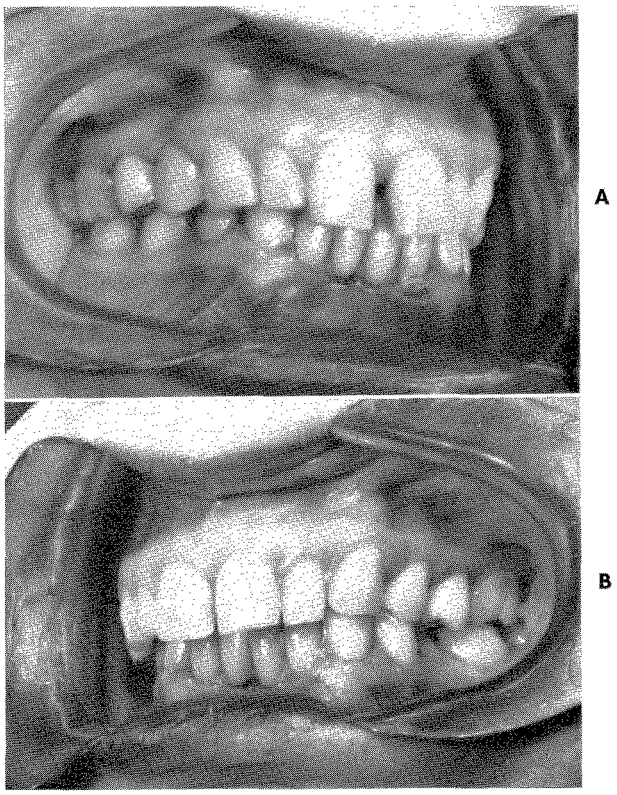


Fig. 1001. A, The right side of the mouth at the start of treatment. **B,** The left side of the mouth at the start of treatment.

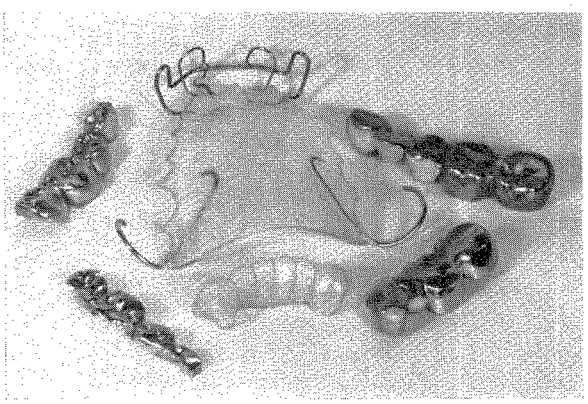


Fig. 1002. The transitional bridges and orthodontic appliance are shown here.

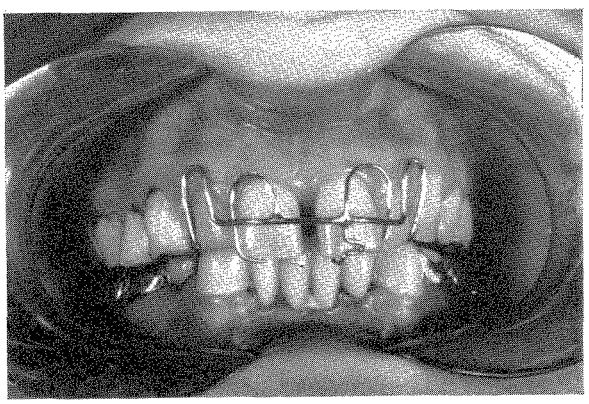


Fig. 1003. The transitional bridges and orthodontic appliance are shown here in the mouth.

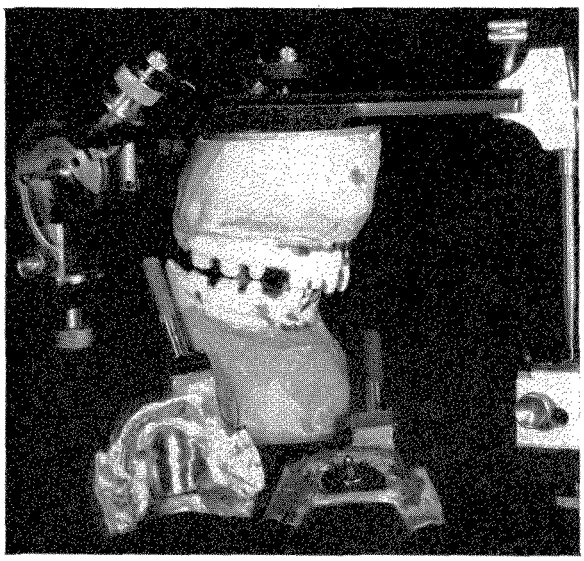


Fig. 1004. Casts were mounted upon the McCollum gnathoscope, and metal clutches were constructed. They are shown in the foreground. The studs that extend from them will serve to hold the recording apparatus.

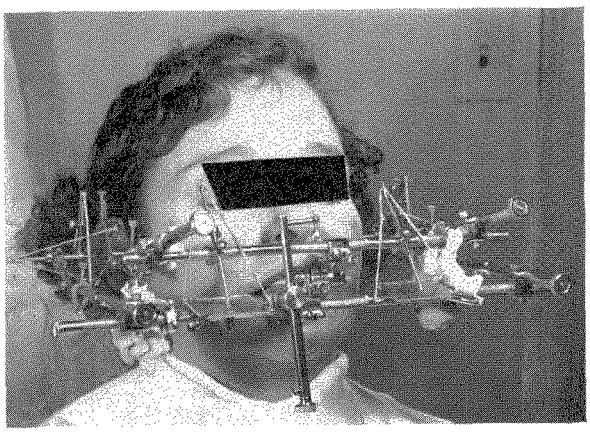


Fig. 1005. The gnathograph was attached to the clutches that were cemented to the teeth. The records of the mandibular movements were made.

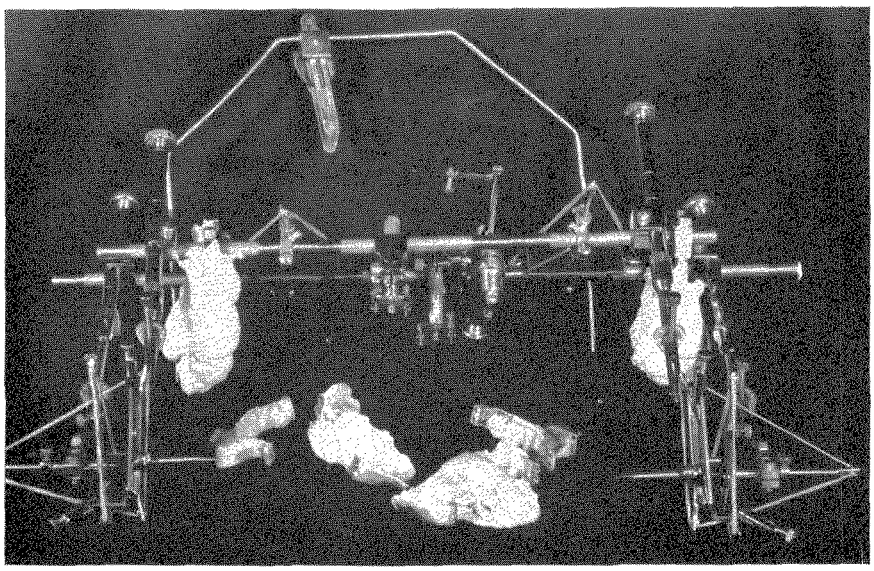


Fig. 1006. The gnathograph was removed from the mouth and will now be assembled, first upon the mounting frame and then on the gnathoscope.

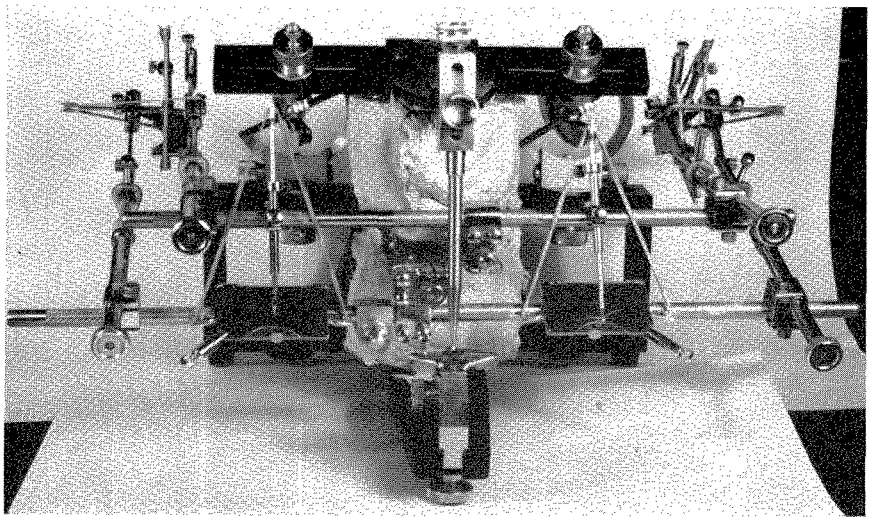


Fig. 1007. The gnathograph is shown here attached to the gnathoscope. The various movements that the patient recorded will be imitated by adjusting the mechanism of the gnathoscope until it is able to duplicate the movements that were made by the patient and recorded by means of the gnathograph. Once the controls have been set, they are never changed.

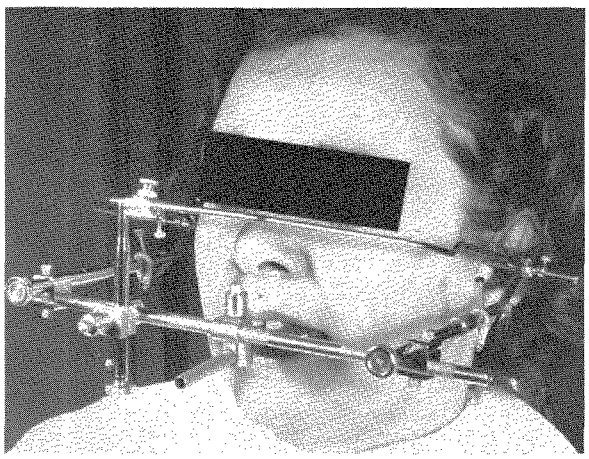


Fig. 1008. After the preparations were completed and the copper-plated dies constructed, the final work is proceeded with. Here a face-bow and an axis orbital plane are being recorded. The points in which the theoretical transverse hinge from the sides of the face have been tattooed as has been the point on the right side of the nose to which the axis orbital indicator arrow points.

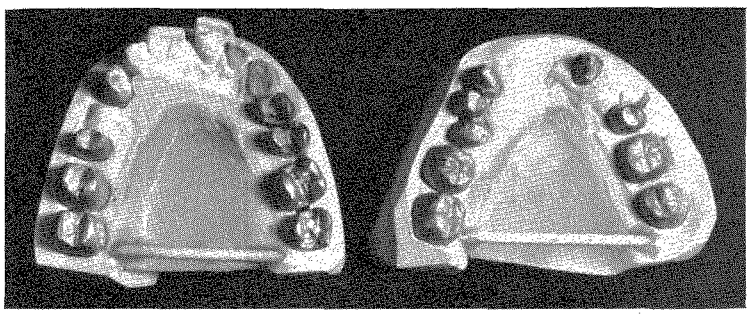


Fig. 1009. These are the work casts with the dies. They are ready to be attached to the gnathoscope by means of the records shown in Fig. 1008, in addition to a wax hinge record.

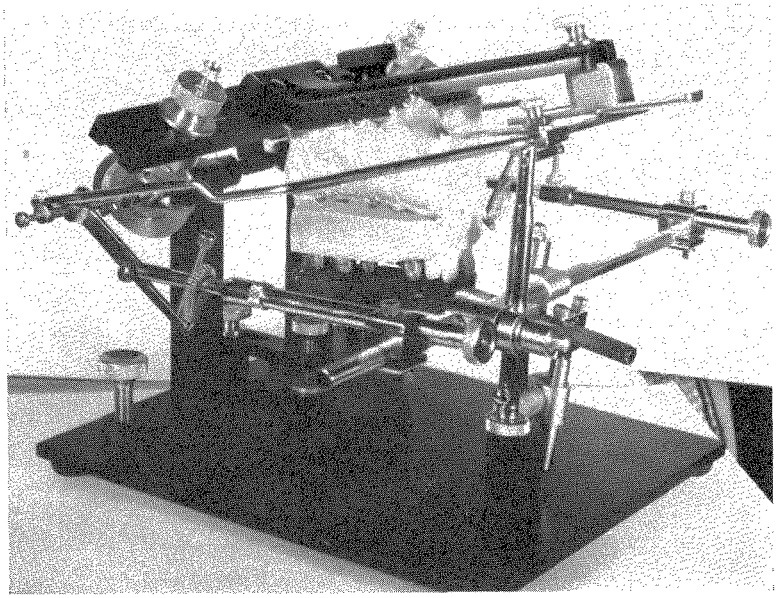


Fig. 1010. The upper cast has been attached to the upper frame of the gnathoscope. This was done on the mounting frame, as shown here. The upper frame will now be removed from the mounting frame, and the lower half of the gnathoscope will be related to it. Then the lower cast will be related to it by means of a wax hinge record.

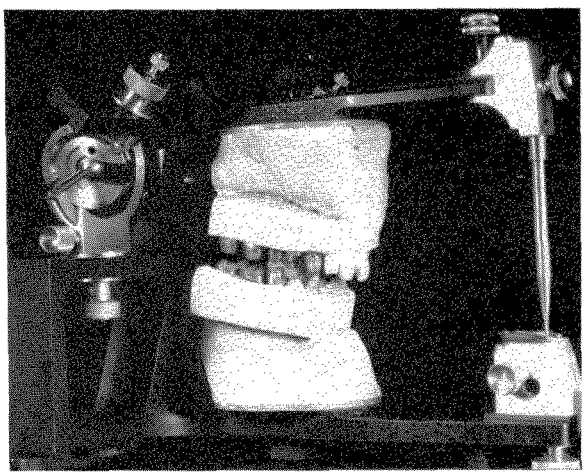


Fig. 1011. The work casts are shown here related to each other on the gnathoscope. Now the wax-up will be coordinated, and the cast crowns will be constructed.

Fig. 1012. The castings have been completed. They are shown here on the articulator. They are ready for their first try-in in the mouth.

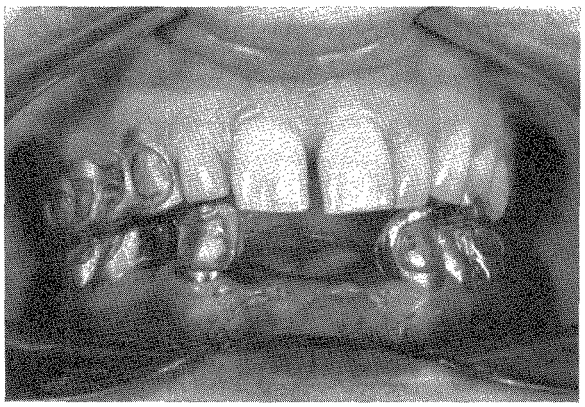


Fig. 1013. First try-in of the final cast crowns. Centric relation and vertical dimension are checked. Cervical fit is checked with radiographs. Then, new hinge wax records, face-bow, axis orbital plane, and upper and lower plaster impressions are taken. These are for making new work casts and mounting them on the gnathoscope.

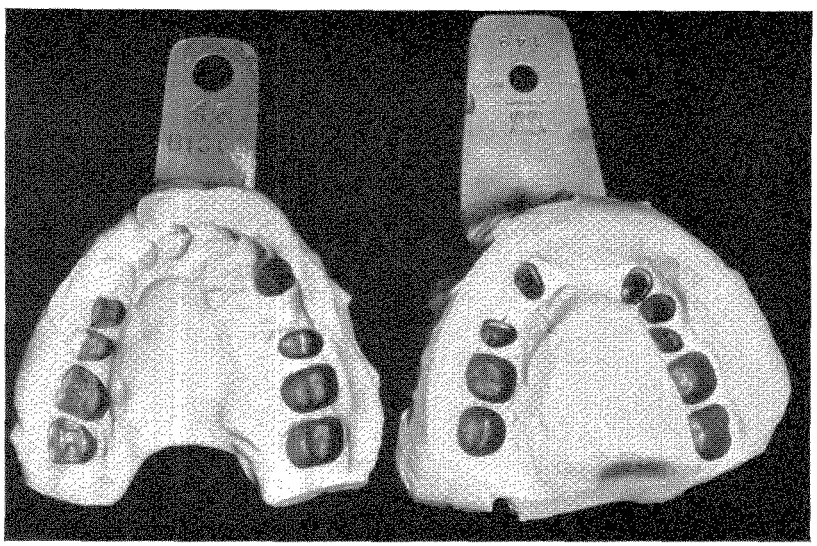


Fig. 1014. These plaster impressions with the cast crowns inside will be poured in stone to make new work casts. These casts will be mounted upon the gnathoscope, and the reconstruction will be completed.

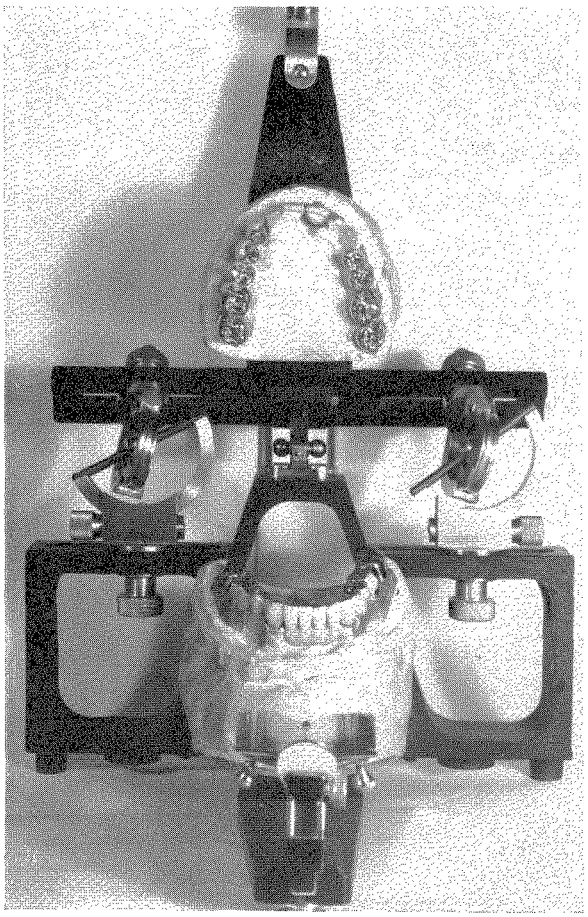


Fig. 1015. The completed prosthesis is shown here just prior to its insertion in the mouth. The lower four incisors were replaced by means of a small removable partial denture. The upper castings are individual ones on the left side but splinted together on the right side where a first bicuspid has been replaced. The lower right posterior castings were splinted together. The lower left posterior castings were first inserted individually, but within two months they were splinted together.

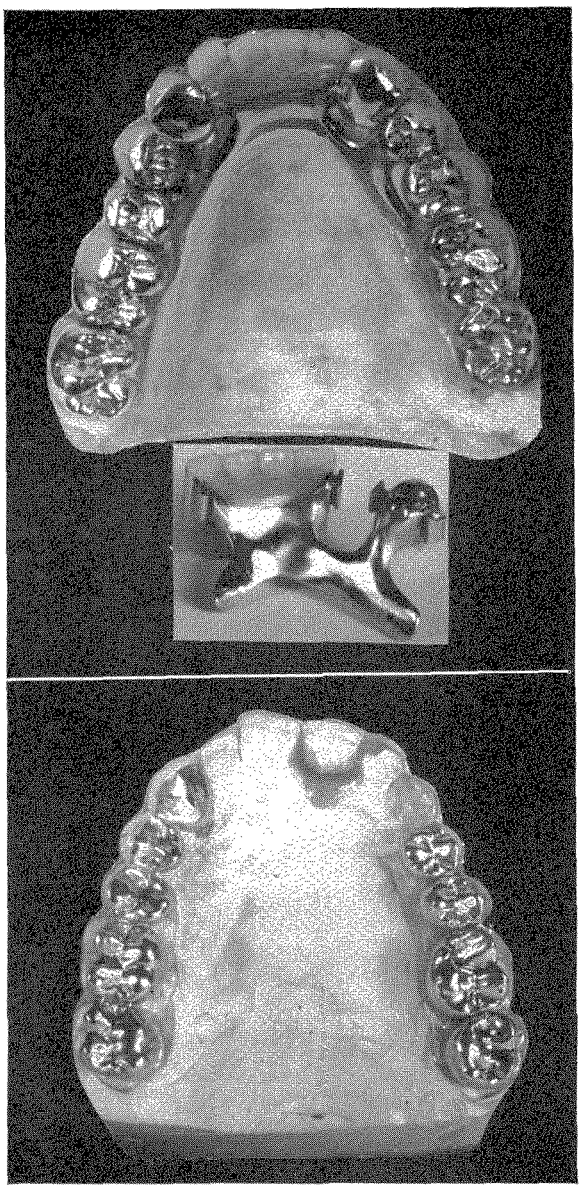


Fig. 1016. Occlusal views of the upper and lower completed prosthesis. The upper five anterior teeth were not yet completed. A close-up of the lower removable partial denture is shown at the bottom of the lower cast.

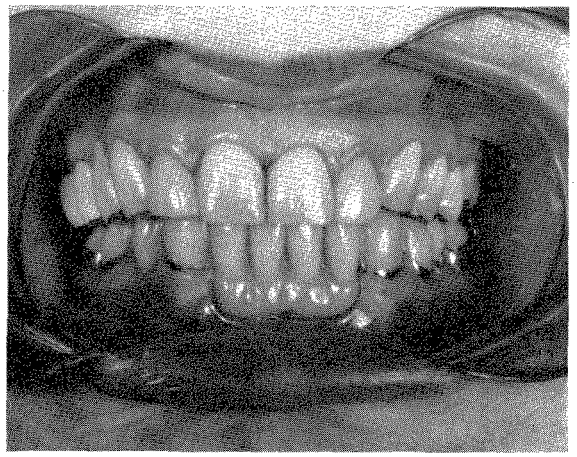
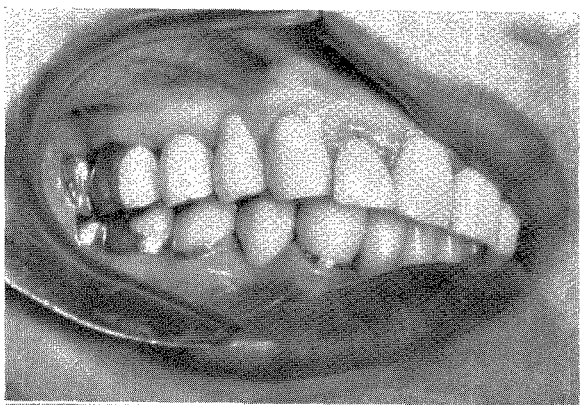


Fig. 1017. The completed work was inserted in February, 1951. Porcelain jacket crowns covered the upper lateral incisors. This is a front view of the completed case.

A



B

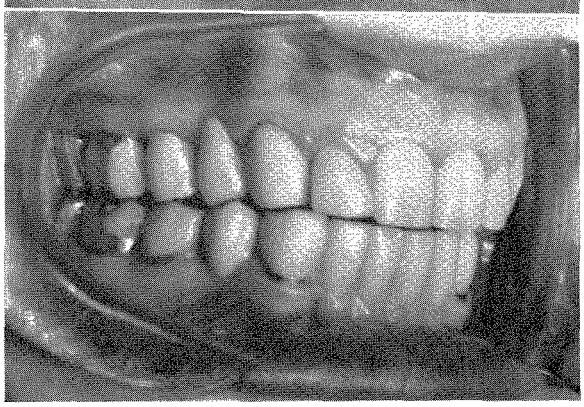
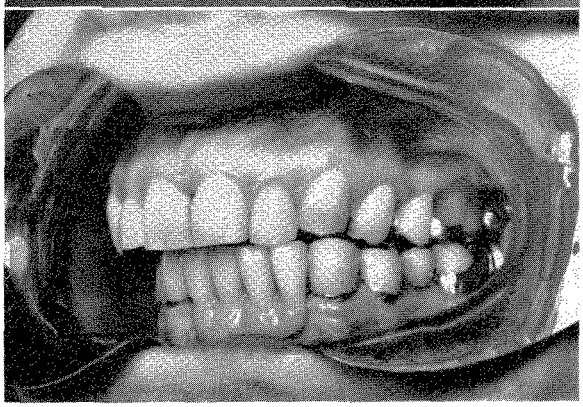


Fig. 1018. A, The right-side view of the completed case—centric occlusion. **B,** The right-side view of the completed case—working bite.

A



B

Fig. 1019. A, The left-side view of the completed work—centric occlusion. **B,** The left-side view of the completed work—working bite.

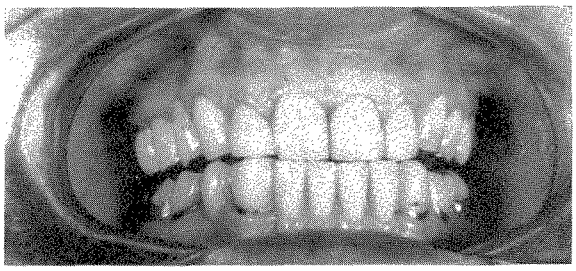


Fig. 1020. Completed case—protrusive bite. Compare this with Fig. 1000, **B**, to observe how the grossly irregular occlusal plane was straightened out in the final work and how the large separation between the upper central incisors was corrected by moving the central incisors together and placing porcelain jacket crowns on the lateral incisors.

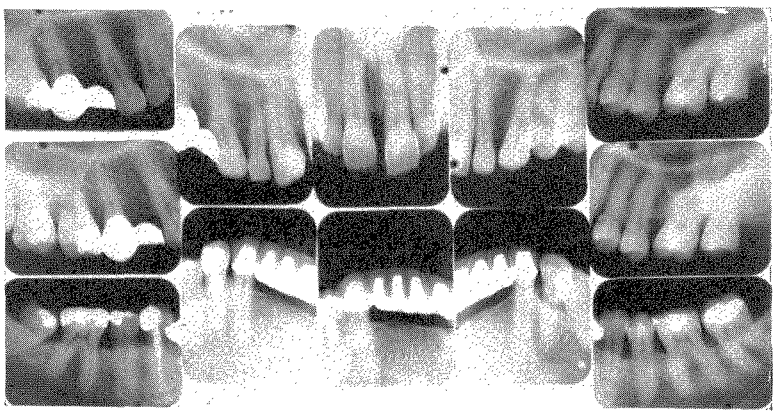


Fig. 1021. Roentgenograms taken before the work was started. These were taken in June, 1950

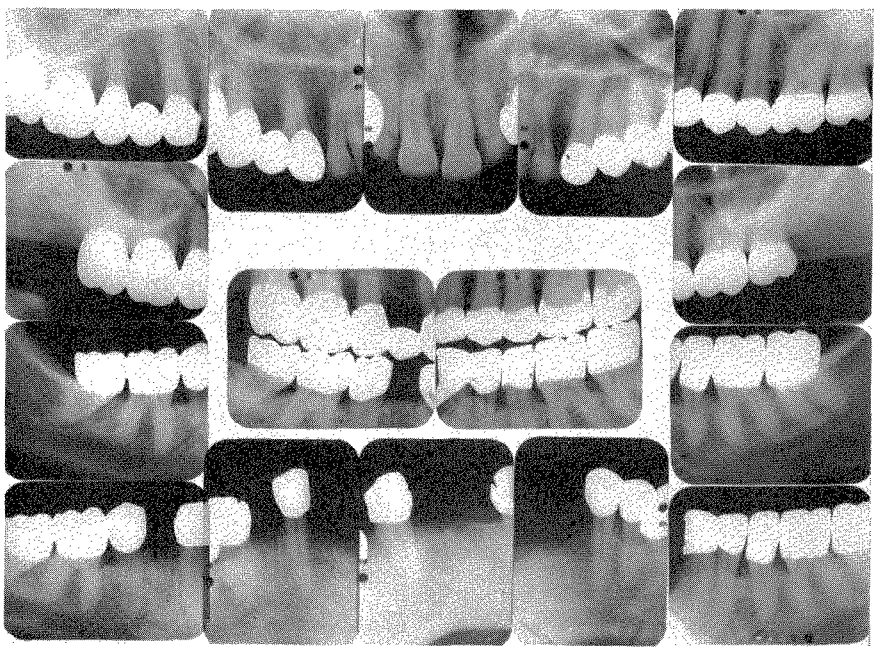


Fig. 1022. Roentgenograms taken when the work was completed. These were taken in March, 1951. The lower left second bicuspid and the first and second molar crowns had not yet been splinted together, nor were the upper central incisors completely brought together.

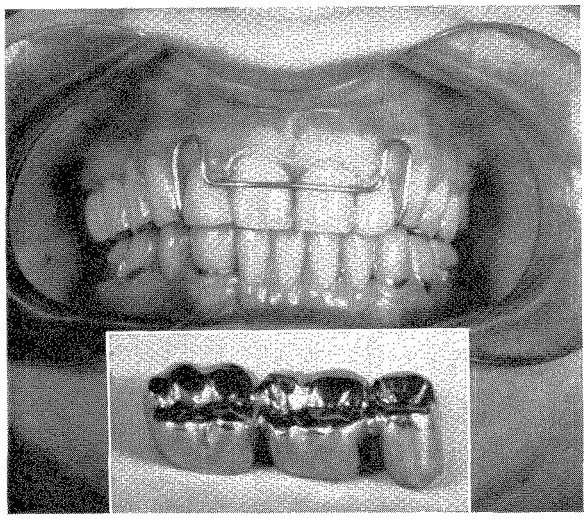


Fig. 1023. This retaining appliance was worn every night for one and one half years. After that the upper anterior teeth were self-retentive. The lower left posterior splint is shown in the foreground. These crowns were first inserted individually but later were removed and soldered.

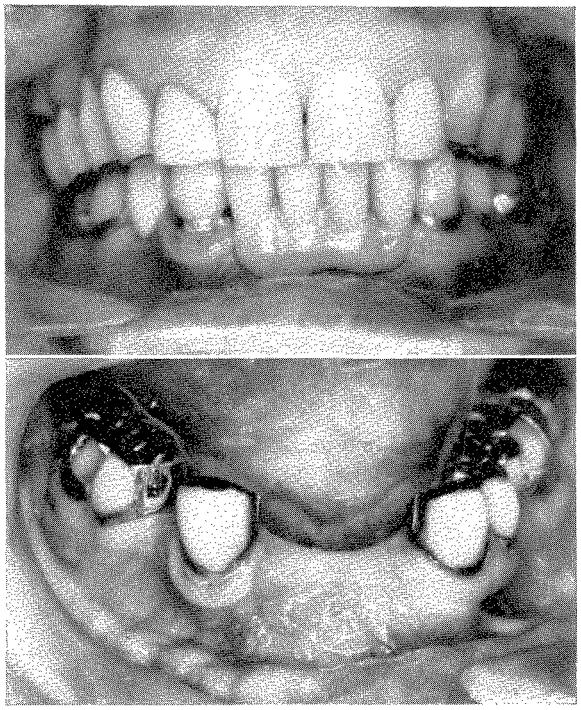


Fig. 1024. The mouth as it looked in August, 1960, with and without the lower bridge, nearly ten years after completion. The patient was 48 years old when these photographs were taken.

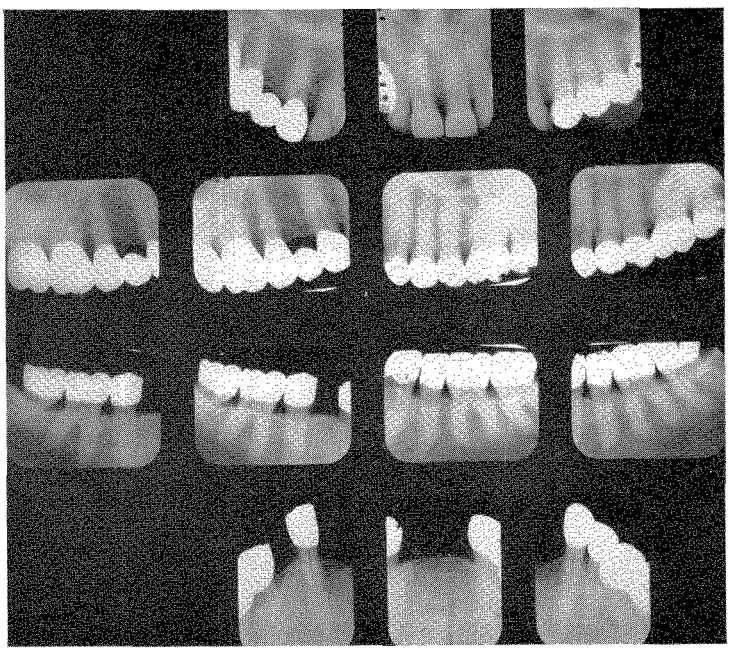


Fig. 1025. Roentgenograms taken in August, 1960.

performed, and radiographs were taken at regular intervals. No other treatment was necessary. The last roentgenograms were taken in 1960, just ten years after the work was completed. At the time of writing she was 49 years old. (Figs. 1000 to 1025.)

FURTHER ANALYSES OF DEEP VERTICAL OVERBITE CASES

Patients who present deep vertical overbites or large horizontal overjets and occlusions that must be rehabilitated present many problems that at times discourage the most optimistic operators. As a rule the anteroposterior occlusal curve is steep and may be different on either side. The transverse curve may also need correction. The teeth may be crowded or spaced, and their numbers may be considerably reduced.

In diagnosis, the mouth should be regarded as a single unit. There are times when compromises must be made because of limitations to treatment. The end results should possess reasonable stability, pleasing esthetics, and adequate function. These results should be accomplished with a minimum of damage to the oral tissues and should have reasonable longevity—otherwise the difficulties encountered are not commensurate to the great effort expended.

WHY PEOPLE WISH TO RETAIN NATURAL TEETH

In many cases the maintenance of the natural teeth, even if for a short time, may have emphatic psychosomatic overtones. This being so, there are many patients who cannot be told in the usual casual, offhand, and arbitrary manner to have all their teeth removed. The following reasons have been given as to why average people wish to retain their teeth: (1) loss of teeth connotes growing old, (2) desire for maintenance of integrity of the body, (3) maintenance of esthetics, (4) shame, (5) repugnance toward wearing full dentures, and (6) vocational activities.* The loss of all the teeth can result in deep psychological insult.

RETENTION OF A FEW REMAINING TEETH

Based upon sound treatment, a plan for the keeping of only a few remaining teeth may be effective in supporting a removable partial denture for several years. Although it will be conceded that this is not for a lifetime, still the patient may obtain better function and be spared the psychological injury that the wearing of full dentures may cause. The main condition that should be imposed when teeth with guarded prognosis are retained is that the patients be made aware of this and that they share in the responsibility. The object of dentistry is to retain as many teeth as possible when they can be treated favorably and when their expected longevity can be extended far into the future. But it may be equally good dentistry to achieve shorter term objectives for certain patients. This also provides beneficial therapy and is especially effective when dealing with the aged.

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*Bloom, Jack: Diseases of the gums, M. Sc. **8**:513, 1960.

Blind adherence to a fixed rule for retention is not wise nor helpful for the patient in cases in which the remaining teeth are definitely infected or include several whose prognosis is hopeless. These teeth should be sacrificed at the start of treatment if their retention will endanger the final fixed or removable partial dentures. In these cases, full dentures are still not being resorted to. For those patients who have no fear of wearing full dentures there is no problem.

Case 2

Present Condition

In June, 1958, a middle-aged woman presented herself for treatment. Her occlusion had completely collapsed. A deep vertical overbite was present. The teeth were tipped, rotated, spaced, extruded, and generally in very poor condition. Eighteen teeth were missing. The removable partial dentures that she wore served to perpetuate further her faulty occlusion and were contributing to the ultimate destruction of her remaining teeth. The lower anterior teeth were abraded, and the upper anterior teeth were covered with veneer crowns. The upper right molar and lower right bicuspid had extruded and erupted beyond their respective occlusal planes, creating an undesirable locking. The unsightly appearance further served to embarrass the patient. The periodontal tissues were weak, especially around the upper molar and cuspids. The pocket associated with the upper left cuspid was deep, and the tooth was mobile.

Guarded prognosis as to longevity

Although the patient was aware that her oral condition was almost hopeless, she still desired, if at all possible, to avoid complete dentures. The dentist's duty was to tell her the facts, namely, that in view of the questionable prognosis of remaining teeth, the life expectancy of the reconstructed mouth could not be predicted. The safer course would be to extract what remained and to insert full dentures. This would consume less time, would be less enervating to both patient and dentist, and would be a great deal less expensive. This was explained fully in verbal consultation and also by letter. The patient was asked to sign and return one copy of the letter. She was quite willing to comply with this request as long as she could avoid full dentures, if only for a short time. The psychological overtone could hardly have been overlooked.

Difficulties encountered in treatment planning

This mouth was so mutilated that even after the most careful study it was impossible to establish a definite plan of treatment. It was difficult to visualize what this occlusion resembled before the mutilation took place because it had taken years to produce the gradual changes that had now become a permanent part of her dentofacial complex. The interocclusal relationship that was observed at the initial examination was Nature's attempt to establish some sort of equilibrium and to combat the pathological and traumatic forces that were attempting to destroy the teeth. These noxious influences had remolded the entire occlusal

pattern and had produced the gross distortion that the occlusion now presented, yet it was obvious that to subject this organ to the totally different and sudden change made necessary by total reintegration would also be attended by many dangers.

It might also have been possible that the neuromuscular mechanism had been responsible for the great closure of the bite. This had been demonstrated in a similar case reported on pp. 376 to 393, Figs. 799 to 841. If this were so, then the entire disintegration of the mouth and the subsequent reduction of the vertical dimension were due to causes that are not completely understood, and any increase of the present vertical dimension would result in a relapse to the former vertical dimension, with fatal consequences to the remaining teeth. Yet these were the chances that had to be taken if oral reintegration was to be considered.

First phase of treatment

Records were first taken in June, 1958, although the actual work was not started until October. The first temporary work consisted in preparing the teeth and inserting quick-cure acrylic resin crowns or splints. This work was completed by the end of October. The bite was not changed.

Providing a prescription: By this time the future prescription was being crystallized. The right upper molar would have to be removed, and the vertical dimension would have to be increased in order to be able to insert the final prosthesis. The lower right bicuspid would require drastic reduction of its vertical height, even if this meant the removal of its pulp. The upper and lower teeth, with the exception of the lower left second molar, would all have to be splinted. The periodontal tissues would have to receive special attention. The upper and lower missing teeth would be restored by two removable partial dentures retained by precision attachments. A lingual platform would be placed upon the upper anterior splint to definitely engage the lower incisors. Otherwise, with the increase of the vertical dimension, a space would be created.

Second phase of treatment

The second transitional work was started the latter part of October. Upper and lower rubber impressions, together with a wax centric record, were taken. Work casts were poured and attached to a simple laboratory articulator by means of the wax centric record. When the wax record was removed, a large horizontal overjet, due to the increased vertical dimension, was observed. The vertical dimension was increased 5 mm., and the entire occlusion was coordinated in wax at this newly established height.

The second transitional work was inserted on Nov. 10, 1958. Slight adjustments were made in the interocclusal relationship. New wax records were taken, and new work casts were made from plaster impressions. These were attached to the articulator, and removable partial dentures were constructed. The try-in took place on Nov. 26, 1958. A lingual platform on the upper anterior fixed partial denture served to make positive contact with the lower anterior teeth.

On Dec. 22, 1958, the upper right molar was removed. It had not been removed previously because it served to support the old removable partial denture and was

in contact with the old lower lingual bar. On Dec. 24, 1958, the second transitional work was inserted. Postinsertion adjustments were made until Jan. 15, 1959. The bone and soft tissue resorption in the area of the extracted molar made it necessary to reline the temporary removable partial denture with acrylic resin material. The patient accommodated to the new transitional partial dentures and the increase in vertical dimension without too much difficulty. The new prosthesis served to provide a prescription for the final work. The requirement was that it be worn for a period of time and that it be comfortable. It so happened that the patient went south and was not seen again until the end of May, 1959. She visited a local dentist for prophylaxis but was otherwise pleasantly surprised at the absence of the discomfort to which she had continuously been subjected with her former prostheses.

Final phase of treatment

On May 25, 1959, the last phase was started, and the natural teeth were finally prepared. Low-fusing metal transfers were made for all the copper-plated dies. The bite height, which the transitional work presented, was to be maintained in the final work.

On June 9, 1959, the upper and lower transfers were inserted. The vertical dimension was checked carefully, and the centric bite was adjusted. Finally, the upper transfers were soldered together with low-fusing metal directly in the mouth. The same was done with the lower ones. A centric wax record was taken.

Upper and lower alginate impressions were taken. The transfers came out with the removal of the impressions. New work casts were made, and these were mounted upon a simple laboratory articulator. The wax-up was now made at one time in order to establish incisal guidance and vertical dimension. These were to be the crowns for the final work. After they were cast, upper and lower acrylic bite plates were made with which to take the bite when the anterior and posterior final crowns were tried in. The final castings were fitted on June 23, 1959. The vertical dimension of the transitional work was measured carefully before removal. The final castings were made to conform to that vertical dimension. Roentgenograms were taken to check cervical fit. The centric bite was adjusted in the mouth. The upper and lower bite plates were inserted to aid in establishing the vertical dimension and the centric bite. Upper and lower plaster impressions were taken.

The crowns were now soldered together, and the missing teeth were inserted. These upper and lower fixed splints were tried in on July 1, 1959. The vertical dimension and centric relation were again checked. Quick-cure acrylic was added to the incisal tips of the lower castings to create a definite occlusal stop because of the large horizontal overjet. A face-bow record and full upper and lower plaster impressions were taken. New work casts were made. The upper cast was attached to the Hanau Model H articulator by means of the face-bow record. The lower cast was related to the upper one by means of the quick-cure plastic applied directly in the mouth on the lower splint. Upper and lower removable partial dentures were constructed. Precision attachments were used as the retainers. The upper right and left second molars were omitted to decrease function because of the weakness of the remaining upper teeth. The lower right central and lateral

incisors, the cuspid, and the first bicuspid dummies were soldered to the right second bicuspid and attached to the left central incisor by means of a precision attachment. Two cantilever first bicuspid dummies were soldered to the upper splint and contained the precision attachments. The upper anterior crowns were made of platinum, to which porcelain was bonded. Metal lingual surfaces were used in order not to abrade the lower acrylic veneers as a full upper porcelain bonded-to-metal crown would do. The removable partial dentures had gold spurs extending buccally in order to facilitate removal.

The final work was tried in on July 23, 1959. The centric bite was adjusted, and roentgenograms were taken. Check wax records were made. The casts were again mounted and checked for accuracy of centric relation. The final work was inserted on Aug. 11, 1959, about ten months after starting.

Postinsertion care

In November, 1960, it was observed that the precision attachment, which connected the single right second bicuspid to the right lateral dummy incisor, moved too freely in the female box. This was traumatic to the bicuspid. The attachment had been placed in the right lateral dummy in case the right second bicuspid would have to be removed at a later date. In that event, the four teeth that were now a part of the fixed splint could be added to the lower lingual bar. In order to make this section more rigid, a stainless steel pin was inserted from the labial surface. This could be removed later.

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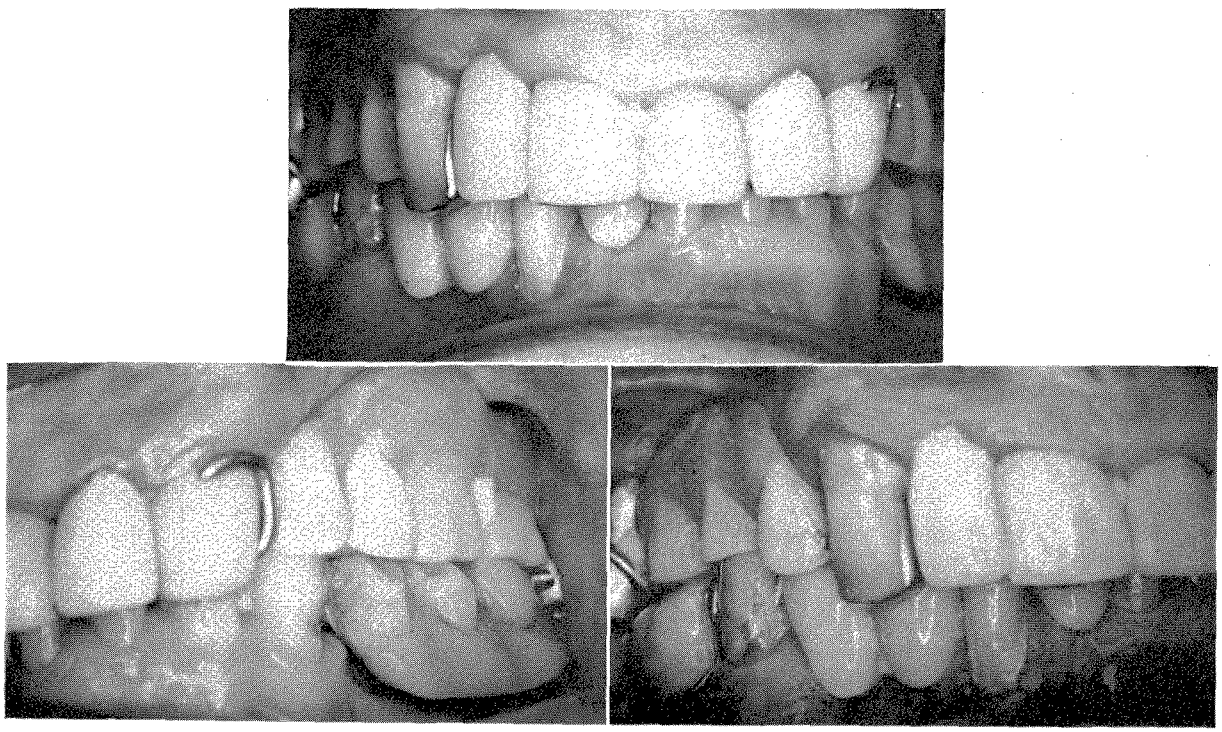

Fig. 1026. A middle-aged woman. The mouth was in an advanced state of disintegration. The bite had collapsed. These photographs were taken in June, 1958. (Figs. 1026 to 1051 are of the same case.)

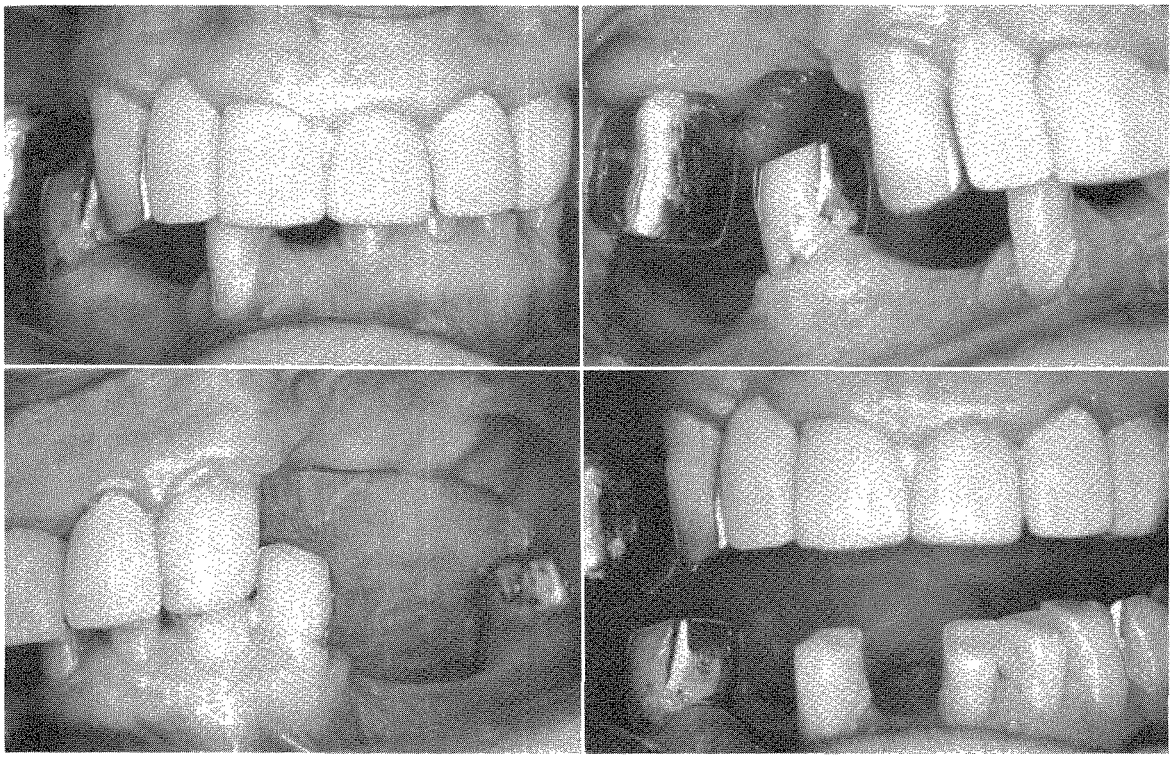

Fig. 1027. The same as Fig. 1026 except that the removable partial dentures had been removed.

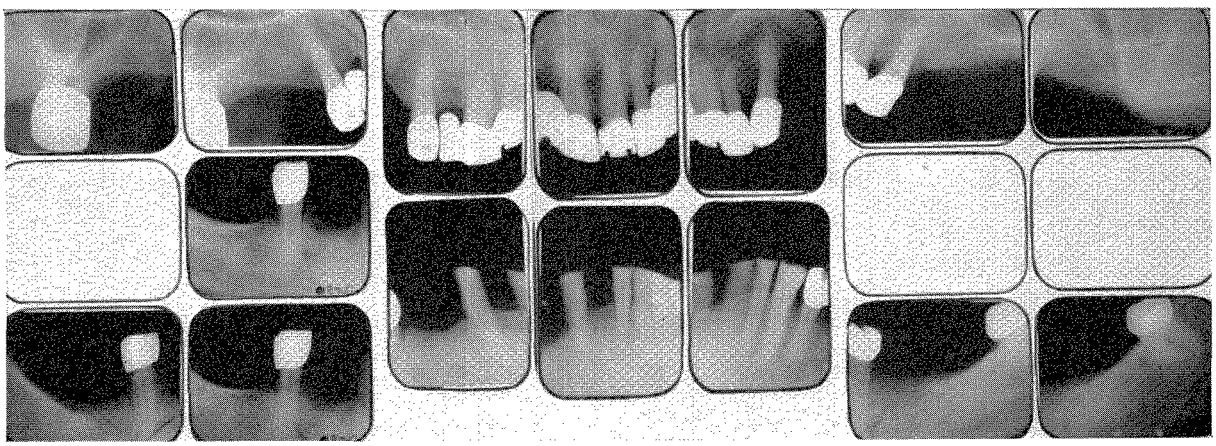

Fig. 1028. Roentgenograms taken at the start of treatment in June, 1958.

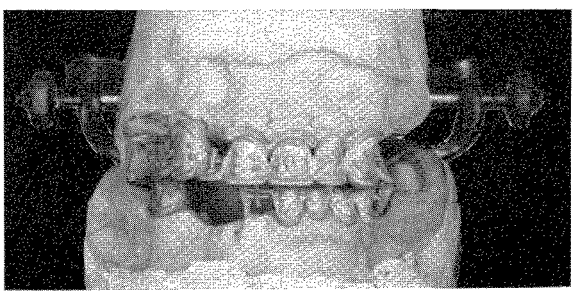

Fig. 1029. Construction of the transitional work. This increased the vertical dimension and placed the mandible in its correct centric relation position. This was started Oct. 8, 1958. The individual splints were cast in one piece.

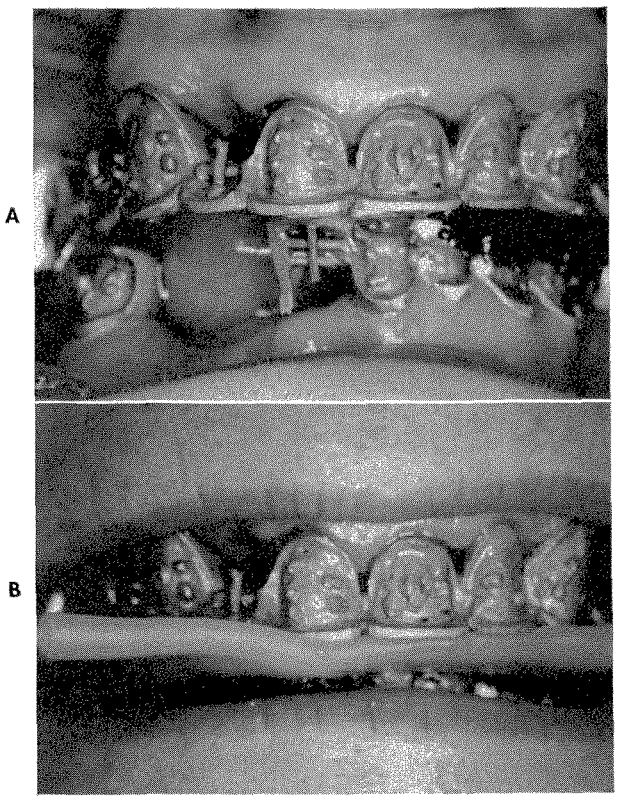

Fig. 1030. A, Try-in of the transitional work. This took place on Nov. 10, 1958. Centric relation and vertical height were the important dimensions to be attained. **B,** A centric wax relational record with the mandible in retrusion was taken. New impressions were taken, and new work casts were constructed. The removable work was proceeded with.

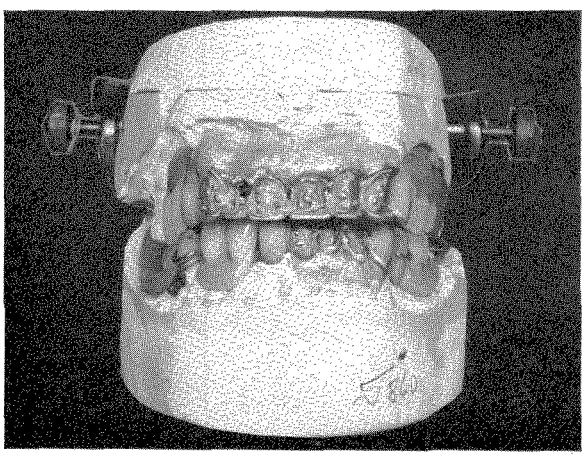

Fig. 1031. The fixed and removable transitional partial dentures are ready for the final try-in to complete the transitional work.

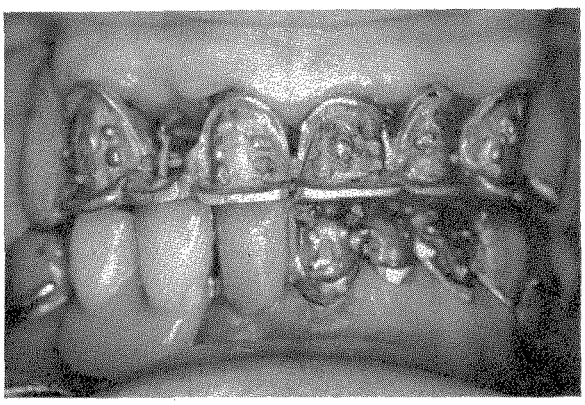

Fig. 1032. The final try-in of the transitional work. This took place Nov. 22, 1958.

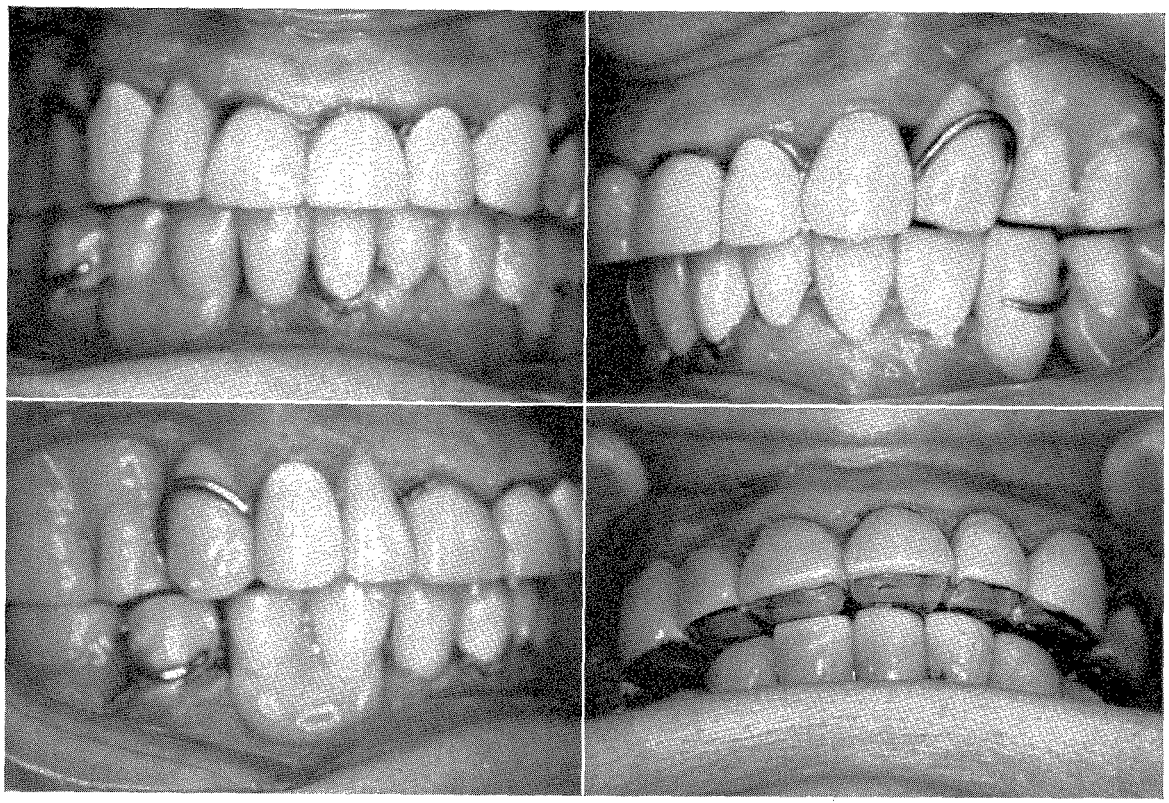

Fig. 1033. Four views of the completed transitional work in the mouth. The large horizontal overjet is shown in the photograph on the lower right. Not only did this transitional work protect the teeth but it also provided the prescription for the final work provided that its measurements were correct and were within the limits of toleration by the soft and hard structures of the mouth and the adjoining tissues. This phase was completed in December, 1958.

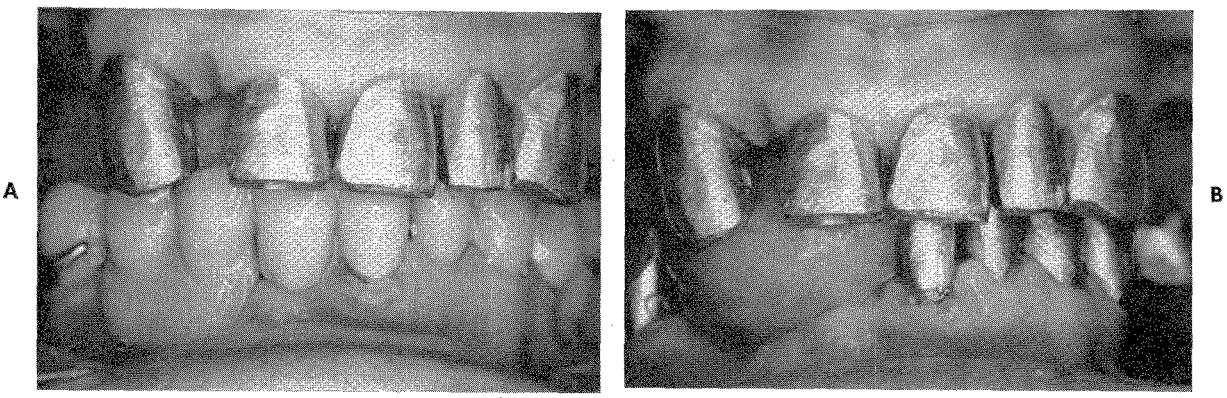

Fig. 1034. A, In June, 1959, the final phase was started. Low-fusing metal transfers were inserted in the mouth. The lower transitional work was kept in place at first to judge the vertical dimension. The object was to retain the same vertical dimension of the transitional work in the final work. **B,** Then the lower transitional work was replaced by the low-fusing metal transfers as shown here. The vertical dimension of the temporary work was duplicated in this manner. Centric relation was also attained. Upper and lower plaster impressions were taken, and wax records were made. New work casts were to be constructed, and the final castings were to be made.

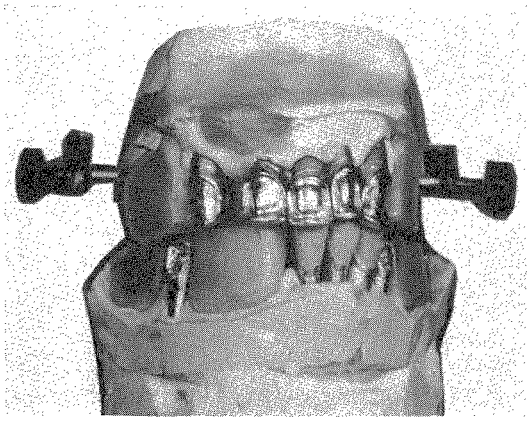

Fig. 1035. These are the final castings and the bite plates that will be used in obtaining the records for the next stage of the reconstruction. The upper castings are made of platinum to which porcelain will be bonded. The lower castings are made of gold.

Fig. 1036. The final castings and bite plates have been inserted in the mouth, and wax records are being taken with them.

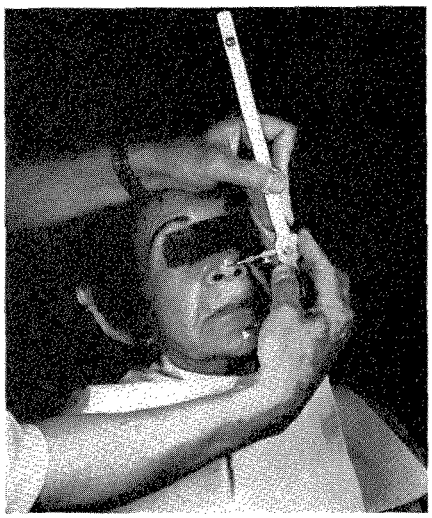

Fig. 1037. The vertical dimension was measured by various methods. One is shown in this illustration. Every attempt was made to copy the vertical dimension of the transitional work which had been inserted in December, 1958, and worn until June, 1959. It had been well tolerated by the tissues.

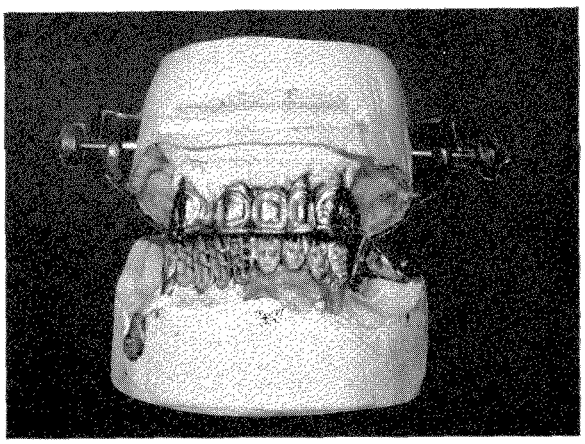

Fig. 1038. The fixed castings were all soldered together to form the anterior splints. They are seen here just prior to their try-ins. New records will again be taken, and new work casts will be made on which the final removable partial dentures will be constructed.

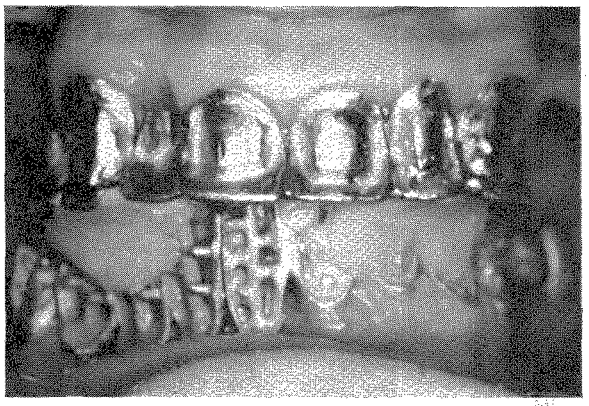

Fig. 1039. The castings that have been splinted together are being tried in the mouth. Quick-cure plastic has been added to provide more definite stops. This is seen on the lower splint. New records and plaster impressions will be taken on which the final work will be completed.

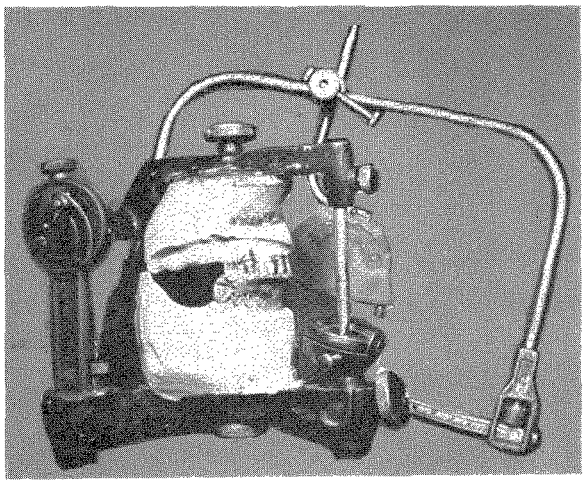

Fig. 1040. At this stage a semiadaptable articulator was used, namely, the Hanau Model H. The new work casts were attached to it by means of new wax records and the face-bow. The final removable partial dentures will now be completed.

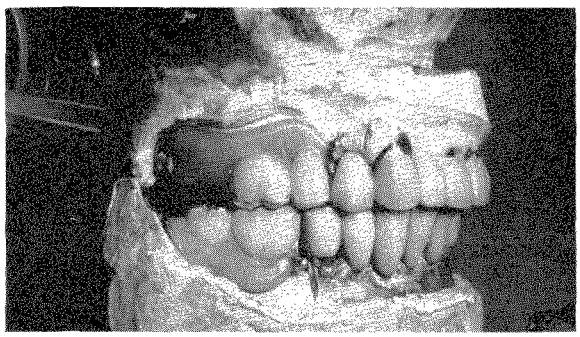

Fig. 1041. The final stage is shown here. Another try-in was made for any further corrections before the prostheses were completed. The plastic on the lower teeth is only temporary. There is white wax on the upper teeth.

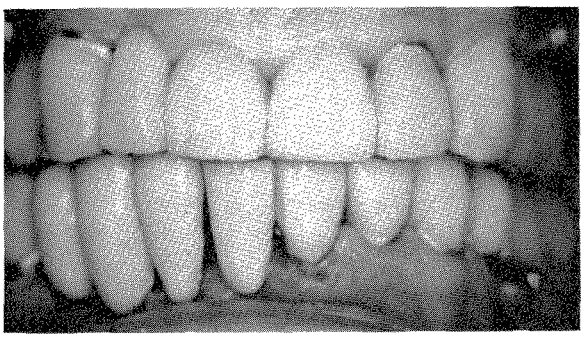

Fig. 1042. The final try-in is shown here. Once again centric relation is checked, as are the mandibular excentric positions and vertical dimension. A thin wax checkbite record is also taken in case of the necessity of remounting on the articulator.

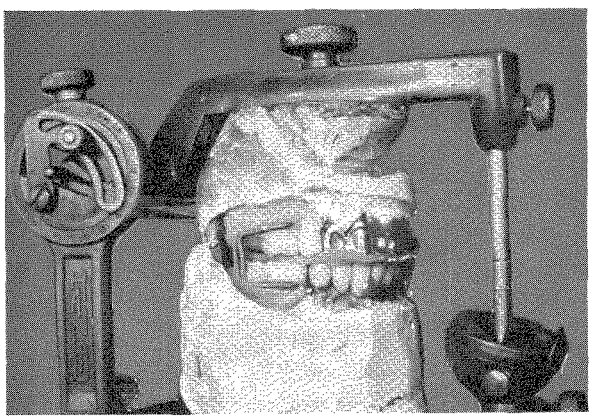

Fig. 1043. As the final check the lower cast was remounted as shown here. The occlusion was again coordinated for slight premature or initial contacts, and the work was completed. Porcelain was bonded to the upper platinum crowns. Plastic was veneered to the lower gold crowns.

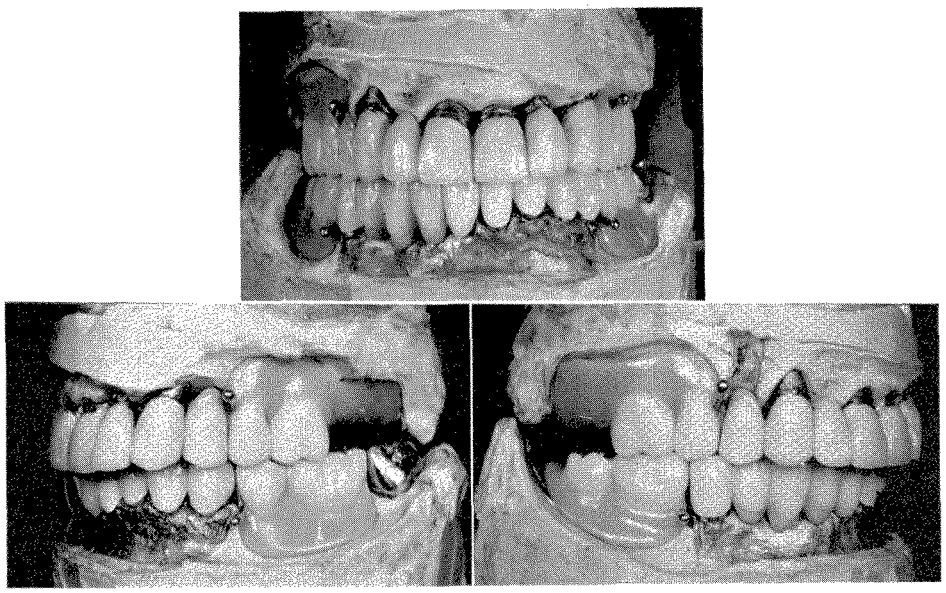

Fig. 1044. Three views of the completed work on the articulator. The upper posterior teeth were reduced in number in order to eliminate the possibility of excessive function because of weakness of structures. The gold knobs that project on either side from the removable partial dentures help the patient remove the dentures and also make it possible to remove them in a line that is parallel to the direction of the insertion of the precision attachments. This lessens the trauma on the abutment teeth.

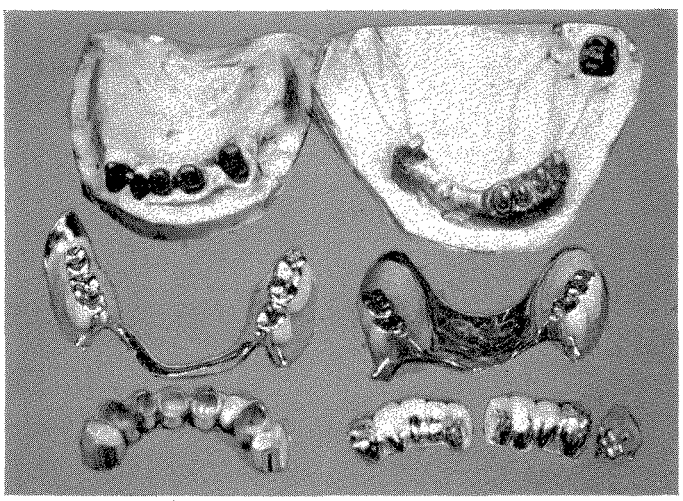

Fig. 1045. The fixed and removable prosthesis has been removed from the casts. The lower fixed parts are in two sections anteriorly. These are joined by a precision attachment just mesial to the right central incisor throw-off. The female precision attachment in the throw-off is parallel to the remaining lower female attachments. This is to provide for a degree of safety in case the right bicuspid is lost and the lower partial denture must be repaired. The upper anterior teeth have lingual surfaces of platinum. This will provide for less abrasion to the lower acrylic tips than would be the case if the fused porcelain of the upper crowns had covered the lingual as well as the labial surfaces. The gold occlusal surfaces on the removable partial dentures provide for equal wear. The tissue coverage is extensive, and the frames of the removable prostheses are rigid.

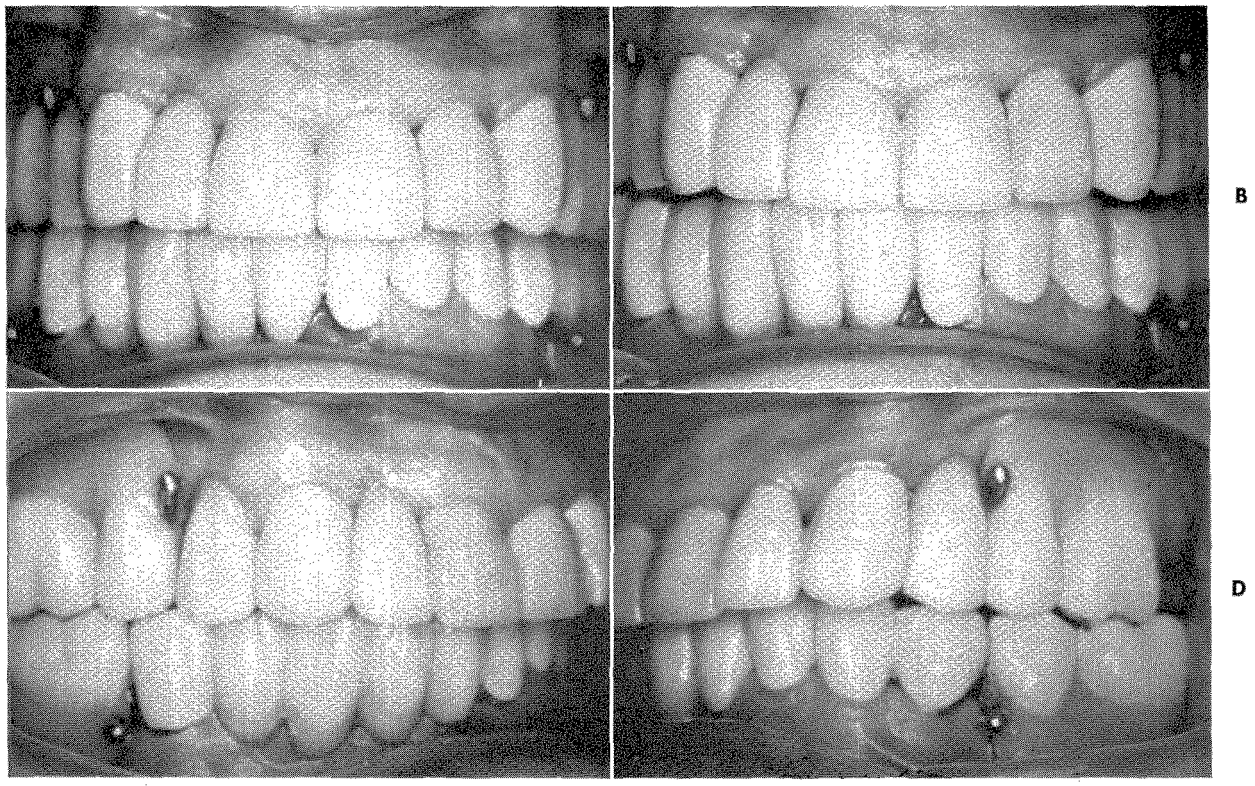

Fig. 1046. The final work was inserted on Aug. 11, 1959. This was ten months after starting. Four views of the completed work are shown here. **A,** Front view, centric bite. **B,** Front view, protrusive bite. **C,** Right-side view, centric bite. **D,** Left-side view, centric bite.

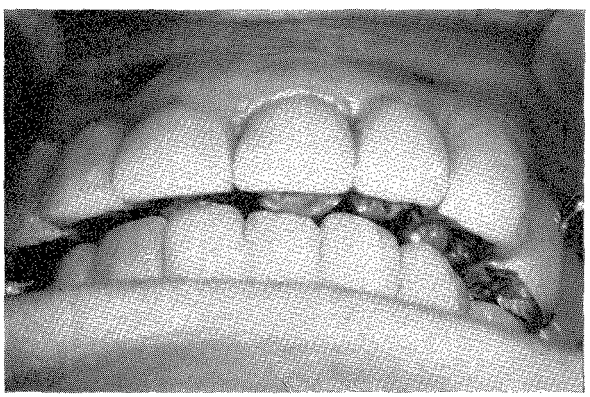

Fig. 1047. A lingual platform extends from the upper anterior teeth. This provides contact for the lower incisors, which would otherwise be impossible owing to the large horizontal overjet.

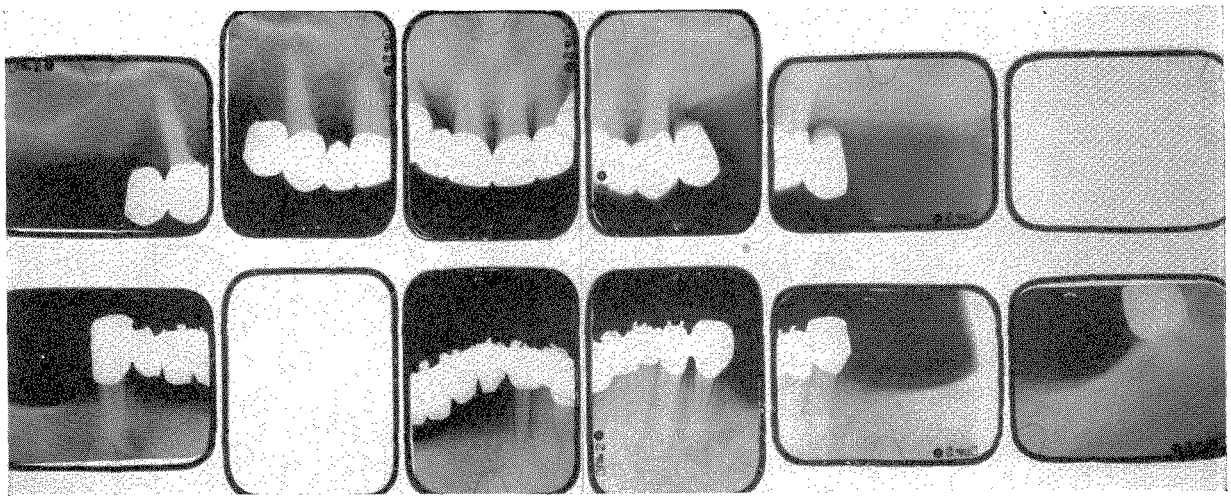

Fig. 1048. Roentgenograms taken after the work was completed. These were taken in August, 1959.

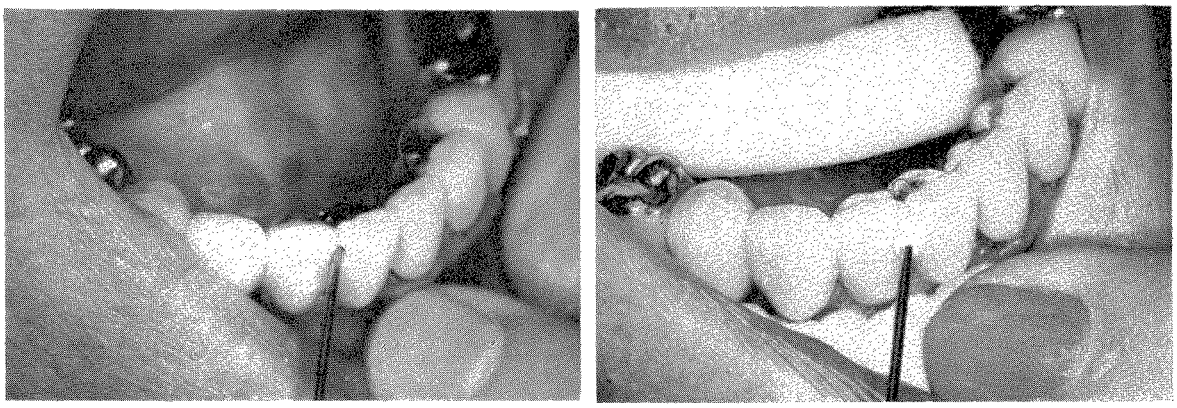

Fig. 1049. In November, 1960, clinical examination revealed excessive movement of the posterior right segment of the lower splint in the region of the precision attachment. A hole was drilled from the labial surface to engage the male precision attachment, and a stainless steel wire was inserted and cemented in place as shown in the two illustrations. This served to make the precision joint rigid. Otherwise the single right bicuspid would be jeopardized.

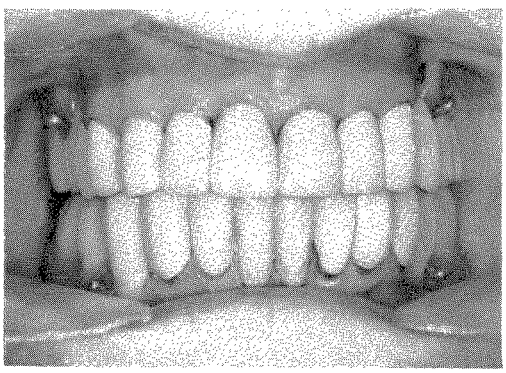

Fig. 1050. Anterior view of the mouth as of 1962.

Fig. 1051. Roentgenograms taken in July, 1963.

Summary

Excluding this, there were no postinsertion difficulties in the four years since completion at the time of this writing (September, 1963). The patient was very pleased with the outcome, including the esthetics. Her masticatory function was adequate. A comparison of the photographs of the mouth at the start and finish show what was accomplished. Although it is impossible to predict that the useful life of the work done would last for the entire lifetime of the patient, at least the patient felt that her original decision to retain her teeth was a wise one. If and when the time comes for insertion of full dentures, she will be better prepared mentally for them. In addition, the occlusion will now permit the insertion of full dentures much more readily than had this reintegration not been accomplished. (Figs. 1026 to 1051.)

CONTINUATION OF TREATMENT OF DEEP OVERBITES

Several cases of deep anterior vertical overbites have already been presented in this text, and a warning was given that these occlusions ordinarily should not be disturbed once the patient had attained adulthood unless there was some evidence of breakdown. Orthodontists are better able to cope with this type of malocclusion when children are involved, but much greater difficulties present themselves when adulthood is reached. Interfering with this type of bite in adults, without good cause, has created many serious problems that more than offset the limited relief produced for the patient. Unless there are pathological manifestations, these deep overbite cases should be left alone. In such cases usually the teeth give evidence of extensive abrasion that may also be accompanied by the exposure of pulps during the wearing away process.

In these examples, it is more likely that the pulp recedes as the abrasion takes place, filling the pulp chamber with calcarious material. In cases of extreme bite closure, as a result of abrasion, the oral cavity becomes smaller, and both deglutition and functional chewing are adversely affected. The loss of natural teeth that have held strategic positions and the failure to have them replaced have also

caused the distortion of normal arch contours and a closure of the bite. In the restoration of these mouths, an attempt should be made to restore normal arch form and correct interocclusal relationship. This usually includes the restoration of the vertical dimension. Occasionally, in cases in which the occlusion has deteriorated, a large free-way space is present. This makes it possible to use conformative dentistry or complete oral rehabilitation, depending upon the extent of the breakdown. Many patients with a deep overbite have already undergone oral rehabilitation with unhappy results. These unfortunate patients must again submit to further reconstruction procedures.

Case 3

Past history

In July, 1959, a 43-year-old man came for dental consultation. He presented a deep vertical overbite in closure. According to his history, his bite had been raised in 1945 when he was 29 years old. Lower posterior splints and upper crowns had been placed on his bicuspids and molars. These brought about an increase in his vertical dimension, making it impossible to contact his anterior teeth. No previous records were available apart from a few useless memories.

The patient stated that a short time after his front teeth were taken out of contact, he noticed that they had again contacted. This indicated that either the posterior teeth had been intruded, the anterior teeth extruded, or a combination of both had taken place to the extent of the increase in the vertical dimension. His medical history showed that he had a rare disease called Boeck's sarcoid (or sarcoidosis). This manifests itself as a swelling of various glands of the body. Its significance in his dental problem is unknown. He seemed otherwise healthy and active.

Present condition

The anterior upper and lower teeth suffered from abrasion. The roentgenograms revealed a nonvital lower right second bicuspid with an incomplete root filling but no postapical pathology. The upper left bicuspid and molar area revealed periodontal pockets. The temporomandibular joint roentgenograms showed small mandibular fossae and large condyles. When the mandible moved from rest to contact position, there was a superior posterior positioning of the condyles in the fossa.

Discussion

There was a possibility that in closure this mandible had been displaced posteriorly. If this proved true, it was probable that in the reconstruction it would be brought forward to a more favorable position.

An examination of the mouth and the study casts revealed that the midline had moved a full half of a lower incisor to the right. In the attempted repositioning, it was planned to bring the mandible forward and slightly to the left in order to obtain a more favorable interocclusal relationship. It has been stated previously

that repositioning in its true sense is an extremely difficult procedure. Although it may be possible to reorient the neuromuscular mechanism to new paths, this must be considered infrequent. The usual repositioning is accomplished when the mandible has been released from an incorrect position and is permitted to assume its correct position. This does not require the same degree of neuromuscular reorientation as the true repositioning. In this case it was hoped that there was a false distal positioning which, once released, would allow the mandible to come forward and to the right. This was only a conjecture.

Another consideration was the heavy facial musculature and the capacity of these masticatory and facial muscles to exert considerable pressure. This patient clenched and bruxed his teeth. There was no reason to believe that he would stop these pernicious habits when his occlusion had been reintegrated. There are some investigators* who believe that clenching and bruxing habits cease when the correct interocclusal relationship is attained. The numerical sampling of their research, however, has been too small to justify any accurate conclusions. It is safer not to count upon these injurious habits disappearing when the occlusion has been reconstructed.

Still another factor to be considered was that the posterior teeth had already been intruded after the vertical dimension had been increased in 1945. Another increase would further elongate the clinical crowns of these posterior teeth and therefore be undesirable. With due consideration to the above factors, the decision was made to increase the vertical dimension the smallest possible amount.

Chief complaint

The patient was concerned primarily with his appearance and secondarily with the abrasion of his front teeth. In order to comply with his wish for the best possible esthetics, some form of porcelain crowns would have to be made in order to cover the anterior teeth. This would in itself require an increased vertical dimension sufficient to permit the insertion of porcelain crowns without the fear of fracture. The alternate was not to cover the lower anterior teeth but simply to smooth out their sharp abraded edges while at the same time placing lingual pin ledges in the upper anterior teeth to the thickness of the slight increase of the vertical height. Both methods were discussed with the patient. He expressed keen disappointment at the suggestion that his front teeth would not have the esthetic benefit of porcelain jacket crowns, but he accepted the alternate decision on my advice. Even his present posterior gold crowns had been objectionable to him. Their occlusal surfaces had been flattened out either by bruxing or by the original flat anatomy which lacked anatomical detail. More probable was a combination of both causes.

First stage of rehabilitation

The actual work was started in September, 1959, with the removal of the posterior work. Old bridges were repaired and used as temporary ones. Quick-cure acrylic crowns were used to cover other prepared teeth. They were recemented

*Ramfjord, Sigurd P.: Dysfunctional T.M.J. and muscle pain, J. Pros. Dent. **11**:353-373, 1961.

with Opotow temporary cement. As the teeth of each one of the four posterior segments of the arch were prepared, a squash bite was taken against the opposing arch, and low-fusing metal transfers were constructed for the copper-plated dies. This was done until sixteen low-fusing metal transfers were completed. In the first stage, no attempt was made to increase the vertical dimension. This increase would take place in the second stage.

Second stage of transitional work—intrusion of posterior teeth

At the start of the second stage all the temporary work was removed. Only the anterior teeth held the original bite. The large posterior interocclusal space that was present when the anterior upper and lower teeth contacted clearly demonstrated the amount the bite had been raised in 1945. The intrusion of the posterior teeth together with the extrusion of the anterior teeth, or a combination of both as a result of the abnormal muscular pressures, silently testified to the violation of the original free-way space.

Constructing second transitional work, which was to incorporate prescription for final work

With all the posterior teeth uncovered, a hinge wax record was obtained with a 4 mm. bite opening. A protrusive wax record and a face-bow were also taken. The vertical dimension was measured carefully. Then the low-fusing metal transfers were inserted one by one until all sixteen posterior teeth were covered. Upper and lower alginate impressions were taken. The copper dies were placed in their respective transfers, and work casts were made. The transfers were removed, and the casts were mounted on the Hanau Model H articulator by means of the face-bow and the hinge wax record. The protrusive wax record served to set the sagittal condylar inclination, whereas the lateral postinclinations were set by the formula provided by the Hanau Manufacturing Co., namely:

$$\frac{\text{The condyle inclination}}{8} \text{ plus } 12 \text{ equals lateral recording}$$

When the wax hinge record was removed, it was observed immediately that the vertical dimension was excessive. Accordingly, it was lowered until the tips of the lower incisors from a lingual view were 2.5 mm. from the lingual gum tissue, behind the maxillary incisors.

Setting articulator for repositioning mandible

By placing steel disks, with the aid of sticky wax, in the anterior part of the left and right condylar slots on the articulator, and by having the left steel disk thicker than the right, the mandible was not only advanced but also moved toward the left. In the original evaluation, it had been decided to attempt to reposition the mandible in a forward direction because of the superior posterior positioning of the condyles in the mandibular fossae when the mandible closed from rest to contact position. The repositioning to the left was an attempt also to correct the

right midline deviation observed in the mouth and on the casts. Whether this was possible remained to be seen.

Eccentric occlusal records

With the articulator set, the entire posterior occlusion was waxed up at one time. The question that may be asked here is, "What eccentric occlusal records were obtained in order to set the articulator?" With the Hanau Model H articulator that was being used to construct the second transitional work, two wax centric bites, a protrusive bite, and a right and left lateral bite were obtained. The amount of protrusion is just a tip-to-tip incisor relationship. The amount of lateral movement is such that the upper and lower buccal cusps are directly over each other. When adjusting the articulator and mounting the casts, it sometimes happens that this instrument does not accept these intraoral occlusal wax records accurately. This indicates that the rotational centers of the instrument are different from the rotational centers of the patient. Compromises are sometimes accepted without mental repercussions, as allowances can be made for these evident inaccuracies by future checkbites and remounts. In this way the finished result has an accuracy which has clinically been proved to be well within the range of tolerance.

Establishing occlusal plane

In the so-called fully adaptable articulator, such as the Transograph, the inclination of the occlusal plane bears a definite and exacting relationship to the cranium, the mandibular fossa, and the gonial angle. This relationship is said to be found when an axis orbital plane or a cranial plane is taken. When the casts are then mounted and the instrument set according to the records obtained, we are told that the distances of the occlusal surfaces of the individual teeth from their controlling vertical and sagittal axes are the same as in the head. Therefore, with an instrument of this nature, the inclination and other measurements of the occlusal plane are specific. In gnathology also they claim a definite relationship between the slant of the occlusal plane, the curve of Spee, the Bennett movement, and condyle paths. However, with semiadjustable articulators, such as the Hanau Model H, the position of the casts is arbitrarily determined, and the position of the occlusal plane bears a different relationship on the instrument than it does in the head. Therefore the radii that are used when cusps are carved are not the same as when the mandible moves in natural function.

In both cases the working casts contain all the dies in proper relationship to each other. The vertical dimension has been established and the incisal guide pin is set to control the degree of vertical opening. The distance between the upper and lower prepared dies is measured and is fairly evenly divided to allow room for both upper and lower final castings. In some cases the wax-up is started on one arch by using a template as a guide. An arbitrary occlusal plane is waxed up even though we realize that changes will have to be made. Once the wax-up is finished in one arch, the opposing arch is waxed, using the completed one as a guide. Cuspal inclines are coordinated in such a manner as to obtain a working and a balancing bite, as well as simultaneous protrusive contact over all the anterior teeth. Changes

usually have to be made in the original arbitrary occlusal plane on the arch that is completed first.

Actually, with no axis orbital plane, the occlusal plane can take any cant at which the models are arbitrarily set. Provision must be made between the upper and lower casts to provide sufficient room for upper and lower teeth. The cusps of their teeth must be so coordinated that they will meet each other in the terminal functional orbit without clashing. They will be guided into centric occlusion by their various hinge axes, whereas the condyles are in an unstrained centric relation position with reference to the mandibular fossa.

The wax-up—carving the cusps

Relative to the carving of the cusps in the original wax-up, there are other methods than the one just described. For example, when incisal guidance has first been established, before the posterior cusp carving has been started and the condylar inclination set, the cusps can be coordinated using these two known factors. The actual carving can also be initiated between one or two upper and lower teeth rather than fabricating one whole arch in wax before the opposing arch is started. The wax-up is usually the work of the technician. The controls for the carving of the cusps depend upon the articulator used, how the mandibular movements have been obtained, and what form of anterior guidance has been used. Incisal platforms, upon which guide pins rest, have adjustable cams and come with flat, convex, or concave metal leaves. Cusp carvings are also affected by condyle paths and your belief or disbelief of whether or not they are fixed and immutable.

Irregularities in occlusal curves

When a patient comes for treatment, it is rare to observe a symmetrical occlusal curve. Each will have its own peculiarities in an anteroposterior and transverse direction due to the effects of muscular imbalance, nerve reflexes, and the like. This will produce characteristic convexities and concavities in the form and shape of these curves.

Although this may be true for some individuals, there are others in whom these irregularities can be traced to premature tooth loss, and as a result shifting, rotation, and spacing of the remaining teeth. Irregularities can also be traced to avoidance of pain due to pulp injury by caries and to traumatic accidents. After years have elapsed, it is difficult to determine the factors that can readily be corrected in the newly established occlusal curves and those due to morphological, physiological, and anatomical factors that cannot be corrected. Total correction seems to be preferable rather than an attempt to retain the former irregularities in the completed work, even though, in some cases, the original asymmetry may recur.

Insertion of second transitional work

Returning now to the case being described (Case 3), the entire occlusion was fabricated in wax and was completed in slow-cured processed acrylic crowns. The vertical dimension was increased slightly. This was checked by observing the relationship of the lower incisors to the lingual gum pad of the upper anterior teeth

on the articulator and in the original casts. The second transitional work was inserted on Nov. 5, 1959. A comparison of the mouth at the time of insertion and at the start of treatment discloses a vertical increase of approximately 2 mm.

With the increase of the vertical dimension upon the insertion of the posterior splints, the anterior teeth were taken out of contact. In order to avoid unequal extrusion of these teeth or intrusion of the posterior teeth, the upper incisors were prepared for full crowns, and the cuspids were prepared for pin ledges. A quick-cure acrylic splint was inserted providing contact with the lower incisors. Temporomandibular roentgenograms were taken. No changes were observed. Clinically, the mandible was positioned forward and to the left. A free-way space of 1.5 mm. was present.

The matter of anterior porcelain jacket crowns was again discussed. The patient was finally willing to accept the financial responsibility for breakage. The upper and lower incisors were then prepared for slow-cured transitional acrylic splints. The interocclusal distance was evenly divided, and a contacting platform was provided on the upper splints. They were inserted on Dec. 10, 1959. For the first time a definite contact was established between the upper and lower anterior teeth in centric occlusion.

Final stage—the Transograph

The final work was undertaken in mid-December, 1959. The articulator known as the Transograph was chosen as the machine to be used in constructing this final prosthesis.

The Transograph and Transographic articulation were described in 1957.* Briefly, their four major principles underlying functional articulation are as follows: (1) the temporomandibular joint rotational centers—the hinge axes, (2) the cranial reference plane, (3) the collateral bodily shift of the mandible in function—the so-called Bennett movement, and (4) the envelope of motion.

The following are some of the fundamental concepts of Transographics:

1. As the condyles are irregular bodies, the axes by-pass each other as they pass through the condyles and do not intersect in one point in the condyle.
2. The transverse axes are never symmetrically positioned.
3. The purpose of the cranial plane is to provide the articulator with correct radii from the vertical axes to any given tooth, and their articulator provides for the correct distance between the two sagittal axes and the subject's median line through the use of the cranial plane.
4. The vertical and sagittal axes can be adjusted by the use of radial lateral wax bites taken at three different combined lateral and vertical jaw positions under the rule that "control of three out of line points on a sphere means control of all points on this sphere."
5. "By substituting pin and sleeve bearing for the axes indicator pins in the hinge bow and by designing the hinge bow to transform itself into a fully mounted, slightly flexible articulator, the Bennett movement is integrated automatically by the principle of mechanical equivalents. With every minute movement, the

*Schweitzer, J. M.: The Transograph and Transographic articulation, J. Pros. Dent. **7**:595-619, 1957.

instrument, turning on its asymmetrical transverse bearings, produces a torque that has the same effect as the actual Bennett."

6. The entire envelope of motion of the patient is captured, but only the functional envelope of motion is used. The entire envelope of motion is not used because it includes the bruxing movements that are detrimental.

7. "Well articulated teeth never touch until they reach final and complete occlusion."

8. The functional boundary of the patient's usable envelope of movement is captured by means of the cam and cam follower which is part of the cranial plane.*

With reference to hinge axis, hinge position, and functional jaw movements, Transographics states:

"Everything in this universe that rotates while bearing against another surface does so around an axis for, at least, a certain number of degrees. In the human jaw, the axes lie in the mandibular angle throughout the entire opening and throughout the condylar translational phase of the closing stroke but shift to the temporomandibular joint or joints through the final phase. This last is the only phase with which we need be concerned.

"Functional jaw movements have long been separated into those essential and those not essential to occlusal articulation. Opening movements have been discarded entirely; teeth cannot collide while moving away from each other. Closure movements accompanied by translation of the working condyle have also been labeled 'nonessential.' They are the fantastically erratic functional zigzags that occur with the occlusals still well separated and in no danger of collision. This brings us to the 'terminal functional orbit' or TFO, so named several years ago by Theodore Messerman of Cleveland.

"The TFO is defined as 'the area within which the lower occlusals move during functional closure when one or both condyles are in hinge position.' Hinge position is defined as 'the rotating position of a condyle in its fossa that permits location of the temporomandibular joint hinge axes.' The instant at which one or both condyles (usually one) reach hinge position is variable. Teeth may be ten or they may be 2 mm. away from contact but hinge position will always occur in time to lend precision to final, tridimensional jaw closure. If this were not so, dentistry's 'centric occlusion' would be a farce."†

Using the above concepts, a transverse hinge axis recording was taken, and the preparation of the upper six anterior teeth for full crowns was completed. This entailed a changing of plans, wherein the upper cuspids were to receive lingual pin ledges that would have been stronger. The full porcelain jackets provided better esthetics. The lower central and lateral incisors were also prepared for full crowns. On Dec. 17, 1959, the four posterior acrylic splints were removed, and the face-bow of the Transograph was used with the cranial plane to make a recording. With the mandible in its retruded position, three hinge wax records were taken at three different degrees of jaw opening. These would be used later to set the transverse axes of the instrument under the rule previously stated that control of three out-of-line points on a sphere means control of all points on that sphere. When the mounted Transograph accepts these records perfectly, its inventor maintains that

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*Page, Harry L.: Fundamentals of practical articulation, D. Digest **65**:250-254, 1959.
†Page, Harry L.: Personal communication, Oct. 29, 1962.

it is indisputable evidence that the Transograph has complete control over the radii and axes that govern the patient's opening and closing arcs.

Three right and left lateral wax records were then taken using first a moderate lateral distance and, finally, an extreme lateral distance. These lateral records are made to set the vertical and sagittal axes of the instrument so that those axes on the Transograph correspond to those in the head of the patient. The vertical axes control the side-to-side movements of the mandible whereas the sagittal axes control jaw rocking. The inventor of the Transograph stated, "To prove that the instrument and head vertical axes correspond, it is necessary to show that such axes will also accept various degrees of right and left jaw movement. When no change in plate and slider-sleeve relationship takes place as the vertical axle pins are released at these right and left positions of the jaws, such proof is provided. Finally, if each interposed wax matrix fits snugly between the fitted upper and lower duplications in the instrument, it shows that the sagittal axes in the Transograph have identical relationships with their counterparts in the head."*

After recording three different degrees of lateral movement, the posterior teeth were covered, one by one, with low-fusing metal transfers. This step was taken in order to provide for the accurate seating of the dies before pouring the new work casts. With the transfers in place, upper and lower plaster impressions were taken, and stone models were poured. The transfers were removed, and the upper cast was attached to the upper frame of the Transograph. The upper arms rested upon the cranial plane horizontal bars. The cranial plane according to Page "is a reference plane set up on the immobile upper head. When carried over to the articulator, it serves to so position the upper cast that radii from the vertical axes to the upper arch are the same as in the head. Since the lower cast will be related to the upper by a hinge occlusal record, the cranial plane also serves to provide correct radii for laterals of the moving lower jaw."†

After the upper cast had been attached to the crossbars of the upper frame, the lower cast was attached to the crossbars of the lower frame and related to the upper cast by means of one of the three hinge wax records. The cranial plane was removed, and the anterior cam was placed into position. The articulator was opened, and the two other hinge wax records were checked for acceptance. Following this, the lateral wax records were used according to the directions, and the vertical and sagittal axes of the Transograph were set. With the three axes set, the Transograph was now ready for the fabrication of the entire wax-up.

Upon completion of the posterior occlusion, the castings were made and returned to the instrument for correction. The cam follower, which had been placed as accurately as possible between and above the two upper central incisors, was moved to follow the cam. The side arms of the cam had been set previously at 55° off the cranial plane in order, according to this theory, to engage the boundaries of the functional envelope of the patient's mandibular movement. Setting the side arms of the cam at a lower angle would encourage the so-called pathological bruxing movements.

On Jan. 7, 1960, the final crowns were tried in the mouth. Those for the right side were inserted first in order to check the vertical dimension against the transi-

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*Page, Harry L.: Hinge axes, D. Digest **66**:411-415, 1960.

†Page, Harry L.: A short discussion on articulators, unpublished article, February, 1961.

tional work which still remained in position anteriorly and on the left side. There had been only a very small further increase of the vertical dimension in the final work. When the right and left posterior crowns had been inserted, the anterior splints were removed, and wax records were again taken. Low-fusing metal transfers were then inserted over all the anterior teeth. A face-bow, together with a cranial plane, were recorded. Full upper and lower plaster impressions were taken. The copper-plated dies were placed in their respective positions in the metal transfers, and stone casts were made. The face-bow, which finally becomes the articulator, was placed upon the laboratory bench. The side arms which made it an articulator replaced the side pins of the face-bow.

The new upper and lower work casts were mounted and related by means of the hinge wax record and were finally checked for accuracy by means of the two other hinge bites. The cast crowns were soldered together in each of the four posterior segments of the arch. The upper cuspids and the six lower anterior teeth were to receive platinum copings. These eight anterior porcelain bonded-to-platinum crowns would be stronger than all porcelain jacket crowns and would be better able to withstand the interocclusal pressures. On Jan. 18, 1960, all the work was inserted in the mouth, and another face-bow and cranial plane were taken. A new mounting was made, this time upon the original Transograph.

The final acrylic facings were processed, and the porcelain jacket crowns, together with the porcelain bonded-to-platinum jacket crowns, were completed. Definite lingual platforms were provided on the upper jacket crowns to furnish stops for the lower incisors. Duplicate porcelain jackets were made for the four upper incisors. On Feb. 17, 1960, the final work was completed. First, the posterior work was inserted without removing the anterior temporary splints to observe the degree of vertical increase beyond that of the transitional work. The anterior crowns were then inserted. Completed roentgenograms were taken on Feb. 25, 1960. Stone casts were made for final records. Postinsertion occlusal adjustments were uneventful. Roentgenograms were taken of the temporomandibular articulation. These disclosed nothing unusual. A comparison of the original centric contact position with the completed centric contact position revealed the actual amount of vertical increase. The work had required almost six months to complete.

Somewhere in the reconstruction procedure, the repositioning of the mandible was lost because the completed position was very similar to the original except for the vertical dimension. The patient was very comfortable, the structures were healthy, and function was excellent. The repositioning was an experiment that may or may not have succeeded. In this case it does not seem to have been of any consequence. (Figs. 1052 to 1092.)

While still dealing with attempts at mandibular repositioning and changes in vertical dimension introduced by the dentist, it has already been shown that there must be satisfactory reasons for altering these positions. Without thoughtful planning and skillful execution, the entire stomatological system may be thrown eskew. Cases that have been rehabilitated without regard to well-established biomechanical principles end, for the most part, in failures. Although, by experimentation, we must continually strive for new cures in treatment, we must primarily be certain that disease is present before attempting procedures containing many elements of danger in their execution.

Text continued on p. 510.

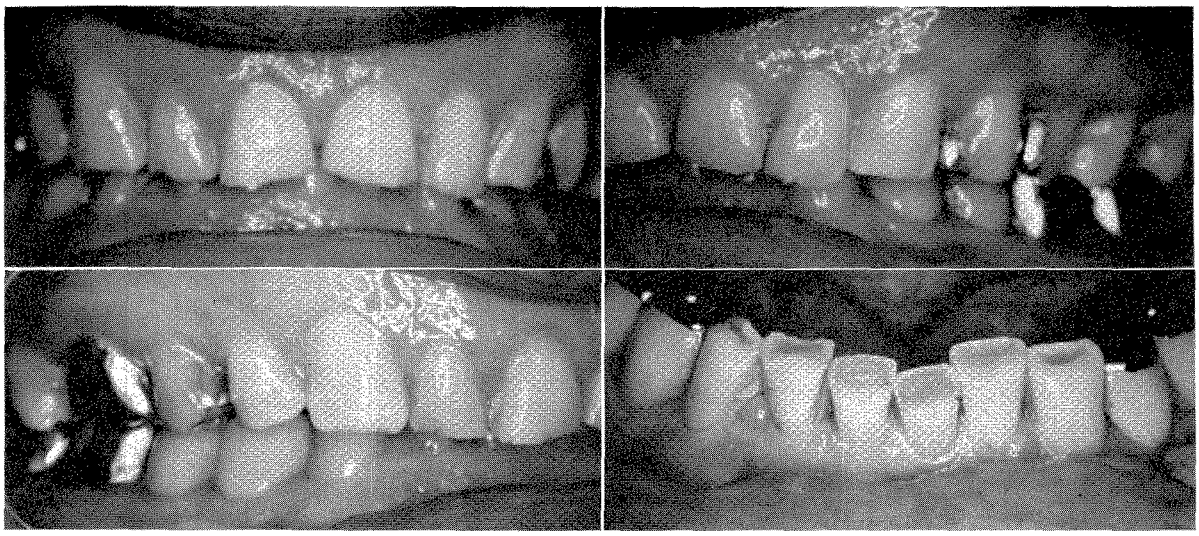

Fig. 1052. Four views of the teeth of a 43-year-old man whose bite had already been raised ten years previously. These photographs were taken in July, 1959. The anterior teeth are again in a closed-bite relationship. The lower incisors were severely abraded for a person of his relative youth. (Figs. 1052 to 1092 are of the same case.)

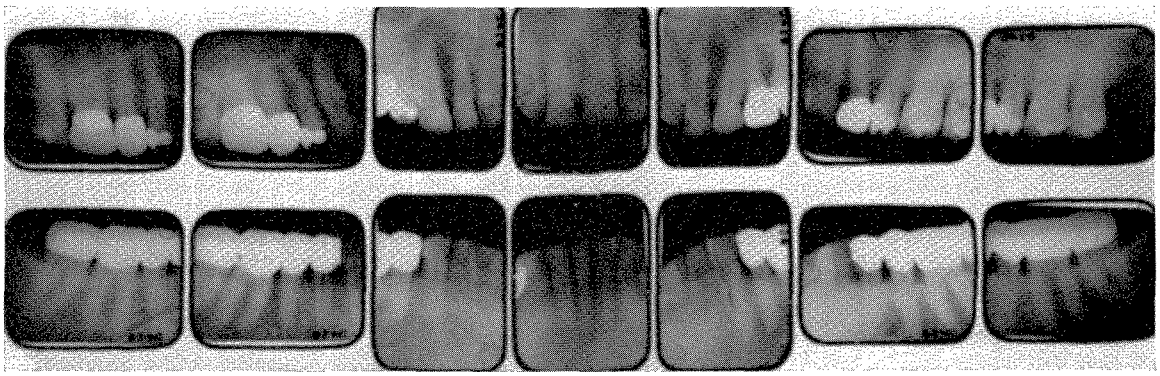

Fig. 1053. Roentgenograms that were taken in August, 1959, before treatment was instituted.

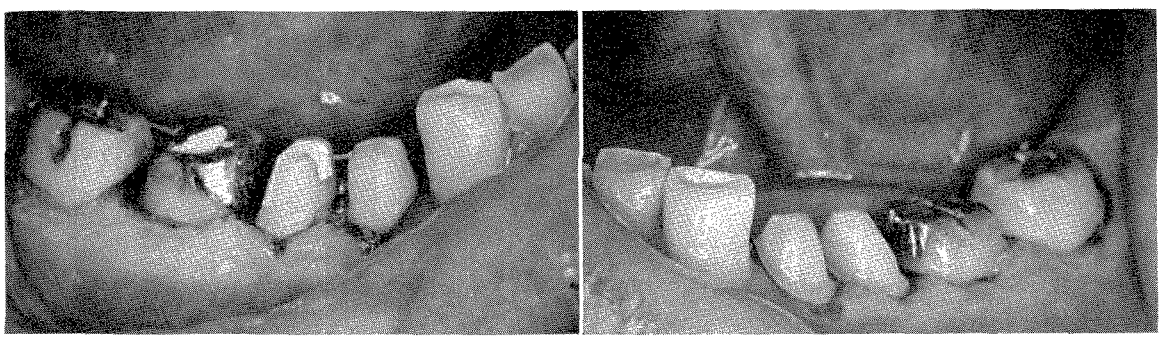

Fig. 1054. The lower posterior splints that had been inserted ten years previously were removed, and the teeth were cleaned and reprepared. It was very evident from the difference in the vertical height of the clinical crowns of the cuspids and the posterior teeth that the posterior teeth must have been depressed when the bite was raised previously. The history indicates that there was no contact at first between the anterior teeth but that contact was established within one and one half years. This would account for the depression of the posterior teeth plus the extrusion of the anterior teeth that is evident from these photographs. This was shown by other examples in the text.

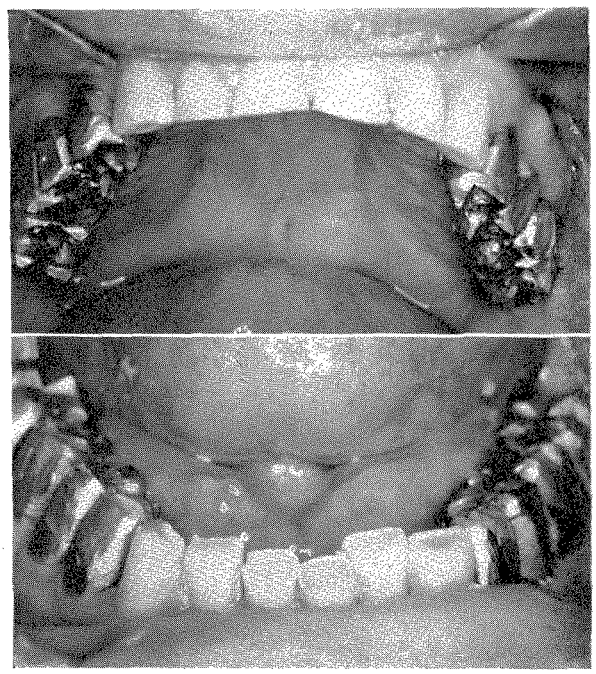

Fig. 1055. Low-fusing metal transfers were inserted on all the lower and upper posterior teeth. These were made on copper-plated dies.

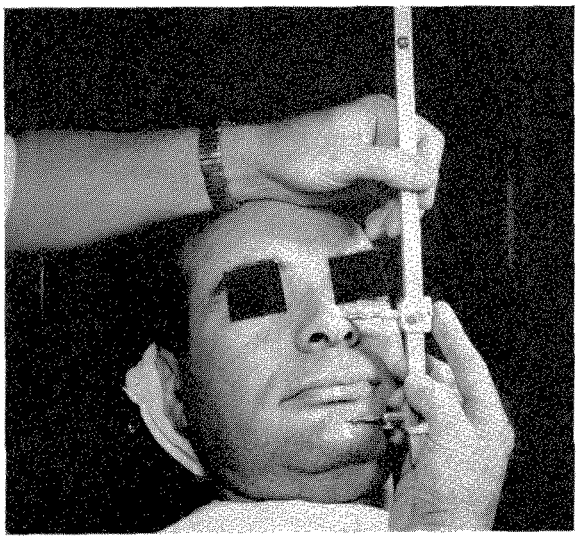

Fig. 1056. The vertical dimension was kept constantly in mind and frequently measured.

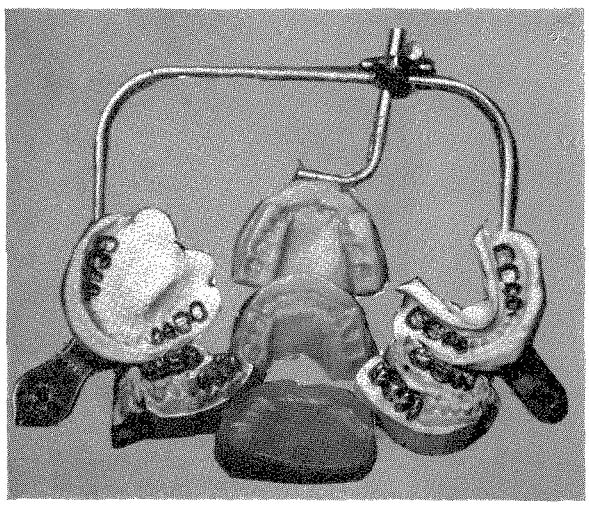

Fig. 1057. Records were obtained for purposes of attaching the work casts to the Hanau Model H articulator in order to construct the transitional work.

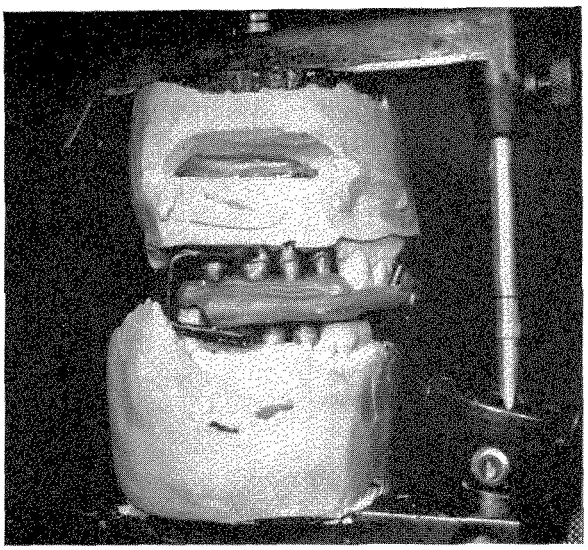

Fig. 1058. The work casts were mounted by means of the face-bow and wax records.

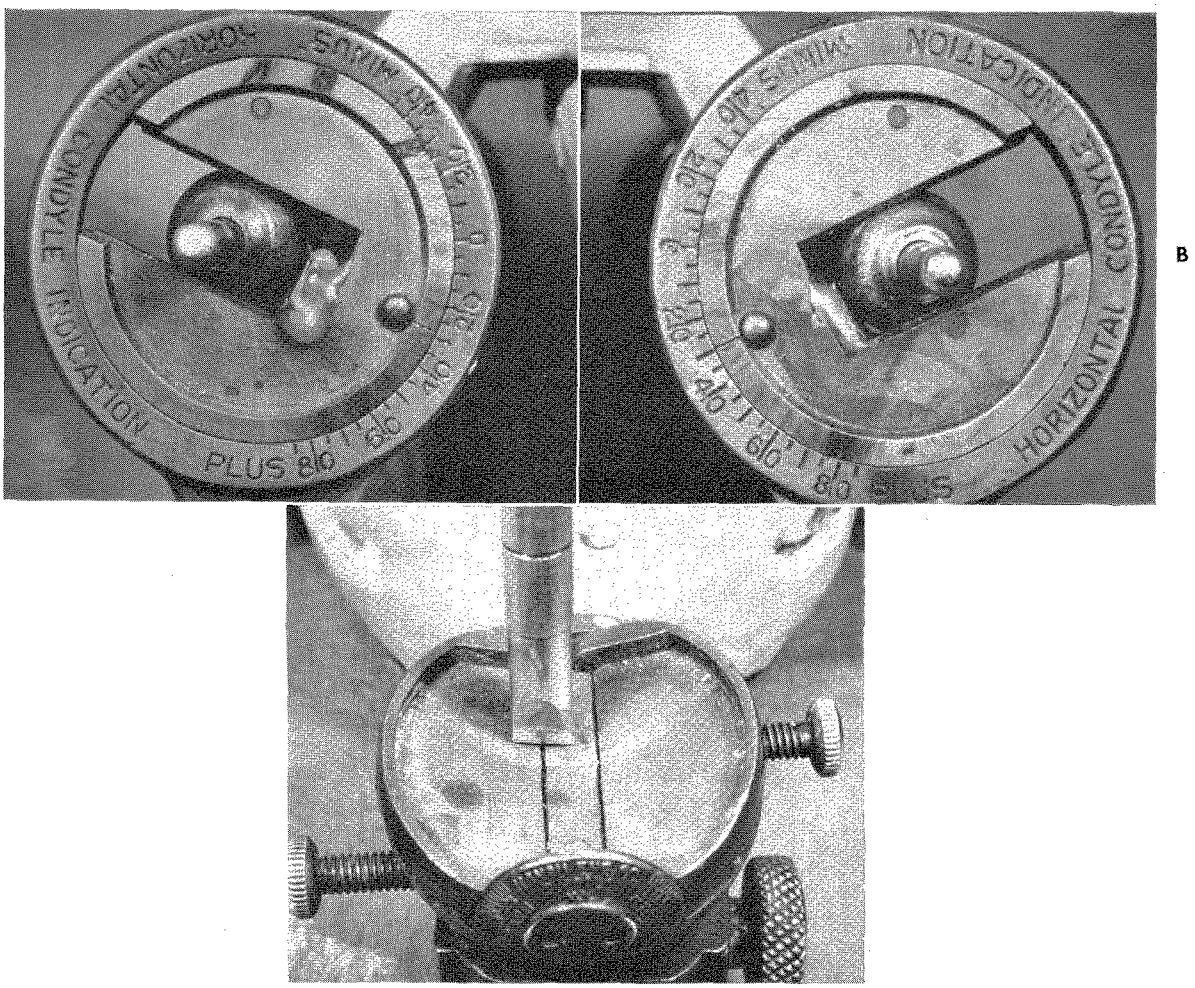

Fig. 1059. In Fig. 1052, **upper left,** the mandible had deviated to the right. An attempt was made at this time to position it to the left in the transitional work. It was also going to be repositioned forward if this was possible. Accordingly, metal disks were inserted in the anterior portions of the condylar slots as shown here. These would serve to advance the mandible arbitrarily. The right metal disk was wider than the left one. This would serve to rotate the mandible toward the left. Whether or not this was possible to accomplish is only conjecture, but the attempt was made in the transitional work, and nothing was lost in trying. **A,** The right condylar slot with the metal disk inserted and held with sticky wax. Observe that it is thicker than in **B. B,** The left condylar slot with the metal disk. **C,** The incisal pin was positioned to the right which indicated that the mandible had been rotated to the left.

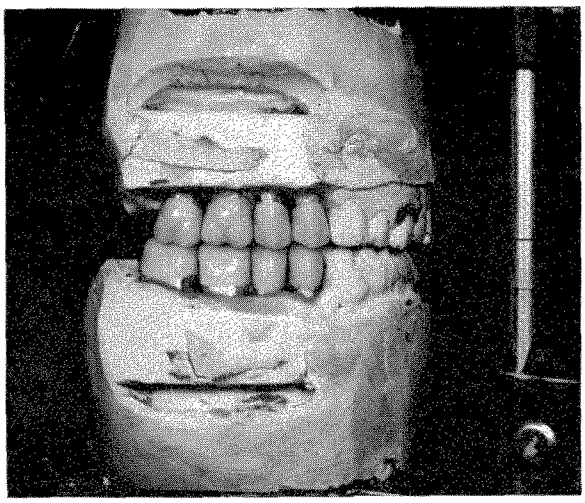

Fig. 1060. The occlusion was coordinated at a higher vertical level. The entire wax-up was made at the same time, and the crowns were processed in slow-cured acrylic resin. The completed transitional work is shown in this illustration.

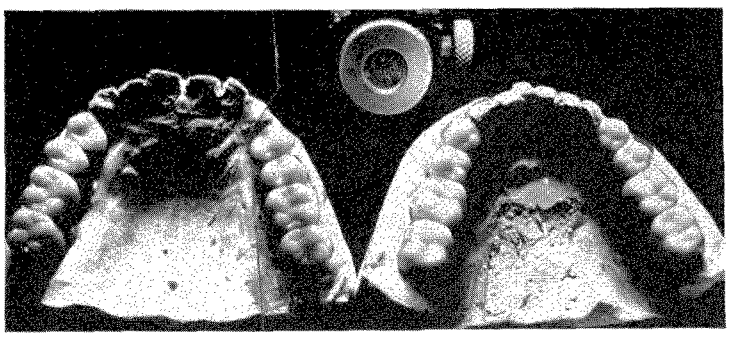

Fig. 1061. An occlusal view of the completed acrylic resin crowns is shown here. Observe the anatomical detail.

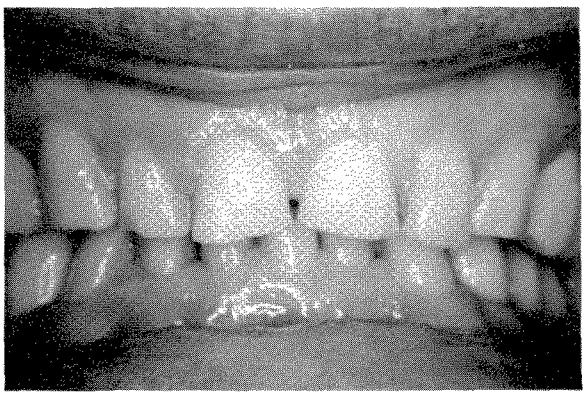

Fig. 1062. The transitional work was inserted in the mouth. This was done on Oct. 29, 1959. The amount the vertical dimension had been increased may be seen if this illustration is compared with Fig. 1052, **upper left.** The mandible was advanced, but the correction of the lateral position of the mandible was unsuccessful if this illustration is compared with Fig. 1052, **upper left.**

Fig. 1063. The upper and lower anterior teeth were prepared for crowns. The transitional slow-cured acrylic resin splints are shown here.

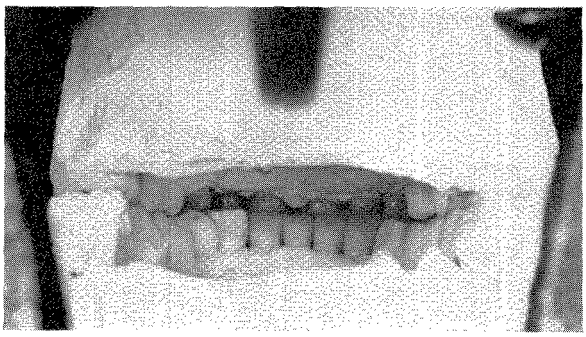

Fig. 1064. A lingual contour was provided on the upper incisors so that the lower incisors made definite contact with the lingual platform of the upper incisors. Formerly they contacted the upper lingual gum pad.

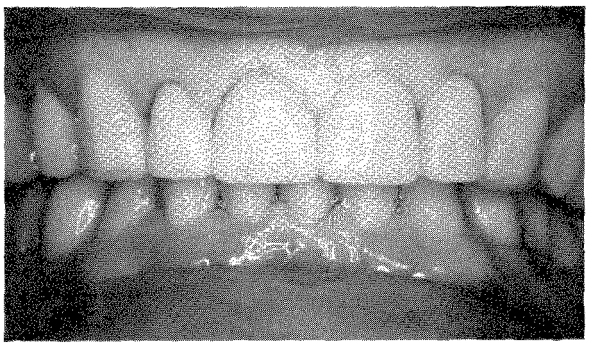

Fig. 1065. The transitional work was now complete. This reconstruction not only served to protect the teeth and give the patient a degree of comfort, but it also provided a prescription for the final work. This photograph was taken in December, 1959.

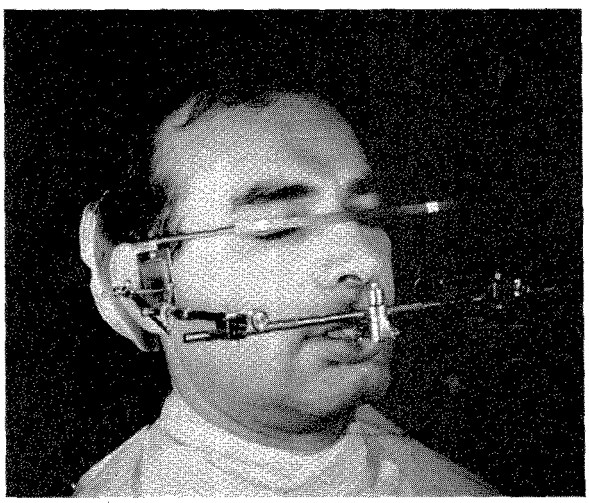

Fig. 1066. The final phase consisted first in taking a transverse hinge axis record. This was taken with a hinge-bow that was attached to the mandibular teeth by means of a clutch. The two metal recording screens were held in position by means of the rod which rested on the bridge of the nose.

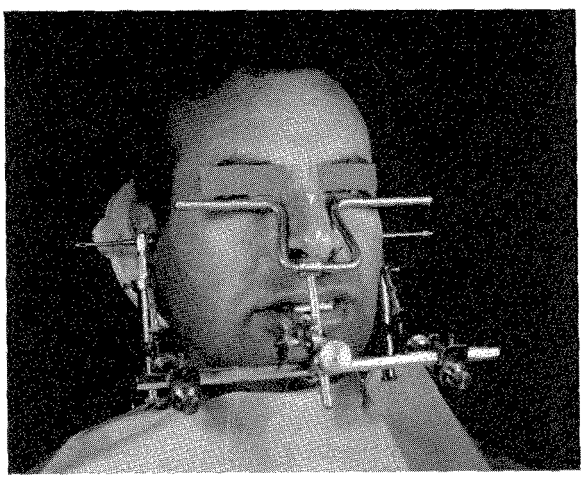

Fig. 1067. The Transograph is shown in position. It is now being used as the face-bow and is held by the bite fork which has wax on both sides and is being held by the teeth. The cranial plane is also being registered. (Read text.)

Fig. 1068. In order to set the controls of the articulator, these hinge wax records are taken at different levels. Two are shown here in **A** and **B.** Then three additional wax records are taken with the mandible in different degrees of its right and left lateral positions. One such record of the extreme right lateral position is shown in **C.** Another one is shown of a left lateral wax record in **D.** When these nine wax records were taken, the posterior teeth were not covered by any transfers, so that there were no interferences from the teeth.

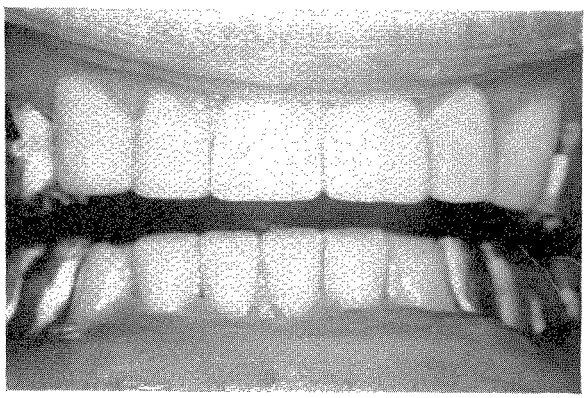

Fig. 1069. After the face-bow, cranial plane, and wax positional records were taken, the low-fusing transfers were placed upon their respective teeth, and impressions were taken from which work casts were constructed.

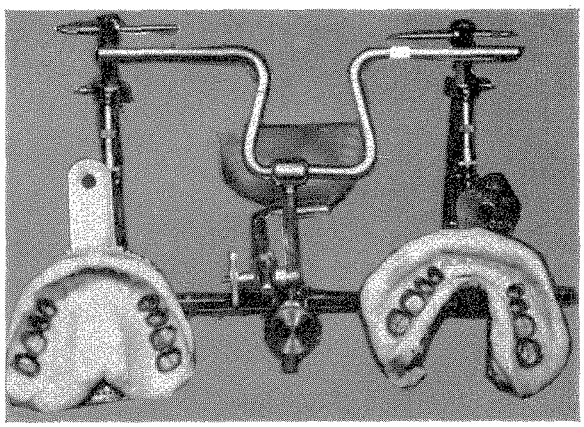

Fig. 1070. The Transograph face-bow was removed from the mouth. The impressions with the transfers in place ready to receive the copper-plated dies are in the foreground. The face-bow will now be converted into an articulator, and the work casts will be attached to it. Observe the different levels of the right and left condyles as recorded by the pins. Also observe the right angle system in accordance with Transographic concept of every axis being perpendicular to its plane of rotation.

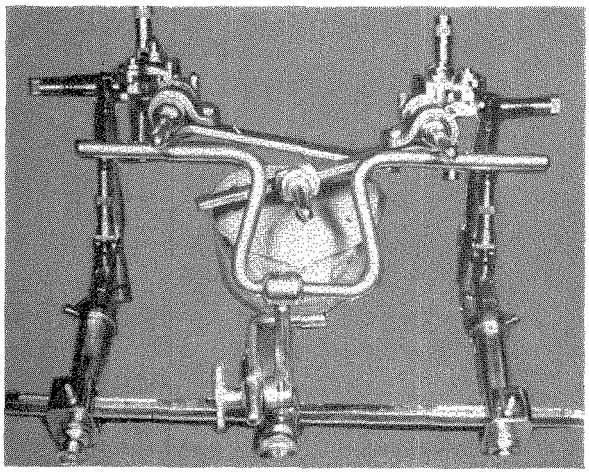

Fig. 1071. The condylar pins were removed, and the side arms were inserted. The upper cast is being attached to the upper frame. The centering pin or cam has been inserted on the anterior crossbar. It is positioned as accurately as possible between the two upper central incisors.

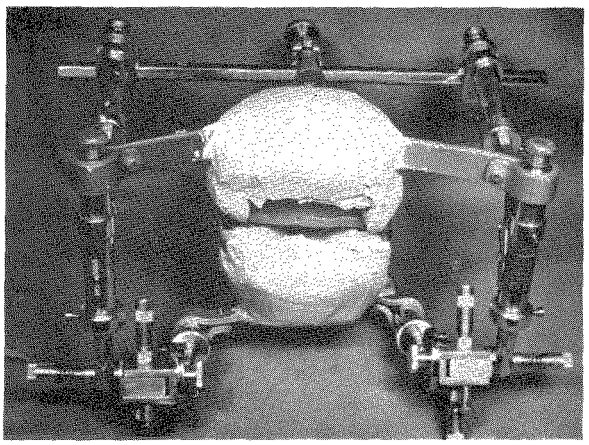

Fig. 1072. The Transograph was turned upside down, and the lower cast was being attached to the lower frame and related to the upper cast by means of one of the three hinge bites that were taken in the mouth. The slide and slider assemblages are in their neutral positions.

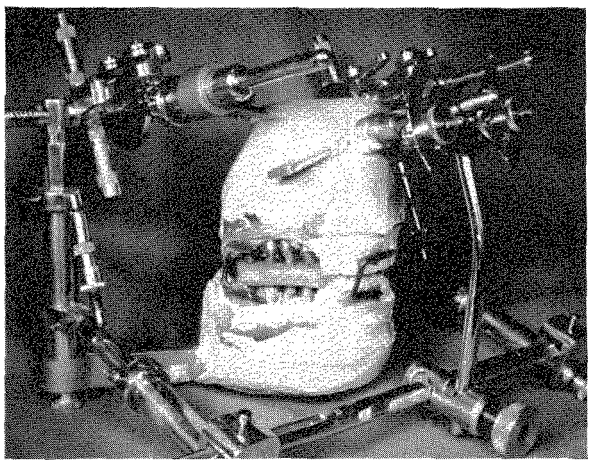

Fig. 1073. The Transograph has been uprighted. Both casts were attached and related to each other in hinge position. Now the hinge wax record will be removed, and the correctness of the hinge position will be tested. The anterior fork with the cam has been attached.

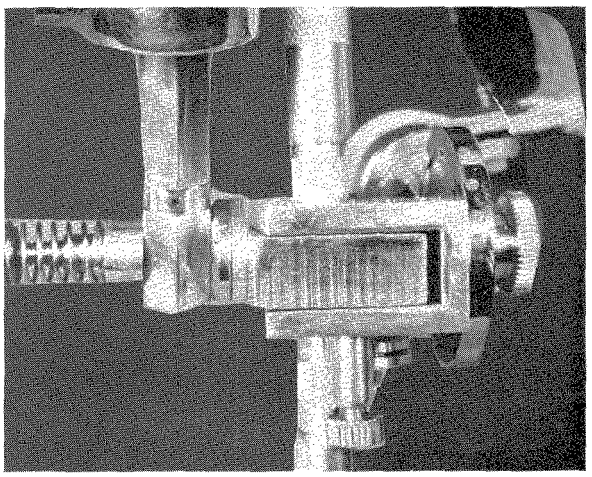

Fig. 1074. With the hinge wax record removed and the screws that lock the slide and slider assemblages released, there should be no movement of the assembly which is different from that shown at the bottom of Fig. 1072. This is a close-up showing no movement of the slide. The screw released the assemblage so that when the other two hinge bites are inserted, if the mandible is not in its true hinge position, the distance laterally or anteroposteriorly would change, and the error would be readily picked up.

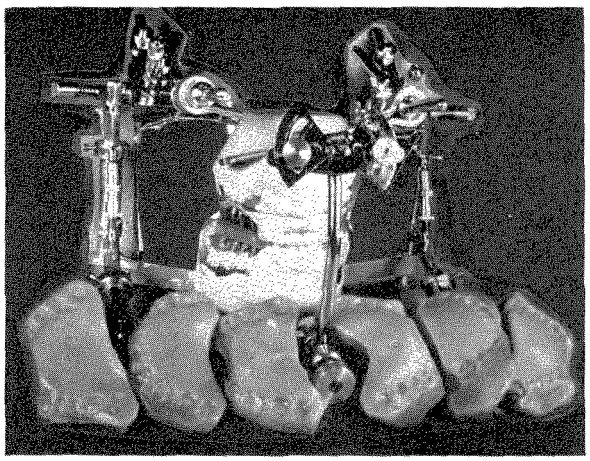

Fig. 1075. The vertical and sagittal axes will now be set by means of these wax records. When this has been accomplished, the Transograph is able to copy functional jaw movements.

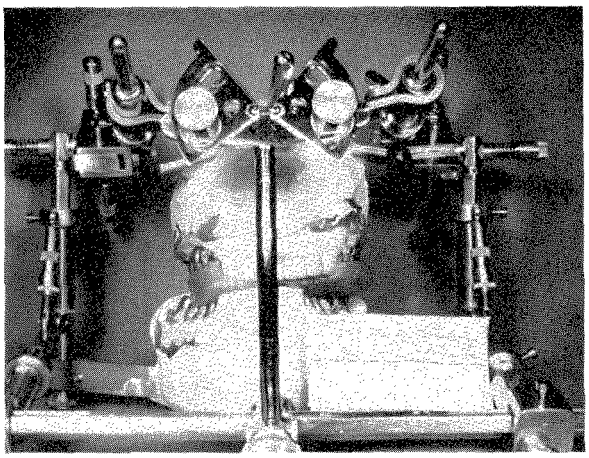

Fig. 1076. This is an extreme right lateral wax record. It will be used to set the left sagittal and vertical axes. The teeth should seat accurately in their wax matrices, and after the axes are set, two different right lateral wax records taken at different degrees of lateral movement must also be accepted to check the setting. This record shows a slight discrepancy.

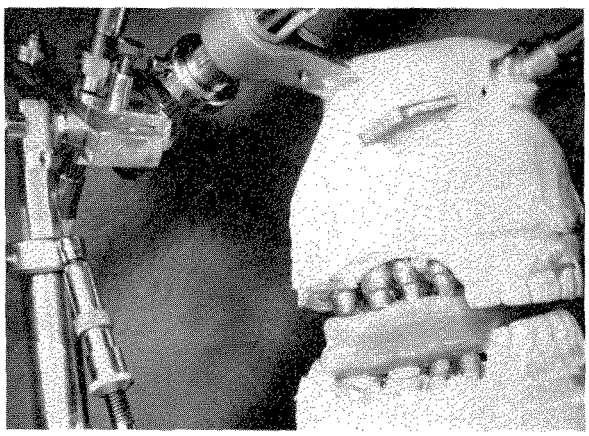

Fig. 1077. The Transograph accepting a thick right lateral wax record accurately. This test is a very difficult one for any articulator to comply with.

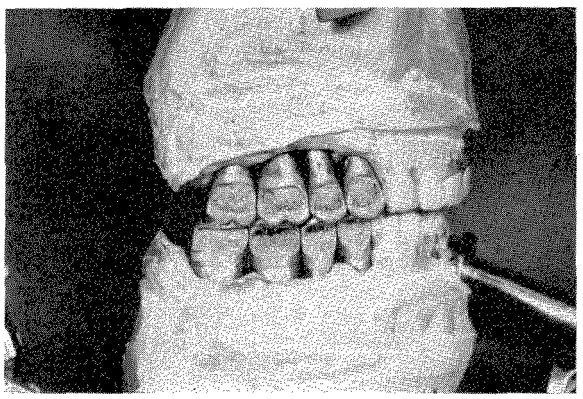

Fig. 1078. The Transograph has been set. The wax-up has been completed, and the occlusion has been coordinated. In this illustration the posterior crowns were cast and were ready for try-in in the mouth.

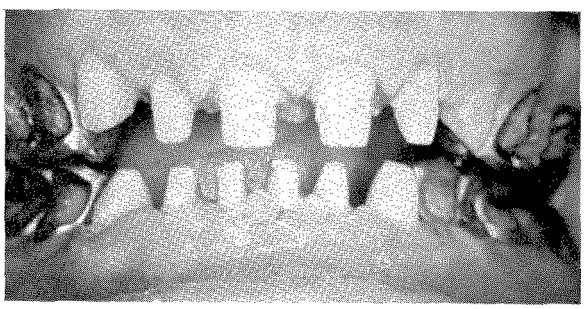

Fig. 1079. The posterior crowns were inserted. New wax records will again be taken, as well as a face-bow and cranial plane.

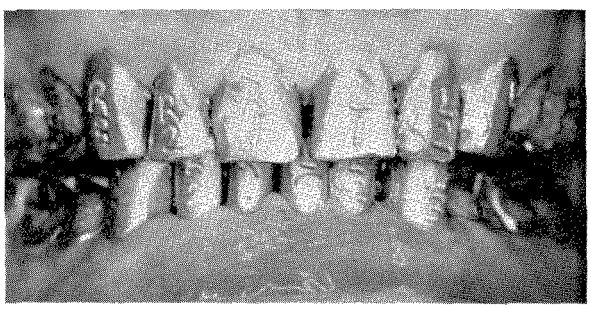

Fig. 1080. Low-fusing metal transfers cover the anterior teeth. They are marked for identification. New plaster impressions will be taken.

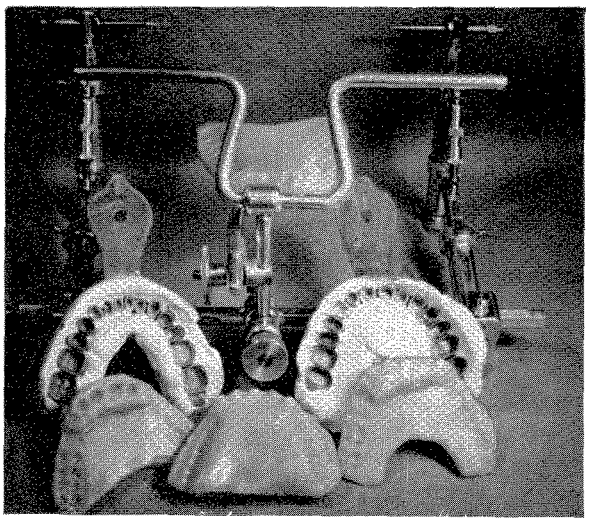

Fig. 1081. The records that were taken in order to attach new work casts to the Transograph and in order to proceed with the completion of the prostheses.

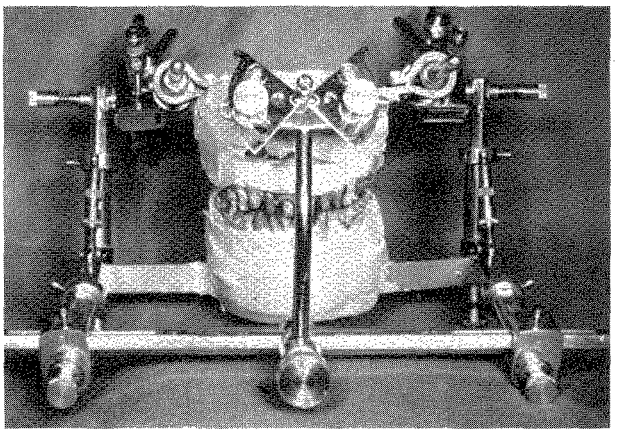

Fig. 1082. The final work on the Transograph ready for try-ins.

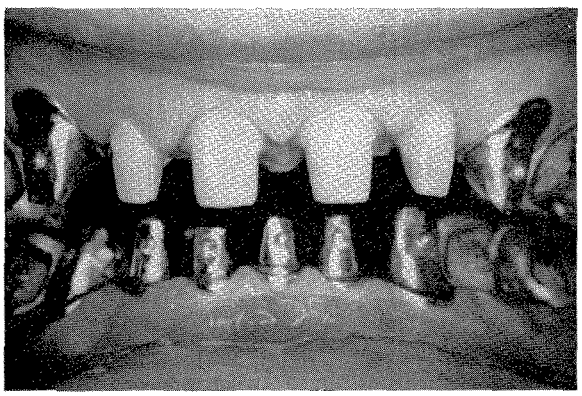

Fig. 1083. The final try-in before completion. The anterior lower crowns and the upper cuspids will be porcelain bonded to platinum. The platinum matrices are shown in the illustration.

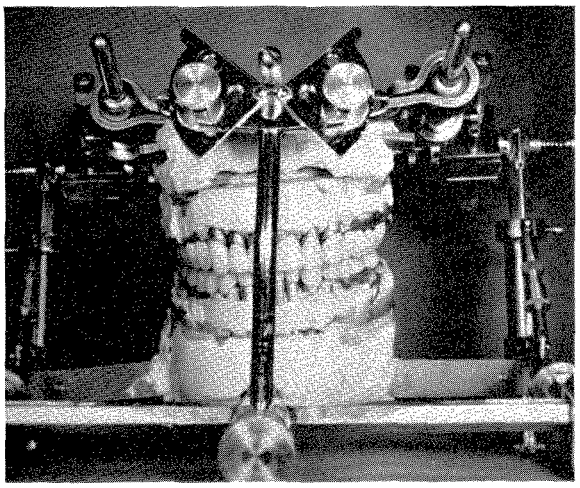

Fig. 1084. The completed work on the Transograph.

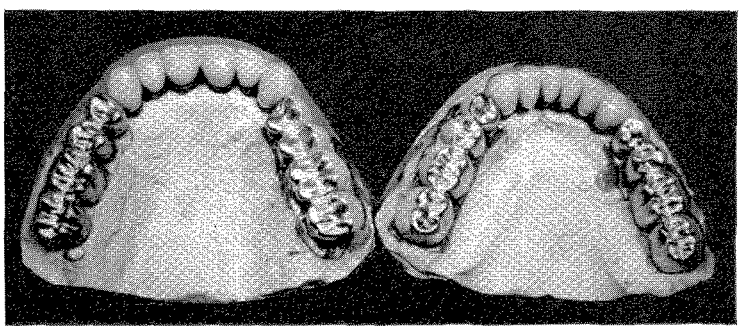

Fig. 1085. Occlusal view of the completed work.

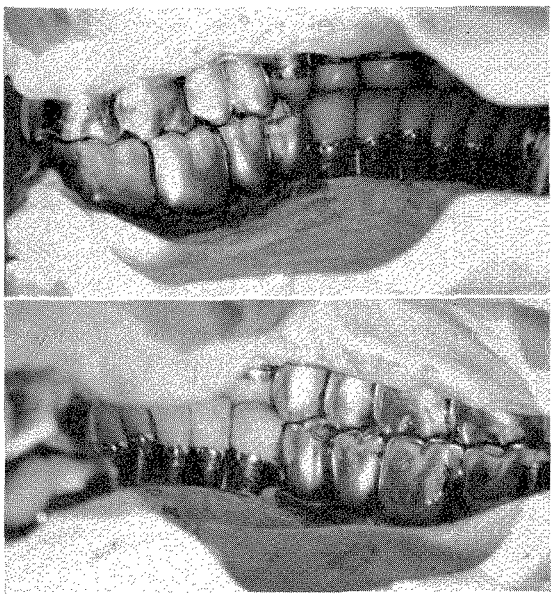

Fig. 1086. Right and left views taken from the rear showing the interocclusal relationship.

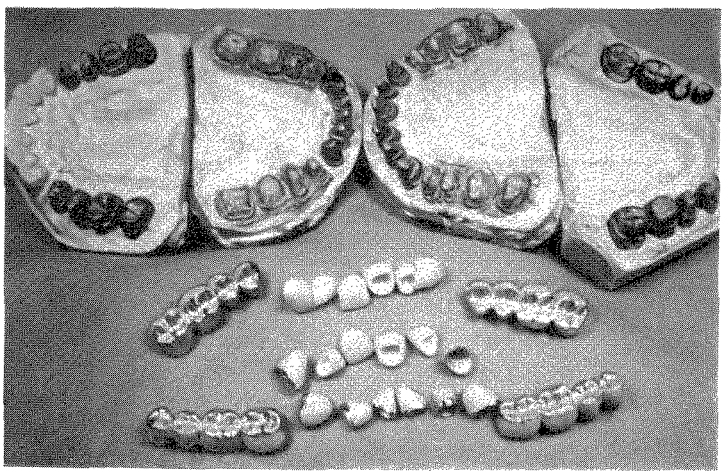

Fig. 1087. The completed prostheses removed from the casts. The posterior crowns were splinted together. The upper four incisor porcelain jackets were duplicated.

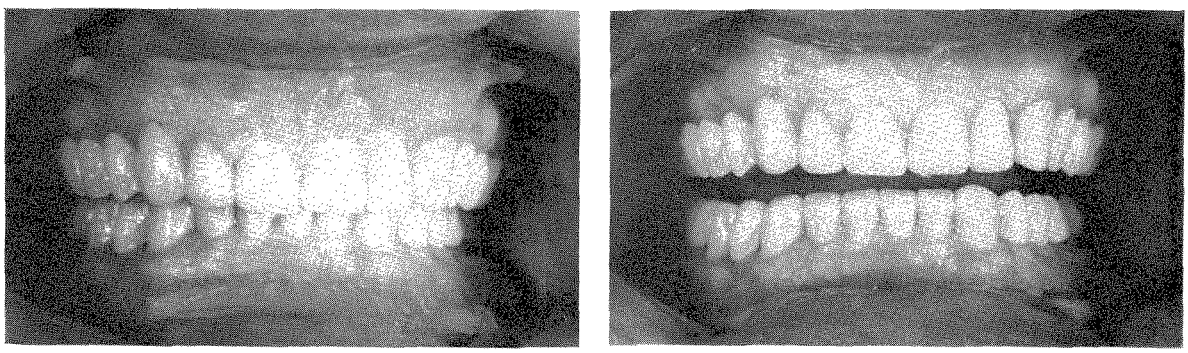

Fig. 1088. Two views of the completed work. This was inserted on Feb. 17, 1960. This is six months after the start of the work.

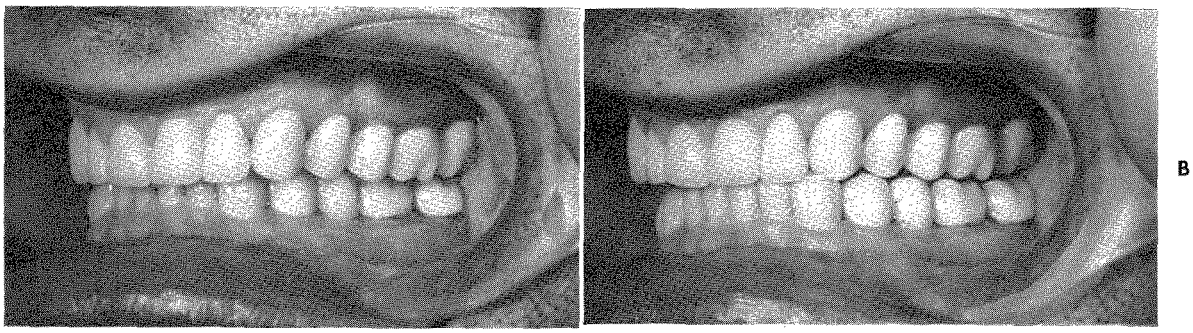

Fig. 1089. **A,** Completed work, left side, centric bite. **B,** Completed work, left side, working bite.

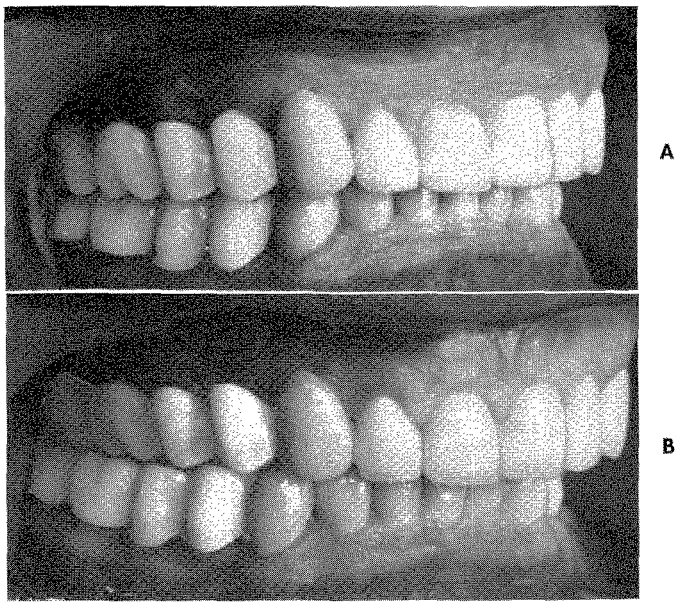

Fig. 1090. **A,** Completed work, right side, centric bite. **B,** Completed work, right side, working bite.

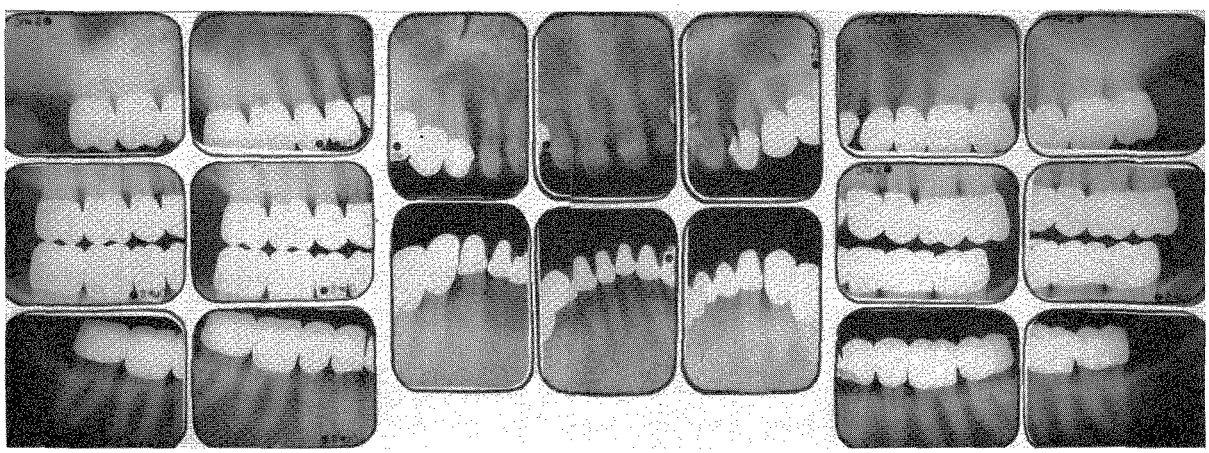

Fig. 1091. Roentgenograms taken at the completion of treatment, February, 1960.

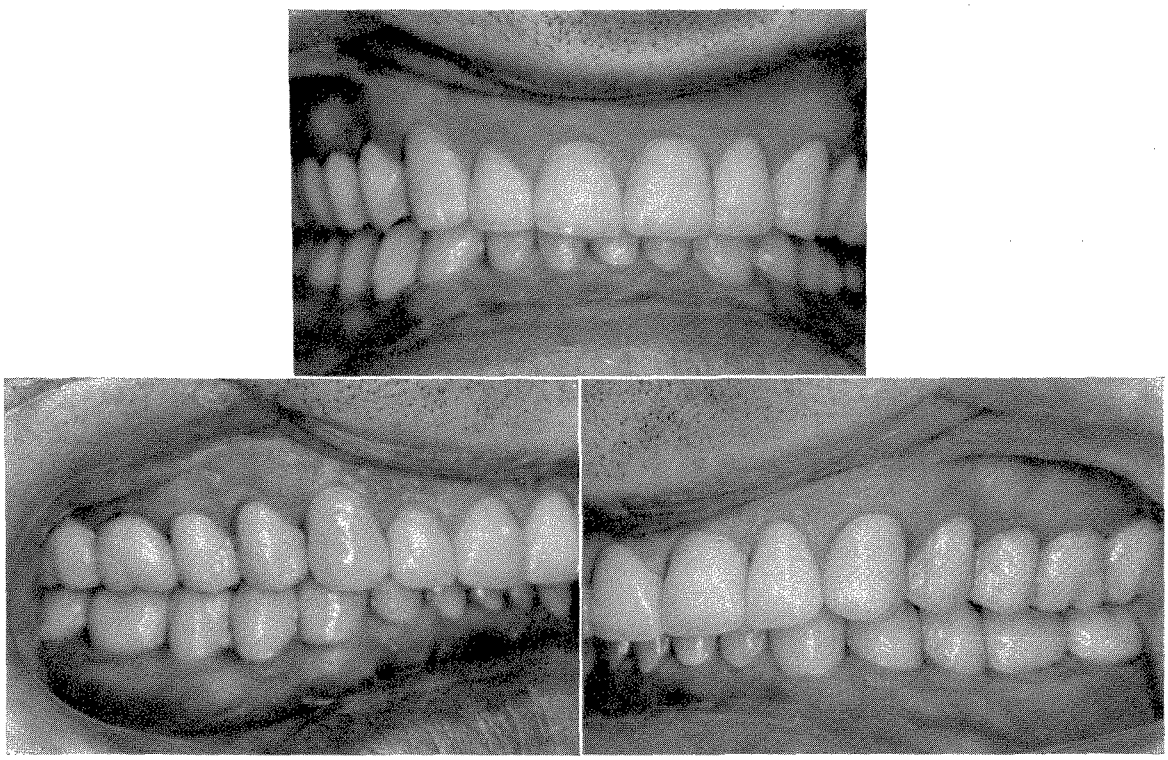

Fig. 1092. Three views of the mouth taken in 1962.

Case 4

Chief complaint—present condition

In 1959 a comparatively young woman was referred to me by her family physician because of severe mental distress arising from a dental problem. An examination of her mouth disclosed that her bite had been raised by inserting modified three-quarter crowns on her six lower posterior teeth (the second bicuspids and the first and second molars). Sixteen teeth anterior to these posterior teeth had been taken out of contact. The work had only recently been completed.

Not alone had the free-way space been violated, but the correct interocclusal contact position had also been lost in the procedure. She no longer knew where to bite and was constantly aware of her teeth. Her mandible was never at rest. It was impossible to obtain a correct centric relational wax record. Her emotions were mounting to the breaking point. Although many individuals are able to tolerate incorrect mandibular positions without physical and mental distress, there are others who cannot. If this form of vertical repositioning is attempted for the latter group, any one of a variety of unpredictable and dangerous factors may be introduced which brings on severe physical and/or mental distress. It is oftimes extremely difficult to undo the damage.

This patient was on the verge of hysteria and cried frequently. She was not able to supply any entirely satisfactory reason for having had her bite raised, except for the anterior recession of her gums and the stippling of the enamel of her upper incisors. Her dentist was vague when questioned. He stated that he had not

quite finished the work and was going to place additional gold inlays in her lower first bicuspids. He was unable to furnish any records or study casts, although he said he had made them. No temporomandibular roentgenograms had been taken before the bite was raised.

An unfortunate sequel of the attempted bite raising was a twitching of the lower right lip which started after a mandibular injection for the preparation of the lower right second molar. This twitching had been a source of untold discomfort and emotional distress and had caused her to visit neurologists and physiotherapists. They had not been able to relieve her. She had become very self-conscious, and as a teacher of small children, she had been severely handicapped in her regular duties. In desperation she decided to take a year's sabbatical in order to obtain a thorough mental and physical rest, although she could ill afford the expenses. She gave up a plan to take extension courses.

Treatment

The bite had been raised two months prior to her initial visit for consultation. Fearing that intrusion had already taken place, the first objective was to remove the six lower castings from the posterior teeth and permit the mandible again to close to its original interocclusal relationship. In order to equalize the pressure immediately, an acrylic splint was placed over her remaining lower teeth. This served to bring all the teeth into full contact. Within a few days the lower castings were removed. The upper and lower anterior teeth again contacted, and the patient was very happy. Immediate relief from all symptoms except the twitching was obtained.

The lower posterior teeth were then reprepared. A full lower rubber impression was taken. This involved all five preparations except the lower right second molar, which was to be prepared for a full crown after pulp therapy had been instituted and the root canals filled. An upper alginate impression, a face-bow, and right, left, and centric wax records were taken. The work casts were attached to a Hanau Model H articulator by means of the face-bow and wax records. The lower work then was completed. Before the lower left work was inserted, the upper left bicuspids and first molar were prepared for gold inlays. A full rubber impression was taken, and a work cast was made. This was related to the lower cast on the articulator, and the wax-up was coordinated in order better to relate the upper and lower cusps of the teeth on the left side before the lower castings were inserted. After this step the lower castings were inserted in the mouth.

The upper left posterior castings were then completed and inserted. The upper right posterior teeth were now prepared for gold inlays, and the lower right second molar, whose root canals had been filled, was prepared for a full crown. A copper die was made for this tooth. A full upper rubber impression and an alginate lower impression were taken, along with a face-bow and centric wax record. The natural teeth were protected by means of acrylic temporary splints. The occlusion was coordinated, and the right side was completed by the end of August, 1959.

The patient was extremely cooperative in spite of her former dentist's expressed opinion to the contrary when he had treated her. She was deeply grateful. The following are quotations from a letter which she sent.

Jan. 12, 1962

Dear Dr. _____:

It is with real pleasure I am sending this payment to you. It is not often one can feel this way about a bill. Also your kindness in extending time on this payment meant a great deal to me. It is not easy for me to tell you how I feel, but I want you to know you did much more than save my teeth. I was so upset and fearful at the time I came into your office that at times I must have been very trying. Your patience, explanations and consideration were so helpful to me.

Your calling to let me know the x-rays had not disclosed greater complications was so thoughtful (you've probably forgotten the incident)—I never will.

The truth is I can never repay you for all you have done for me.

Sincerely yours,

(Signed)_____

Here, again, is an instance in which a bite was raised without sufficient justification. (Figs. 1093 to 1101.)

Discussion

Almost every dentist encounters some patients with great persuasive ability who use such talents to specify what they wish to have done and how their teeth must look when they are completed. If we permit ourselves to be influenced by such aggressive talkers and carry out their recommendations instead of our own personal advice, we may perform dental work that is decidedly disadvantageous to the patient and perhaps detrimental to the dentist's reputation. Many patients will request such an increase in the vertical dimension that it violates the free-way space. Whether this increase is the patient's or the dentist's own initial plan, it is a serious step in any case, and in some cases it can be disastrous.

When a case presents itself in which the vertical dimension must be greatly increased, a dentist must make sure of the following:

1. He must have a good reason for the increase in vertical dimension.

2. He must take roentgenograms of the temporomandibular joints before the increase. Then he must place a splint in position which will register the amount of change after the vertical increase and take another roentgenogram. In this manner he may be able to observe whether the increase is within physiological limits of safety. Although there are many cases in which the vertical dimension has been increased without any mishaps and without mandibular joint roentgenograms, just one failure may cause a dentist enough regrets to outweigh or to wipe out all satisfaction from earlier successes, and one such failure may mar an entire lifetime of otherwise conscientious work. If it is not possible at the office, roentgenograms of the joints can be taken at a dental school, local hospital, or a commercial x-ray laboratory.

3. When the vertical dimension must be increased an unusual amount, the dentist must be sure to know exactly what changes are being introduced. Bites cannot be raised indiscriminately. Those of us who are able to review and observe this disastrous procedure and the mutilations that result are unanimous in strong professional criticism and condemnation of such procedures.

Text continued on p. 517.

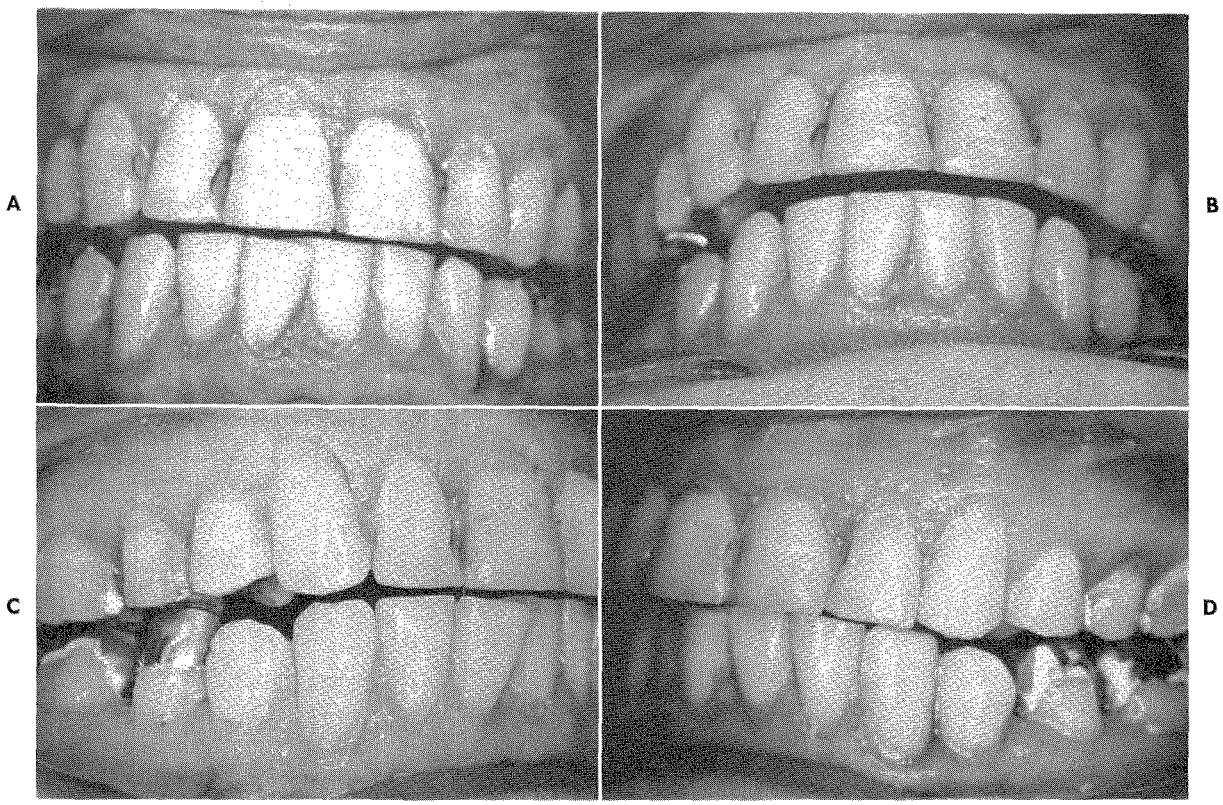

Fig. 1093. Four views of the mouth of a woman in her early forties, at the start of the treatment in June, 1959. Her bite had been raised on her lower second bicuspids and molars. **A,** The mandible is in a forward position. **B,** The mandible is in a retruded position. **C,** Right-side contact, mandible forward. **D,** Left-side contact, mandible in a lateral position. Nowhere was any comfort obtained. (Figs. 1093 to 1101 are of the same case.)

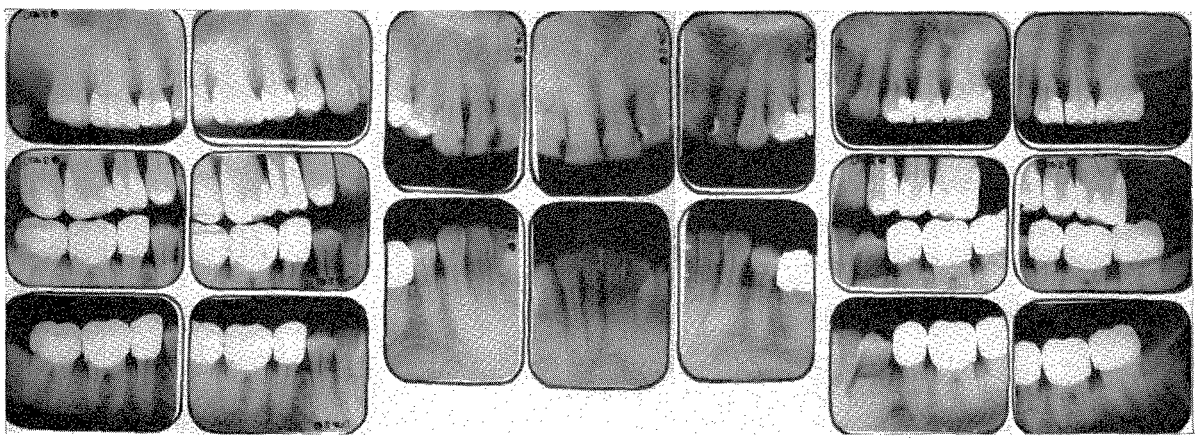

Fig. 1094. Roentgenograms taken at the start of treatment in June, 1959.

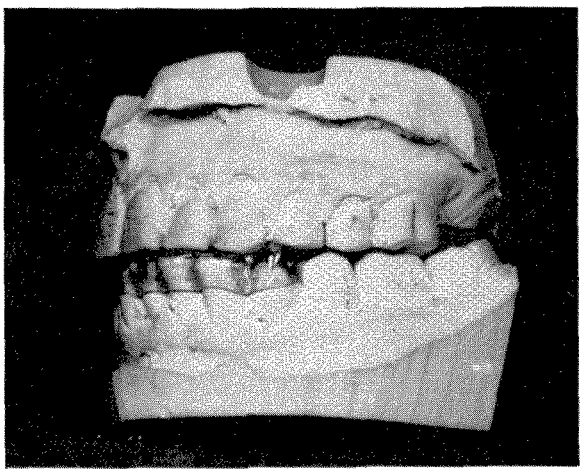

Fig. 1095. This acrylic splint covered her lower anterior teeth to the vertical level of the posterior onlays and provided additional contacts between eight upper and lower teeth. It was worn until the posterior lower onlays could be removed and the bite lowered to its original vertical level.

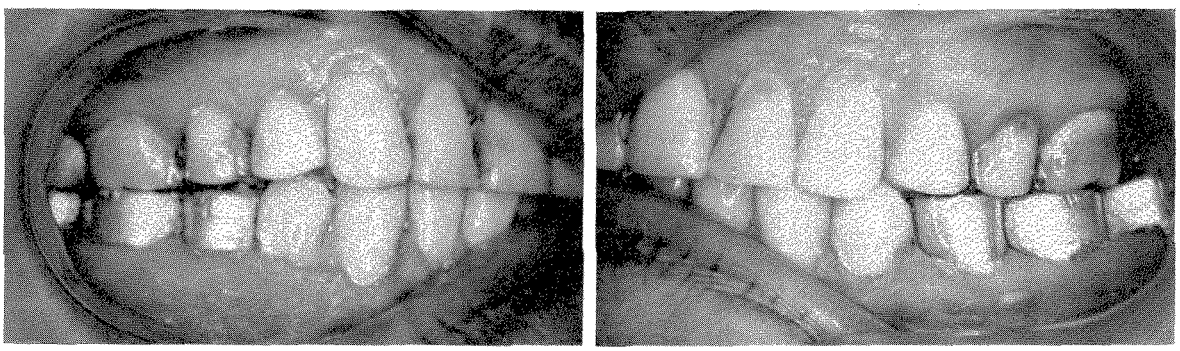

Fig. 1096. The gold lower posterior onlays were removed as soon as possible, and aluminum crowns were first inserted at the former bite level as shown here.

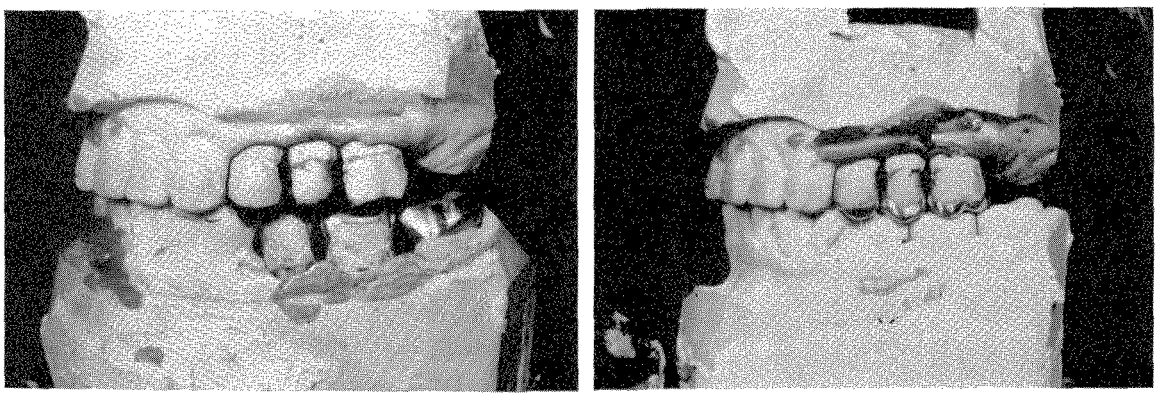

Fig. 1097. The upper and lower left posterior teeth were completed first. The teeth were prepared for gold inlays and three-quarter crowns. Rubber impressions were taken. The work was constructed on a Hanau Model H articulator. The upper and lower left interocclusal relationship was coordinated. **A,** The lower castings in position and the upper wax-up. **B,** The upper completed inlays. The lower castings had already been cemented, and the upper ones had been completed against a stone cast of the lower completed work.

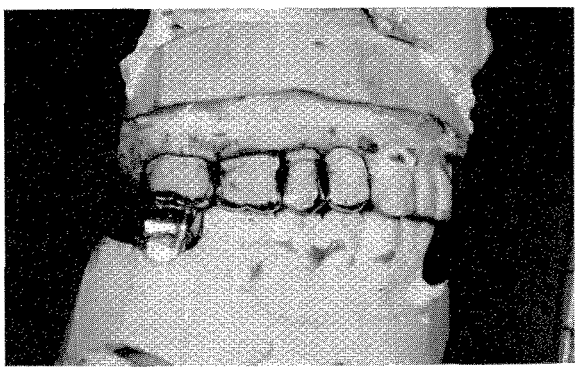

Fig. 1098. The upper right side is here being related to the lower right side. Both upper molars and bicuspids were inlaid, and the occlusion was coordinated. This is a reconstruction by sections, one side being completed at a time. The lower molar crown was also completed and is shown here.

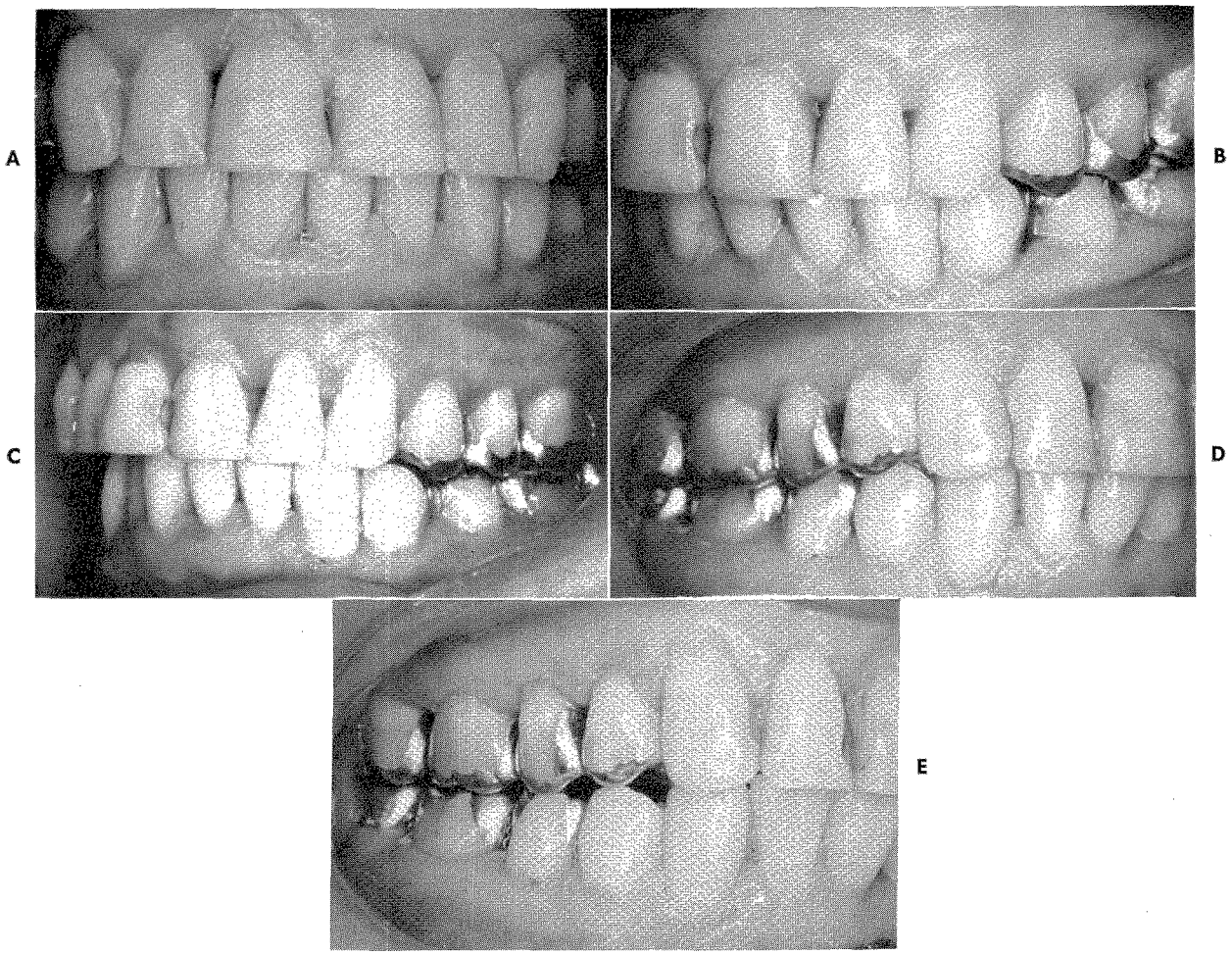

Fig. 1099. A, Front view, centric occlusion. Compare this with Fig. 1093, **A,** to observe the extent of the increase of the vertical dimension. This was the original vertical dimension. It was fortunate that the anterior teeth and the first bicuspids had not been reconstructed since they indicated the former vertical interocclusal contact level. **B,** Left side of the completed work, centric occlusion. **C,** Left side of the completed work, working bite. **D,** Right side of the completed work, centric occlusion. **E,** Right side of the completed work showing the working bite.

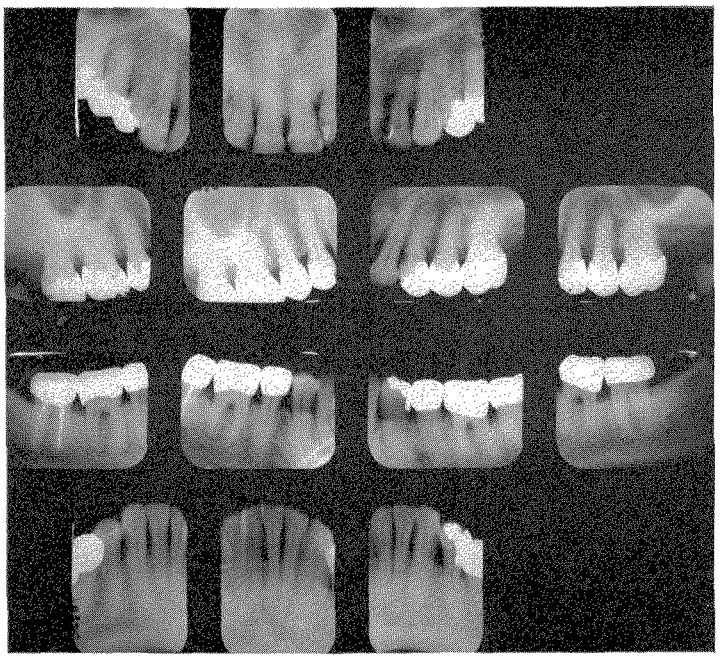

Fig. 1100. Roentgenograms of the completed work taken in August, 1962, three years after completion.

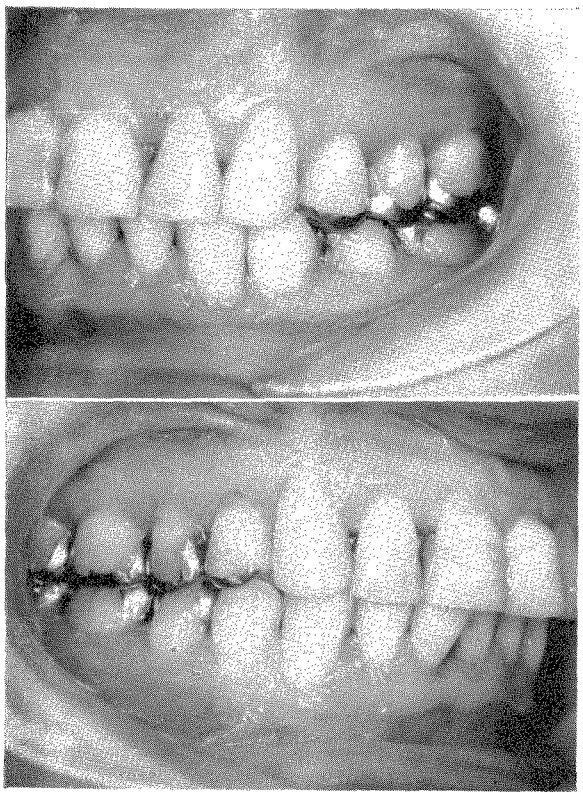

Fig. 1101. Two views of the mouth in 1962, three years after completion.

Case 5

Present condition—chief complaints

In April, 1960, a 25-year-old woman was referred by a psychiatrist. He wanted to be sure her difficulty was not dental. She was an actress whose specialty was dancing and singing. On her first visit she reported that her mandible and her temporomandibular joints were so painful she claimed she had to support her jaw with her hands to relieve the discomfort. Her former dentist was in the process of inserting porcelain jacket crowns anteriorly and posteriorly. Much of this had already been done. The vertical dimension had been increased at least one quarter of an inch posteriorly. The anterior teeth were completely out of contact and presented a large horizontal overjet.

Severe muscular trismus was present. Opening the mouth was performed by manual manipulation, and it appeared to be a painful process. It was accompanied by clicking of the joints and a marked mandibular deviation. Her history report mentioned several three-hour visits and many local and conductive injections for the relief of pain during these sessions. The roentgenograms disclosed posterior teeth that had been reduced radically to permit for the insertion of porcelain jacket crowns. When the patient became hysterical and difficult to treat, the dentist suggested that she was uncooperative, overemotional, and unreasonable. In many respects this case was similar to Case 4, which was just reported.

Fortunately no difficulty was experienced in obtaining her previous records. These included original casts that had been made before any work had been performed. No roentgenograms had been taken of the temporomandibular joints. The former dentist insisted he had done what the patient wanted, and he stated that the patient, because of her profession, had persuaded him to insert anterior and posterior porcelain jacket crowns to solve the esthetic problem. In order to provide the extra room necessary for posterior all-porcelain crowns, it was necessary to increase the vertical dimension an excessive amount. The dentist was surprised at the difficulties his treatment had precipitated and remarked that he had never experienced any similar trouble previously. Not only was the patient upset physically and emotionally, but she said all her savings had been used for these dental services. For the past several months she had been unable to work because of the discomfort.

Treatment

The original casts demonstrated that in 1959 the upper and lower incisors were in contact and the occlusion was normal. A vertical overbite was present. When she came for the first time on April 4, 1960, a large horizontal overjet was present with no vertical overbite. Her discolored and offensive-smelling plastic quick-cured splints were reduced immediately until the anterior teeth almost contacted. Some degree of relief was obtained from the muscular spasm.

Roentgenograms of the temporomandibular joints were taken. They revealed a posterior positioning of the right condyle in the fossa. Upon opening the mouth, the condyle remained in the fossa. The roentgenograms also revealed a posterior position of the left condyle in the fossa, but not so severe. Upon opening the mouth the left condyle moved downward but not within the acceptable normal range.

The vertical height of the right and left acrylic splints, even after their reduction, still testified to the abnormal increase of the vertical dimension.

Complete rest was prescribed with the use of warm packs. Refrigerated ethyl chloride sprays had already been used by another consultant in an effort to relieve the muscle spasm. Shortly after her first visit both lower temporary splints were removed. This permitted the anterior teeth to make positive contact for the first time since their insertion. A return to her former bite was also confirmed by the positive contact between the upper right unprepared central incisor and the lower incisors. The muscular trismus was less severe, and the patient was much more comfortable and hopeful. All this was accomplished within ten days.

On May 9, 1960, the acute symptoms disappeared so that it was possible to obtain impressions in order to make casts for the study of the occlusion. A face-bow and centric record were also taken. The stone casts were mounted upon a Hanau Model H articulator. A metal disk was placed upon the anterior stop of the right condylar slot in order to protrude the right condyle from its retrusive position in the fossa. A Hawley bite plate was made to aid in the forward movement of this condyle. This was inserted on May 25, 1960. The posterior occlusion was left slightly out of contact. By now the muscular trismus had subsided, and the right condyle was able to move out of the fossa during opening and protrusive movements. The patient was in excellent spirits as more normal function returned. On June 15, 1960, a new slow-cured acrylic splint was inserted on the lower left side.

No further work was performed until mid-August so that the muscles and joints would have a well-earned rest. Lower left posterior porcelain jackets had been made by the previous dentist. They had never been reduced in vertical height. Therefore, by inserting them it was possible to obtain an exact measurement of the amount this vertical dimension would have been increased. The result demonstrated an increase of one fourth of an inch beyond the normal in the bicuspid and molar regions. In October these porcelain jackets were reduced to the normal bite height and were inserted. It was necessary to make plastic jackets for the cuspid and first bicuspid because of the extreme thinness of the incisal and occlusal surfaces of the porcelain after grinding them. On the lower right side she accepted gold inlays in the bicuspids and the second molar. A porcelain bonded-to-platinum crown was made for the right first molar. These were inserted in March, 1961.

Even at this date there was a slight deviation present when she opened her mouth, and the right condyle was still deep in the fossa. Whether or not this was its original position or its position that was assumed because of the trauma will never be known because of the lack of original roentgenograms of the joint. The porcelain jacket crowns that were made by her former dentist were causing some gingival periodontal irritation, but she claimed she was in no financial position to have them changed. When possible, at such time when she has the funds available, the crowns will be changed to gold veneers. She wears the Hawley bite plate every night and often during the day. She reported it gave her comfort and a sense of security. (Figs. 1102 to 1117.)

Discussion

In cases of this nature in which finances are limited, are we justified in recommending porcelain jacket crowns on all the teeth? This type of dentistry presents

replacement problems due to breakage. Have we the right to impose this repeated financial burden, or should we insist upon procedures not requiring the heavy expense of postinsertions? Although her professional needs as an actress may suggest the best in esthetics, this factor alone did not appear to necessitate the placement of porcelain jackets on all her posterior teeth. The drastic reduction of the entire tooth was undesirable and dangerous, especially at such an early age. This, plus the possible problem of future upkeep, created an unhappy and controversial situation.

In May, 1962, the upper left porcelain bridge fractured due to a weak connection between the dummy and the abutment casting. This reaffirms the original conclusions that this type of bridgework, under the given circumstances, poses an undesirable future hazard.

This case was a very disagreeable experience to the patient and to her former dentist. It illustrates that patients should not be permitted to dictate the prescription if it does not coincide with the dentist's own professional views and his own appraisal of the most feasible remedies. Good records must always be taken,

Text continued on p. 527.

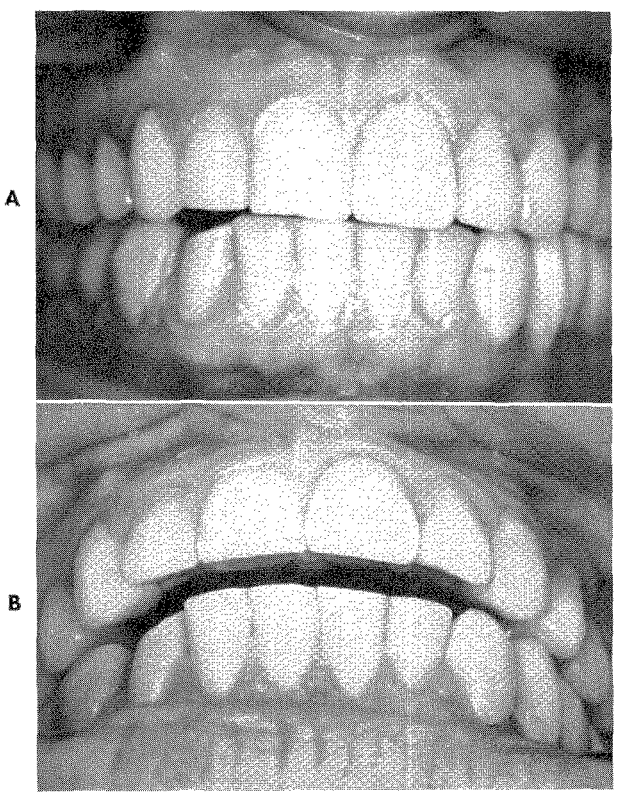

Fig. 1102. A, Teeth of a 25-year-old woman whose vertical dimension was greatly increased. These photographs were taken on April 8, 1960, when she was first examined. The extent to which the vertical dimension was increased may be judged by observing the anterior opening of the bite. The posterior teeth are in contact. **B,** The head was tipped backward to show the extent of the opening. (Figs. 1102 to 1117 are of the same case.)

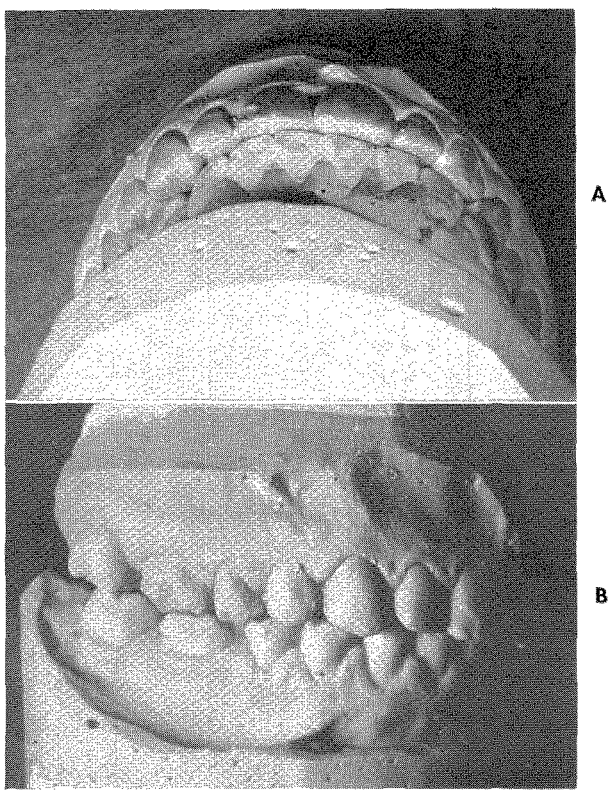

Fig. 1103. A, Casts of the patient's teeth shown in Fig. 1102. These were made in 1959 before the vertical dimension was increased. Observe that the anterior teeth contact. **B,** A right lateral view before the bite was raised. Compare the vertical overbite of the upper right cuspid with Fig. 1102 to judge the extent of the bite opening. For a left lateral view, see Fig. 1107.

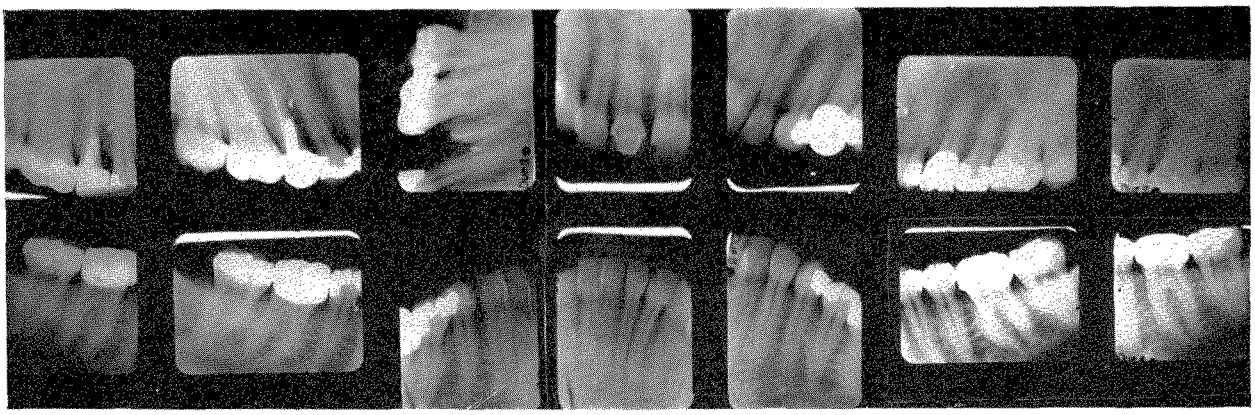

Fig. 1104. The original roentgenograms that were taken in December, 1958, before the vertical dimension was increased.

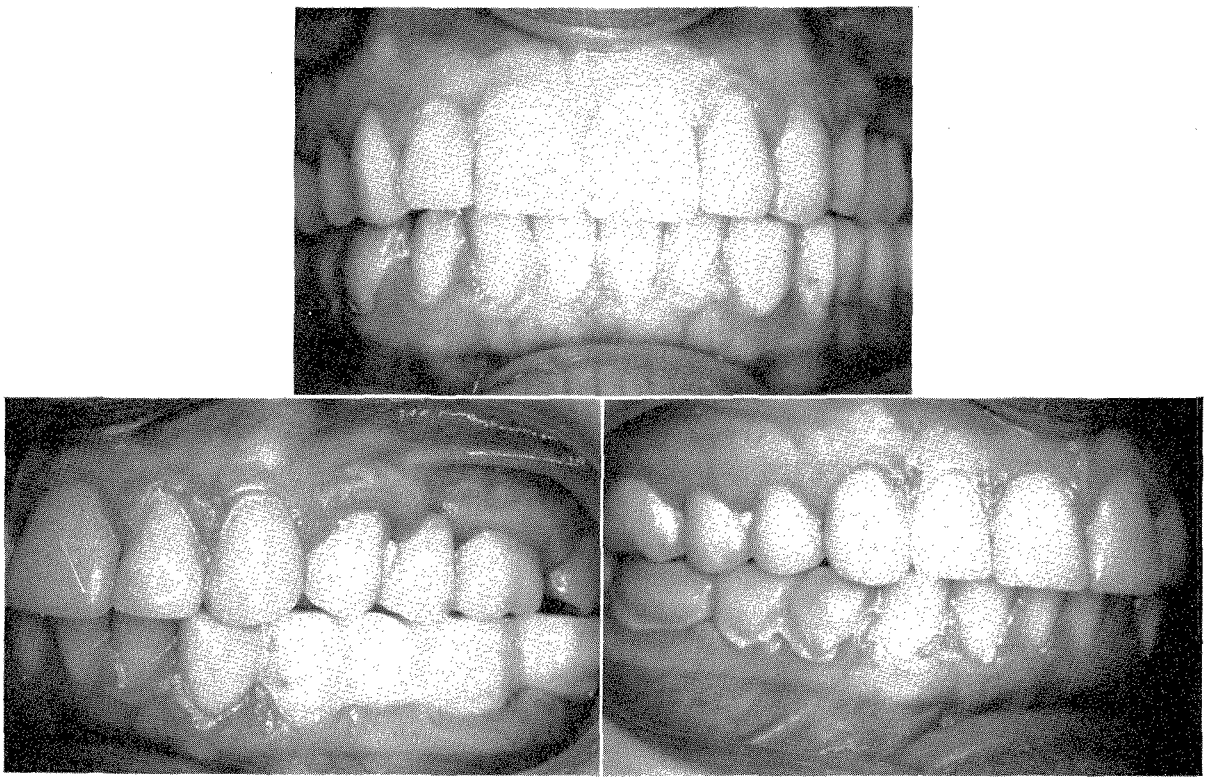

Fig. 1105. The bite was completely lowered within a very short time. Fortunately the upper right lateral incisor had not been covered with a porcelain jacket, and therefore it provided a key to the former vertical dimension. The lower posterior acrylic resin splints are still in position, but their vertical height has been greatly reduced.

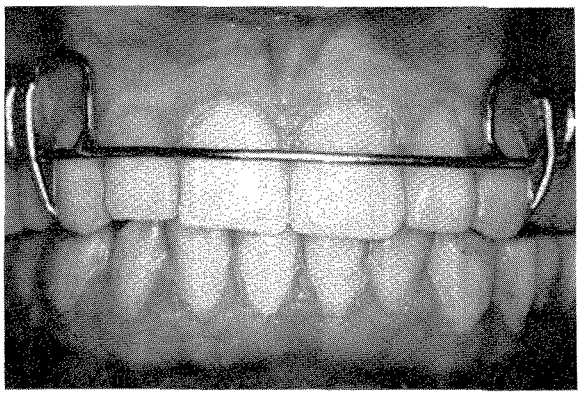

Fig. 1106. A Hawley bite plate was inserted. The posterior teeth were taken slightly out of occlusion.

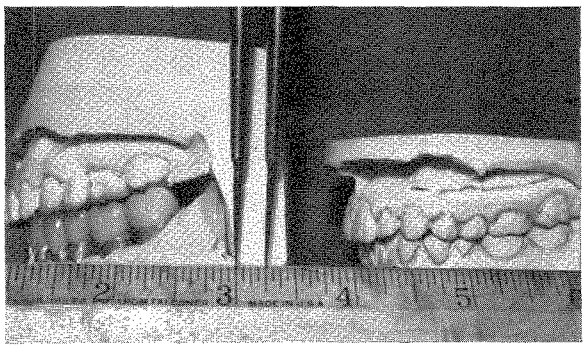

Fig. 1107. The porcelain jacket crowns that were made by her former dentist and were going to be inserted are shown on the left side. The left-side view of the original casts before the bite was raised are shown on the right side. Measurements that were made with the caliper shown in the illustration indicate that the vertical dimension was raised one quarter of an inch in the molar region. This means that it was raised even more in the incisor region. (Refer to Fig. 1103, **B,** to see the right side of the original casts.)

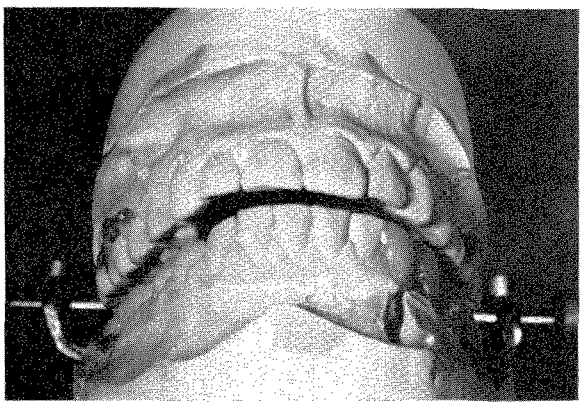

Fig. 1108. These are the same casts as shown in Fig. 1107 on the right side with the porcelain jacket crowns in position on the left side. This mouth was being rehabilitated one segment at a time. This can be dangerous because the large increase of this vertical dimension places the mandible in an entirely different interocclusal relationship depending upon the arc of closure. In this case the mandible moved posteriorly. This would necessitate wider lower buccal and narrower lower lingual surfaces. To attempt to coordinate this occlusion by the segmental technique can be dangerous.

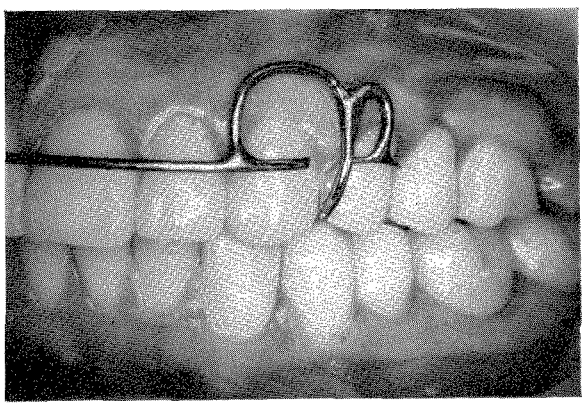

Fig. 1109. The porcelain jacket crowns were lowered by grinding and were finally inserted. The cuspid had to be made of plastic since the porcelain became too thin to be used.

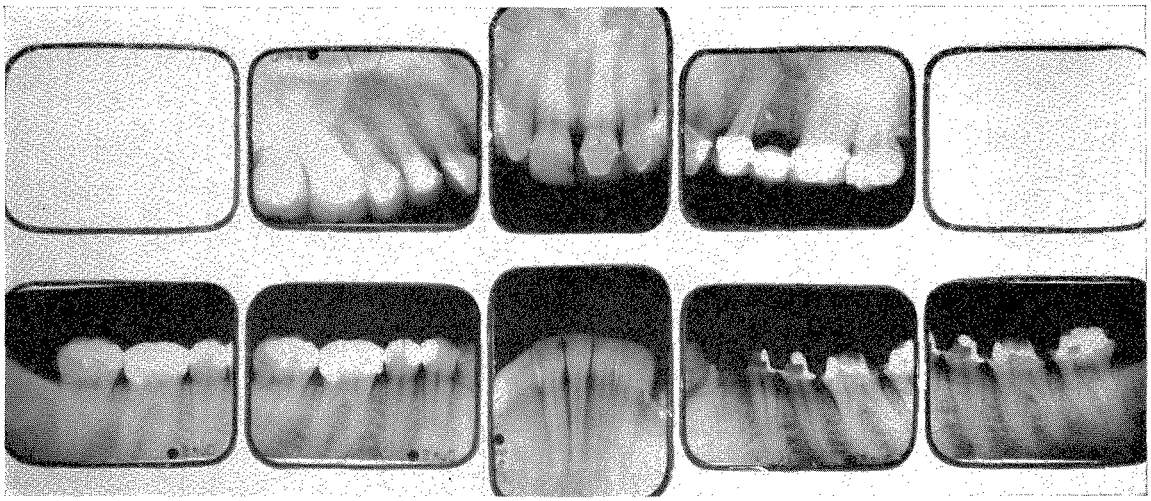

Fig. 1110. Roentgenograms taken on April 8, 1960. These were taken before treatment was instituted. Observe the excessive amount of tooth structure which was removed on the lower left side in order to prepare these teeth for porcelain jacket crowns.

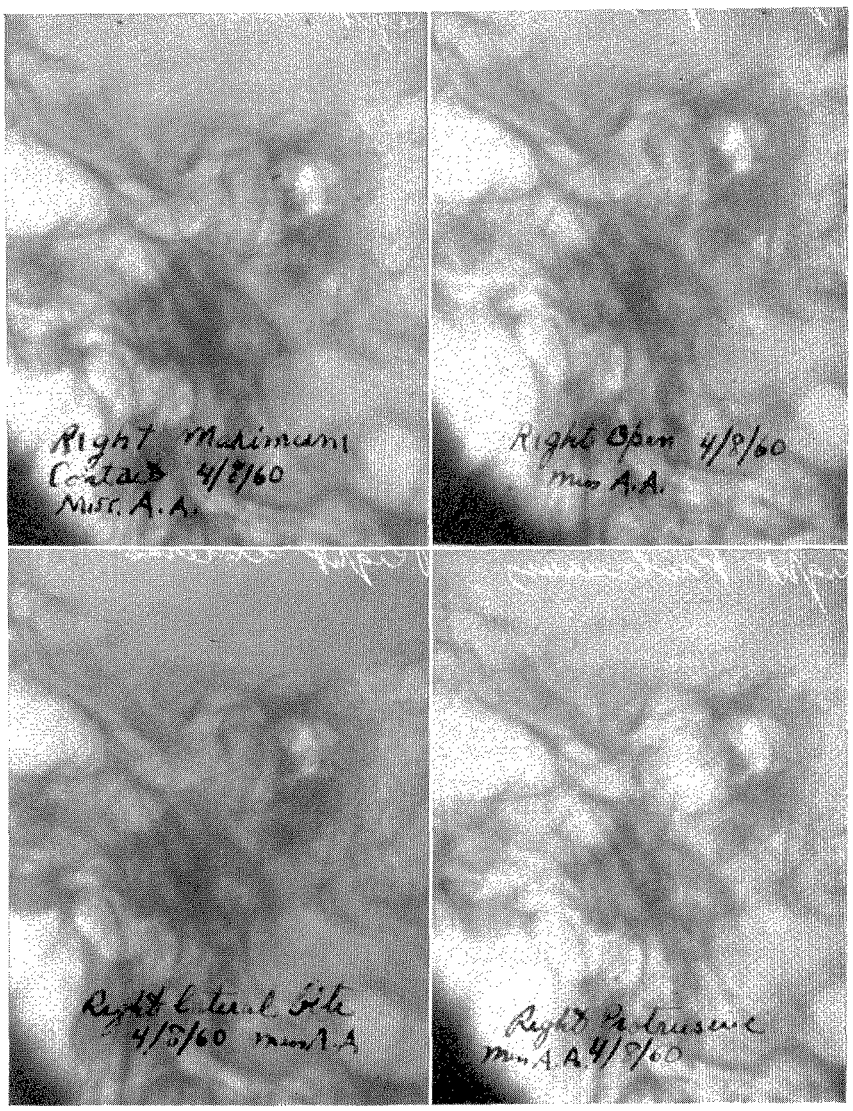

Fig. 1111. Roentgenograms taken of the right temporomandibular joint on April 8, 1960. The position and movements of the condyle are abnormal.

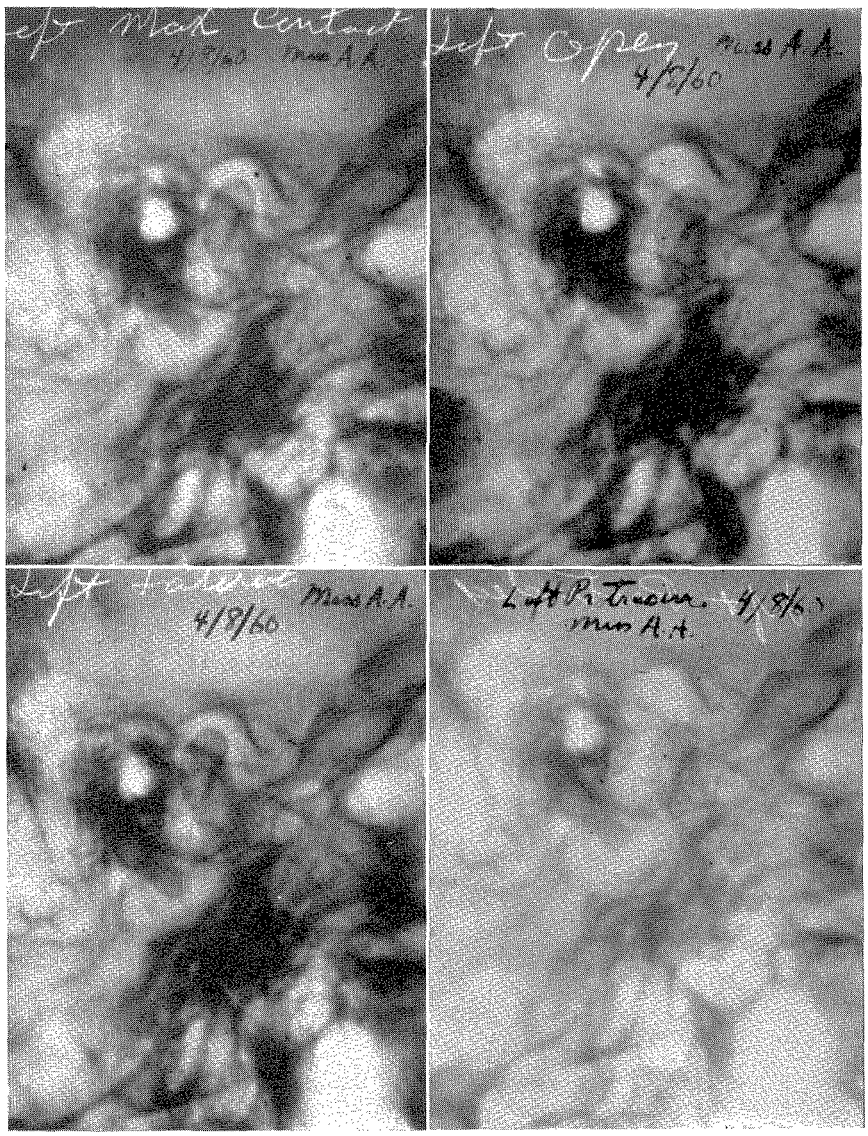

Fig. 1112. Roentgenograms taken of the left temporomandibular joint on April 8, 1960.

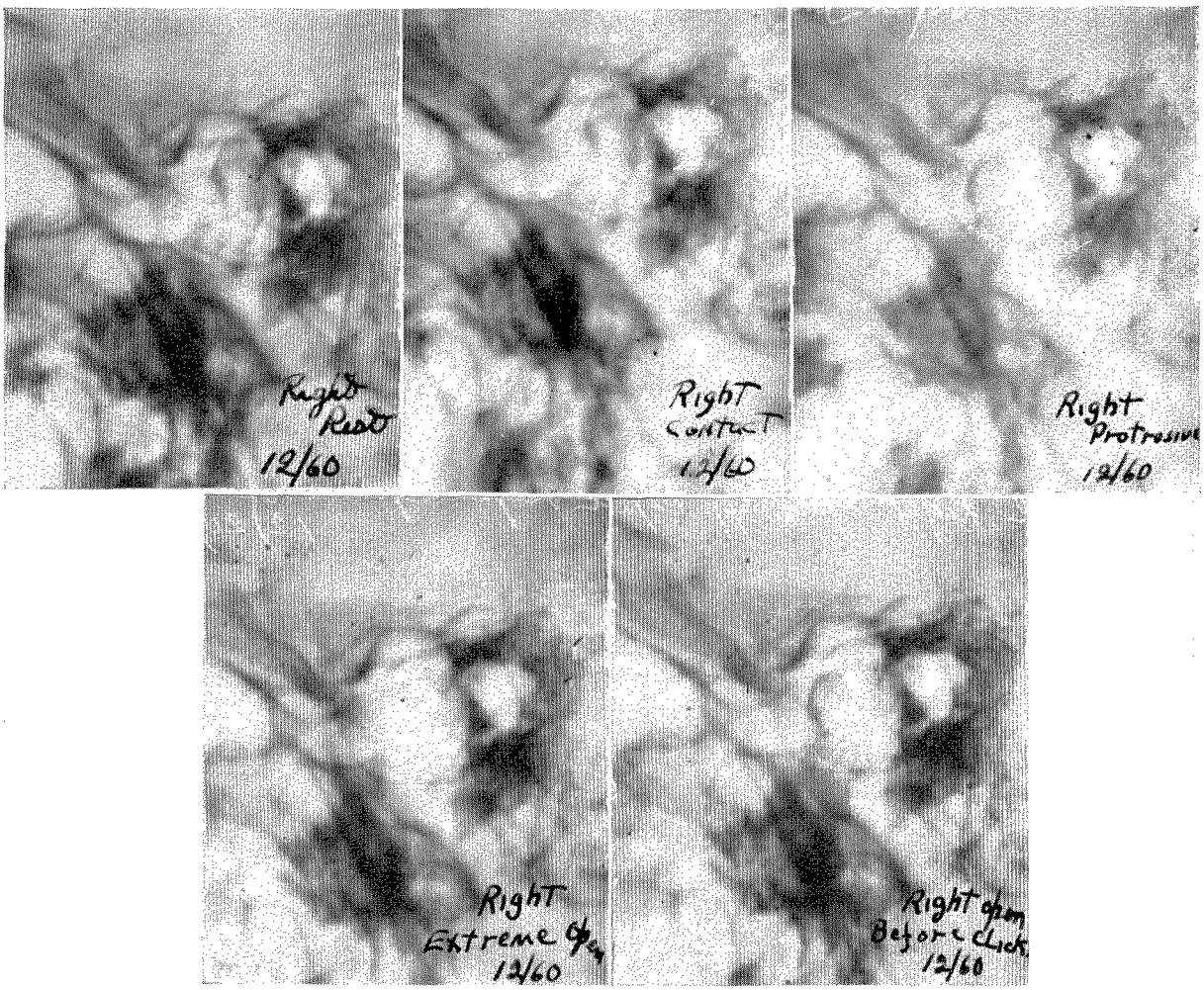

Fig. 1113. Roentgenograms taken of the right temporomandibular joint in December, 1960. Although the position of the condyle is more normal in the open positions, the condyle still lies abnormally posterior and superior in the mandibular fossa.

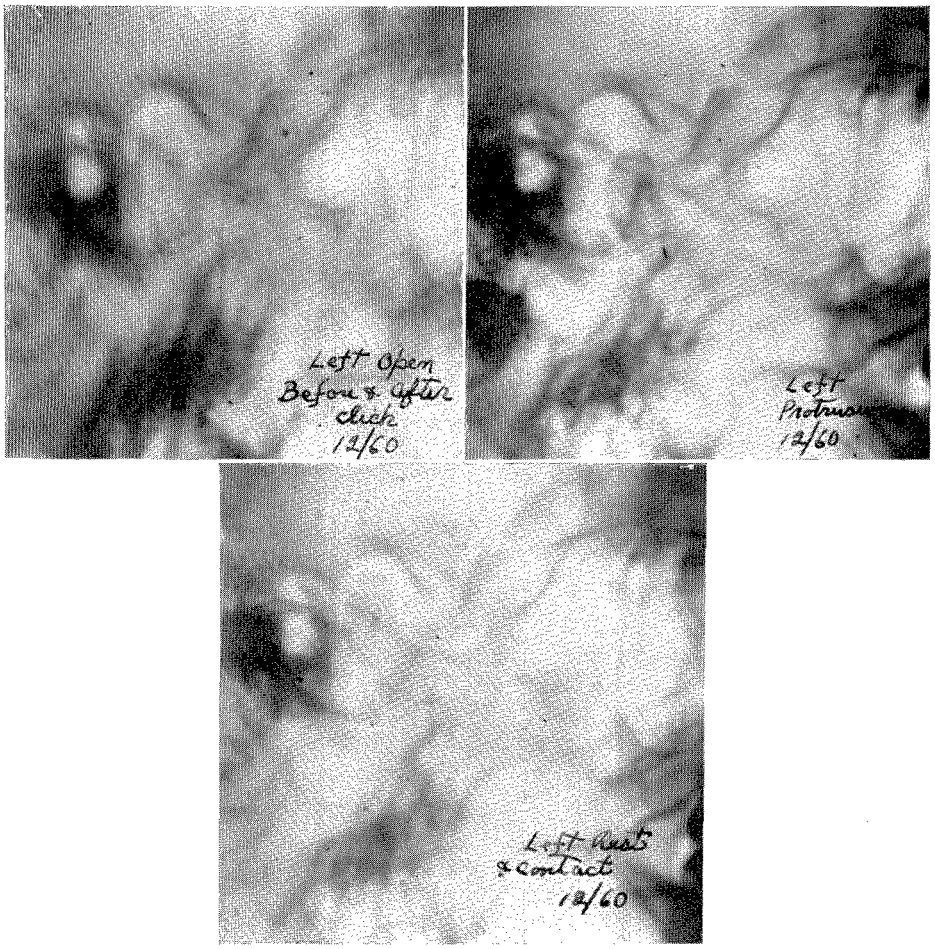

Fig. 1114. Roentgenograms taken of the left temporomandibular joint in December, 1960.

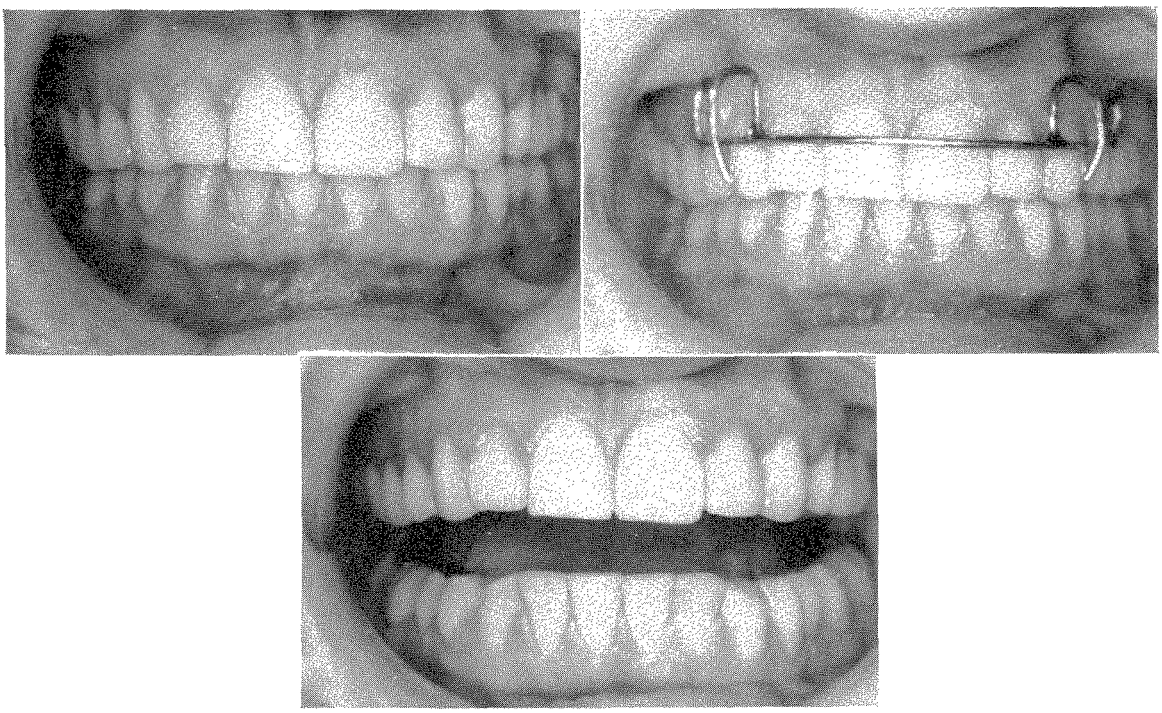

Fig. 1115. Three views of the teeth. These were taken in August, 1960.

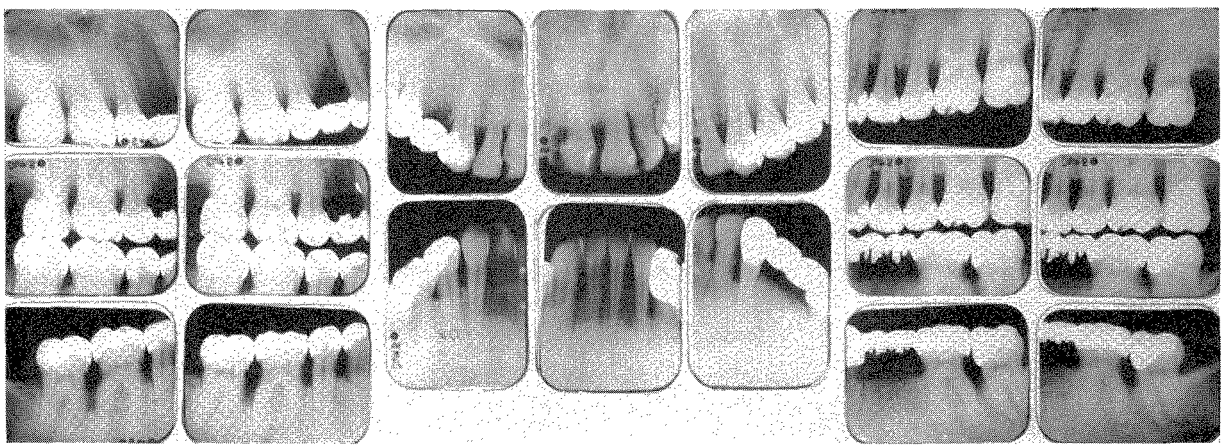

Fig. 1116. Roentgenograms taken in August, 1961.

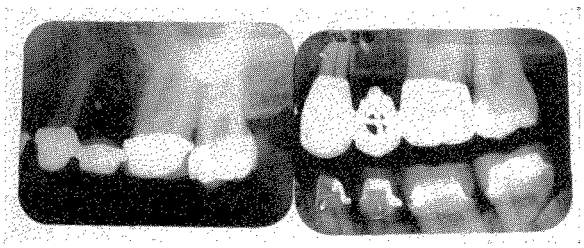

Fig. 1117. In May, 1962, the upper left porcelain bridge fractured and was replaced by a gold bridge with plastic veneers. The roentgenograms are shown here. This substantiates the conclusion that the post-insertion expense for this type of work did not warrant its insertion.

both to study the case before undertaking work of this nature and to protect the dentist should the result fall short of expectations. Also, a dentist should be very slow to state or to imply that a patient or former patient is a borderline mental case or has been excessively difficult to handle. Although it may seem to provide some justification for mediocre or poor work, it usually is shown in a controversial hearing to be a worthless rationalization and almost no excuse at all. The following letter from the patient's own psychiatrist is evidence that the patient's dental problems were unrelated to her chronic personality problems.

Dec. 4, 1961

Dear Dr. _____:

In answer to your letter of Nov. 29, 1961, concerning Miss _____, let me state that she had been referred to me in November, 1959, because of a rather disturbing chronic personality problem. This had preceded her dental troubles by many years and was in no way precipitated by them. The dental situation was only an intercurrent, unrelated condition. I might quote, in part, my note of April 11, 1960:

"This patient had a disturbing episode due to dental trouble—she found herself unable, for the last three weeks, to open her mouth fully, and had marked pain and spasticity on the left side in chewing. She lived on fluids and banana mush. Her dentist declared this [to be] largely emotional and had treated her with Atarax. He thought the condition would clear up spontaneously in another couple of weeks. It was clear to me that this trouble was entirely mechanical and not at all hysterical; this patient has no hysterical symptoms otherwise and there is no known tendency to conversion. She began to become panicky because the condition interfered with her singing auditions; she could not open her mouth wide enough, and this threatened her success in competing for a job which she needs desperately to support herself for the next winter. . . . Accordingly she was referred to another dentist who spotted the difficulty and in the first session made it possible for her to eat. She was greatly relieved. . . ."

In the social stratum from which this patient comes, conversion hysteria of the highly dramatic type in which one would see this kind of symptoms has become exceedingly rare. We no longer see gross hysterial paralyses, spasms, and the like. For this reason, the diagnosis should always be made with great caution and only after all somatic pathology has definitely been ruled out.

Very sincerely,

(Signed)_____

Chapter 10

OPEN BITE

The teeth, the temporomandibular joint, and the neuromuscular mechanism are usually in a state of equilibrium in the majority of our patients. The teeth may even be in malocclusion, but for most people they are in equilibrium with their surrounding structures. The tongue pushes forward and outward from within the oral cavity while the lips and cheeks exert their inward pressures, thus maintaining the form of the dental arches and the interocclusal relationships by these static and dynamic antagonistic pressures.

INSERTION OF A SMALL OR LARGE PROSTHESIS REQUIRES ADJUSTMENT IN ORAL ENVIRONMENT

When a prosthetic appliance is inserted in the mouth, whether it be a single filling or a large removable partial denture, there is some adjustment that the various hard and soft structures must make in order to re-establish equilibrium. If ordinary skill is employed, this usually occurs in a relatively short time. This takes place as postinsertion adjustments are made. The bite is equilibrated and refined and the saddle areas are relieved when tissue impingement is observed. The prosthesis settles and is finally accommodated.

Many fillings have been inserted by dentists that either lack interproximal contact or have excessive contact. In addition they may have been in premature vertical contact. In most cases Nature has a way of making minor adjustments and of creating the proper equilibrium, even where the prosthesis is not in original harmony with the surrounding structures. This familiar sequence is occasionally varied, and such a departure is shown by a case in which the insertion of a single filling with an improper interproximal contact or some other simple incorrect procedure upsets the entire equilibrium of the stomatological system. These cases can cause no end of difficulties and often tax the ability of the most capable dentist to restore the norm that was present before the balance was upset. Four such cases were reported in 1951.*

*Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., pp. 224-227, 695, 921-931.

Case 1

Insertion of two gold inlays altered entire occlusion

The first case was that of a 45-year-old man. In 1936 he had two gold inlays inserted in the upper left posterior teeth. As a consequence he stated that his entire occlusion had changed. His structures had remained in excellent condition in spite of the occlusal disturbances. This patient was first treated in 1939 by equilibration. In February, 1948, his bite was again equilibrated. The case report in 1951* shows the procedure which was used. According to his history, in 1936, after the inlays had been inserted and his discomfort began, he went to several dentists for adjustments. Each dentist ground his occlusion according to his own conception of what the interocclusal relationship should be. This compounded the man's troubles and made a return to his original interocclusal relationship impossible.

When he was first examined in 1939, an open bite was present posteriorly. The occlusion was equilibrated until maximum contact was attained, but his bite continued to open as time elapsed. During the following twenty-three years his occlusion had been equilibrated by grinding several times. Although the results were successful at the time of treatment, a year or two later the bite would reopen. In 1957 several crowns were inserted, and his interocclusal relationship was again corrected. By February, 1962, it had again opened. The patient was then 69 years old. Again a premature contact was observed in the area of the lower left third molar. This time the contacts were again closed on both sides, but a temporary plastic crown was inserted on the lower left third molar. It is interesting to note that for the first time in many years, at the time of this writing (June, 1963) both right and left posterior contacts remained closed.

Discussion

There are various phases of this case that may be discussed. The occlusion was not observed before 1939, and it is assumed as factual that before the insertion of the two inlays in 1936, the occlusion was normal. Several dentists had ground the teeth between 1936 and 1939. The changes effected were nonreversible. Although an intraoral tracing device was used during the equilibration, after the original examination it was possible that a functional off-centric bite was perpetuated rather than a correct centric relational bite. If so, the continual opening of the bite may have resulted from the frustrated attempts of the mandible to reach its terminal hinge position during intervals of functional chewing or swallowing. The establishment of an excentric mandibular position of maximum contact could also have augmented bruxing and clenching habits.

With the full complement of teeth present, upon his initial visit it would have been unwise to advise complete oral rehabilitation because of the great number of natural teeth present and the great amount of time and expense this work would have necessitated. He was in no position to afford the expense then or now. Even if he had been able to undergo complete oral rehabilitation, would it have been justified in view of the present knowledge of the causative factors of the continued

*Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., pp. 921-925.

relapse. Consider the fact that his alveolar bone was still in excellent condition and that his function was better than average. He had yet to lose a single tooth. It was possible that a tongue thrusting habit was present accompanied by a false swallowing habit and that he had an open bite before 1939. Perhaps there were continued slow changes taking place in his temporomandibular joints and in the gonial angles of his mandible. If the gonial angles became more obtuse, the bite would open.

In February, 1962, new records were taken of his interocclusal relationship. A decided premature contact was discovered in the left third molar region. The mandible could readily be retruded. The left third molar had been covered with a full crown in 1957. This was removed, and the occlusion again equilibrated with the mandible in its retruded position. An attempt was made to establish maximum interocclusal contact with the mandible in its retruded position. The lower left third molar was covered by a temporary plastic crown which could be readily adjusted if necessary. His occlusion had not changed since the 1962 adjustments. Even if we concede that the continued eruption of the lower left third molar caused the open bite on the left side, it would be difficult to reconcile the opening of the bite on the right side with this same cause. It is usually found to be a combination of causes such as the continuous eruption of the molars, a false swallowing habit, and a powerful tongue which thrusts itself in many directions.

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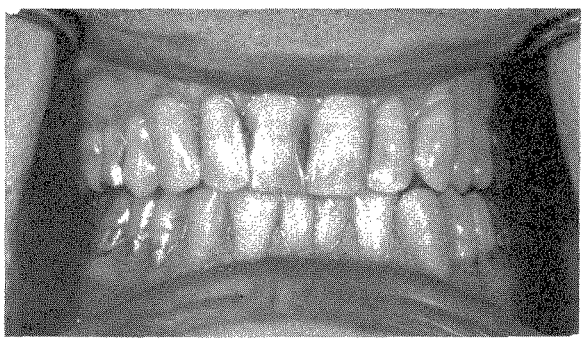


Fig. 1118. This photograph was taken in 1941. The patient was first examined in 1939. His bite was equilibrated by grinding. (Figs. 1118 to 1133 are of the same case.)

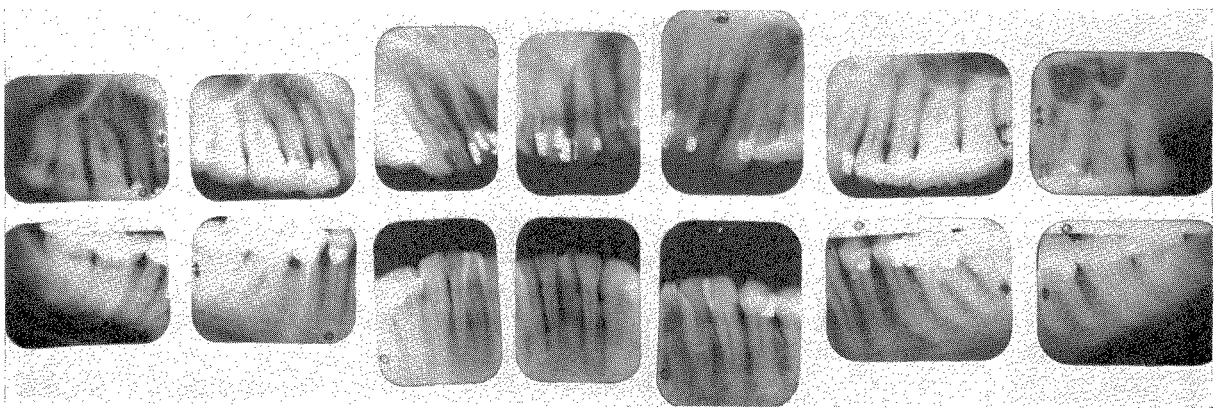


Fig. 1119. These roentgenograms were taken in March, 1938. The patient brought them in when he was first treated in 1939.

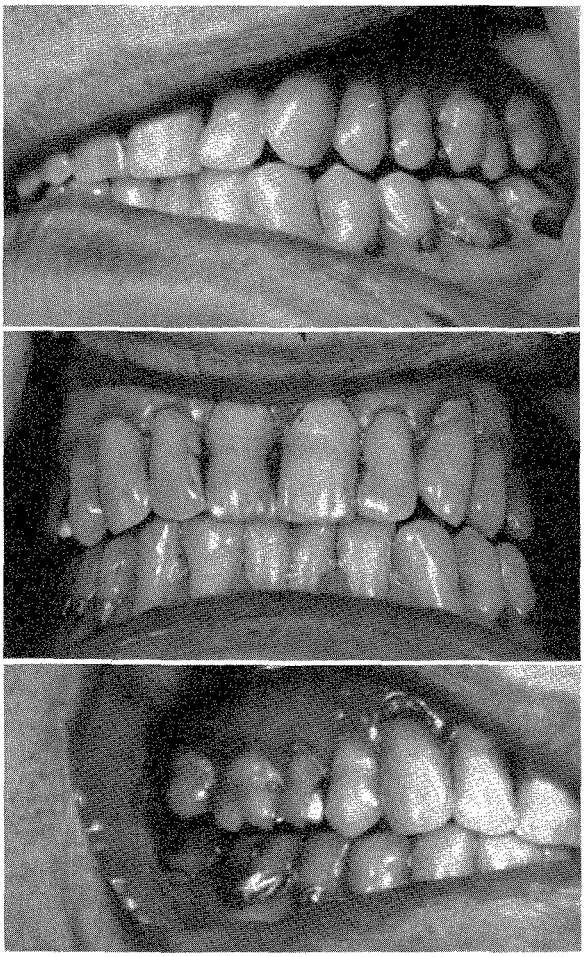


Fig. 1120. In February, 1948, the mouth looked like this. The bite had again opened.

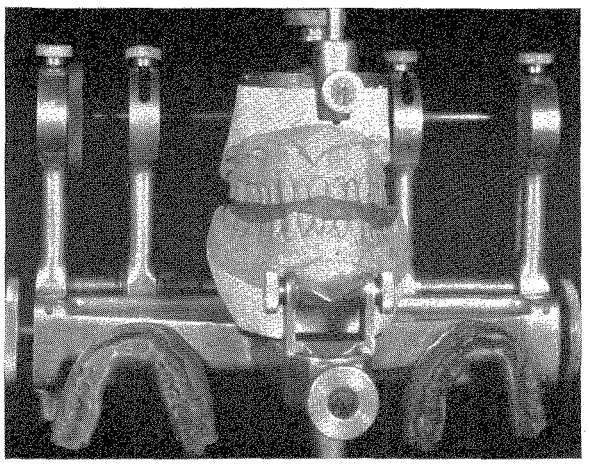


Fig. 1121. The casts were attached to the kinoscope, and the occlusion was studied.

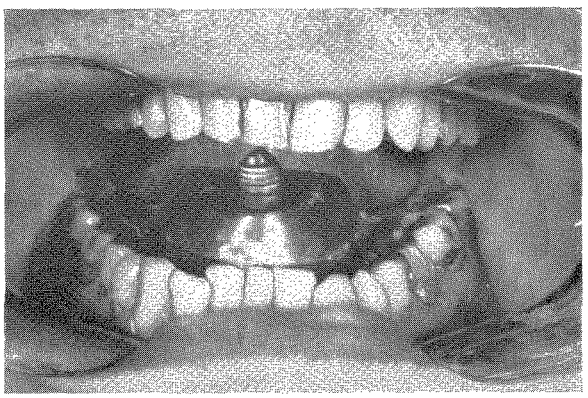


Fig. 1122. Central-bearing plates were cast to fit the arches and then inserted in the mouth. The pin was gradually lowered until the first cusp made contact. The grinding was done with small stones. Articulating paper was used to mark the premature contacts.

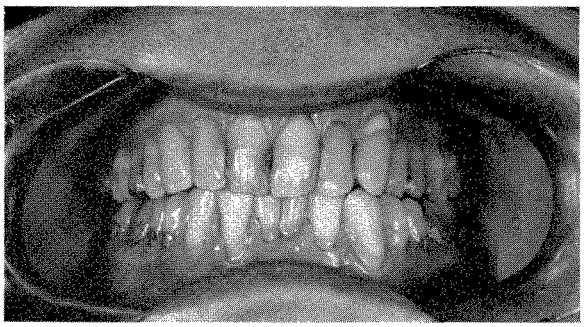


Fig. 1123. The work was completed in February, 1948, as shown here, and the patient was made comfortable. The open bite was closed. Most of the grinding was done on the anterior teeth and the upper left posterior teeth. The following is taken from a letter the patient wrote a week after the work was finished: "As to my bite, it is wonderfully improved. Feels more natural than at any time I can remember. Also helps my enunciation. Think those lower front teeth got in the way of my tongue!"

Fig. 1124. In September, 1953, the bite was again open.

Fig. 1125. In December, 1957, the bite was again closed. This time the upper four incisors and the upper posterior left molars were crowned. Two views of the closed bite at the end of treatment are shown here.

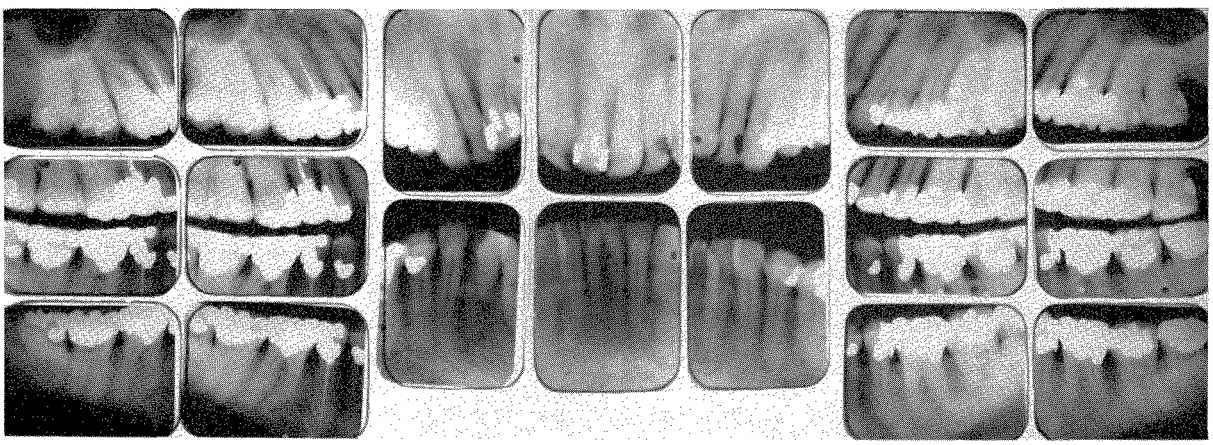


Fig. 1126. Roentgenograms taken in November, 1955. Compare these with those taken in April, 1958, to see the prosthesis that was inserted in 1957.

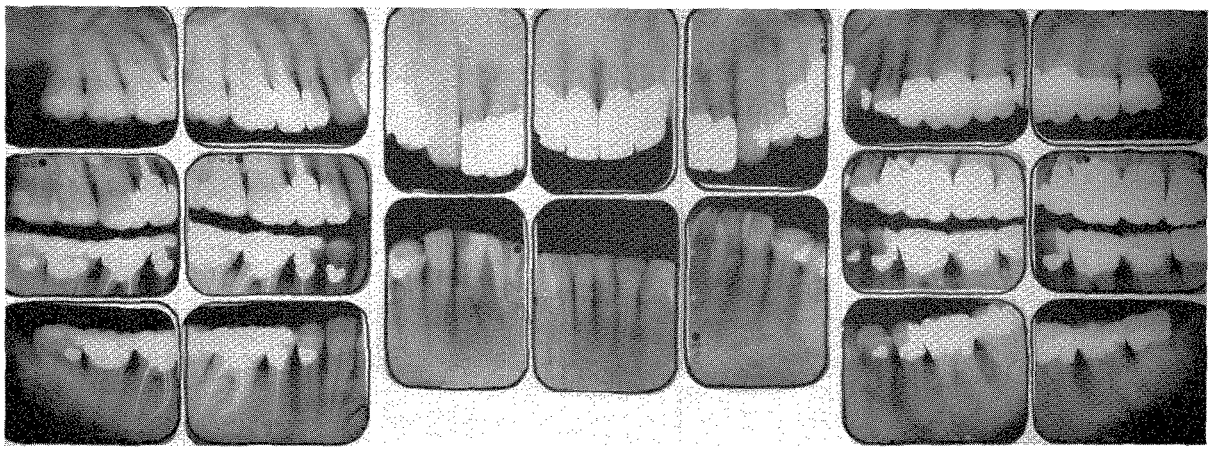


Fig. 1127. Roentgenograms taken in April, 1958. Compare these with those in Fig. 1126 to see the extent of the prosthetic work done in 1957, when the posterior open bite was again closed.

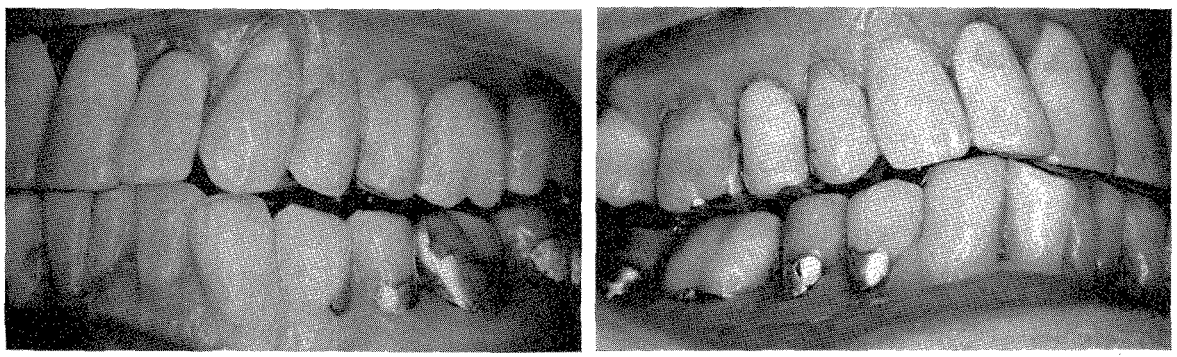


Fig. 1128. By February, 1962, the posterior occlusion was again open as shown by these two views.

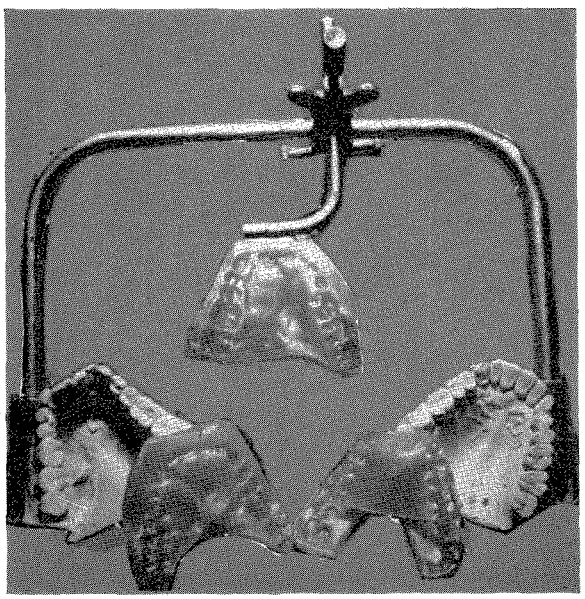


Fig. 1129. New records were taken for another evaluation. These casts were mounted on the Hanau Model H articulator.

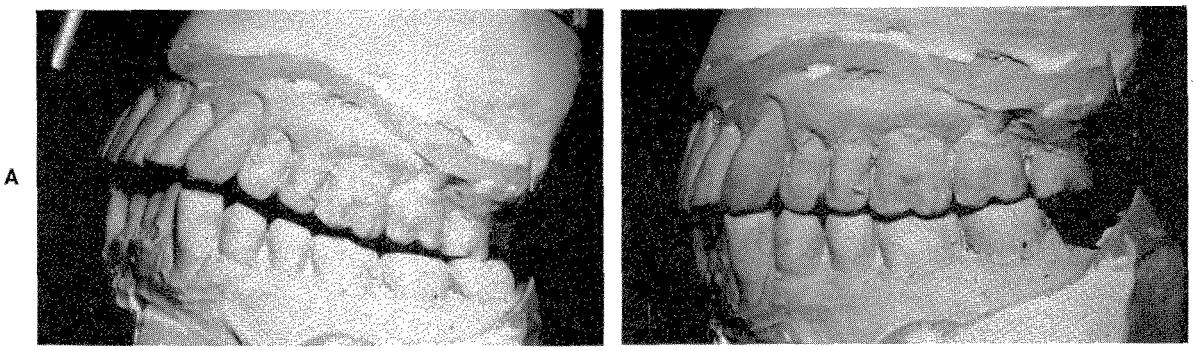


Fig. 1130. **A,** The lower left third molar was in premature contact and was forcing the mandible forward. **B,** With the removal of the lower left third molar from the stone cast, the remaining teeth came into contact as shown here.

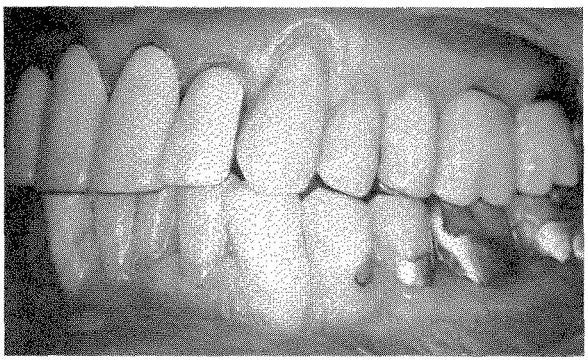


Fig. 1131. The left side is again in contact. The lower left molar was reduced to a noncontact position, and a temporary acrylic crown covers it. This was done to be able to see its effect upon the future occlusion.

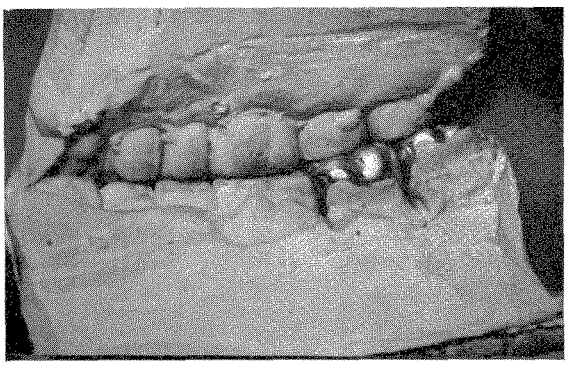


Fig. 1132. The addition of two large gold inlays in the right second and third molars served, once again, to close the open bite on the right side. A lingual view of the inlays is shown in this illustration.

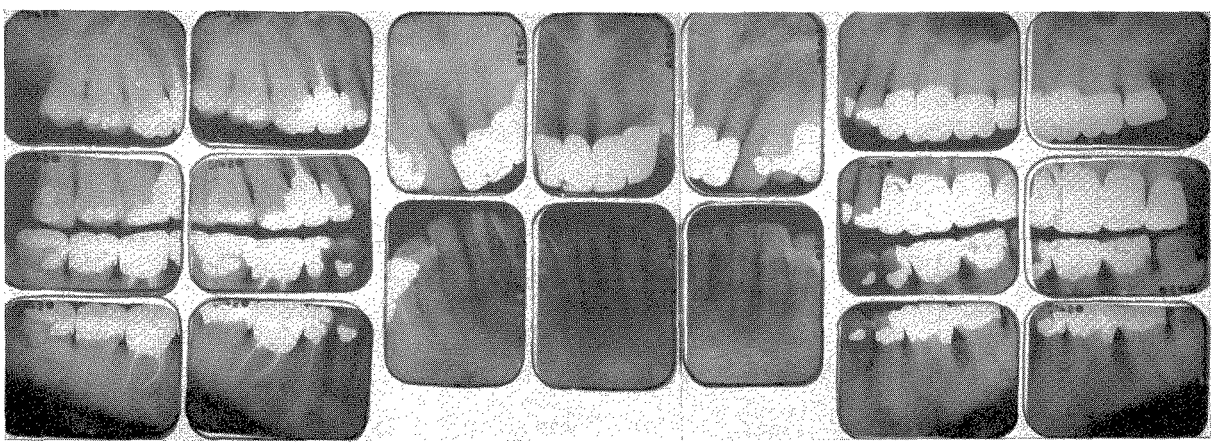


Fig. 1133. The roentgenograms that were taken in 1962. The patient was 69 years old at that time.

The outcome is still problematic. It is possible that his function takes place in an anterior position in spite of his ability to retrude his mandible. He continually mentioned prematurities in the incisor region. These had been adjusted several times but recurred. This case shows the influence of unchartered factors worthy of serious study. (Figs. 1118 to 1133.)

USE OF SIMPLE PROCEDURES BEFORE RESORTING TO COMPLETE REHABILITATION

Although the insertion of an inlay or a small bridge, which alters the interocclusal relationship, may be unnoticed by some patients and does no apparent damage, even though permanent irreversible changes may take place in the interocclusal relationship, there are other patients whose occlusions, under similar conditions, are damaged to such an extent that complete oral rehabilitation is required to again establish an integrated occlusion. This is especially so if these conditions are unrecognized for a reasonable length of time, such as a few months.

It is generally recognized that complete oral reintegration is a serious and difficult procedure and is attended by many pitfalls. It should not be undertaken unless it is absolutely necessary. If, therefore, the insertion of a small piece of prosthesis does cause interocclusal imbalance but function and the oral structures have not been visibly or radiographically impaired and the patient is not suffering from any mental or physical discomfort due to it, equilibrating techniques rather than total rehabilitation should be employed to relieve the occlusal stresses.

Although these modified and much simpler procedures may fall short in their ability to restore true centric relation or hinge occlusion, there are still many patients who neither recognize nor are troubled by these occlusal discrepancies and whose oral structures do not seem to be harmed by them. This simpler form of treatment, namely, occlusal equilibration, seems a great deal safer, less time consuming and expensive, and certainly more conservative.

Case 2

Insertion of one gold inlay altered entire occlusion

A case that fits into this category was reported in 1951.* The patient, female, came for treatment in 1932. Four porcelain jackets were inserted on the upper incisors. The photograph taken of the completed work showed that the median line of the upper incisors was directly over the lower right central and lateral proximal contact. In other words the mandible was one whole incisor to the left. There was a malocclusion present which included a lower left canine cross-bite. The completed photographs taken when the jackets were inserted revealed interocclusal contact in the incisor region.

In 1945 a gold inlay was inserted in her upper left second molar. Within two months her entire occlusion had altered. Her mandible had deviated to the right, and an open bite had developed. The inlay was a distoclusal one with no tooth behind it. The discrepancy, if one was present, must have been greater in the

*Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., pp. 224-227.

Fig. 1134

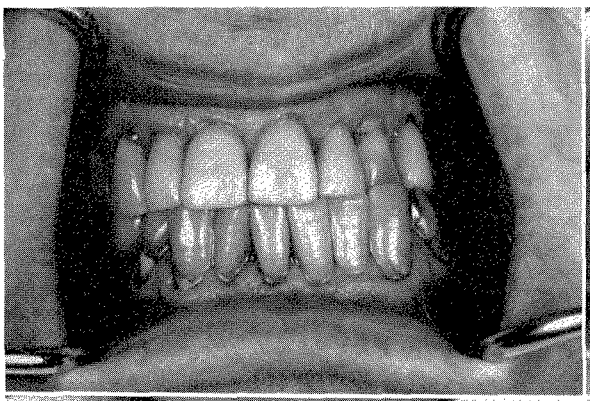


Fig. 1135

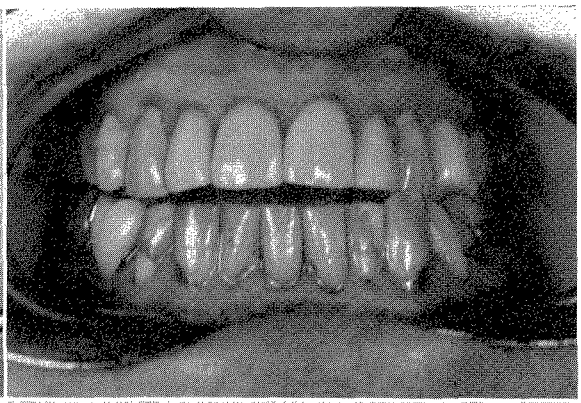


Fig. 1136

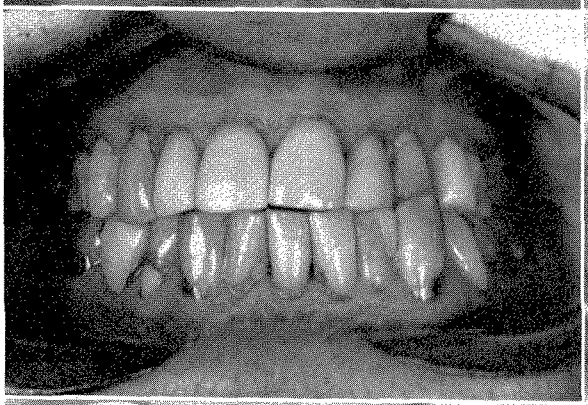


Fig. 1137

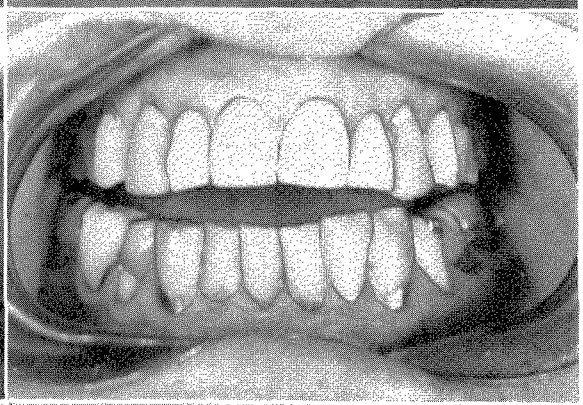


Fig. 1138

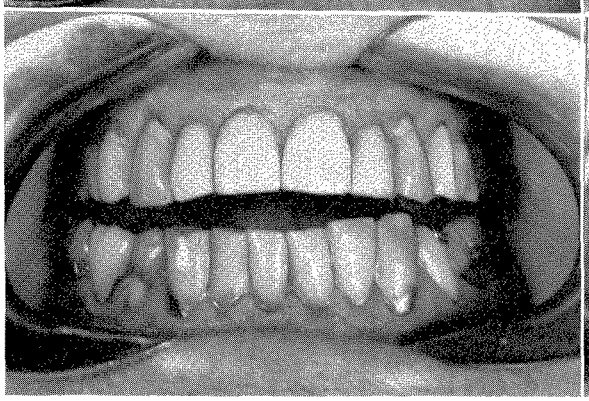


Fig. 1139

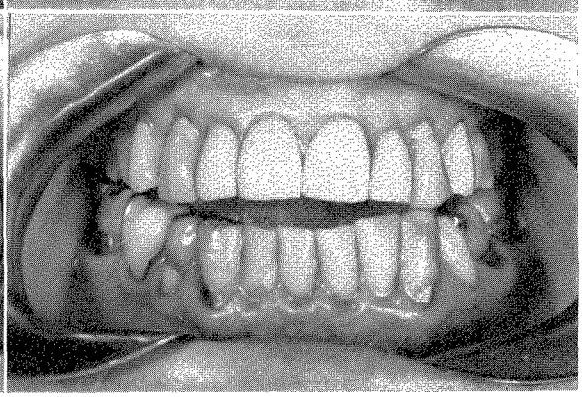


Fig. 1134. Anterior view of the mouth of a woman in her early sixties. Note the median line which deviates to the left one whole incisor. This photograph was taken in 1935. (Figs. 1134 to 1141 are of the same case.)

Fig. 1135. Same case ten years later (1945). A faulty inlay inserted in the upper left second molar caused a mandibular deviation to the right and this open bite relationship in two months' time.

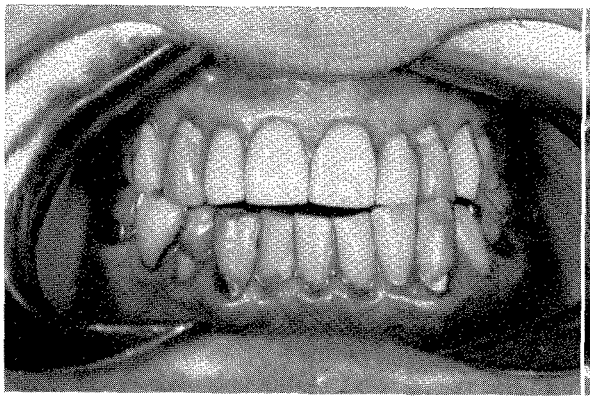
Fig. 1136. The teeth were ground back to correct occlusion by judicious spot-grinding.

Fig. 1137. The same case in 1949. In an unstrained position of physiological rest it would seem that the median line is now correct and that the mandible has shifted to the right. This is correct, but observe in Figs. 1138 to 1141 that as the mandible closes it shifts to the left even without any premature cusp guidance. This is undoubtedly due to the unequal pull of the masticatory muscles which have been functioning in this position for over seventy years. This deviation is not a false deviation but a true one.

Fig. 1138. Median line is starting to deviate to the left as the mandible starts to close.

Fig. 1139. Further deviation of median line to the left as closure continues.

Fig. 1140



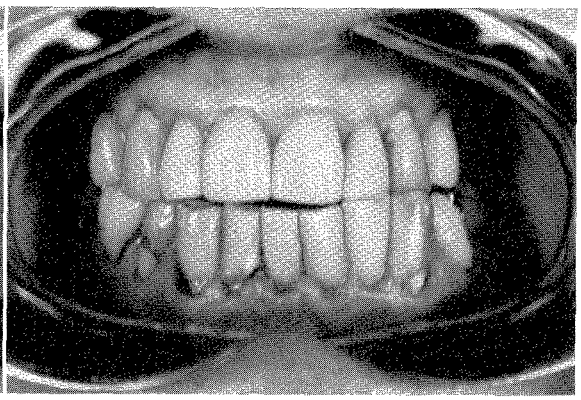


Fig. 1141

Fig. 1140. Only now does the patient state that she contacts a cusp. Up to now unequal muscle pull has guided this mandible to the left.
Fig. 1141. The final position of centric occlusion. The median line changed very little in fourteen years. Compare with Fig. 1134.

interocclusal relationship than a faulty contact in the same arch. Equilibrating her occlusion by judicious spot-grinding resulted in an interocclusal relationship that closely resembled her 1935 photograph.

In 1949 the occlusion again revealed a small amount of further shifting. Apparently the introduction of a single gold inlay in 1945 continued to have its ill effects seven years later regardless of the efforts to equilibrate the occlusion and restore the original bite. One may contend that her original bite was not a true centric relation but rather an excentric bite. Although this may be true, at that time the patient was able to contact her anterior upper and lower teeth, and her oral structures were normal. The patient did not recognize the occlusal discrepancy. It was brought to her attention. She died in 1952 in her early eighties. The altered occlusion had never caused her an inconvenience. (Figs. 1134 to 1141.)

Case 3

The following case is also in the same category, namely, one in which the insertion of two posterior upper right molar gold inlays altered the entire occlusion in a comparatively short time. This patient was first treated in 1938. She presented a tip-to-tip occlusion. A photograph of her mouth was published in 1951.* During the past quarter of a century her dentistry had been purely conformative, consisting of several small fixed bridges and some gold inlays. Her structures were excellent, and her function was adequate. The dental roentgenograms revealed very little change over the years.

In June, 1958, she received her regular examination and prophylaxis. Two old amalgam fillings in the upper right second molars needed replacement. They had been inserted over twenty-five years previously and were to be replaced by gold inlays. The molars had spread apart, and in order to prevent further migration a lug and lug rest were constructed to join the two teeth. This work was completed in June, 1958. The insertion was uneventful, and the patient was not heard from until she received her next recall card. This was in November, 1958. At this exam-

*Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., p. 695, Fig. A.

ination a decided change had taken place in her interocclusal relationship. An anterior open bite was now present.

Upon questioning, the patient stated she was aware of a peculiar feeling on the right side of her mouth directly following the insertion of the inlays, but it did not bother her enough to seek treatment. In November, 1958, and again in November, 1959, the bite was equilibrated by grinding the occlusion with the aid of carbon paper. There was still no feeling of discomfort by the patient, and she permitted the various adjustments only because she was told that it was a necessary procedure.

In December, 1959, the occlusion was again equilibrated. This time a lingual metal frame was constructed on which to mount a central bearing screw for the mandibular teeth and an upper metal platform upon which the central bearing screw could contact. With these centralized in the mouth, the screw was gradually lowered while removing the premature contacts until the bite was equilibrated. This was neither easy to perform nor entirely effective in its application, and is decidedly a compromise treatment to be used only by an experienced operator.

Although the open bite was corrected and the patient never experienced discomfort, either before or since, the interocclusal relationship was never completely satisfactory after 1958. She had maximum interocclusal contact in a functional excentric position but not in her centric relation or hinge occlusion. Oral reintegration by means of complete occlusal reconstruction could be suggested, but under the present circumstances this seemed neither desirable nor justifiable. Her function was good, and her structures were normal. She was happy with her existing interocclusal relationship. At the time of this writing (1962) she was in her seventy-fifth year. (Figs. 1142 to 1148.)

The three open bites presented in this chapter resulted from the insertion of gold inlays that in turn altered the occlusion. Open bites have been described in previous literature.* Some of the material that follows was taken from an article published by me in 1957.†

*Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., pp. 750-770.
†Schweitzer, J. M.: The open bite from the prosthetic point of view, Dental Clinics of America, Philadelphia, 1957, W. B. Saunders Co., pp. 269-283.

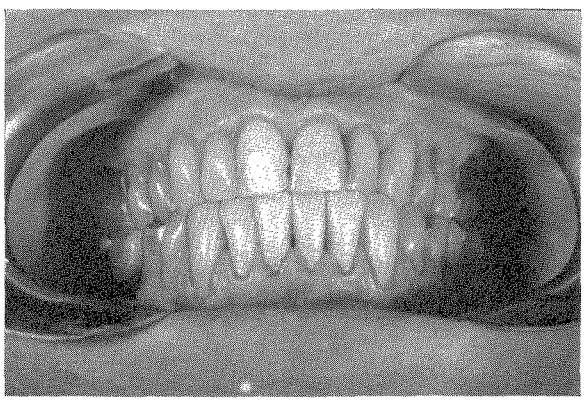


Fig. 1142. This photograph was taken in 1947 at the age of 60. (Figs. 1142 to 1148 are of the same case.)

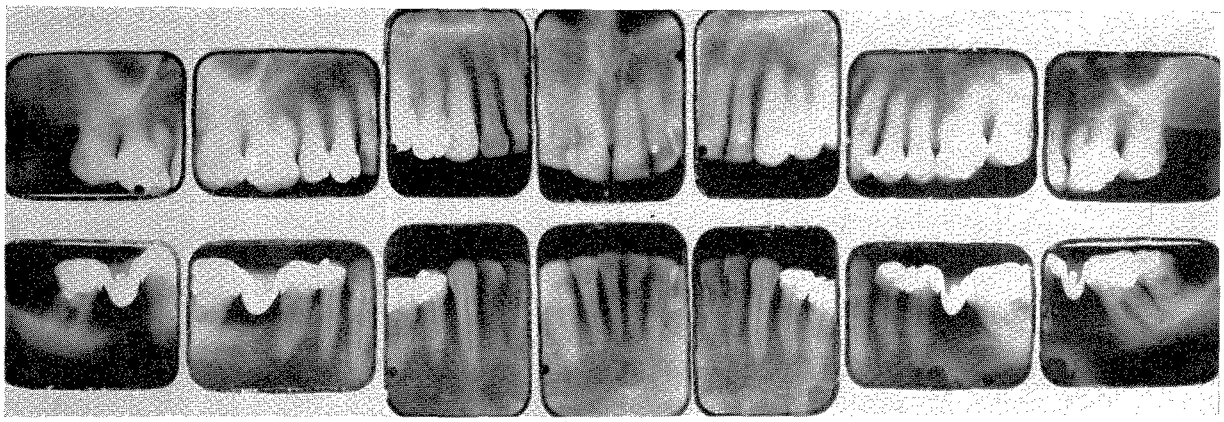


Fig. 1143. Roentgenograms that were taken in 1938 when the patient was 51 years old.

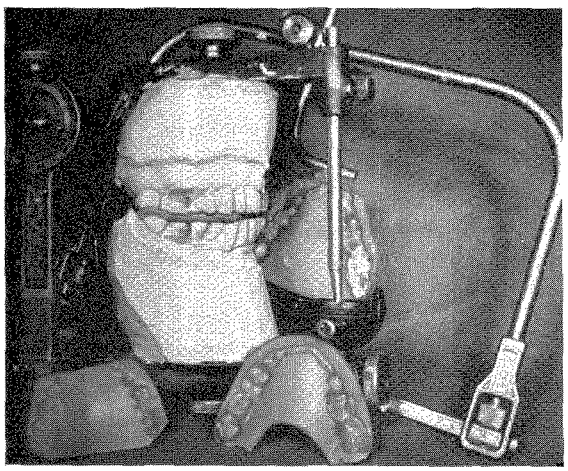


Fig. 1144. The occlusion had changed following the insertion of two gold inlays in the upper right molars. In December, 1959, study casts were made and mounted upon the Hanau Model H articulator for an evaluation.

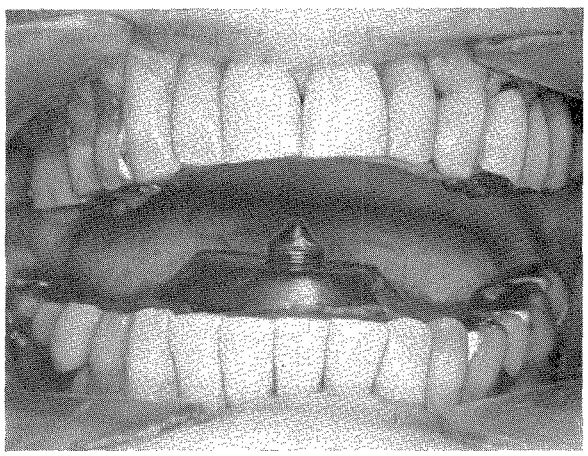


Fig. 1145. Central-bearing plates were constructed on the casts and inserted in the mouth. The occlusion was then equilibrated by grinding in an effort to return it to its original relationship.

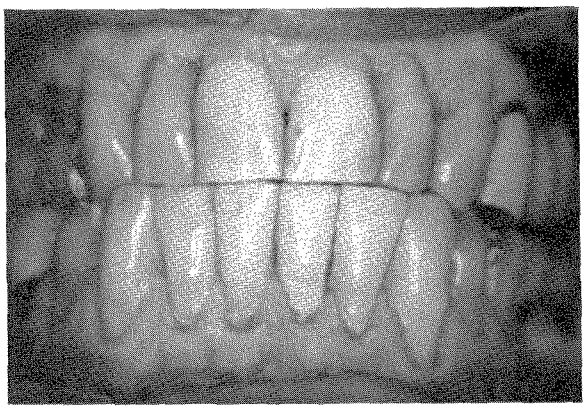


Fig. 1146. The occlusion was equilibrated to close as shown here. Compare this with Fig. 1142 to see the similarity. This photograph was taken in February, 1960.

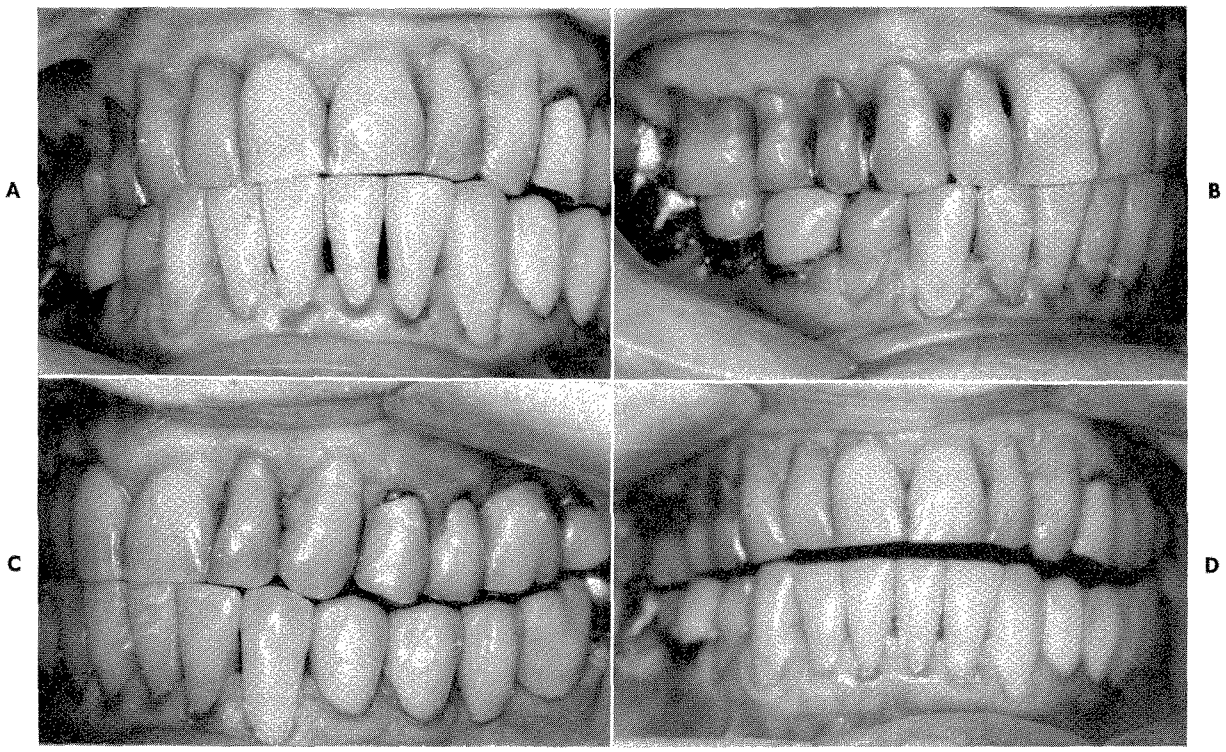


Fig. 1147. These are recent views taken in 1962. The patient was then 75 years old. **A,** Front view. **B,** Right-side view. **C,** Left-side view. **D,** It can be observed that the patient still has an initial contact in the posterior area on the right side. After that she is able to bring her teeth together as shown in **A,** but force is required to do so.

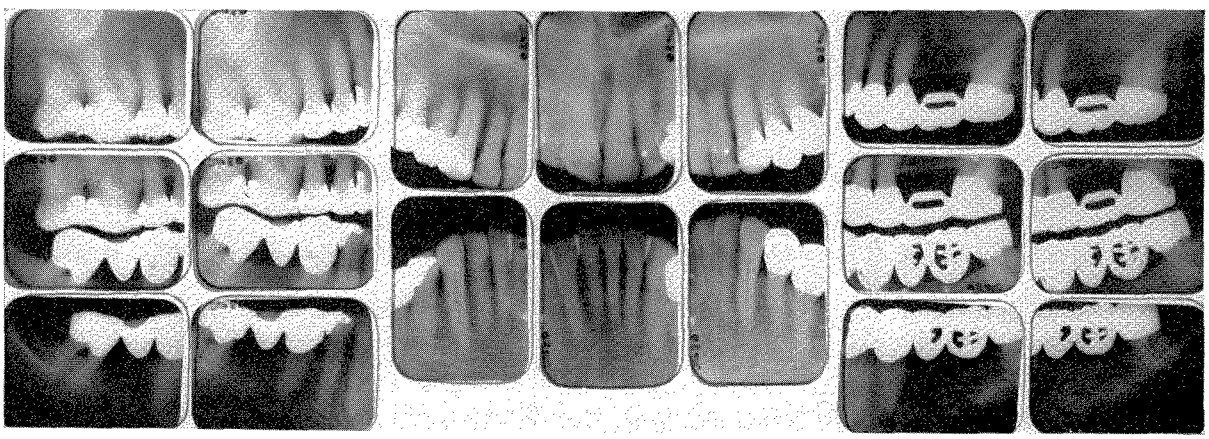


Fig. 1148. Roentgenograms taken in 1962.

SOME CAUSES OF OPEN BITES

Open bite may appear in any of the classes of malocclusion, although it is more often found in Class I. It is characterized by the presence of space between the upper and lower teeth anterior to the first or second molars. The upper and lower canines are most often involved. It may be due to overeruption of the posterior teeth or to failure of the anterior teeth to reach their occlusal level (infraversion). Many of the early workers recognized that hereditary cases of open bite were rather uncommon and spoke of etiological factors of vague origin that often prevented successful treatment. Blair and Ivy* presented evidence of early rickets as an ordinary etiological factor. Anderson† related open bite with an interference to vertical growth as a result of an obscure cause or group of causes in no wise associated with the teeth or pressure. Such general factors as metabolic disturbances, heredity, intrauterine influences, disharmony of the temporomandibular articulation, endocrine complications, muscular activity or inactivity, and childhood disorders have been given as causes of open bite.‡

POSTERIOR POSITIONING OF MANDIBLE OFTEN RESULTS IN ANTERIOR OPEN BITE

Where the mandible has drifted into a protrusive position in order to attain maximal function in a malocclusion, or where the mandibular teeth have been incorrectly related to the maxillary teeth in a false protrusive position by the dentist, the correct posterior positioning of the mandible results in an anterior open bite. This sometimes makes it necessary to reduce the vertical dimension instead

*Blair, V. P., and Ivy, R. H.: Essentials of oral surgery, St. Louis, 1923, The C. V. Mosby Co., pp. 350-370.

†Dewey, M., as revised by Anderson, George M.: Practical orthodontia, ed. 9, St. Louis, 1960, The C. V. Mosby Co., p. 369.

‡Anderson, G. M.: Year book of dentistry, Chicago, 1936, Year Book Publishers, Inc., p. 667.

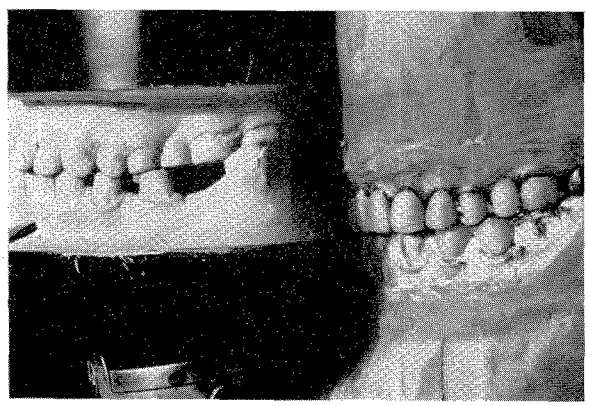


Fig. 1149. On the left are the original casts of a patient whose mouth was reconstructed. The mandible is in an excentric protruded position. The completed reconstruction is shown on the right side. (Figs. 1149 to 1151 are of the same case.)

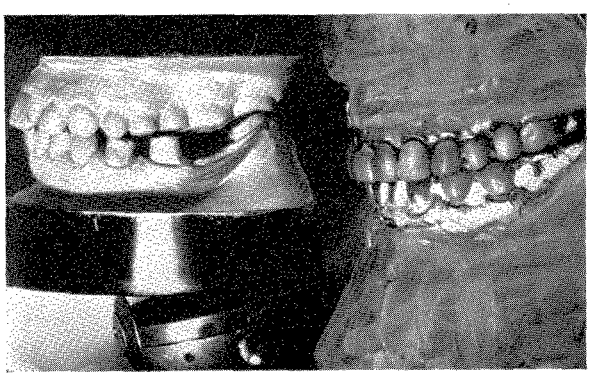


Fig. 1150. The mandible was retruded as shown in the casts on the left. Compare with Fig. 1149 (left side). In so doing the vertical dimension was automatically raised. The completed work on the right is the same as shown in Fig. 1149.

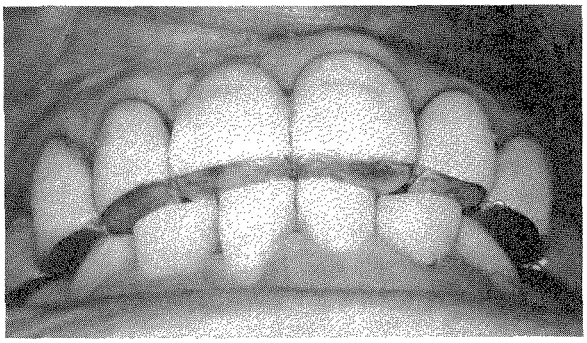


Fig. 1151. In moving the mandible posteriorly not only was the vertical dimension increased but also a space was created between the lower and upper incisors. To provide for incisal contact, a lingual platform was built on the upper crowns to engage the lower incisors. It is shown in this illustration.

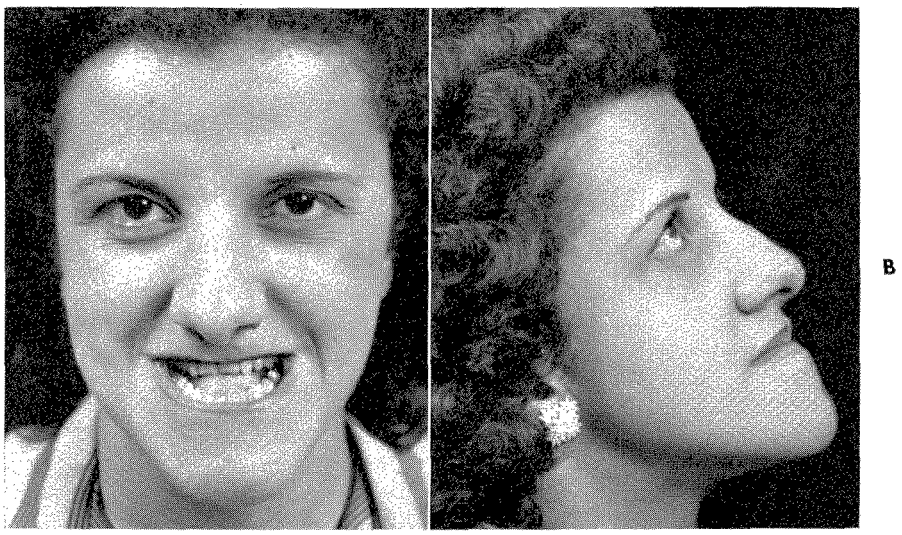


Fig. 1152. Case of mandibular protrusion reduced by orthodontics and surgery. **A,** Anterior view showing extent of projection of lower teeth. **B,** Lateral view indicating obtuse angle and elongation of mandible. (From Sarnoff, J., and Adelman, A. B.: Prognathism: case report of surgical reduction, D. Digest **54**:12-17, 1948.) (Figs. 1152 to 1156 are of the same case.)

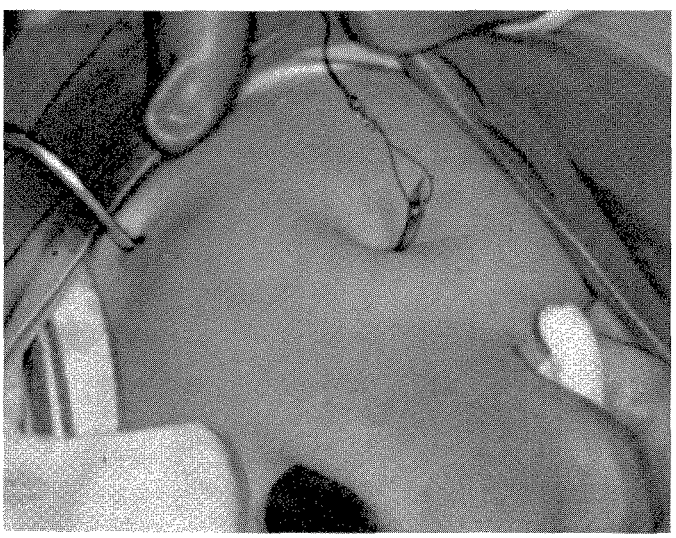


Fig. 1153. Blair needle in position behind the mandible with Gigli saw wired to needle and ready to be pulled through. (From Sarnoff, J., and Adelman, A. B.: Prognathism: case report of surgical reduction, D. Digest **54**:12-17, 1948.)

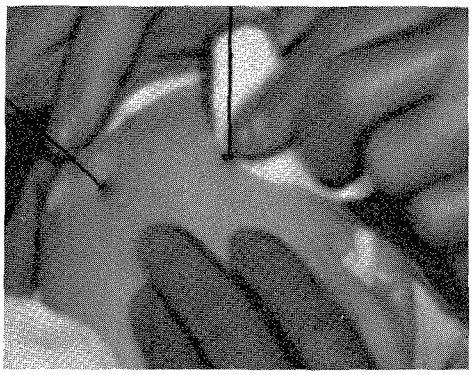


Fig. 1154. Gigli saw in action cutting through the ramus. (From Sarnoff, J., and Adelman, A. B.: Prognathism: case report of surgical reduction, D. Digest **54**:12-17, 1948.)

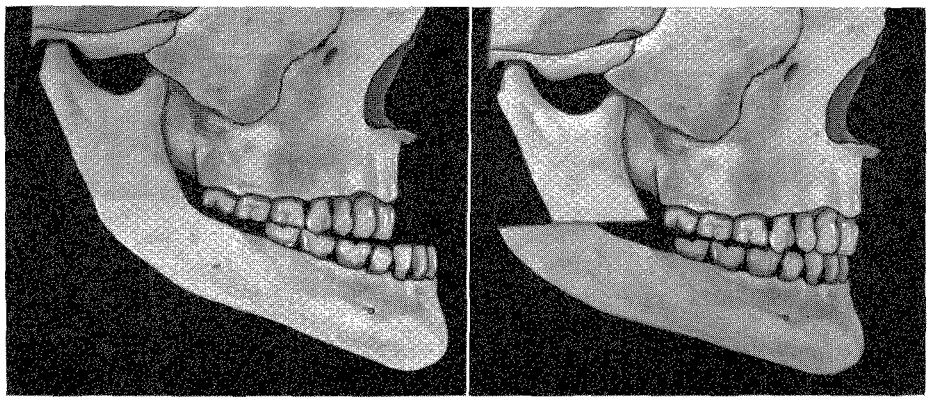


Fig. 1155. A, Preoperative relation of teeth and mandible in this case. **B,** Visualization of mandible after osteotomy demonstrating articulation of teeth and position of mandibular sections. (Orthodontic appliances cemented on before the operation and used after the operation aided in this case.) (From Sarnoff, J., and Adelman, A. B.: Prognathism: case report of surgical reduction, D. Digest **54**:12-17, 1948.)

Fig. 1156. Lateral view of patient showing final results of osteotomy. (From Sarnoff, J., and Adelman, A. B.: Prognathism: case report of surgical reduction, D. Digest **54**:12-17, 1948.)

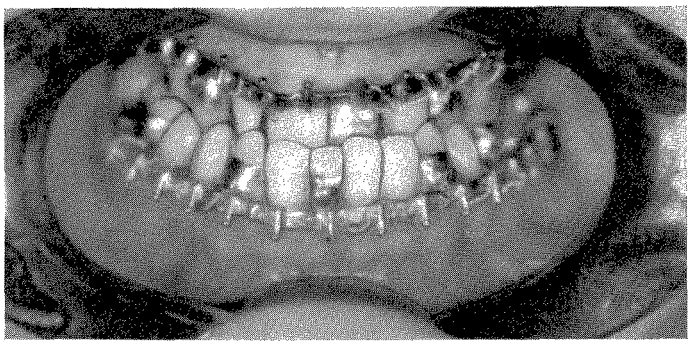
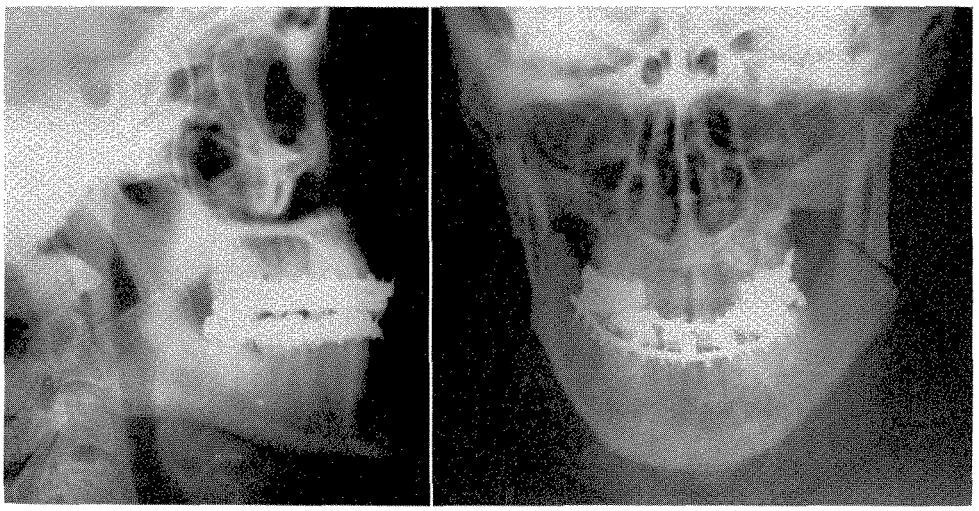


Fig. 1157. Preoperative view of the mouth of a young woman with a Class III (Angle) malocclusion about to be treated by a combination of surgery (bilateral osteotomy of the ascending rami) and orthodontics. The orthodontic appliances are in position before the operative procedure. (Courtesy Dr. Leo Winter, New York, N. Y.) (Figs. 1157 to 1160 are of the same case.)

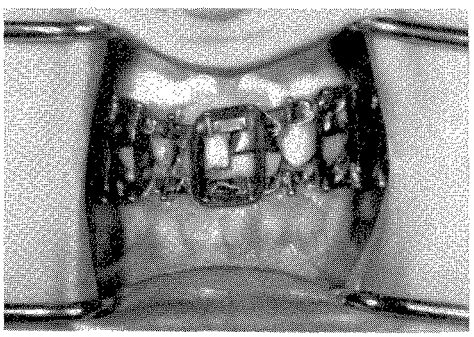
A



B

Fig. 1158. A, Lateral radiograph showing cut through the ascending ramus. The mandible is positioned posteriorly and wired there by means of the orthodontic appliance. **B,** Anterior radiograph showing both rami cuts of the osteotomy. (Courtesy Dr. Leo Winter, New York, N. Y.)

Fig. 1159



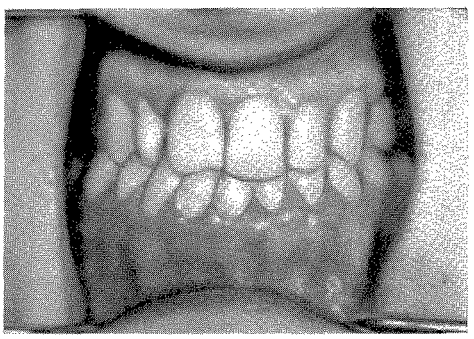


Fig. 1160

Fig. 1159. Anterior view after operative procedure showing orthodontic appliances to complete treatment and mandible positioned correctly. Rubber bands connect upper and lower appliances.
Fig. 1160. Completed case. Fixation took eight weeks, and there was union on both sides. (Courtesy Dr. Leo Winter, New York, N. Y.)

of increasing it in order to attain maximal contact and equal distribution of forces at a normal centric relation. Treatment produces stable results in these cases. (Figs. 1149 to 1151.)

In Angle Class III malocclusions, an open bite from the bicuspids forward is sometimes present. This is due to a disparity between the sizes of the arch associated with a growth and developmental problem, and it can usually be corrected by a combination of surgery, orthodontics, and prosthesis. Three cases that had been treated by a combination of orthodontics and surgery were reported in 1951.* (Figs. 1152 to 1160.)

DISPARITY IN ARCH SIZE ASSOCIATED WITH DISTORTED GROWTH PATTERN

Case 4

Present condition

In February, 1954, a male patient in his thirties, with a distorted Angle Class III malocclusion, came for treatment. There was a deformation of the entire skeletal pattern of the head. In this case, as in many cases of this type, the palatal vault was extremely narrow and very deep. The maxillary arch was also narrow, especially in the bicuspid and molar region. Roentgenograms of the temporomandibular joints exhibited normally positioned condyles. This indicated that without surgical interference it would have been impossible to retrude the mandible to aid in the correction of the open bite and extreme malfunction.

The patient had limited resources and had already visited several hospitals as well as many dentists, oral surgeons, orthodontists, and prosthodontists in an effort to obtain aid for his problem. When he first presented himself, he was completely discouraged. He stated at the beginning that neither he nor his wife was willing to consider surgical intervention. Ten teeth were missing. Three of the remaining teeth were nonvital, and others were carious. A lower left fixed bridge, which was supported by a bicuspid and a third molar, was in position.

Treatment planning

There were several problems associated with this case. They are as follows: (1) surgery and orthodontics had been ruled out, (2) finances were restricted, and (3) his employment was such that he could keep only late appointments after regular work hours.

With this in mind, the following was the prescription. The caries would be cleared up. Better function would be provided, and an attempt would be made to improve the esthetics if financially feasible. Considering that neither he nor his family were too concerned with the esthetics, function was the paramount objective.

Function must have been extremely difficult. On the right side the contact was slight between the mesioclusal surfaces of the single upper and lower molars,

*Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., pp. 743-748.

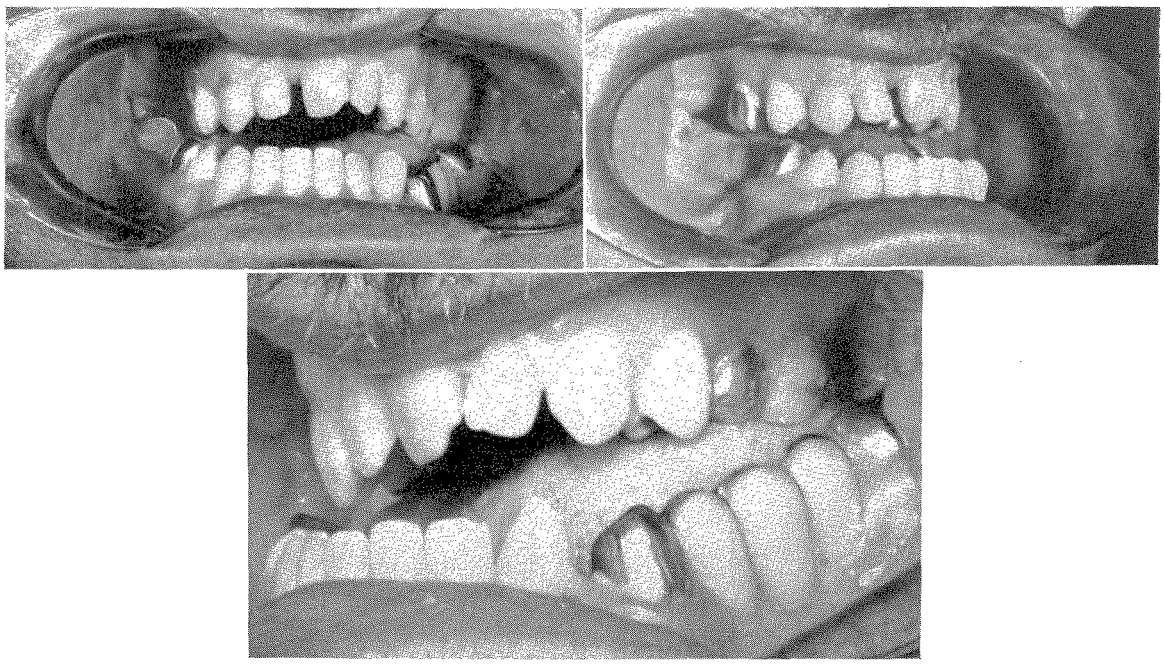


Fig. 1161. Some idea of the deformity may be obtained from these three views of the mouth with the teeth in so-called contact. These photographs were taken in February, 1954. (Read text.) (Figs. 1161 to 1165 are of the same case.)

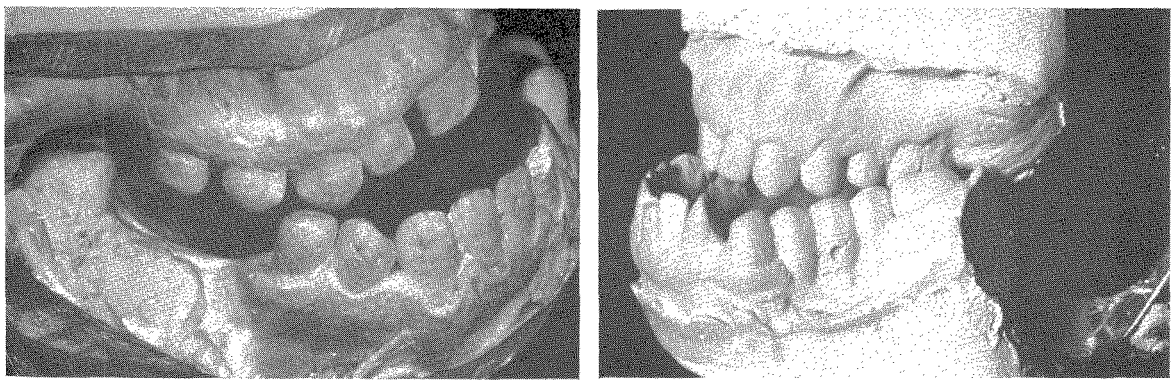


Fig. 1162. The right-side and left-side views of the casts which give an even better idea of the deformity.

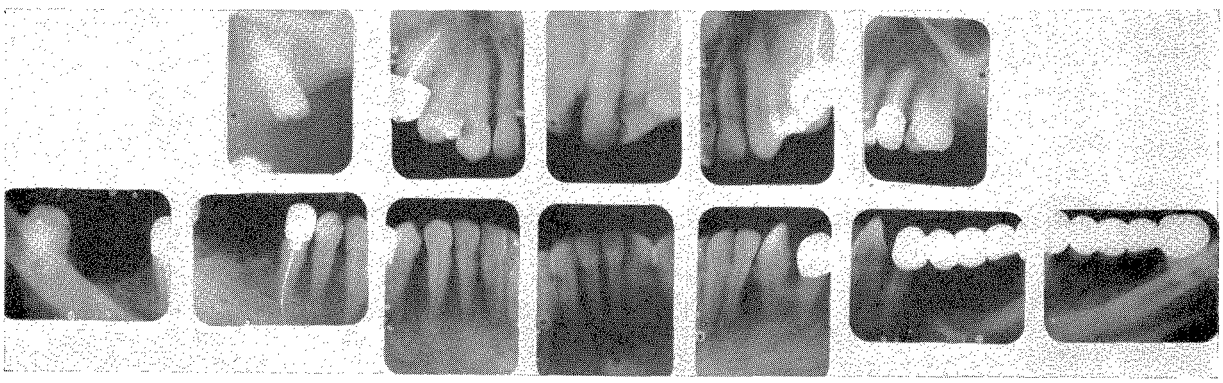


Fig. 1163. Roentgenograms that were taken in February, 1954, at the start of treatment.

whereas the upper right cuspid made contact with the lingual surface of the lower second bicuspid only in an excentric position. On the left side only the lower molar made contact.

Treatment

He was most cooperative. The carious teeth were first treated. Following this a lower right fixed bridge was inserted. The upper right second bicuspid was crowned. The upper left second bicuspid and first molar were crowned and joined together for additional strength. Finally, an overlay removable partial denture was constructed using a stainless steel frame. An acrylic anterior section was added that contacted his lower natural teeth and built out his receded upper lip. His function was now adequate, and his appearance was presentable. This reconstruction required almost a year to complete as it was difficult for the patient to keep regular appointments.

Four years later, in 1958, the lower left fixed bridge was replaced with a new one that added still more functional contacts. He did not wear his removable

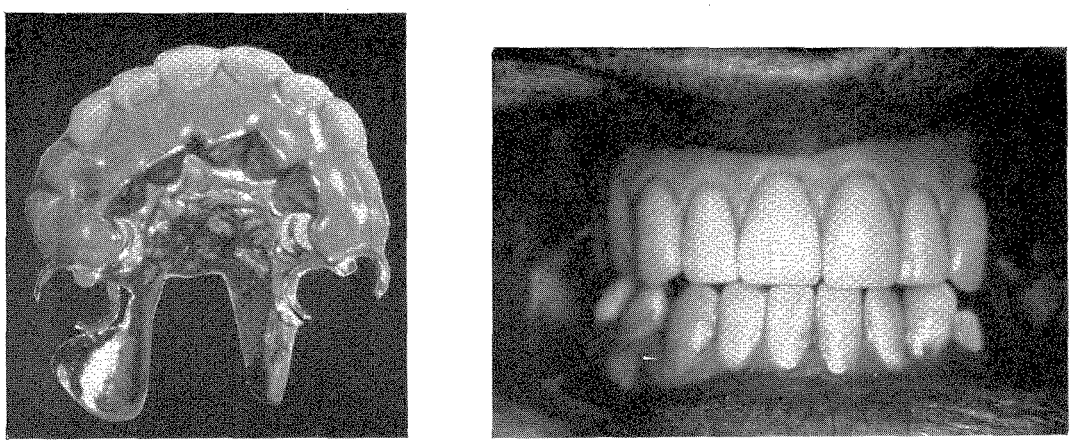


Fig. 1164. The prosthetic appliance inserted over the incisors and the bicuspids in order to close the open bite and provide contact. Esthetics and speech are also important factors.

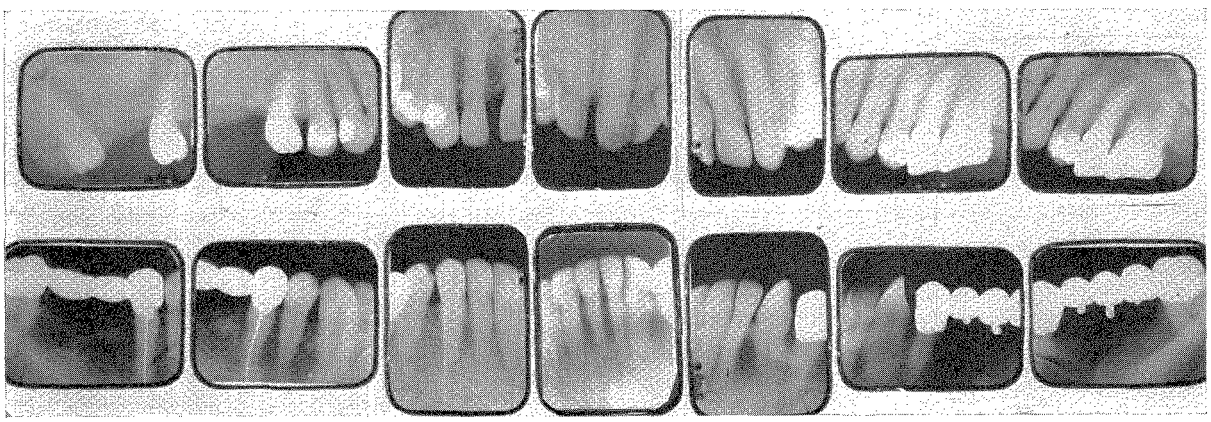


Fig. 1165. Roentgenograms that were taken in August, 1960.

partial denture as often as prescribed, but his function had so greatly improved that he felt it unnecessary and wore it only on social occasions. This was not a case on which elaborate techniques and intricate articulators were necessary. Good conformative dentistry, common sense, and a pleasant patient-doctor relationship were most important. For this patient dentistry made a worthwhile contribution to his well-being. The patient died from a cerebral hemorrhage in 1960. (Figs. 1161 to 1165.)

OPEN BITE AS DEVELOPMENTAL ANOMALY

Infraclusion has been considered as a developmental anomaly due to a perturbation or irregular variation of growth forces. Hellman attacked open bite as a growth problem and placed great significance upon the height and depth of facial dimensions and their effect upon the position of the face. He observed that in maloccluded open bite cases, the face and skull as a whole were longer, and the ramus and the body of the mandible shorter. This also contributed to a more obtuse mandibular (gonial) angle than in the normal. He saw no arrest in the development in the incisal region and stressed the growth factor: "It would seem that growth is the predominating factor in the establishment of occlusion, as it is in the development of the entire individual. But, growth is not constant and definite. It varies in intensity; it varies in different structures and in different parts of the same structure—but, growth cannot be controlled. It is, therefore, also necessary to recognize our limitations."*

Where open bite is a result of a distortion of the skeletal pattern or an inherited pattern of growth, fairly stable results are possible at the termination of prosthetic treatment. In some cases, such as the one just presented, the vault of the palate is extremely narrow and deep, the maxilla is very narrow in the bicuspid and molar regions, and the upper incisors protrude. The mandible is very wide in the bicuspid and molar regions, when compared to the maxillae, and posterior cross-bites often exist. In cases in which the patients are content with the esthetics, these are best not disturbed because, although in apparent malocclusion, they are in neuromuscular equilibrium, and it is dangerous to upset this balance.

Case 5

As an example, the case of a 52-year-old woman was presented in 1951.† This patient was examined for the first time in 1942 at the age of 43. A severe malocclusion was present. The maxillary arch was narrow and constricted from the first molar forward. The dome of the palate was excessively narrow and deep. It took great effort to obtain readable roentgenograms of her maxillary teeth. The posterior teeth were in a cross-bite relationship. The lower arch was much wider than the upper arch. The upper anterior teeth protruded, and the four incisors were considerably out of contact.

During the next twenty years only the necessary conformative dentistry was performed. The lower missing teeth were restored by fixed partial dentures. Gold

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*Hellman, M.: Open bite, Int. J. Orthodontia **17**:421 and 444, 1931.

†Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., pp. 757 and 758.

inlays were inserted where necessary. The interocclusal relationship had not been disturbed or altered. She had been instructed in habits of good oral hygiene and encouraged to come at least three times a year for periodontal checkups and prophylaxis. This is all the more necessary in these cases in which caries takes place more frequently due to unnatural overlapping contacts and malposition of the teeth that augments the collection of debris. She had been a moderately cooperative patient. As the years passed, the teeth and oral structures deteriorated to some small extent, but to no greater degree than the average normal case. She was 63 years old at the time of writing. In 1960 it was necessary to remove the upper right first molar whose infected pulp had been treated in 1942. A fixed partial denture was inserted.

In constructing this fixed bridge, three natural teeth were used to support one dummy because of the small peg-shaped roots of the molars. The original occlusion had to be restored carefully—otherwise it could be readily changed by careless operative and prosthetic procedures. Where the balance was so important, it was

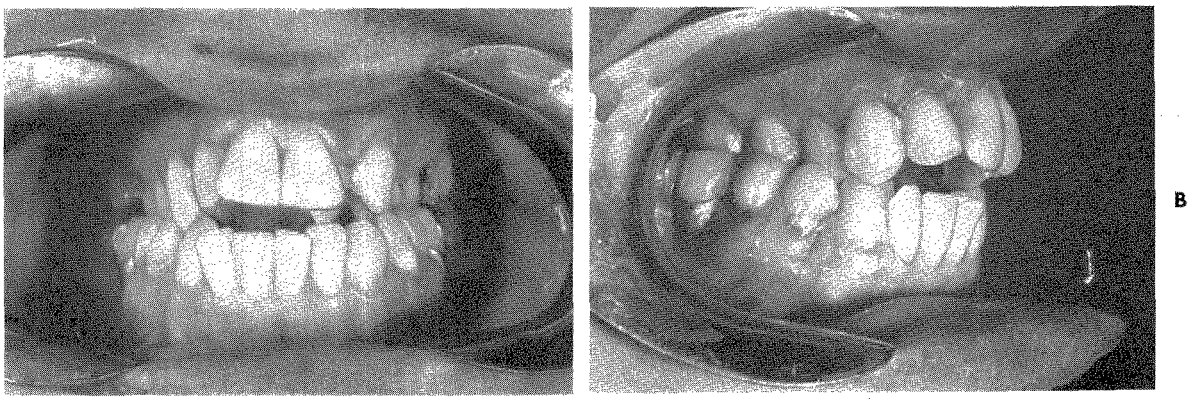

Fig. 1166. **A,** Anterior view of open bite in a 52-year-old woman (1951). Constricted arch and palate. Teeth crowded and bunched. This case was undoubtedly due to a developmental failure during the growth period. **B,** Lateral view to demonstrate the extent of the open bite. (Figs. 1166 to 1170 are of the same case.)

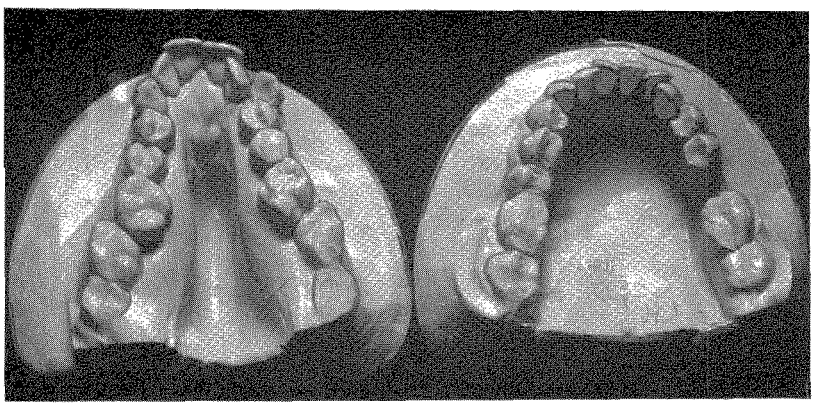

Fig. 1167. Occlusal views of the models of the teeth of the patient shown in Fig. 1166. Observe the extreme disparity in the size of the arches and the narrowness of the upper vault. Nature made the best effort possible under very poor conditions, since the teeth were in fair condition in spite of this disparity.

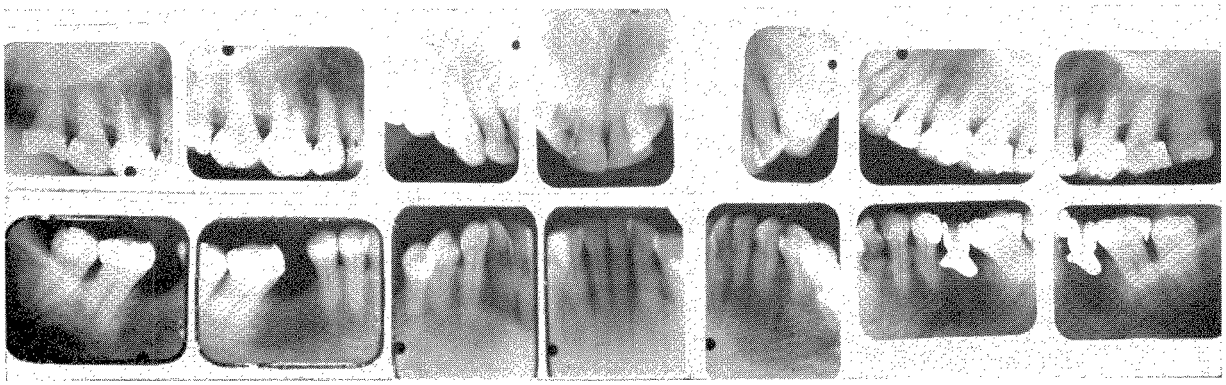

Fig. 1168. Roentgenograms that were taken in 1942 at the age of 43.

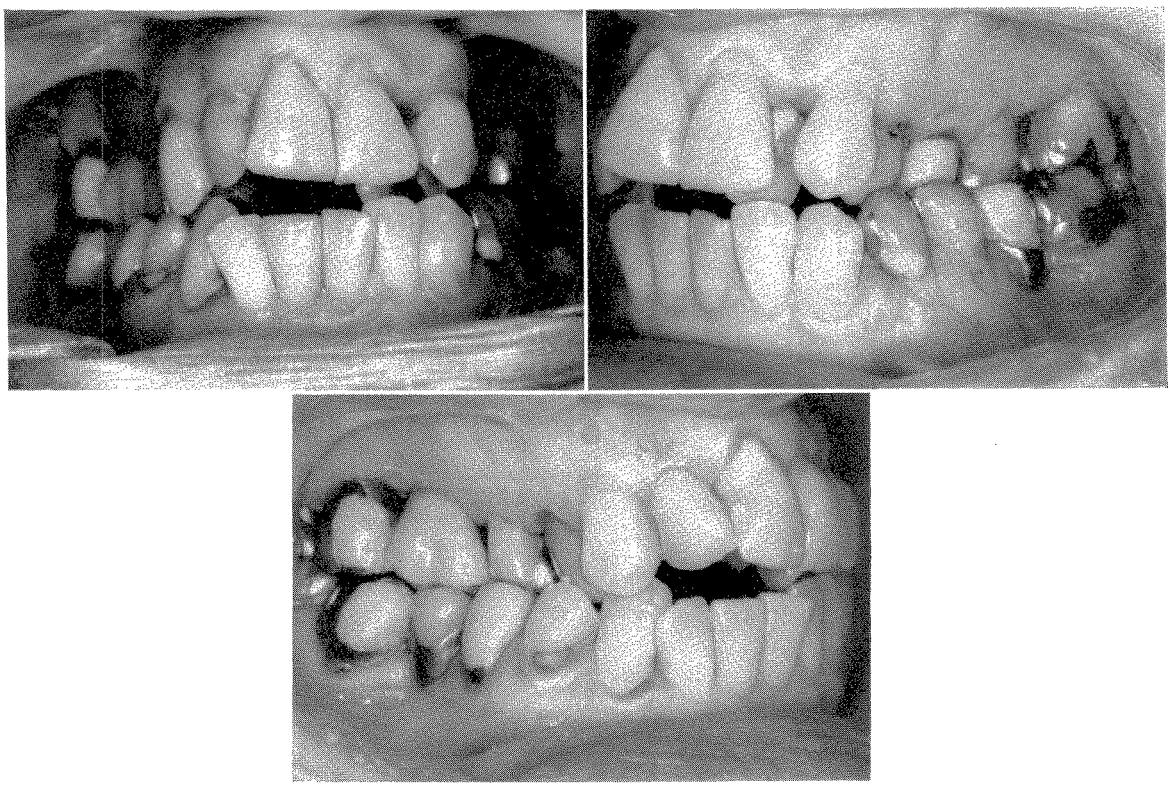

Fig. 1169. Three views of the same patient shown in Figs. 1166 and 1167. These were taken in 1962 at the age of 63.

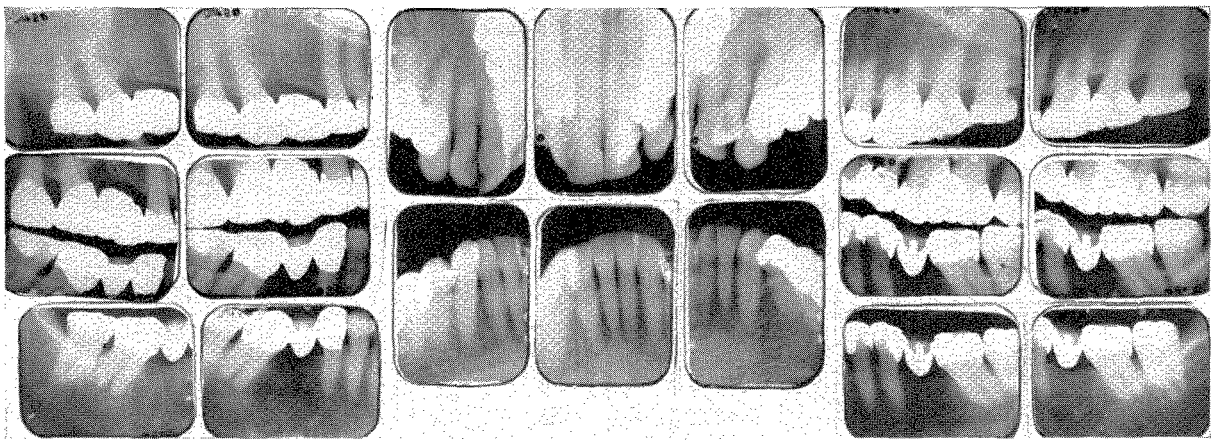

Fig. 1170. Roentgenograms taken in 1962. Only the upper right molar had been removed, and this was not done until 1960. It was nonvital and had a questionable future in 1942. (See Fig. 1168.)

wise to retain and to copy the existing occlusion closely, or the result could be embarrassing to the dentist and distressing to the patient. There is much to be learned by observing these and similar cases. Most of them should be treated conservatively. Such patients should be taught the importance of maintaining good oral hygiene and should be encouraged to come regularly for examination and oral prophylaxis. (Figs. 1166 to 1170.)

ADDITIONAL CAUSES OF OPEN BITES

Open bites caused by tongue thrusting, thumb-sucking, and false swallowing habits present special problems because of their continued recurrence even after treatment. It would, therefore, seem prudent not to disturb the equilibrium of these teeth unless it became absolutely necessary.

Case 6

A case of this nature was reported in 1951.* This patient was examined for the first time in 1947 when he was in his sixtieth year. His anterior open bite was of considerable magnitude. From the stained teeth, the accumulated debris, the gum recession, and the root caries, he was also judged to be a mouth breather. His teeth had been neglected, yet he was not in favor of having any extensive dental work performed.

With persuasion, he permitted his mouth to be restored to reasonably good condition by 1949. The anterior open bite had not been disturbed. Only conformative dentistry was performed. The 1956 photographs show good interocclusal posterior contacts. He experienced no unusual dental trouble until 1959 when the alveolar plate labial to the upper left central incisor was fractured while biting an apple. The teeth were wired, and a compromise recovery was made. At the time of writing he was 76 years old and was retired. It had become even more difficult

*Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., pp. 759-760.

to persuade him to come for his regular periodic examination and prophylaxis. Because of the malocclusion, plus the neglect, his mouth had finally begun to degenerate. The posterior teeth, as well as the cuspids, which formerly presented interocclusal contact, had now begun to separate in several areas. The plastic veneers had become unsightly.

AGING AFFECTS MUSCULAR COORDINATION

It is possible that as the aging process sets in the neuromuscular coordination is different from that which he employed when he was younger. As a result, the equilibrium of his oral structures may have been upset. Patients similar to this are best treated by conservative means. In this manner dentistry makes its best contribution to the maintenance of these oral structures. (Figs. 1171 to 1176.)

The result of the tongue pressing outwardly may be clearly observed in the

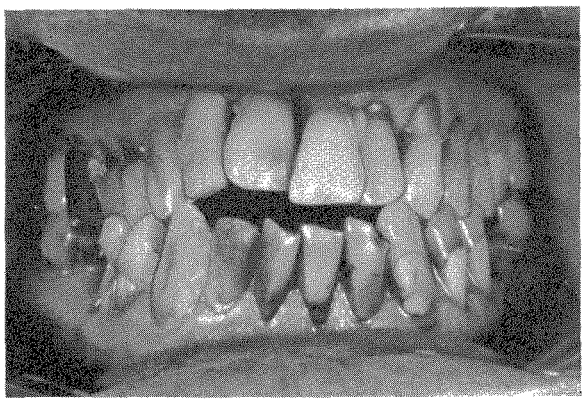

Fig. 1171. Open bite in the case of a 63-year-old man. This photograph was taken in 1948 at the age of 61. The absence of moisture due to the open mouth condition made proper hygiene difficult. The anterior teeth were always stained and covered with tartar and debris in spite of frequent prophylaxis. (Figs. 1171 to 1176 are of the same case.)

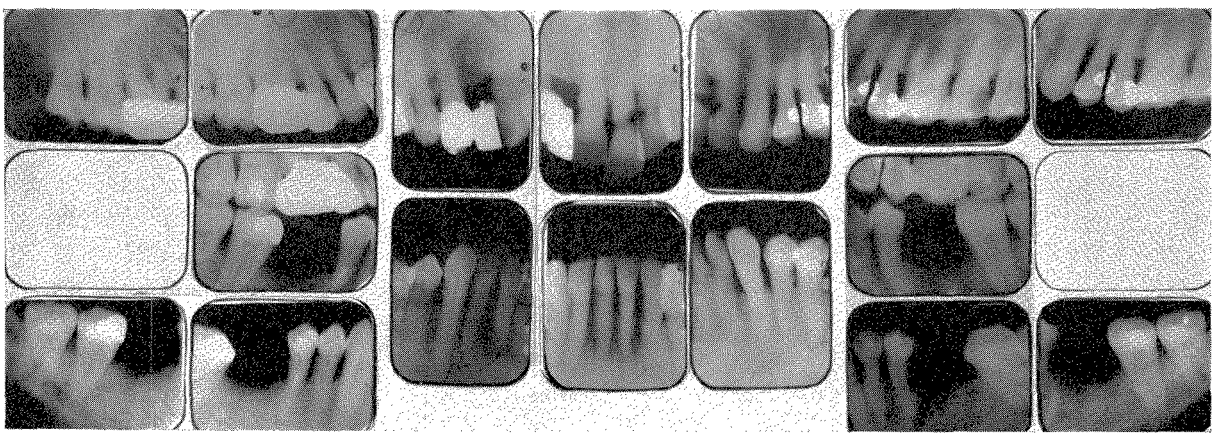

Fig. 1172. Roentgenograms taken in December, 1947, when the patient was first examined.

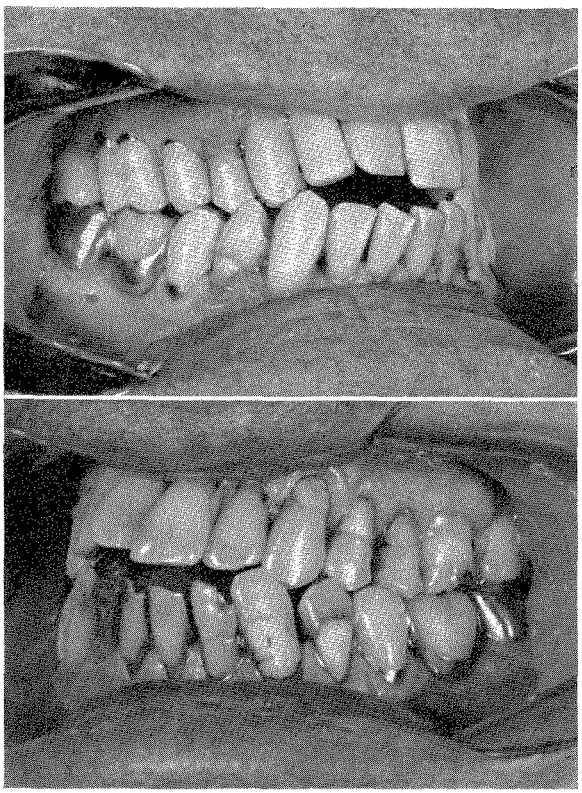

Fig. 1173. This photograph was taken in April, 1949. The teeth were treated and brought to a reasonably presentable condition. The open bite was left alone.

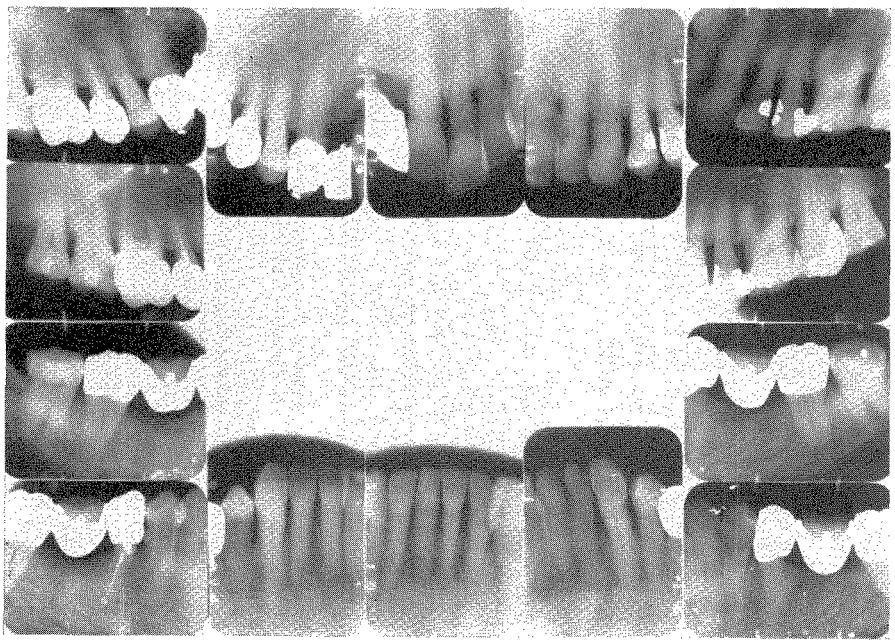

Fig. 1174. Roentgenograms taken in 1950 showing the dental care that was given after the radiographs shown in Fig. 1172 were taken.

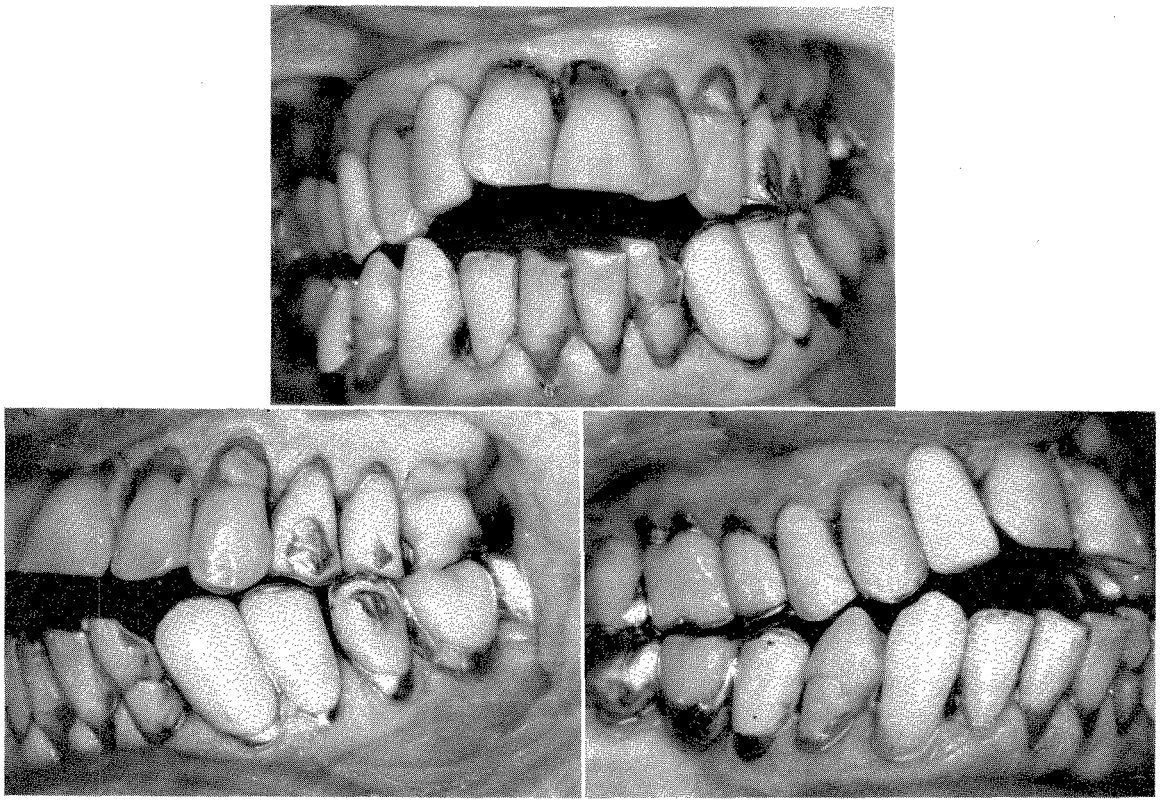

Fig. 1175. Three views of the mouth taken in 1962. The patient was then 75 years old. The bite had opened further, and the plastic had worn. In the 1948 and 1949 photographs, the cuspids and first bicuspids were in interocclusal contact, but they had lost this contact in these photographs.

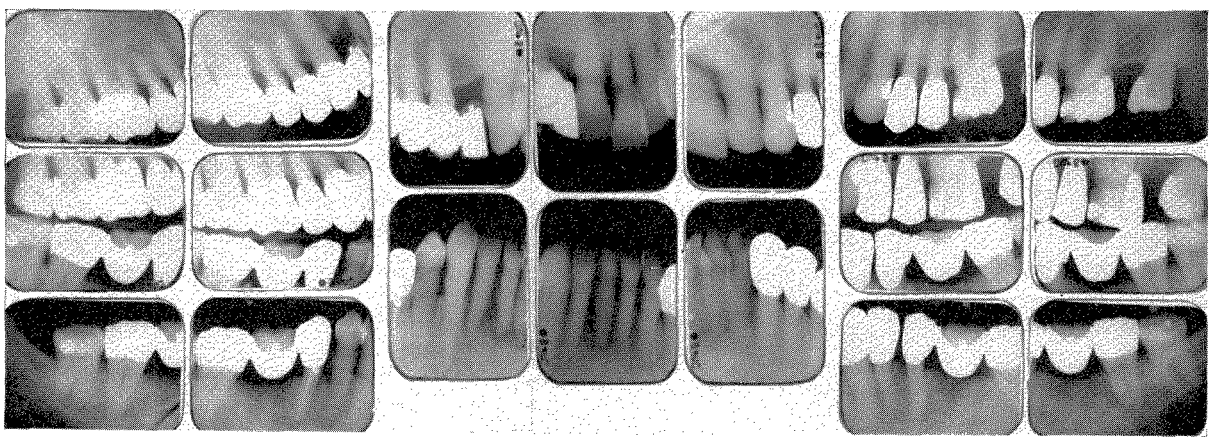

Fig. 1176. Roentgenograms taken in 1962.

mouths of certain individuals. Their anterior bite is open from cuspid to cuspid, and their bicuspids and molars flare outward as a result of the powerful tongue thrust while masticating or with the mouth empty. Not only must the dentist observe these danger signals, but he must also do nothing that will upset this delicate balance as long as the oral structures of these patients are in reasonably good condition and as long as function is normal.

Case 7

In 1950 a 60-year-old woman with an anterior open bite was examined. For the following eleven years nothing but good conformative dentistry was performed. Even when it became necessary to replace her posterior bridgework, the same occlusal pattern was followed. The patient was 73 years old at the time of writing. Her oral structures were in malocclusion but in equilibrium. Her function was excellent. She took extremely good care of her mouth. (Figs. 1177 to 1181.)

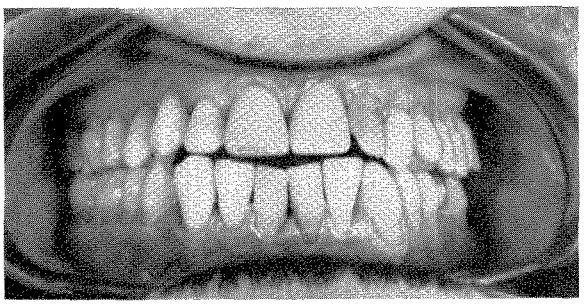

Fig. 1177. This photograph was taken in February, 1950, at the age of 60. The bite is open anteriorly, and the posterior teeth flare out. This is obviously a tongue thrust and may be combined with faulty swallowing. (Figs. 1177 to 1181 are of the same case.)

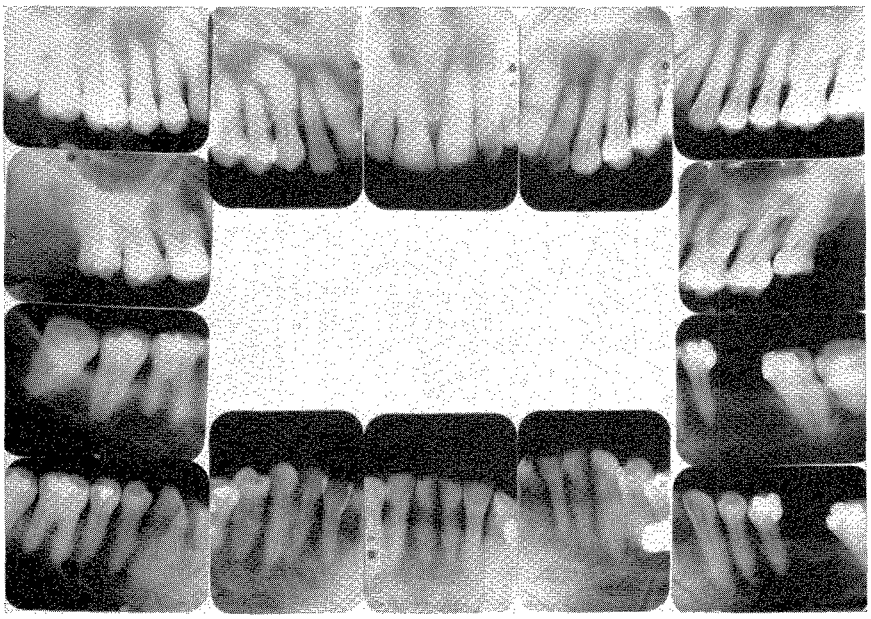

Fig. 1178. The roentgenograms that are shown here were taken in 1950. They disclose fairly normal structures in spite of the faulty occlusion.

Fig. 1179. This close-up photograph reveals the buccal flare of the posterior teeth more clearly. This was taken in 1956.

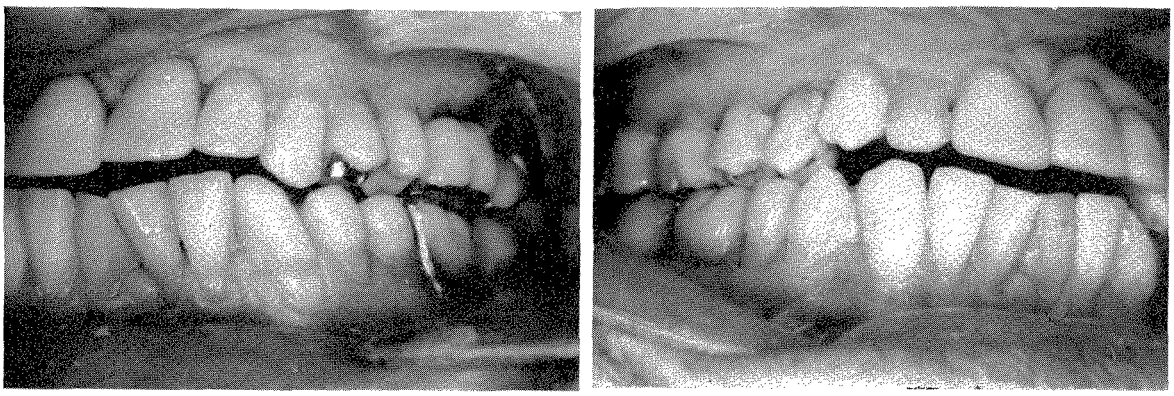

Fig. 1180. These photographs were taken in 1962. The structures are still good. The patient was then 72 years old. No attempt was made to correct the malocclusion.

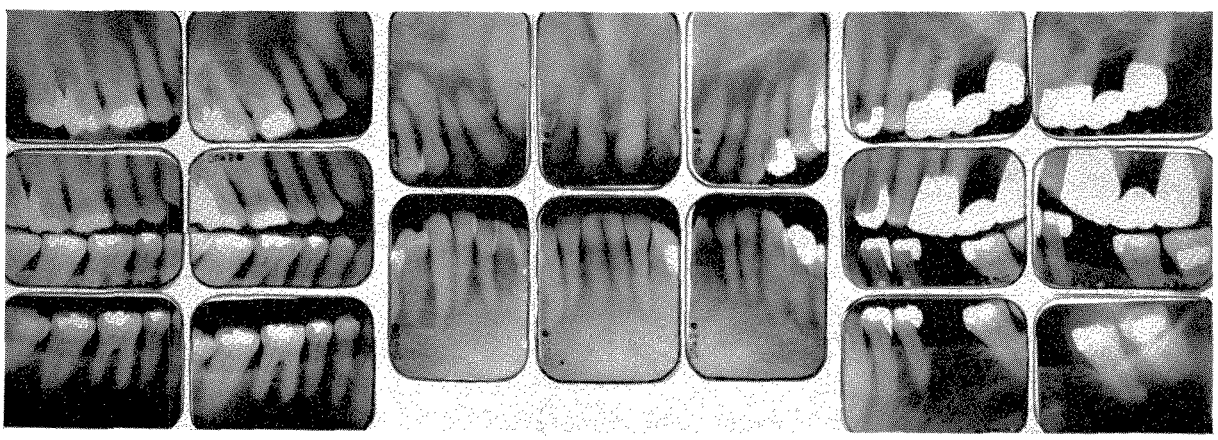

Fig. 1181. Roentgenograms taken in November, 1961.

OPEN BITES CAN BEST BE TREATED IN CHILDHOOD

The best time to treat an open bite is during childhood. Although failures are experienced even then, the attempt to alter the growth pattern and to break any pernicious habits that may contribute to the malocclusion is more apt to be successful at an early age than at any later time.

Case 8

The following case illustrates such treatment for a young girl. Orthodontic treatment was instituted at 9 years of age in 1955 and terminated at the age of 12 in 1958. It was very successful. (Figs. 1182 to 1184.)

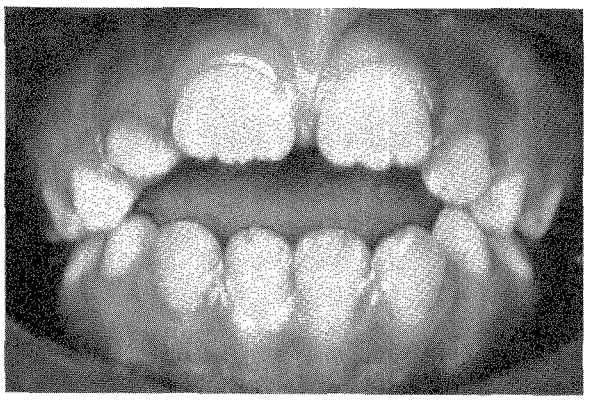

Fig. 1182. An open bite in a 7-year-old girl. A thumb-sucking habit was present. This photograph was taken in April, 1953. (Figs. 1182 to 1184 are of the same case.)

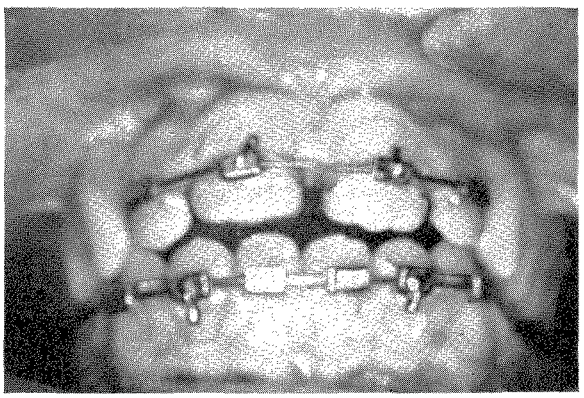

Fig. 1183. Orthodontic treatment was instituted in 1955 at the age of 9. This photograph was taken in 1957.

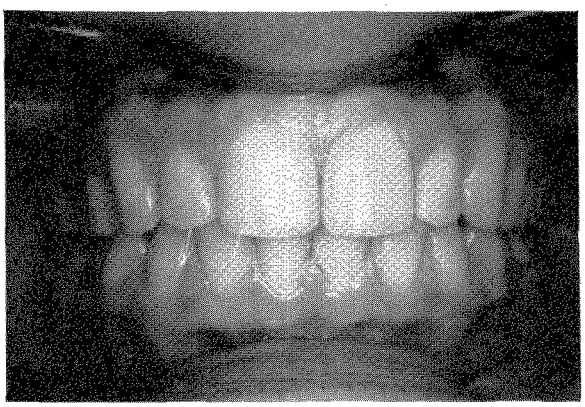

Fig. 1184. The work was completed in 1958 at the age of 12. This photograph was taken in 1963 at the age of 17. The treatment was very successful.

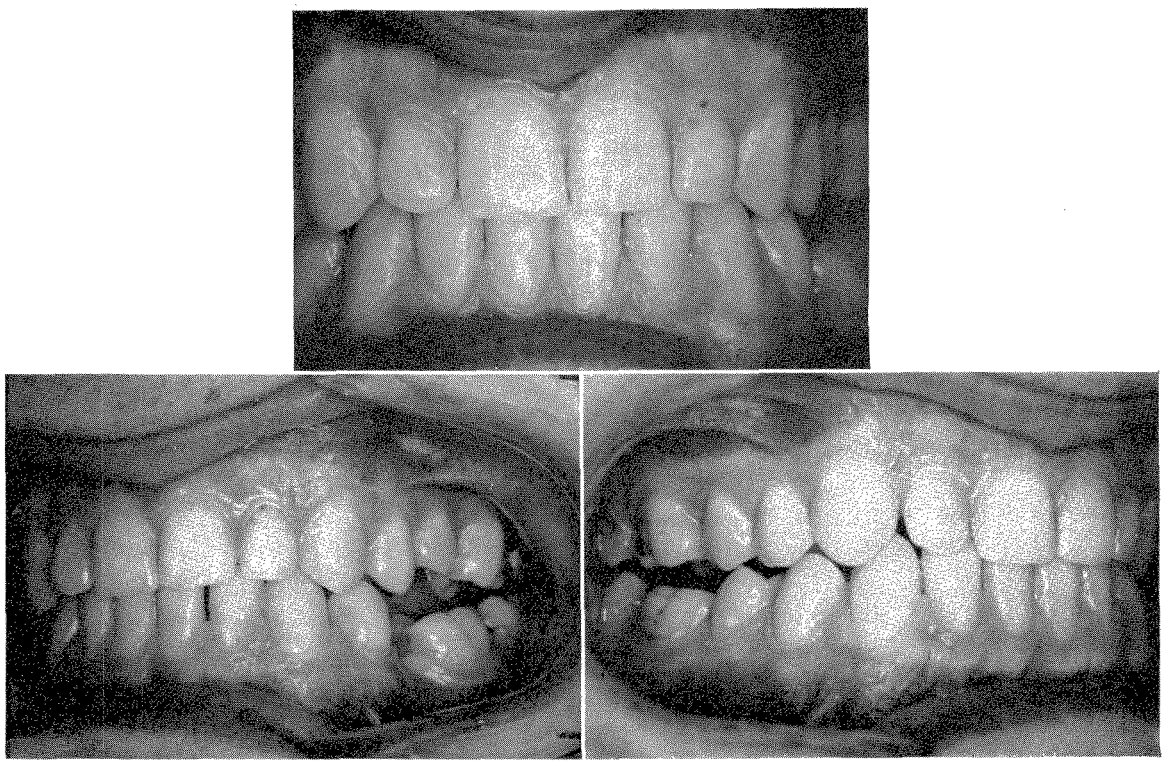

Fig. 1185. Front, left, and right views of the teeth of a 17-year-old boy who already had undergone four years of orthodontic treatment. The open bites were in the posterior areas. These photographs were taken in 1956. (Figs. 1185 and 1186 are of the same case.)

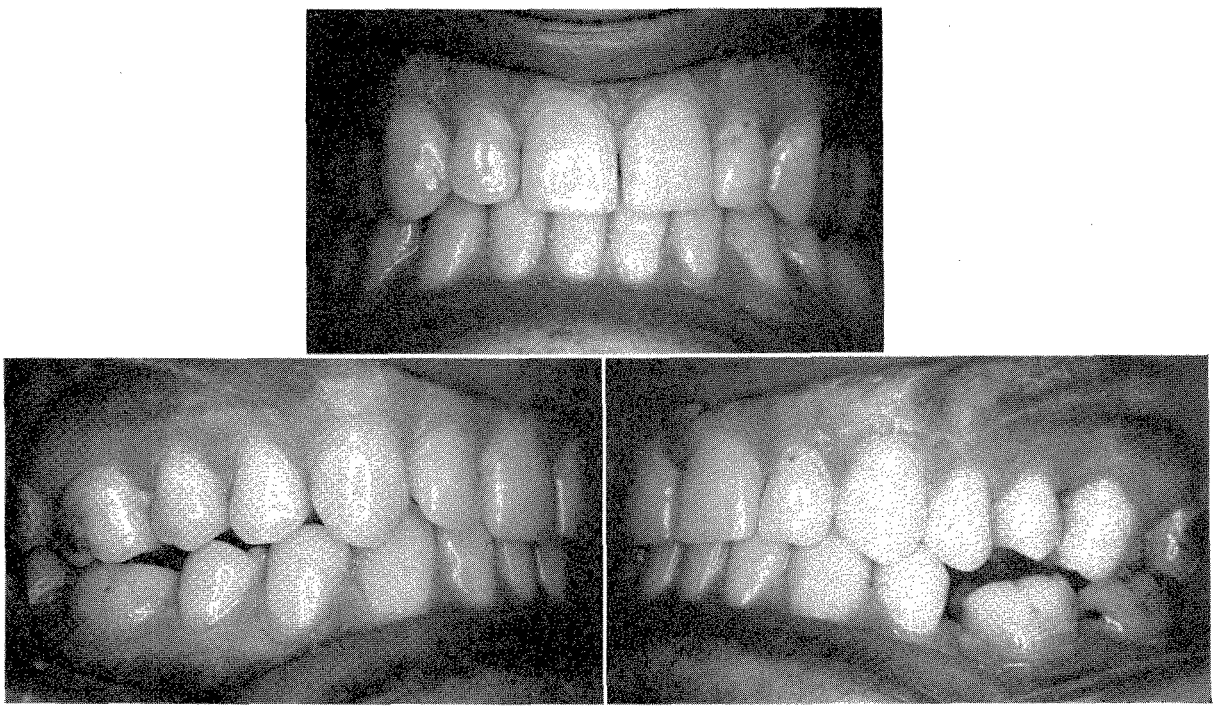

Fig. 1186. Front, right, and left views of the teeth in 1961 at the age of 22. The open bites had been reduced but were still present.

Case 9

Many cases treated by means of orthodontics have ended in relapse or failure. Some result in surprises such as open bites in different areas of the arch. In 1956 the mouth of a 17-year-old boy was examined. Orthodontic treatment had been instituted four years previously. The right and left bicuspid and molar region revealed open bites. The patient was wearing rubber night appliances that had been in position for one and one half years. In 1961, at the age of 22, the open bites in these same areas were present, although considerably reduced in degree. It would now have been possible to insert fixed gold inlays to correct the interocclusal discrepancy. Why these teeth remained below the occlusal plane is still difficult to determine. This case can be considered as a partial success. (Figs. 1185 and 1186.)

DISTORTION IN GROWTH PATTERN FOLLOWING TREATMENT

Case 10

There are times when the orthodontist may be perplexed by a disturbance in the growth pattern during treatment. In 1954 an 11-year-old boy underwent

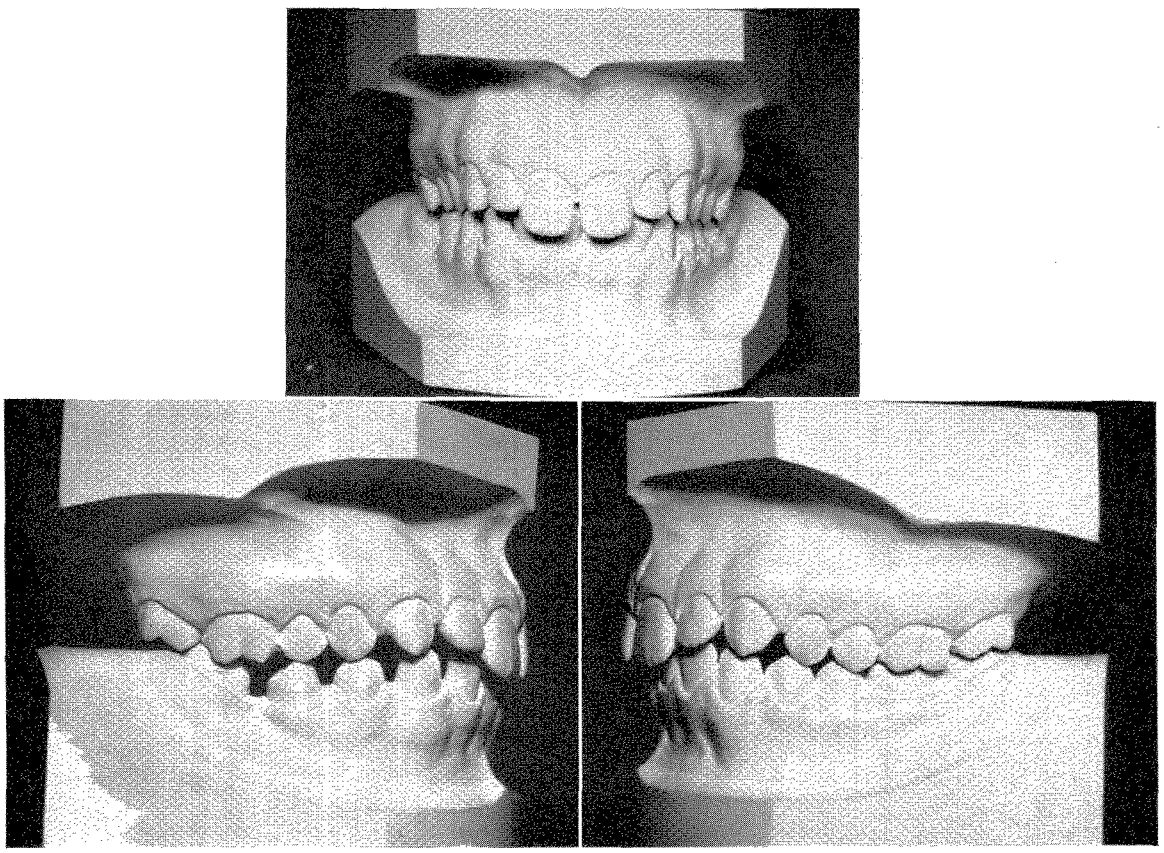

Fig. 1187. Casts of the teeth of an 11-year-old boy who underwent orthodontic treatment in 1954. (Figs. 1187 and 1188 are of the same case.)

Fig. 1188. This is how the mouth of the boy shown in Fig. 1187 looked in July, 1960, at the age of 17, after six years of orthodontic treatment. The teeth were making the best possible contact that the patient was able to achieve.

orthodontic treatment. He had an extreme overbite. When he was examined at the age of 17 in 1960, after nearly six years of orthodontic treatment, the anterior vertical overbite had almost disappeared, and there were open bites in both right and left posterior regions up to and including the lateral incisors and cuspids. The mandible had enlarged, probably as a result of a distortion of the skeletal pattern. The open bite on the right side was severe and involved twelve teeth. What the subsequent orthodontic treatment will be is problematic, but cases such as these present unusual difficulties to the orthodontists. (Figs. 1187 and 1188.)

Case 11

There are slightly different combinations of the types of anterior open bite that have been shown on pp. 549 to 560, Figs. 1166 to 1188. The following is another example. The lower incisors are below the occlusal plane of the cuspids and posterior teeth. The upper incisors may be above the occlusal plane. The bicuspids and molars bear a tip-to-tip interocclusal relation. The upper incisors are tipped forward, and for this reason are subject to traumatic accidents. In the case being shown, that of a 50-year-old woman, the central incisors were already injured and were covered by porcelain jacket crowns. In this case the structures were normal, but in cases in which they are below normal the reconstructed occlusion must be one in which provision is made for the tongue to thrust itself in an anterior direction without being impeded. (Fig. 1189.)

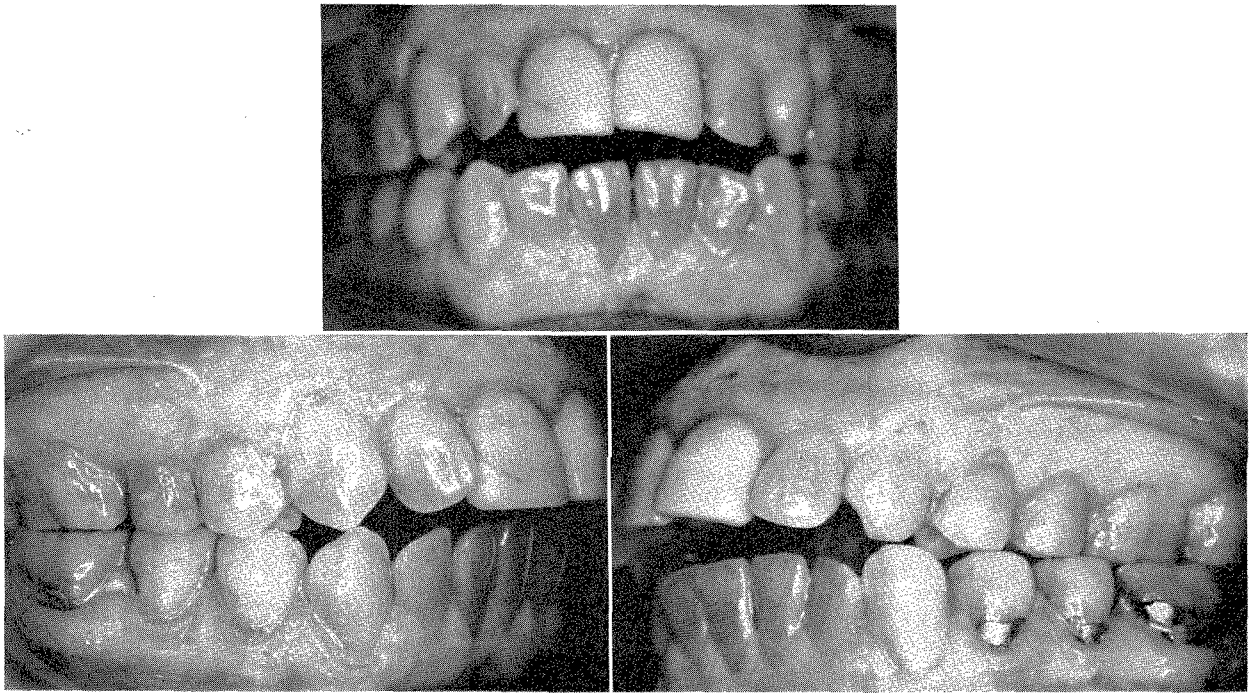

Fig. 1189. Three views of an anterior open bite in a 50-year-old woman. The lower incisors were below the occlusal plane, whereas the upper incisors were above it. The bicuspids and molars were in a tip-to-tip interocclusal relationship. The upper central incisors were covered by porcelain jacket crowns due to a traumatic injury.

INHERITED GROWTH PATTERNS

Cases 12 and 13

Some open bites may result from a familial inherited pattern of growth. The subjects whose photographs are shown in Figs. 1190 to 1199 are sisters whose ages were 65 and 72 years, respectively, at the time of this writing (1962). Both had similar open bites with malocclusion. In inserting prostheses for these patients, the open bites had not been disturbed. Their structures were good, and their function was excellent. (Figs. 1190 to 1199.)

Cases of open bites that are in need of reconstruction should be treated with caution. They can be real problem cases because of their tendency to recur, and no assurance should be given relative to the stability of the results. In some of these cases contact is usually made only in the posterior molar region. The tongues of such patients are large and active. The lips may be flabby, with excessive soft tissue. The dentist is often severely handicapped because of the interference to his operative techniques provided by the lips, cheeks, and tongue. Visibility is also poor.

RECURRENCE CAUSED BY TONGUE THRUSTING

Experience has shown that when this type of bite has been closed, either by grinding the molars down or by building up the lower and upper teeth to inter-

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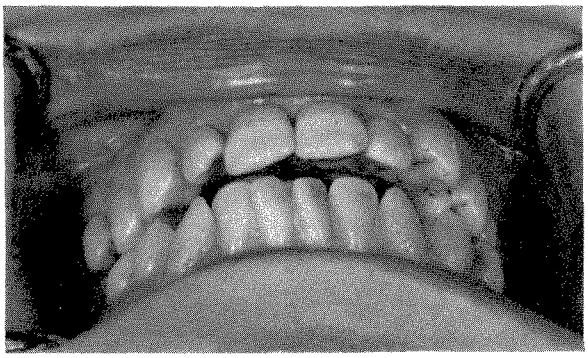


Fig. 1190. A 42-year-old woman with an anterior open bite. This photogrphy was taken in 1939. (Figs. 1190 to 1194 are of the same case.)

Fig. 1191. Roentgenograms taken in 1937 at the age of 39.

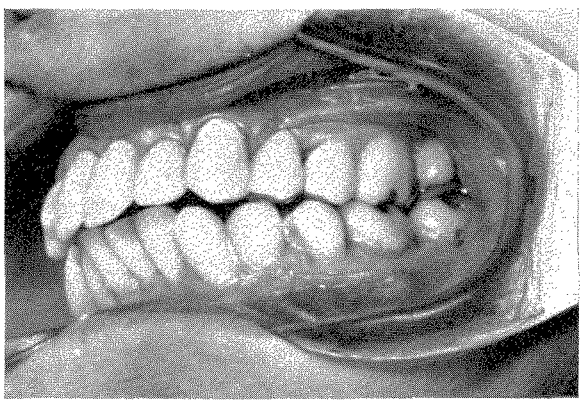


Fig. 1192. The upper left fixed bridge that was inserted in December, 1951, continued the same open bite.

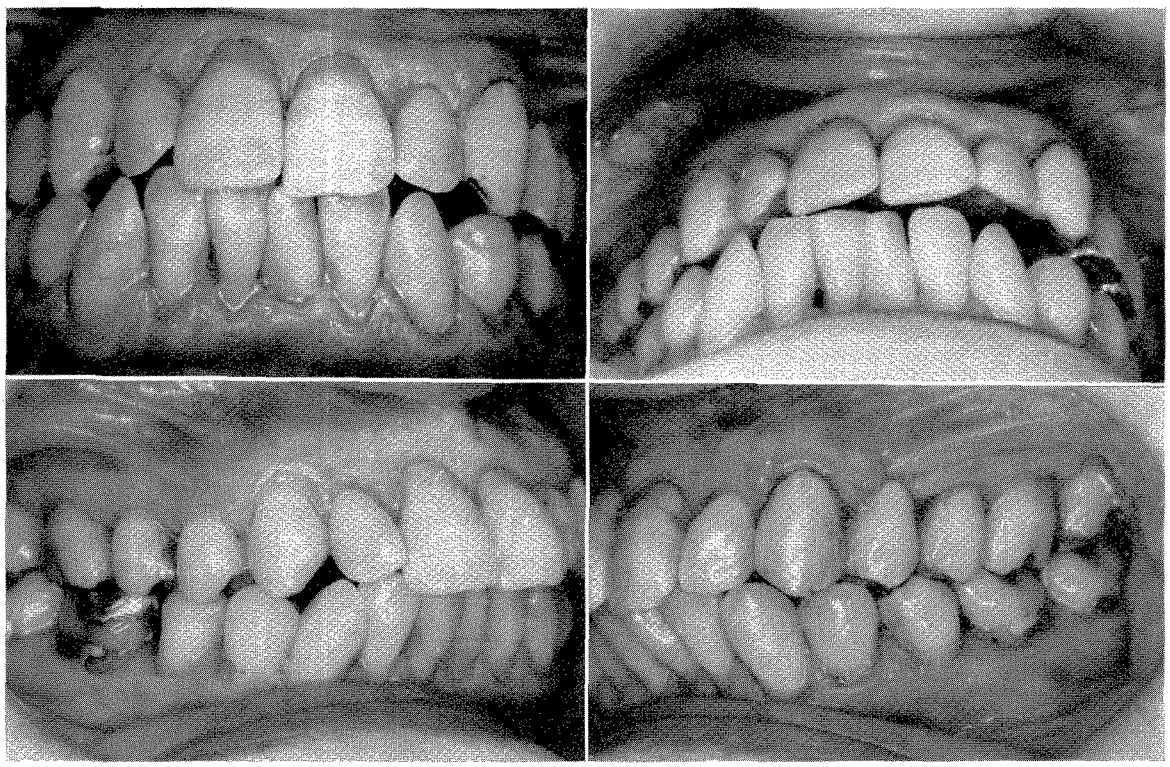


Fig. 1193. Four views of the mouth that were taken in 1962. The open bite was still apparent. The structures were excellent.

Fig. 1194. Roentgenograms taken in 1962 at the age of 65 testify to the health of the oral structures.

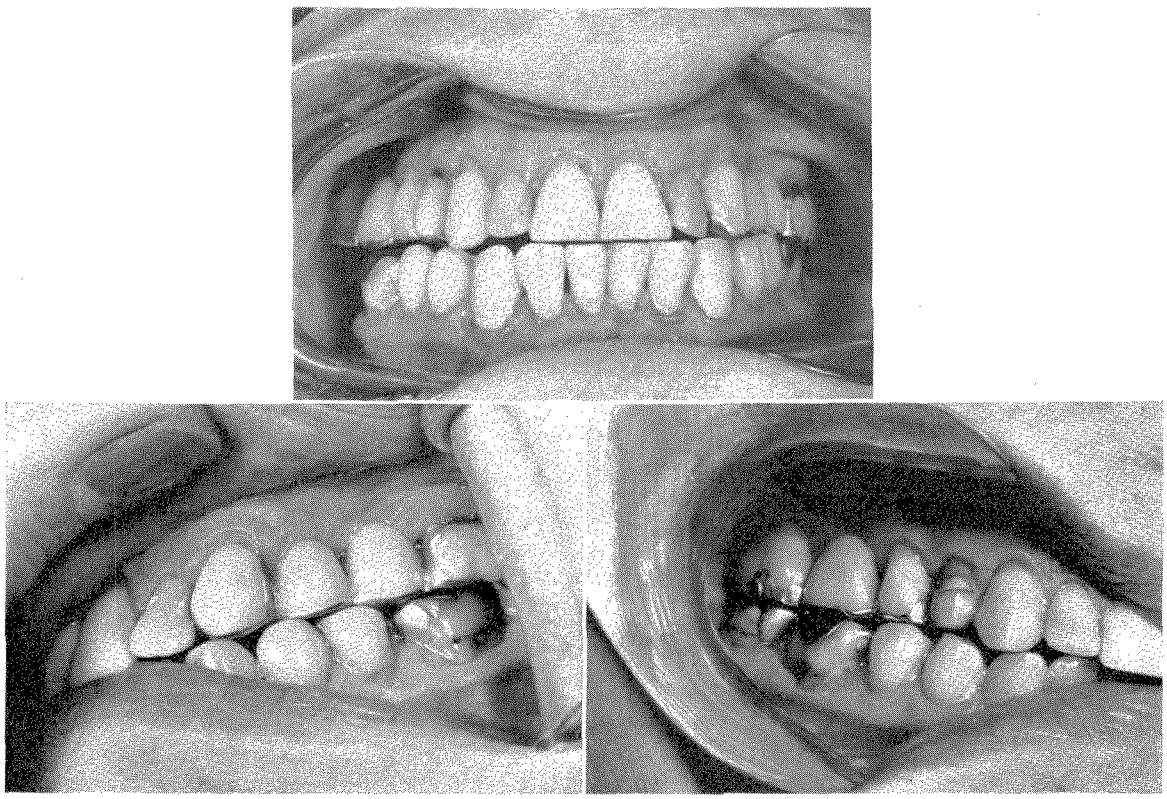


Fig. 1195. The patient whose photographs are shown here is a sister to the one shown in Figs. 1190 to 1194. These photographs were taken in 1939 at the age of 49. Right and left upper fixed partial dentures had been inserted during the year. The anterior bite was open. (Figs. 1195 to 1199 are of the same case.)

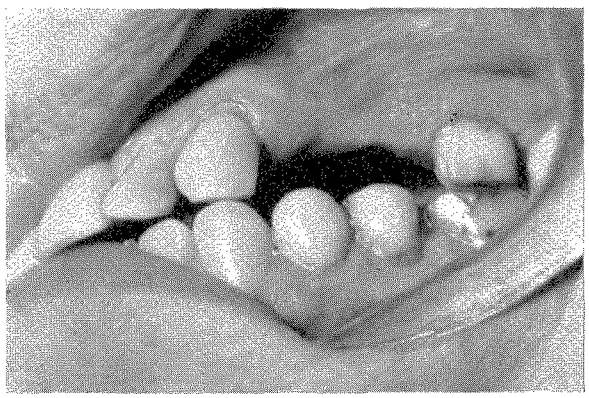


Fig. 1196. The upper lateral and central incisors did not contact even before the insertion of the posterior bridges as is evident from this photograph taken during the preparation for the upper left bridge in 1939.

Fig. 1197. Roentgenograms taken in 1939 when the patient was 49 years old. The upper posterior bridges had not yet been inserted.

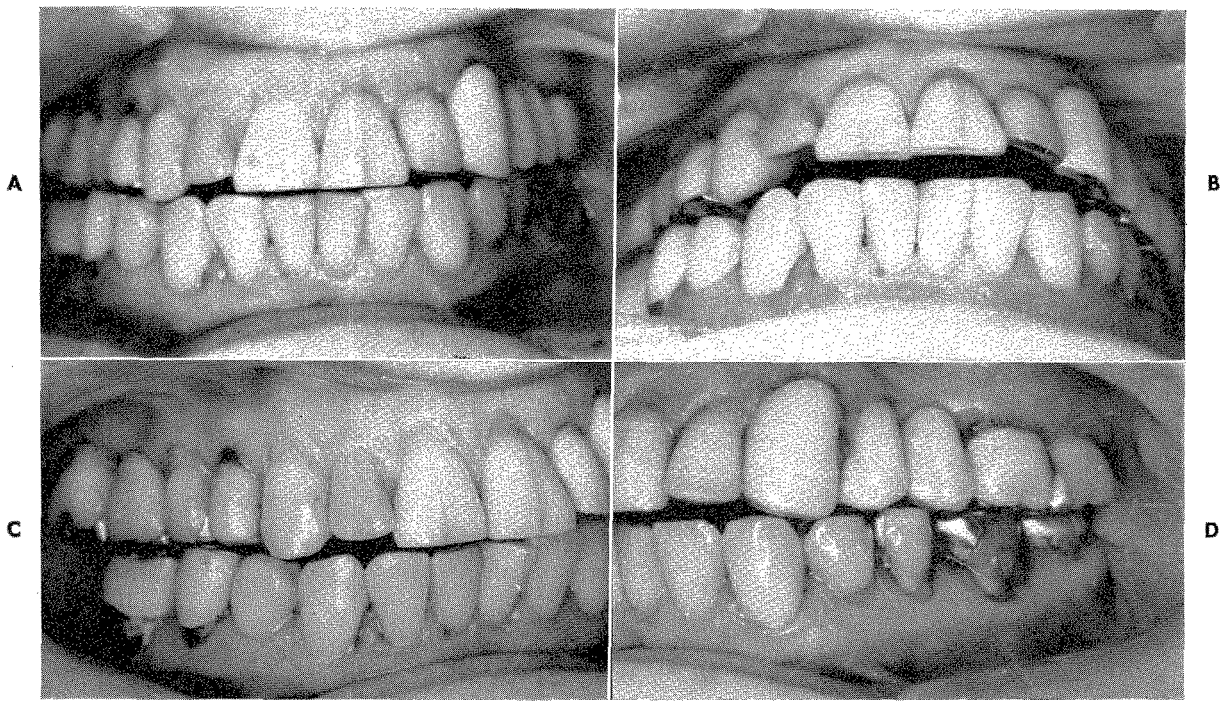


Fig. 1198. Four views of the occlusion taken in 1962. The patient was 72 years old. **A,** Anterior view with mandible retruded and open bite present. **B,** Anterior view with mandible protruded. **C,** Right side in position of maximum function. **D,** Left side in position of maximum function. Many observers would suggest the rehabilitation of this mouth in order to correct the malocclusion and provide maximum function in centric relation. I would heartily disagree with this procedure. The patient was aware of her malocclusion and was unwilling to undergo any extensive treatment. I observed this mouth for nearly a quarter of a century and saw only excellent structures in spite of the malocclusion and open bite.

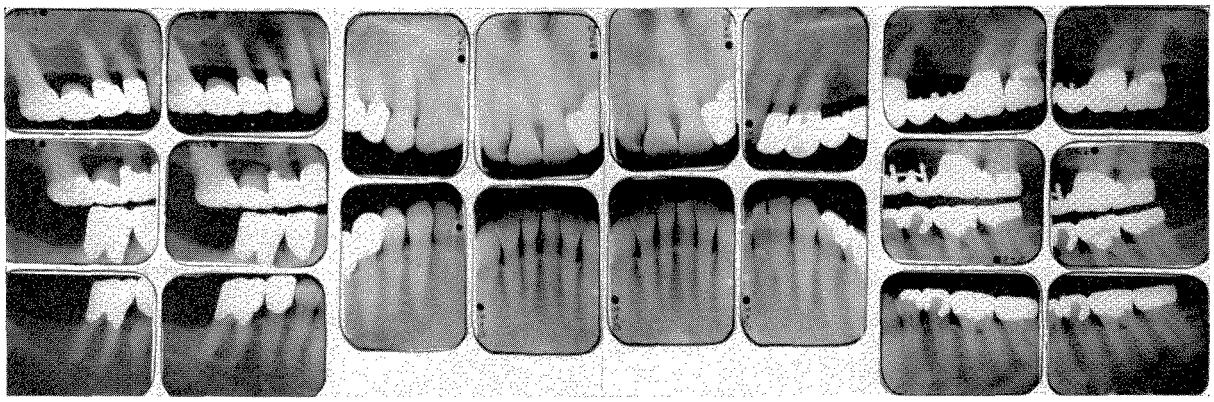


Fig. 1199. Roentgenograms taken in 1962 reveal good structures. Compare these with those that were taken in 1939 (Fig. 1197).

occlusal contact, in a comparatively short time the open bite once again re-establishes itself. This may be due to the continuous eruption of the molars in addition to an anterior thrust by the powerful tongue and a false swallowing habit. The tongue usually moves forward and outward, squeezing itself between the upper and lower teeth. The bony structures of the mandible and maxillae, being plastic, can actually be bent with the greatest effect taking place anteriorly. One must not lose sight of the fact that in open bite cases of this nature the cause may be the continuous growth of the condyle on its superior surface. This would result in a downward and forward positioning of the mandible.

In some of these cases of open bite, in which the tongue is large and powerful, the teeth are so scoured by this muscle that an abrasive and erosive effect is manifest.

There is a primary genetic pattern that is responsible in a general sense for the form and shape of the various body structures. It is, however, the oral musculature, the tongue, the lips, and the cheeks, that are effective in molding the arches and in checking the vertical growth of the teeth. The teeth are positioned anteroposteriorly, laterally, and vertically by the muscles so as not to interfere with their action, and both arch form and tooth position and inclination must be in a neutral muscular zone to attain stability.

Case 14

The following report is that of a male patient reported previously in 1951* who had been treated for over thirty years. This patient died in June, 1962, at the age of 70 years. Closure of the open bite was attempted both by reducing the vertical height of the molars and by building up the teeth anterior to them. In spite of all the effort expended in closing this bite, it opened repeatedly following treatment and was open again early in 1962. Seven years prior to the time of writing, the patient suffered a coronary attack. Since that time there had been only simple nontraumatic operative procedures.

In spite of the occlusal load not having even distribution and in spite of the

*Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., pp. 1041-1047.

malocclusion imposed by the open bite, the structures were in excellent condition and functioned most effectively. He had never been inconvenienced in any degree by his malocclusion nor had any special articulators been used in constructing his oral prostheses. Although it is not my intention to stress this simplicity, neither should its importance be minimized in recording the patient's history. (Figs. 1200 to 1215.) The reader is now referred to the 1941 actual report of the reconstruction, which follows.

Text continued on p. 571.

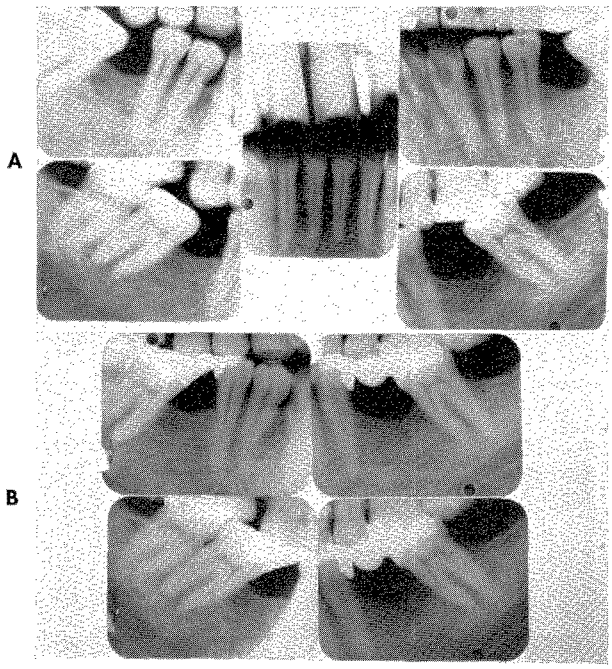


Fig. 1200. These roentgenograms were taken in 1934. In **A** the bite was open. These were taken before any work was done. **B,** The bite was closed by grinding the posterior molars down until all the teeth anterior to them were in contact. Then the posterior molars were reconstructed with fixed bridges, as shown in these roentgenograms. (Figs. 1200 to 1215 are of the same case.)

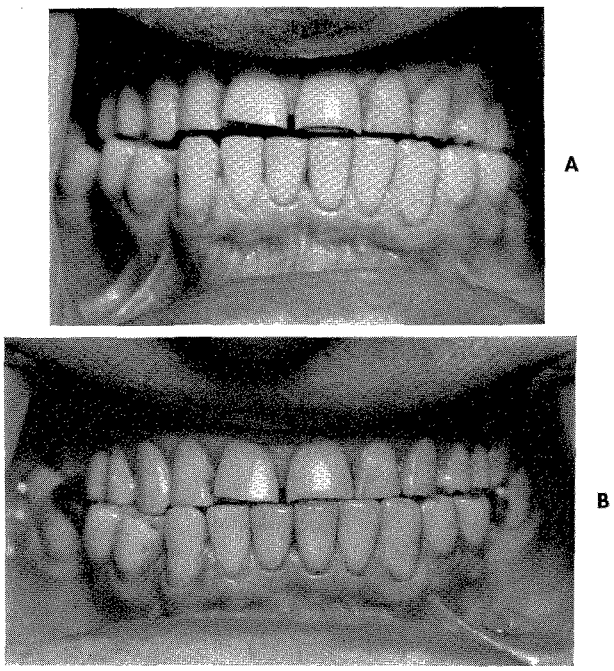


Fig. 1201. A, The mouth of the patient whose roentgenograms are shown in Fig. 1200 is shown here before the bite was closed. He was 42 years old in 1934. **B,** The mouth after the bite was closed. The anterior teeth were brought together by selective grinding. Right and left lower fixed bridges were inserted.

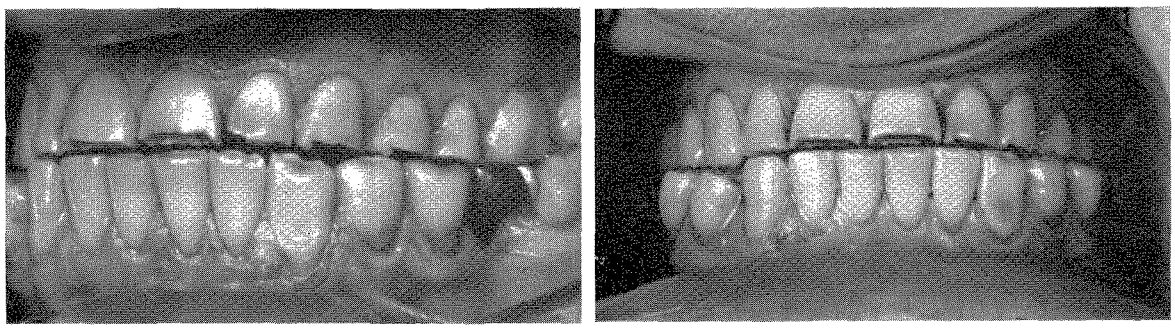


Fig. 1202. By 1939 the bite was again open to the extent shown here.

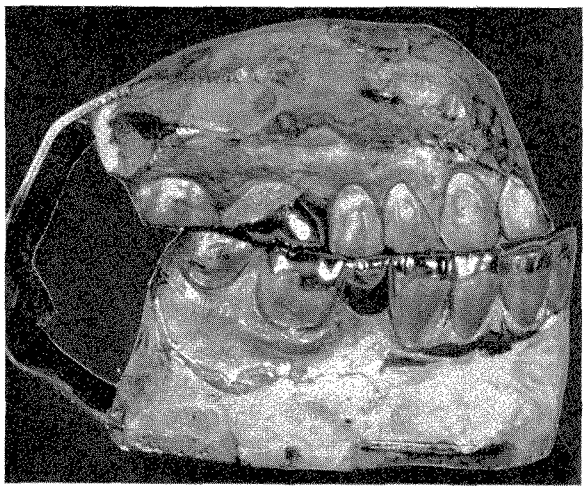


Fig. 1203. The right side was reconstructed in 1941 by means of the gold inlays and the sanitary bridge shown here.

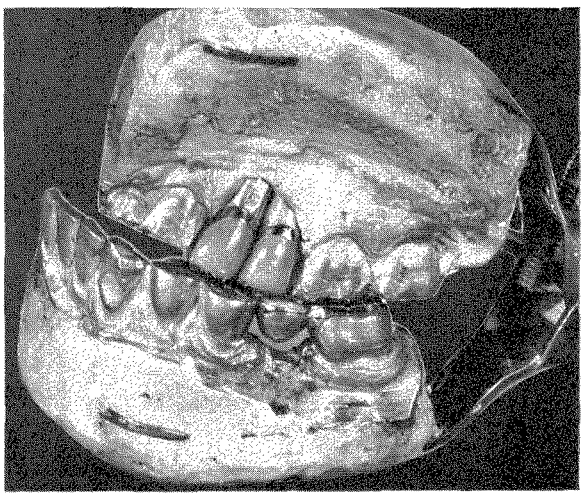
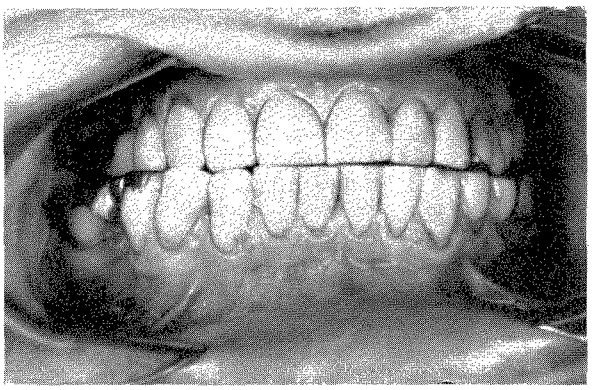
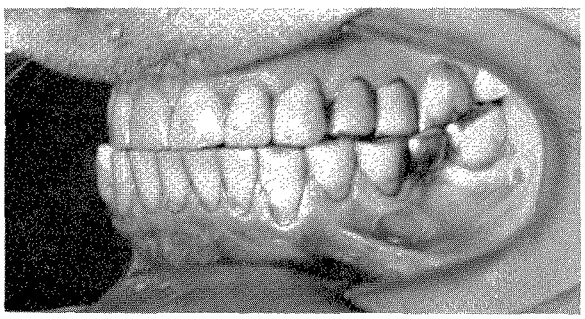


Fig. 1204. The left side was reconstructed by means of full crowns on the upper bicuspids and a sanitary bridge replacing the lower molar. Small unilateral articulators were used as shown here and in Fig. 1203.





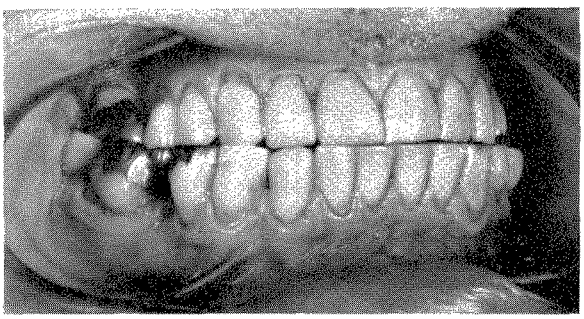


Fig. 1205. The completed work is shown here. These photographs were taken in 1941. The teeth again contact in centric occlusion.

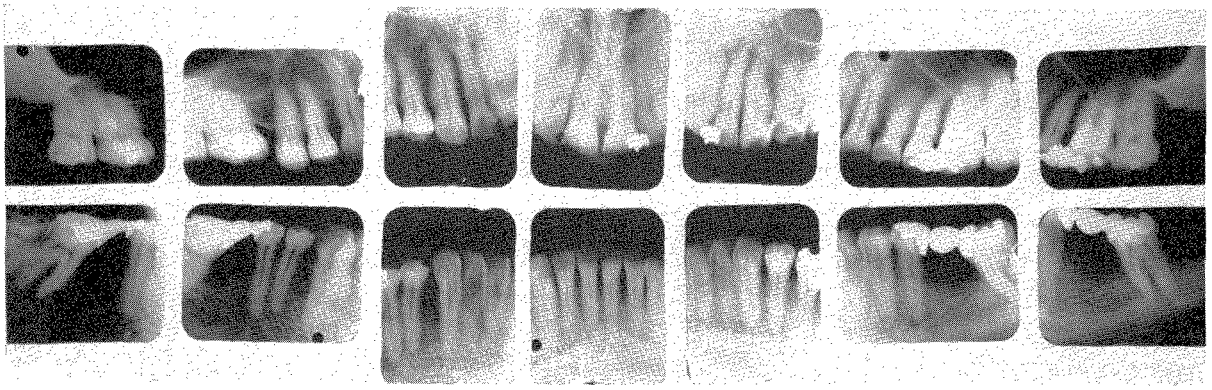


Fig. 1206. Roentgenograms taken in October, 1939.

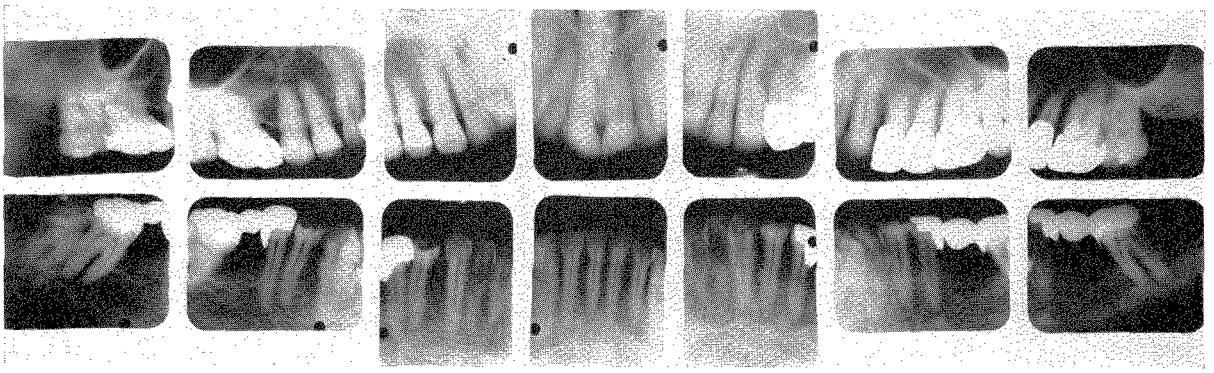


Fig. 1207. Roentgenograms taken in June, 1941, just after the reconstruction.

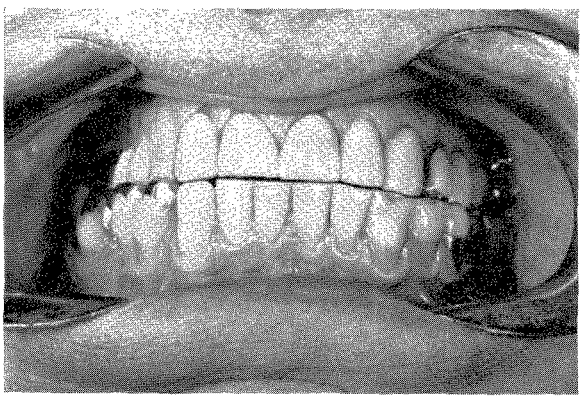


Fig. 1208. In 1953, the anterior bite was again open as shown here.

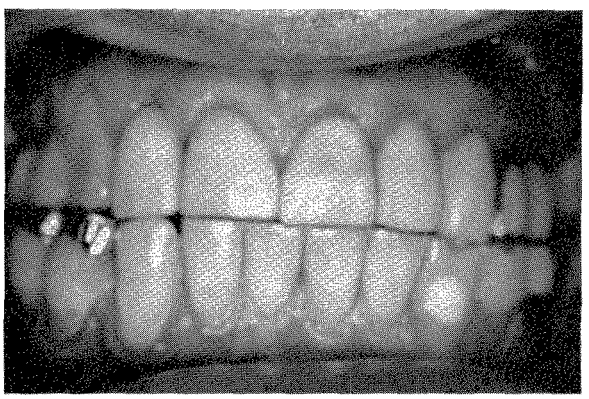


Fig. 1209. In 1955 the bite was again closed by equilibration using stones and articulating paper.

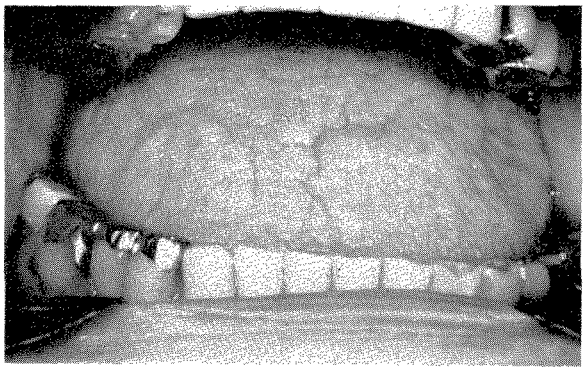


Fig. 1210. An unusually large tongue could have been responsible for pushing the mandible forward or even distorting its shape. The tongue was a severe handicap in all the dental operations. It was often seen to be positioned between the anterior teeth. If this took place at night, during the sleeping hours, it could be entirely responsible for the open bite.

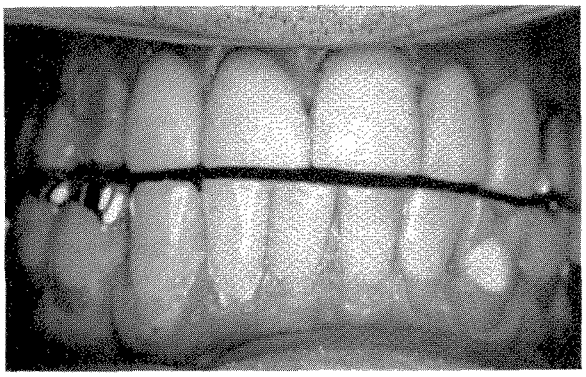


Fig. 1211. The mouth in 1959 showing the extent of the open bite. The mandible is shown here in its retruded position.

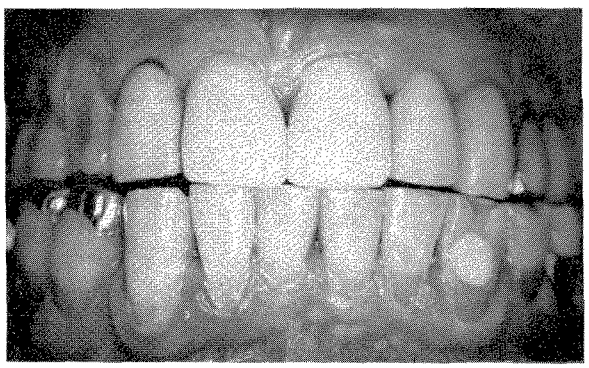


Fig. 1212. The patient had suffered a coronary attack. The two central jackets had to be replaced. This was done in such a manner that the central incisors were elongated to make contact with the lower incisors as shown here.

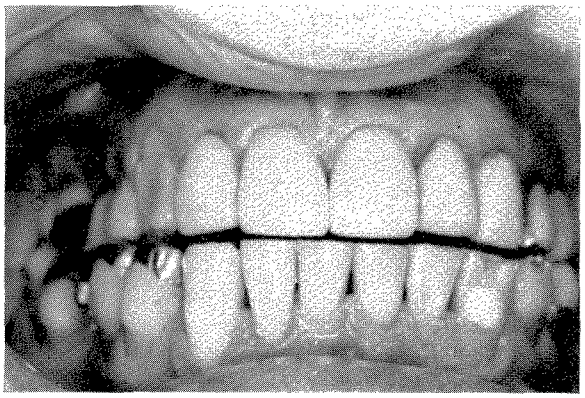


Fig. 1213. Anterior view that was taken in 1961. The patient was over 69 years old. The bite was again open. The upper central incisors no longer contacted.

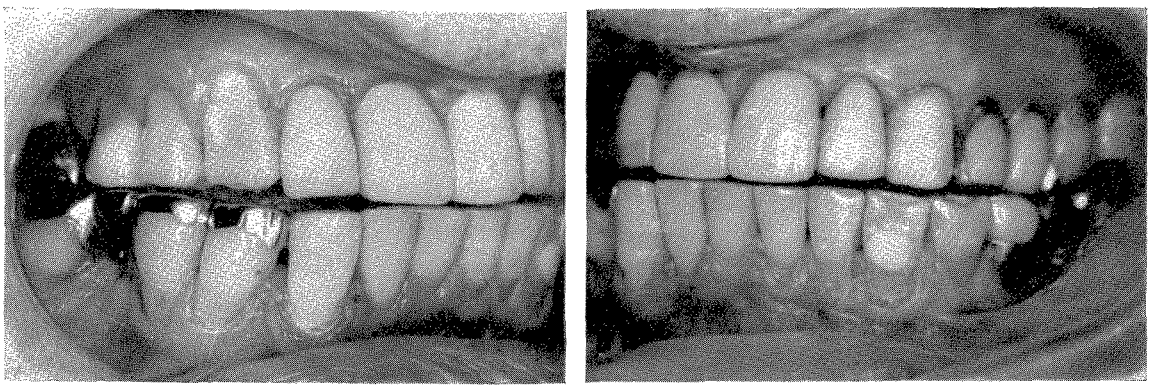


Fig. 1214. Same as Fig. 1213 except these are right and left views.

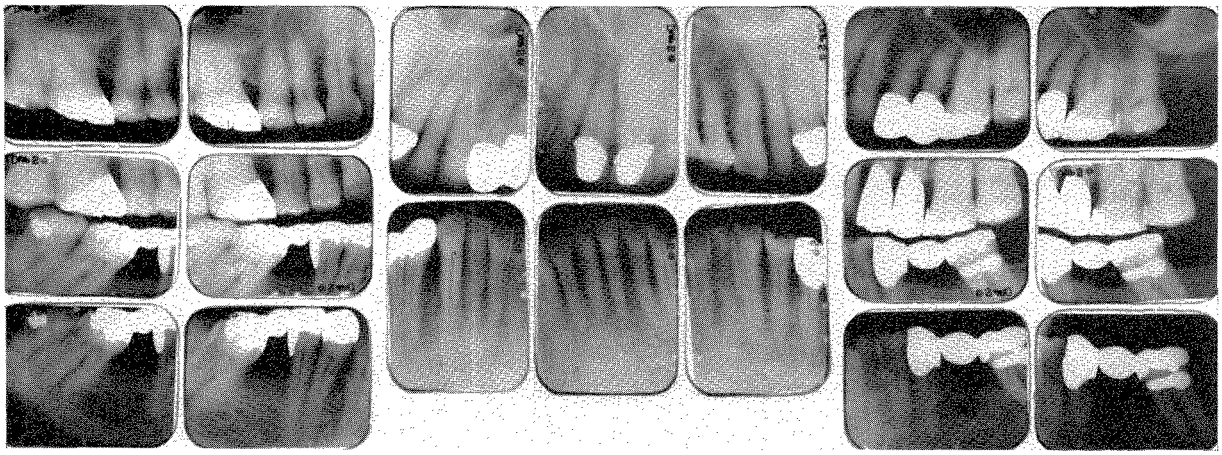


Fig. 1215. Roentgenograms taken in 1961. These were the last records to be made. The patient died of a second coronary attack in 1962. The oral structures were still in excellent condition.

Past history—1941 reconstruction

The patient, a middle-aged man, had been treated in 1934 for what was apparently an open bite. By means of a relatively small amount of grinding on the posterior molars, and by the introduction of a right and left posterior fixed bridge, replacing the lower first molars, the anterior teeth had been brought into occlusion. However, within five years the space again began to appear between the anterior upper and lower teeth. It was apparent that an abrasion was taking place. It was probably first of a chemical nature wearing away the enamel structure, and then of a mechanical nature. This abrasion during the next six years of observation, from 1935 to 1941, was getting worse, causing shortening of the anterior upper teeth and extending backward to the upper left posterior teeth particularly in the canine and bicuspid region. Throughout the mouth abrasion was manifest.

Owing to the large amount of abrasion which had taken place in the region of the upper left anterior and posterior teeth, it was apparent that the patient probably had used that side rather than the right side in chewing.

The vermilion border of the upper lip curled around the anterior teeth in a peculiar way. The vermilion portion hardly showed. At least one third of the upper two central incisors, the upper left lateral incisor, the upper left cuspid, and the upper left first and second bicuspids had disappeared. The teeth were so obviously shortened that it gave a peculiar expression to the patient's mouth. There was no anterior contact whatsoever. In the posterior region the upper and lower bicuspids and molars contacted each other.

The preliminary indices were made; namely, hydrocolloid impressions were taken and poured in stone. The models were mounted on an articulator for diagnosis. Radiographs of the teeth and of the condyles were taken. Photographs were made.

The models were studied carefully. It was decided that an increase in the opening of the vertical dimension of 4 mm. would be sufficient to permit the restoration of the upper anterior teeth and the upper left posterior teeth to normalcy. At the same time this would also permit the reconstruction of most of the occlusal surfaces of the remaining teeth which were in some stages of abrasion. No de-

vitalized teeth were present, and the bone structure was unusually strong. The radiographs of the condyle indicated that the condyle heads were large but otherwise normal. The patient had no symptoms whatsoever of any disturbances of the joint.

Reconstruction was being done in this case in order to restore the mutilated teeth and to bring about contact between the upper and lower teeth as well as to create a better esthetic effect, but not because of any pathological disturbances. The four-inch disk (occlusal) representing an arc, when applied to the occlusal surfaces of the lower teeth, harmonized with the anterior and left posterior teeth but showed decided discrepancies in the right posterior teeth. It was, therefore, necessary to build up the lower right bicuspid and second molar to occlusal height which would harmonize with the disk. The lower fixed bridge running from the second right molar to the second right bicuspid was removed. The distoclusal cavity in the second right bicuspid was prepared to receive a gold inlay. The mesioclusal cavity in the second right molar was prepared for a gold inlay. An occlusal cavity was prepared in the right first bicuspid. Direct wax impressions were taken of these cavities at one time using as a guide the opposite teeth and the undersurface of the occlusal disk. This undersurface was wiped with Albolene so that the wax would not stick. By overbuilding the wax and heating the occlusal disk and applying it to the surfaces of the wax, the wax soon was made to conform to it. The patient was asked to bring his teeth together slowly until they barely touched the wax and then to stop. With the upper right teeth in contact with the lower wax pattern, the anterior teeth were held open about 4 mm., running from the cuspid around the arch to the left second molar. In the anterior region, the opening between the upper and the lower teeth was greater than in the posterior region because they are farther from the hinge axis.

The amount of the increase in the vertical dimension was in accordance with the original plans. The three wax patterns were then removed from their respective teeth and cast in hard gold. These gold inlays were then fitted in their respective lower right posterior teeth, and the bite height was again checked anteriorly. With these gold inlays in position on the right side, the upper left first molar was prepared for an occlusal inlay, using the lower left bridge on the opposite tooth as a guide for vertical height. This was necessary because the upper left bicuspids and the upper left cuspid and incisors were much shorter than the normal, so that room had to be provided to permit the elongation of these teeth rather than to raise the lower occlusal level to meet the upper teeth. This wax pattern in the upper left molar was then cast in hard gold and placed in its position in the mouth. The lower right inlays were also placed in position. The lower left fixed bridge, running from second bicuspid to second molar, was then removed. The lower left second molar was prepared for a mesioclusal inlay. The lower left second bicuspid was then prepared for a distoclusal inlay. During the preparation the occlusal level was lowered in order to permit more room for the elongation of the upper bicuspids.

It may have been possible that while the upper bicuspids were becoming shorter, the lower bicuspids were slowly being extruded, one of Nature's ways of compensation in order to keep occlusal contact. Wax patterns of the molars and bicuspids were taken directly. At this time it was decided to experiment with an acrylic inlay in the occlusal surface of the lower right first bicuspid. As previously

stated, a gold inlay had been made for this tooth. The acrylic inlay was made as an experiment because the metallic inlay would be very visible.

After the lower left gold inlays were cast, they were placed in position in their respective teeth, namely, the lower left second bicuspid and lower left second molar. The upper second left bicuspid was then prepared for a distoclusal inlay. This inlay made contact with the lower teeth at the new occlusal level. The upper left first bicuspid was then prepared for a full-cast crown which would have a porcelain buccal surface. The crown was cast to the present occlusal level. The upper right second molar was also prepared for a full-cast crown which would make contact with the lower right molar and would serve to close the small space remaining between the upper right bicuspid and the upper right second molar. While these last two preparations were being made, the lower anterior teeth were trimmed to a more even level, particularly on the left, in the regions of the left central and lateral incisors and cuspid.

All the castings were placed on their respective teeth in the mouth. The bite was then synthesized in the following manner: All the castings on the left side were removed, whereas those on the right side were spot ground by means of articulating paper until even contact was provided upon all the posterior teeth of the right side. The lower left posterior castings were then placed in position, together with the upper left first molar casting. This was spot ground so that even contact was provided on both sides of the mouth. The patient felt comfortable in all positions.

The next stage was the taking of the impressions for the making of the posterior right and left fixed bridge and the providing of sluiceways for the escape of food on the occlusal surfaces of the posterior inlays and crowns without reducing the bite height. This was accomplished by taking upper and lower plaster impressions of the right and left sides separately, together with a wax bite for each side. It was not necessary to take full-mouth impressions at this time because the bite had been synthesized directly in the mouth and had been checked directly in the mouth.

After the models were made, the right and left fixed bridges were completed. The sluiceways in the inlays were also completed, making certain that the bite was not lowered. Shallow cusps were provided rather than deep cusps. The posterior inlays and bridges were now ready for insertion in the mouth. In some instances it is better not to insert the posterior abutments until the anterior abutments are inserted, so that both posterior and anterior abutments may be inserted at one time. This provides for a more even distribution of the load and avoids trauma on any particular tooth. However, in this case this procedure was not deemed necessary inasmuch as the patient had an open bite for many years, and the posterior teeth had always had to withstand the entire load of the occlusion. As a matter of fact, with the new posterior abutments in position, the patient had more contact points between the upper and lower teeth than he ever had before. Therefore, the cavities were well cleaned out with warm water and alcohol, varnished with cavity varnish, and the abutments were introduced one by one, making certain that they were in their correct positions. First the right side was completed, then the left side. After the introduction of all these posterior abutments, the bite was again checked by means of articulating paper in the mouth, and the patient was made very comfortable in all positions.

The next step was the preparation of the anterior teeth for jacket crowns. Two

teeth were prepared at a time. These jackets were built to the new vertical dimension. The length of the jackets may make it necessary at some future time to place, on the short anterior stumps, metal castings to elongate the stumps over which jackets may be baked. At this time the decision to bake over the bare preparations without the use of the metal copings to elongate the preparations was decided upon because of the transparency of the natural tooth, which permits for much better esthetics. Where the remaining tooth is too short for a jacket and a jacket has to be built over the natural stump to elongate it, the possibility of fracture, owing to the great bulk of unsupported porcelain, is much greater than if the tooth were long and the bulk of the unsupported porcelain were not so great. The porcelain crowns were cemented into position. The entire bite was then rechecked. Final impressions were taken in hydrocolloid material, and stone models were poured. Photographs were taken of the finished case.

The postoperative period was uneventful, and the case was completed (1941). (For follow-up now refer to Figs. 1208 to 1215.)

Case 15

Present condition

In 1950 a 60-year-old woman came for dental treatment. Her mandibular arch was as wide, if not wider, than her maxillary arch. The teeth of both arches were widely spread with large spaces between the anterior teeth. The patient had a slight lisp, probably caused by a fibrous cord attached to the lower anterior portion of her tongue. This may also have been partly responsible for a false swallowing habit that she exhibited. After due consideration, complete oral reintegration was prescribed as the method of treatment.

Unlike the previous case that had been constructed upon very simple unilateral or semianatomical articulators, this case was constructed upon the McCollum gnathoscope using gnathological concepts. (Refer to Chap. 9, p. 465.) This articulator is one of the most complicated of the so-called fully adaptable machines and is the forerunner of the Granger gnatholator, the Stuart and the DePietro articulators. Some of the principles of gnathology are used in Transographics.

This case was reported in the literature in 1957.* The work was started in November, 1950, and completed in April, 1951. No details were omitted in order to follow all the particulars of this anatomical technique.

Postinsertion changes

Within a year after insertion the occlusion began to shift with the left bicuspids presenting an open bite. The teeth appeared depressed. This was corrected by means of gold onlays. Two years after completion, in 1953, there was lack of interocclusal contact in the incisor region. This was unusual and hardly expected because of the extensive upper and lower anterior fixed splinting.

The fact that these splints were intimately connected to large removable partial dentures made their movement more surprising. In spite of this stabilization, these

*Schweitzer, J. M.: Open bite from the prosthetic point of view, Dental Clinics of North America, Philadelphia, 1957, W. B. Saunders Co., pp. 269-282.

upper and lower splints had been thrust apart by strong forces that were operating from within the oral cavity. Probably weak labial and buccal musculature helped accentuate the condition.

An attempt was made to close the open bite by equilibration using stones and articulating paper. This was successful, but one year later, in 1954, the bite again opened, only it was more pronounced than ever. In 1956, five years after completion, the lower right bicuspid became infected. It was nonvital at the start of treatment. Its root was removed leaving the crown in position to become a cantilever. It is entirely possible that the trauma caused by a force strong enough to part the anterior splints also may have caused the removable partial dentures to exert noxious influences upon the abutment teeth. The lower lingual bar was repaired and served until January, 1959, at which time the entire lower prosthesis was remade. This work was completed in April, 1959. It was constructed upon a Hanau Model H articulator.

Discussion

Some interesting observations were made from this case. They are as follows:

1. The force that caused the anterior bite to open must have been strong enough to move a multiple abutment splint out of contact with the opposing teeth.

2. Though the occlusion was fully reintegrated, it was impossible to correct the faulty habits that were responsible for the original malocclusion. The same dangerous pressures existed after the case was completed.

3. Judged by the duration of the finished results, this case cannot be considered a success. Three lower right posterior teeth were removed within a nine-year period, in spite of original careful interocclusal cuspal coordination using a fully anatomical technique and a fully adaptable articulator.

4. It is interesting to speculate on the prevention of the relapse to an open bite had it been possible to provide spaces between the teeth in the completed work.

Text continued on p. 583.

Fig. 1216. Front view of the mouth of a 60-year-old woman before treatment. This photograph was taken in 1950. The wide separations were caused by tongue thrusting and false swallowing. (Figs. 1216 to 1238 are of the same case.)

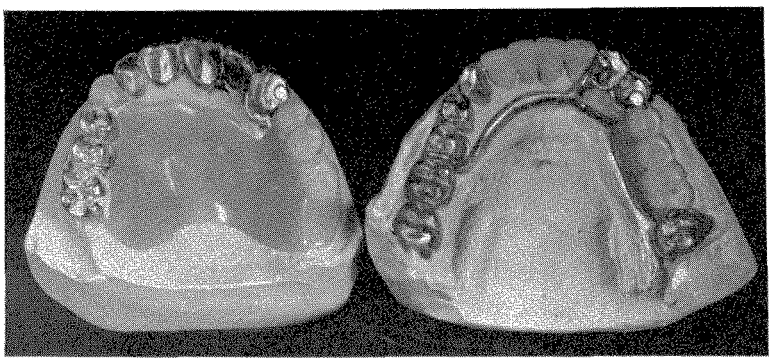


Fig. 1217. This case was treated using the same technique as was employed in the treatment of the case shown in Figs. 1000 to 1025. This photograph shows the upper and lower temporary work.

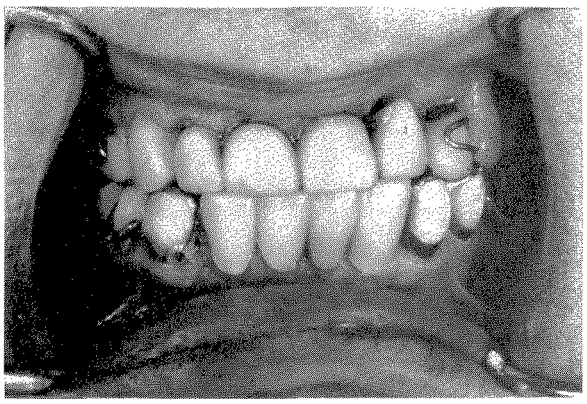


Fig. 1218. The transitional prostheses are in position.

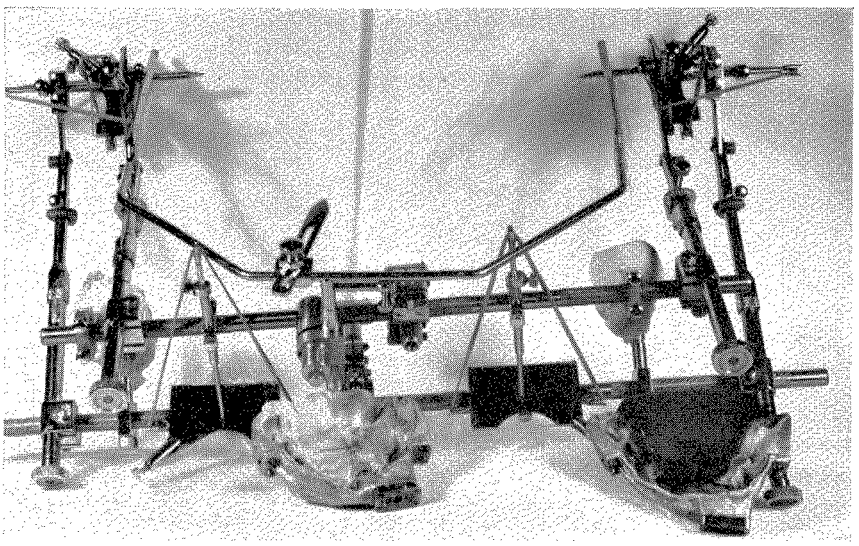


Fig. 1219. The gnathograph shown here had just been removed from the face. The clutches are in the foreground. The axis orbital bow is in position.

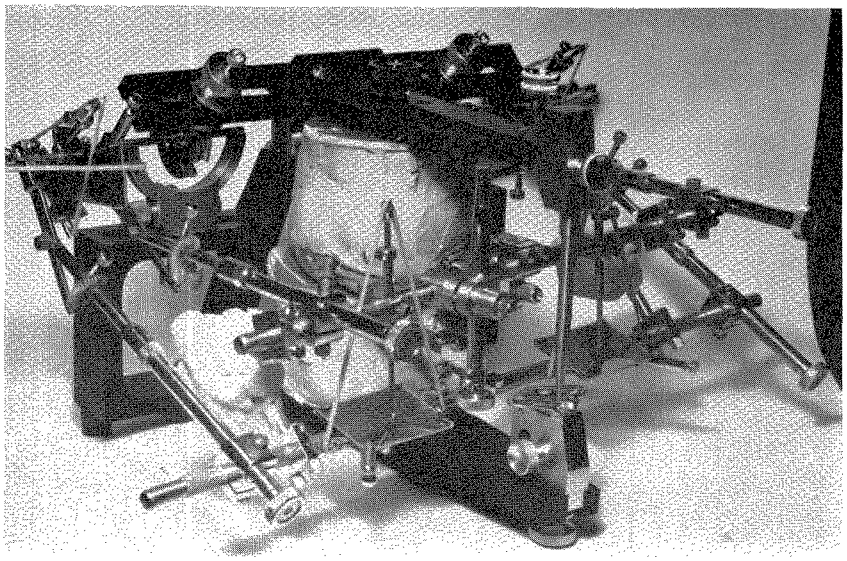


Fig. 1220. The gnathograph was attached to the gnathoscope. The gnathoscope was set to follow the movement of the six recording styluses.

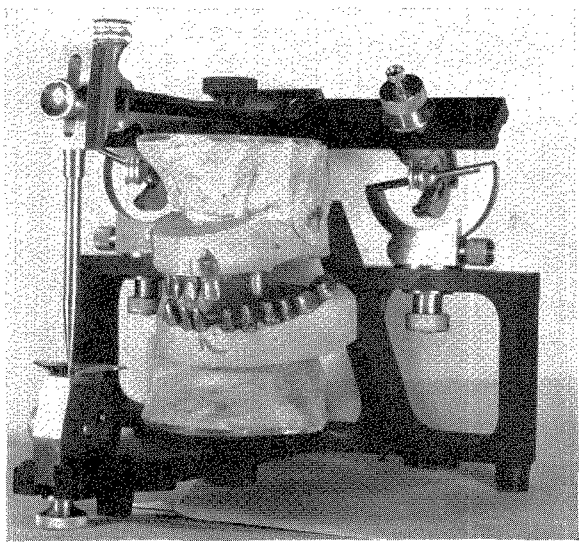


Fig. 1221. A face-bow and axis orbital plane recording were taken. Work casts were poured. These casts which contain the copper-plated dies were attached to the gnathoscope by means of the face-bow and hinge wax records. Low-fusing metal transfers were made for each die. These were inserted in the mouth.

Fig. 1222. The low-fusing metal transfers are shown in position. A new face-bow and axis orbital plane record, as well as new hinge wax records, will be taken for a new mounting on the gnathoscope.

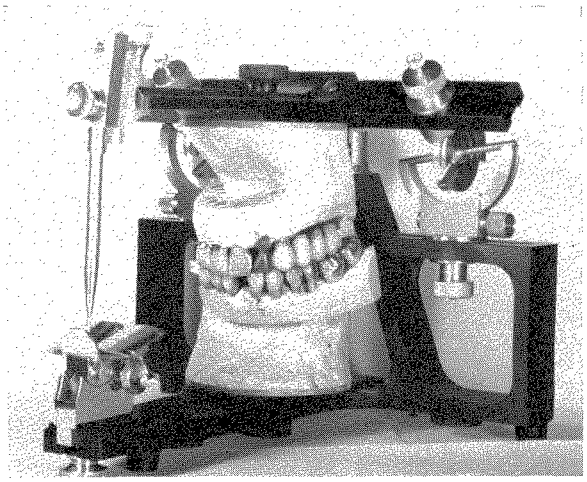


Fig. 1223. The final individual castings are shown here. They were coordinated and are ready to try in the mouth. They are veneered with white wax.

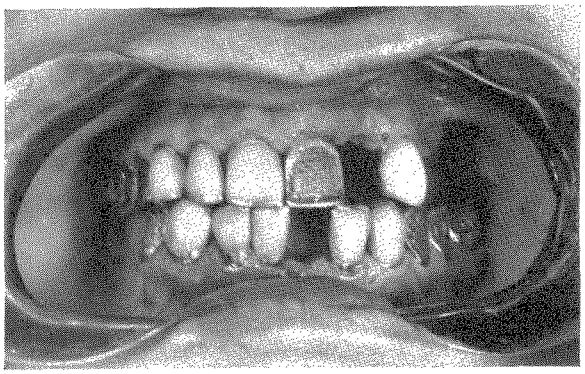


Fig. 1224. The try-in of the final castings in order to further coordinate the interocclusal relationship and to make new work casts upon which the final work will be proceeded with.

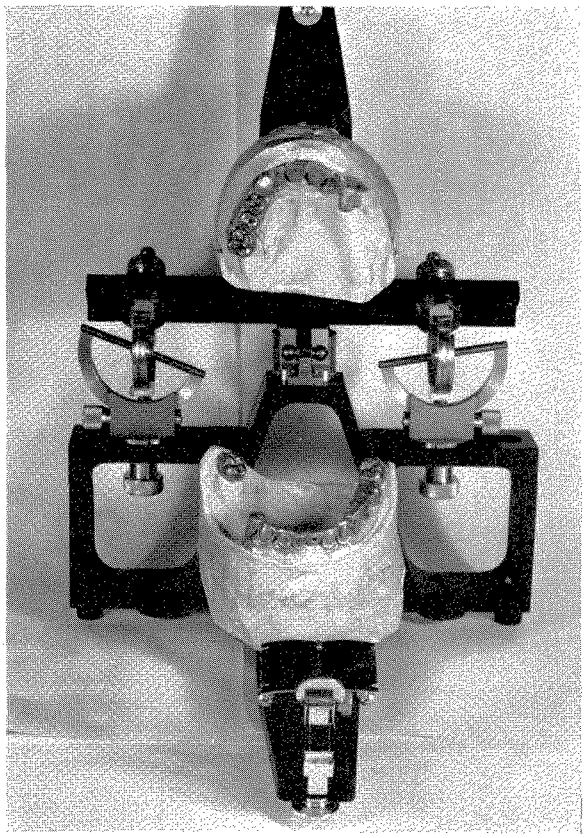


Fig. 1225. The castings are shown on their new work casts. The fixed partial prostheses were splinted together. Another try-in will now be made.

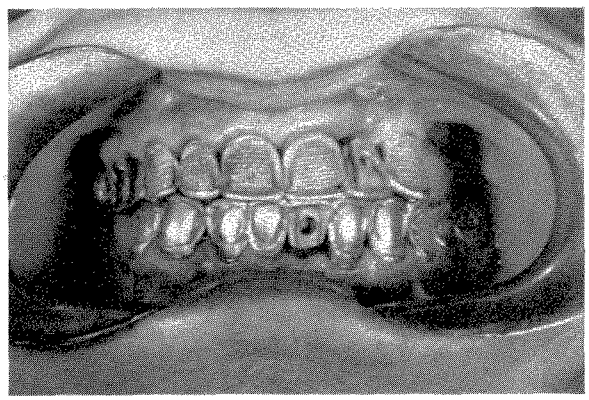
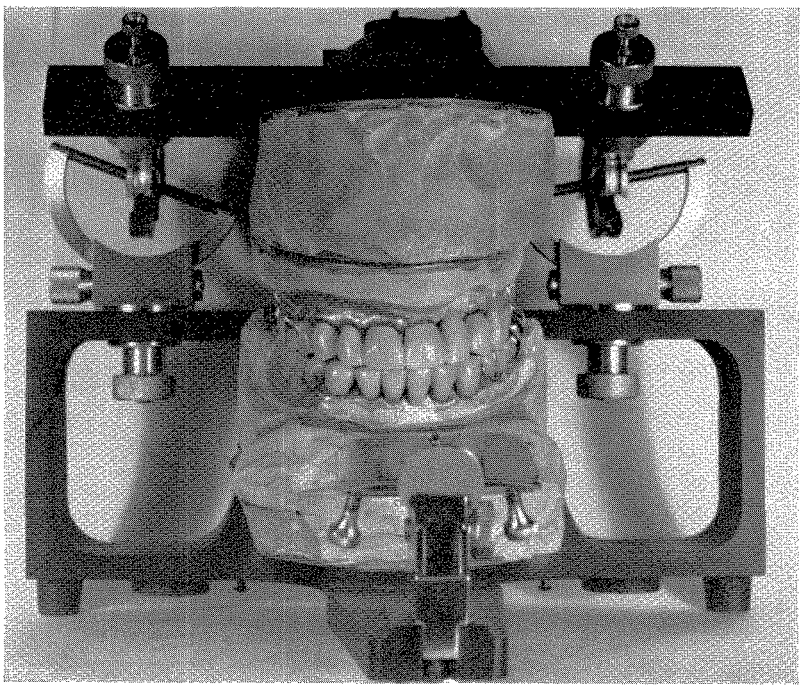
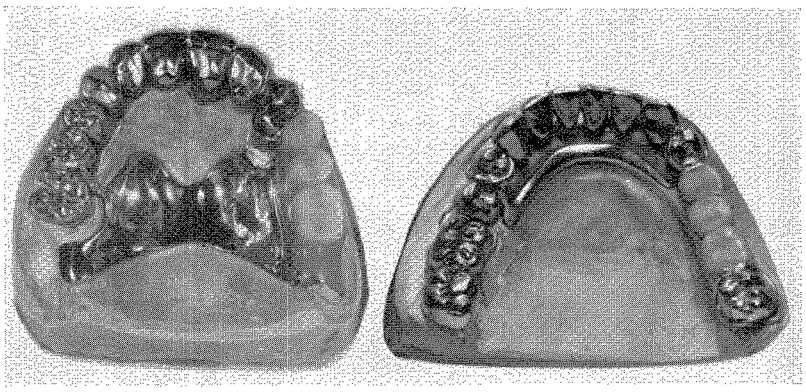


Fig. 1226. Try-in of the fixed prostheses soldered together. Now the removable partial dentures will be constructed.



A



B

Fig. 1227. **A,** Front view of the completed work. **B,** Occlusal views of the completed work.

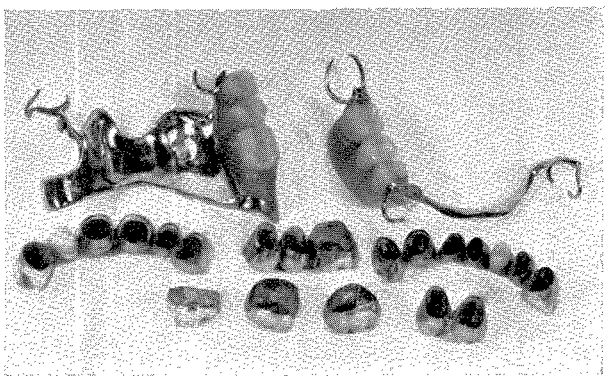


Fig. 1228. The fixed and removable partial dentures were removed from the casts. The removable partial dentures were retained by precision attachments and precision lug rests. The additional strength obtained by "splinting" was taken advantage of.

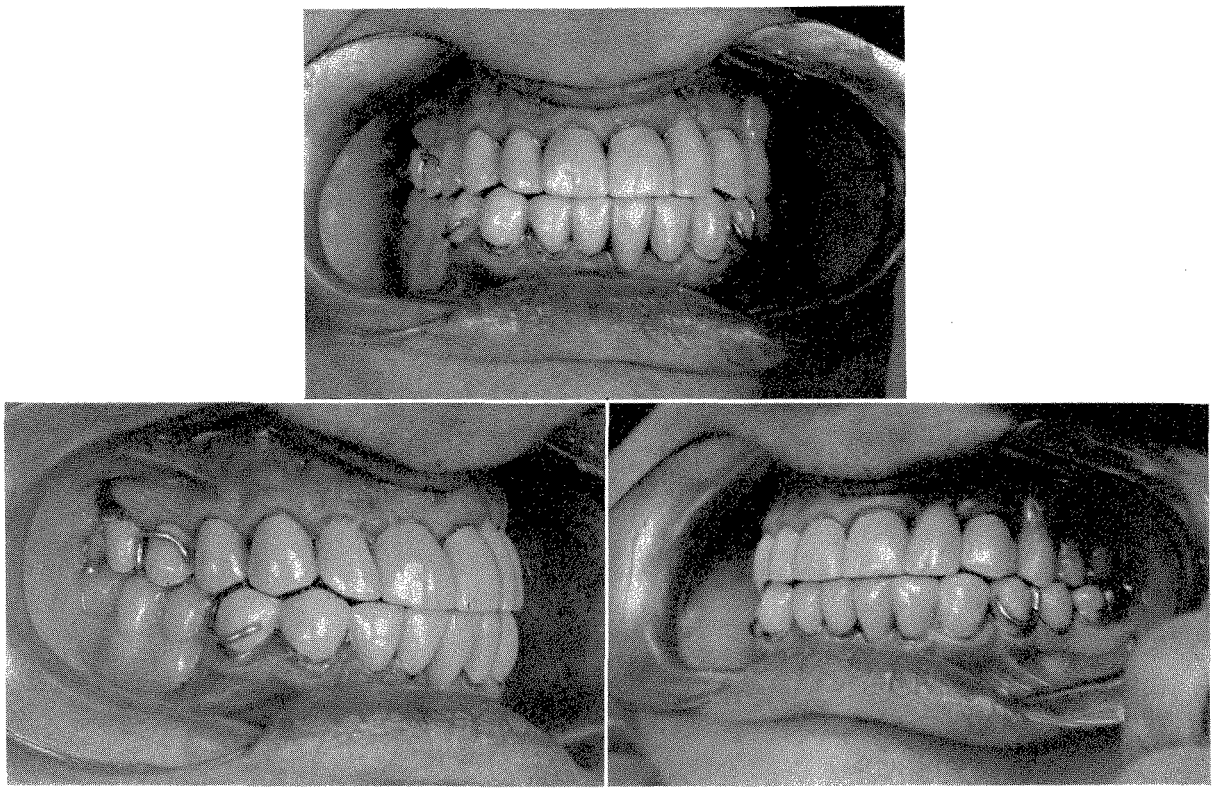


Fig. 1229. Three views of the completed work. These photographs were taken in April, 1951.

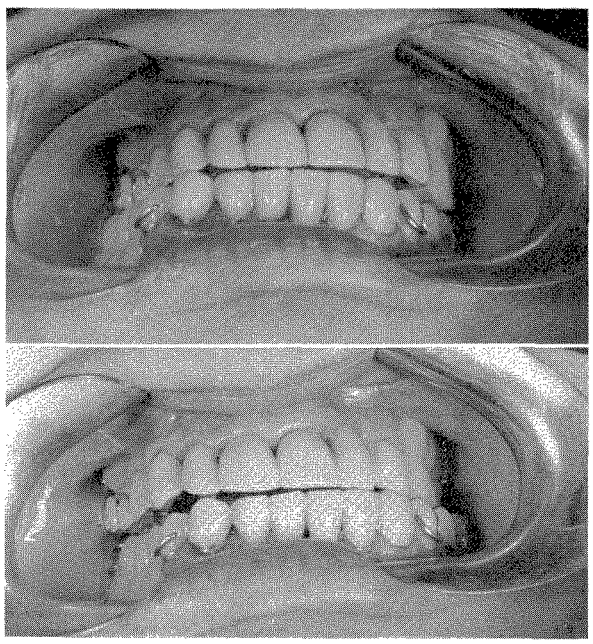


Fig. 1230. The right and left working and balancing bites.

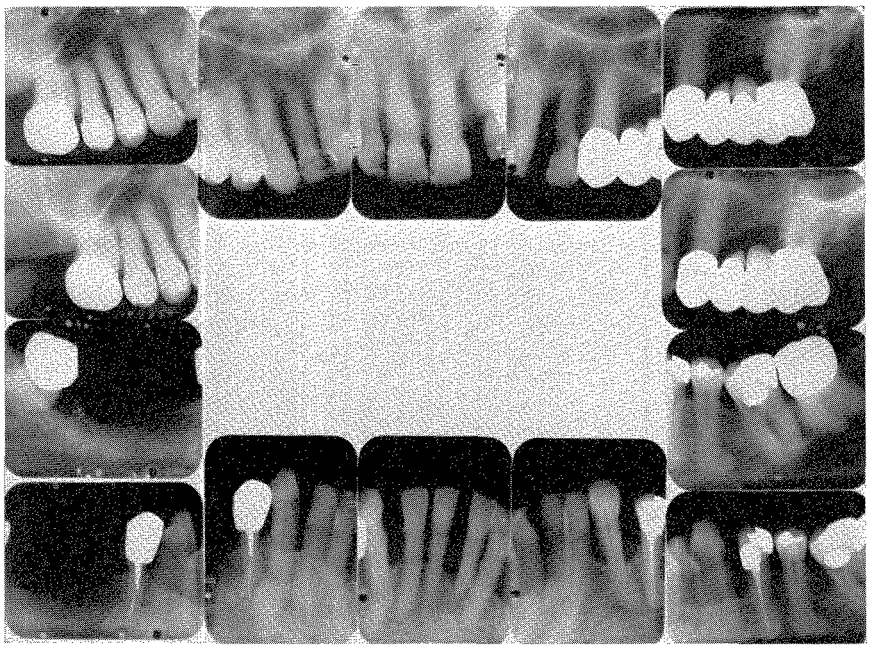


Fig. 1231. Roentgenograms taken at the start of treatment in August, 1950.

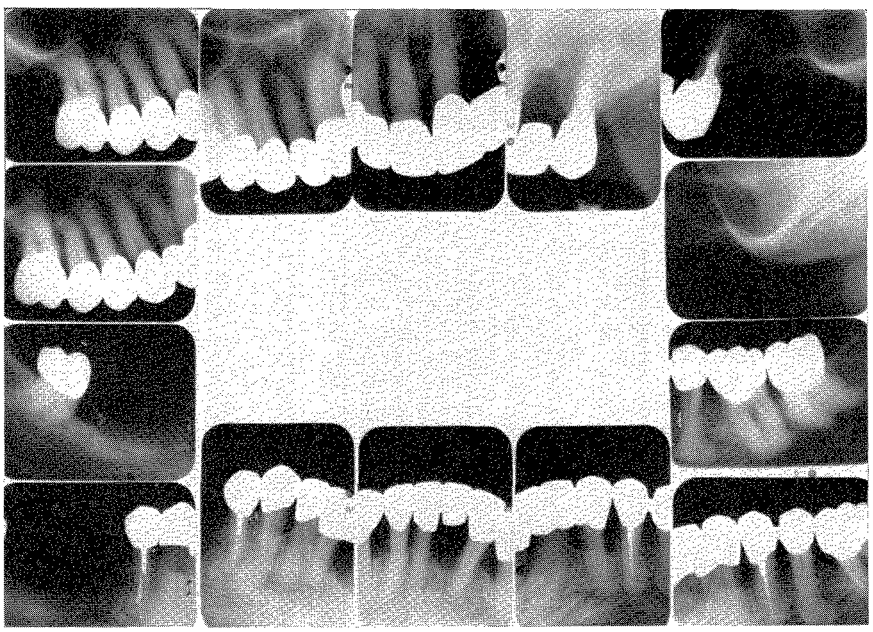


Fig. 1232. Roentgenograms taken at the conclusion of treatment in March, 1951.

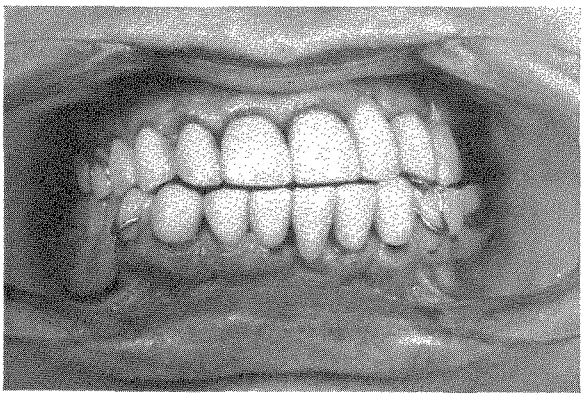


Fig. 1233. By March, 1953, the anterior teeth had separated. They were brought to contact by selective grinding. Here they are shown in an open bite relationship. Compare this with Fig. 1229 at top to see the extent of the open bite.

Fig. 1234. The cord at the base of the tongue was attached well forward as shown here. It was fibrous and strong and could account for the false swallowing plus the habit of tongue thrusting.

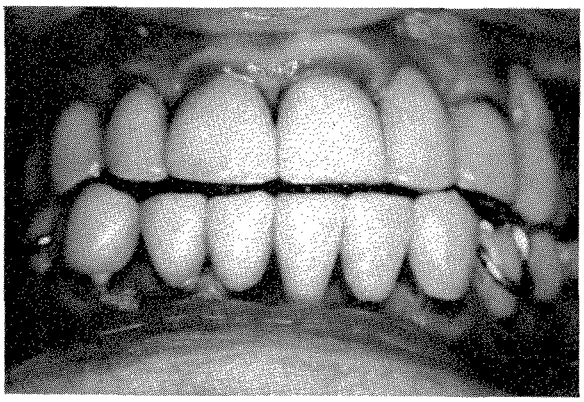


Fig. 1235. By March, 1955, the anterior bite was open again.

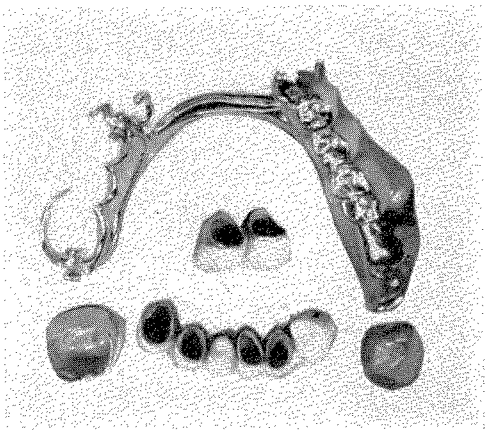


Fig. 1236. In 1959 the lower work was completely redone. This is the final prosthesis which was inserted in March, 1959.

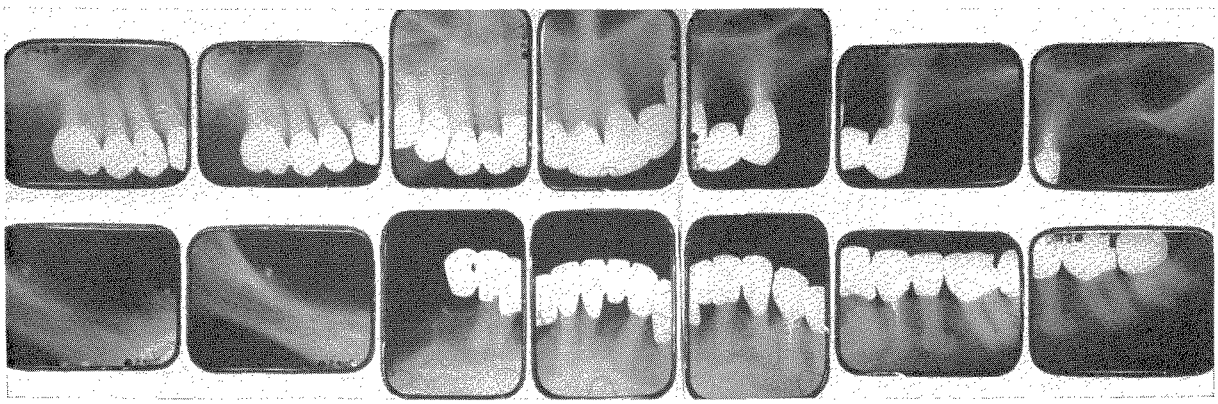


Fig. 1237. These roentgenograms were taken in September, 1961. The patient was then 71 years old.

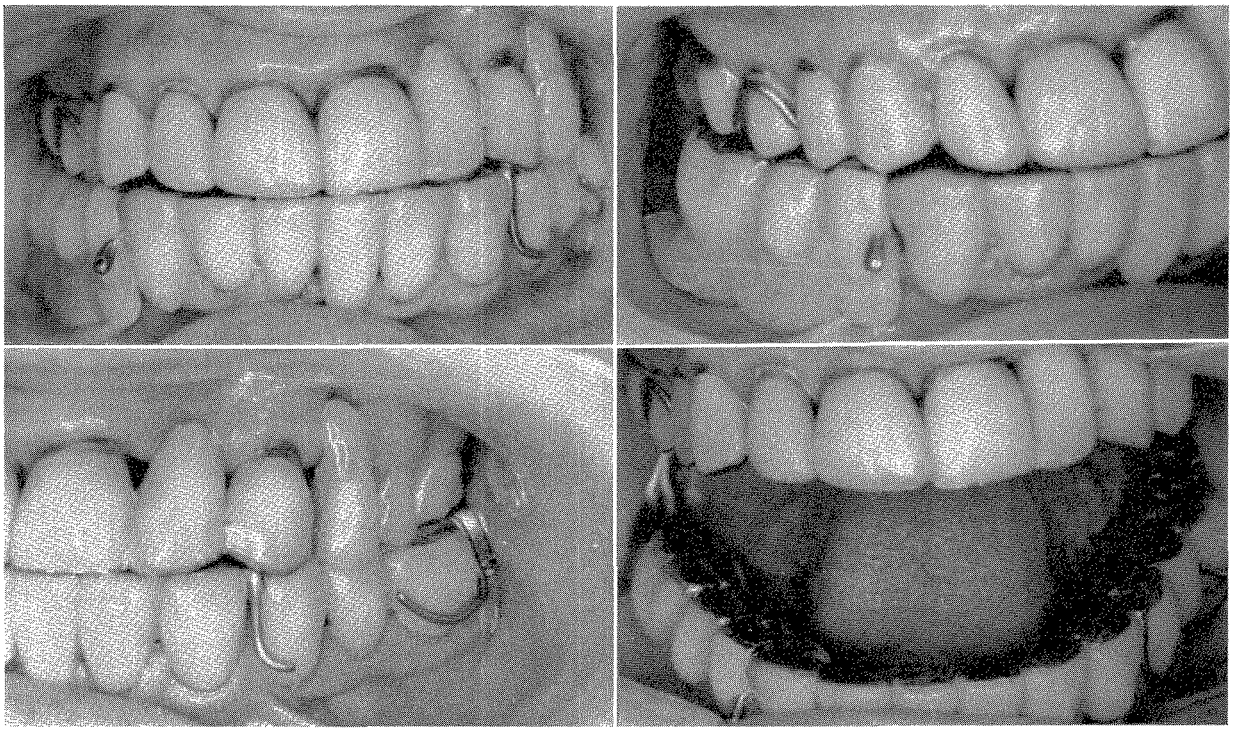


Fig. 1238. Four views of the mouth as it looked in 1962.

In defense of the results over a decade of time, the following can be said:

1. The patient was originally missing eight teeth, and had to lose three more before treatment was instituted because of deep-seated periodontal disease and apical infections.

2. Of those remaining, several had deep periodontal pockets, and three were nonvital.

3. There was marked separation and malocclusion present due to a pernicious tongue thrusting and false swallowing habit which persisted after the reconstruction was completed.

4. The fibrous cord attached to the anterior portion of the tongue continued to interfere with what otherwise might have been a normal swallowing pattern.

The results may be judged only after carefully weighing and comparing all the factors involved. Any benefit obtained by using the precision articulator has been masked and is therefore subject to question. The patient was extremely cooperative and very understanding of her dental problems. She felt that the dental services rendered to her during the previous eleven years kept her from wearing full dentures. (Figs. 1216 to 1238.)

POSTERIOR OPEN BITES

Most of the open bites are found in the region of the anterior teeth. They also occur, although less frequently, in the posterior areas. When a posterior open bite case is in need of extensive prosthetic restoration, a careful evaluation of the muscular forces must be made. These forces must be left in equilibrium or their continued action will destroy the value of the dental prosthesis. In the case about to

be described, the open bite was found posteriorly and bilaterally. That it was also associated with a tongue thrust and false swallowing habit was indicated by the unusually wide lower arch as compared with the upper arch and by the spacing of the lower incisors. Operative procedures in these cases are difficult to perform. The large and powerful tongue is constantly in the way. The patient tries to be cooperative, but the rigidity of the oral musculature makes this difficult. Tooth preparation and the performance of the necessary dental procedures tax the ability and energy of both dentist and patient.

Case 16

In November, 1952, a male adult 44 years old came for dental treatment. The upper left second bicuspid and first molar had been removed not long before because of indefinite neuralgia. He was missing seven posterior teeth. Only one molar contacted on the left side, and the bite was open posteriorly on the right side. When photographs of his teeth were taken for the dental records, his tongue was unconsciously thrust between his posterior teeth. He had great difficulty in following instructions relative to moving the mandible in various directions. The movements were jerky, and his muscles seemed spastic. The lower second bicuspid was deeply embedded in the body of the mandible.

Operative work difficult to perform

There is little doubt that some of the missing teeth were lost as a direct result of this patient's inability to cooperate with his previous dentists. Operative work must have been very difficult to perform. Dentists must have patience and experience to deal with patients with these neuromuscular handicaps.

Space must be provided for tongue thrusting

Comparison to similar cases dictated the prescription for this one. Where the tongue is the offender and a false swallowing habit has been practiced for many years, the correction of these well-established neural patterns is difficult, if not impossible. Although the use of muscle exercises is to be commended, the limited time available and the questionable outcome make this impractical to undertake. If the spaces between the individual teeth are closed and the interocclusal contacts are made tight, the continued pushing and thrusting of the tongue in functional chewing and swallowing, as well as with the mouth empty, will again cause these spaces to open. It is, therefore, necessary that the prosthesis be so designed to permit sufficient space for the same tongue movements that were present before treatment was instituted. Even if the posterior segments of the inserted prosthesis were made in the form of multiple abutment splints, still the internal force is such that the entire posterior splints may be moved buccally just as the anterior splints of the previous case (Case 15) were moved anteriorly. (Refer to pp. 574 to 583, Figs. 1216 to 1238.)

Added to this is the possibility of the posterior teeth being depressed so that, once again, the open bite becomes apparent. The depression may be caused by the constant pressure of the tongue between the teeth. In the case being presented,

the results will be unstable if the treatment plans do not provide sufficient room for the continuation of the pretreatment habits. What must be remembered is that bone is subordinate to muscle.

Treatment planning

With this in mind, this case was evaluated in the following manner. The posterior occlusion would be rebuilt by gold inlays, full crowns, and fixed bridgework in order to accomplish the following: (1) to prevent the teeth from shifting due to lack of proximal contact, (2) to restore the biting surfaces and to distribute the occlusal load, (3) to attempt to break up the pernicious tongue habit and perhaps

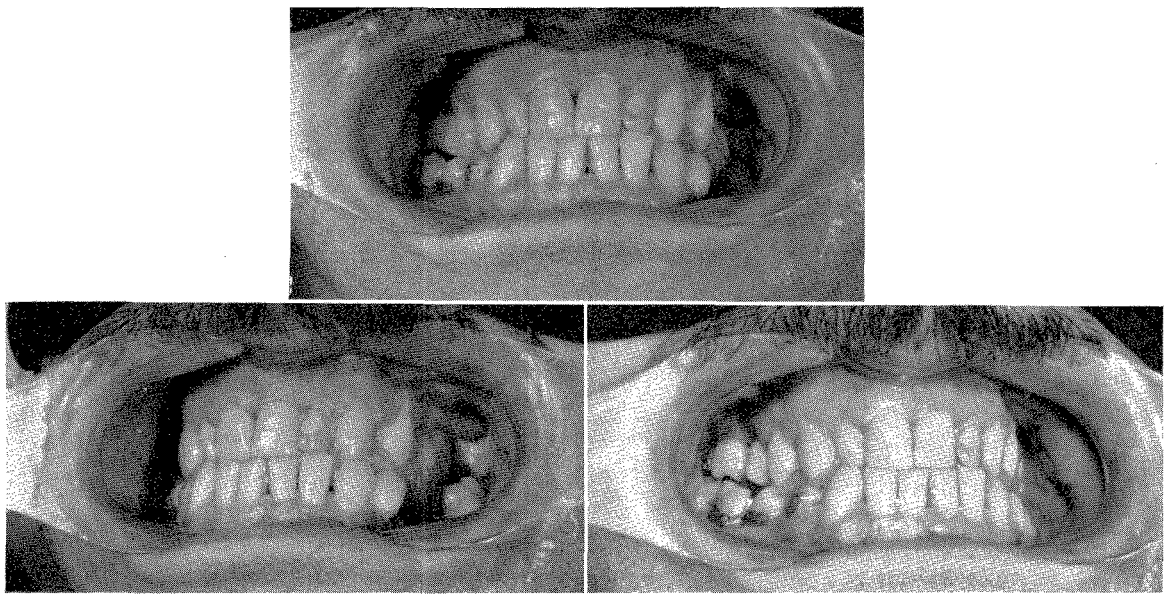


Fig. 1239. Front, left, and right views of the mouth of a 44-year-old man with a posterior bilateral open bite. These photographs were taken in November, 1952. The mandibular movements were jerky and difficult to make. The tongue continually pressed between his teeth, as can be observed in these photographs. (Figs. 1239 to 1248 are of the same case.)

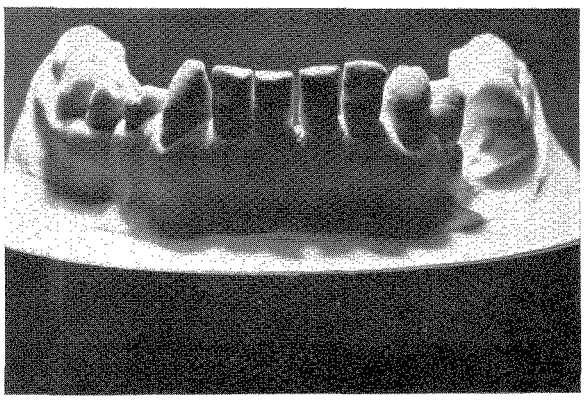


Fig. 1240. The mandibular cast showing the widely spread teeth indicating the severe outward pressures that were brought to bear upon them.

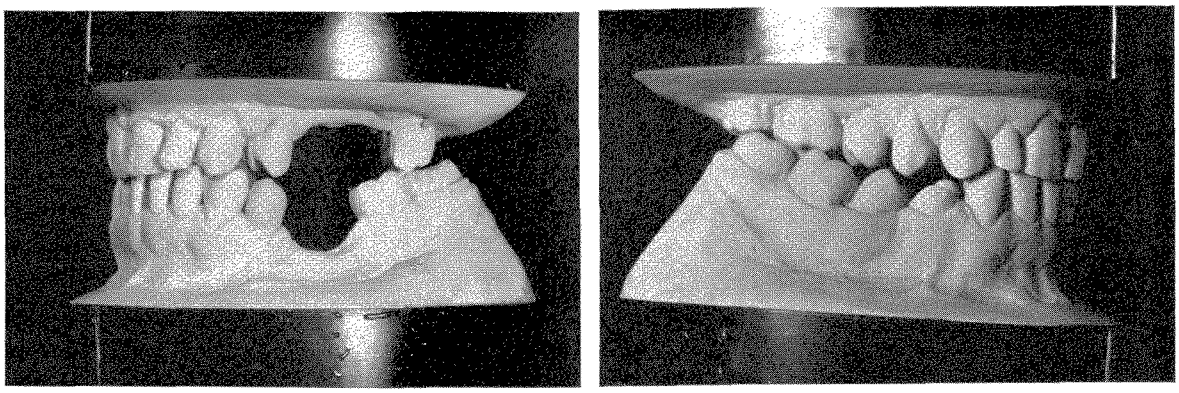


Fig. 1241. Left and right sides of the study casts showing the open interocclusal relationship.

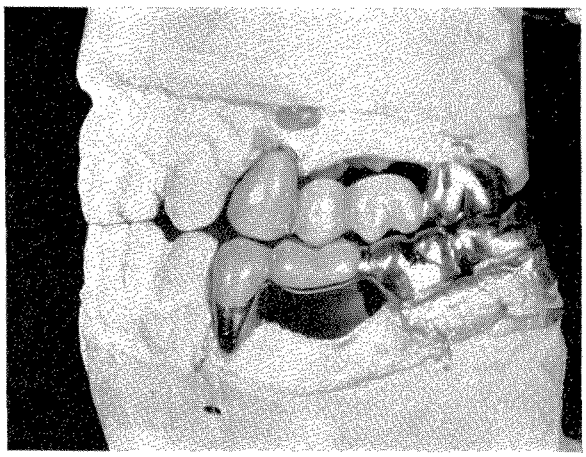


Fig. 1242. The completed left side. The upper and lower sanitary bridges permitted the tongue great freedom of movement in a buccal direction.

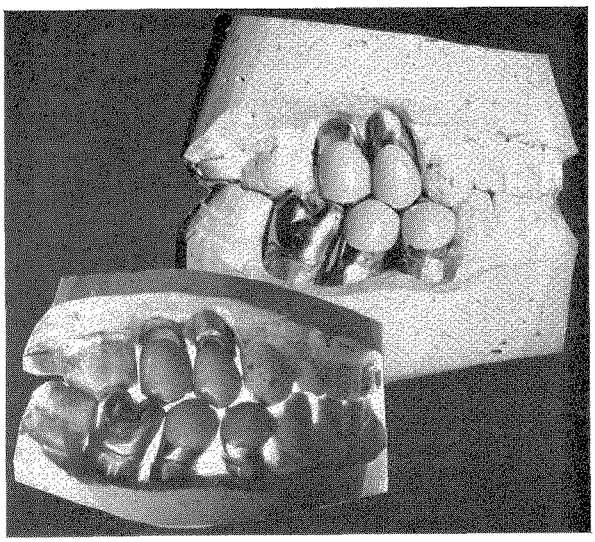


Fig. 1243. The completed right side. Large interproximal embrasures gave some small amount of freedom to the tongue. The light from the lingual surfaces in the lower left photograph shows the spacing more vividly.

permit the continued widening of the mandibular arch, (4) to close the posterior open bite by whatever means possible while providing room for tongue movement, and (5) to maintain the width of the lower arch. In the treatment plan the impacted lower left second bicuspid was not to be disturbed.

Treatment

The description of the exact method of procedure is explained in the illustrations. On the left side the insertion of the so-called sanitary bridges with open saddle areas permitted great freedom for tongue thrusting. On the right side it was more difficult, but essentially the embrasures were made as wide as possible with small openings provided for in the interocclusal contact areas. The work was completed in June, 1953.

Text continued on p. 589.

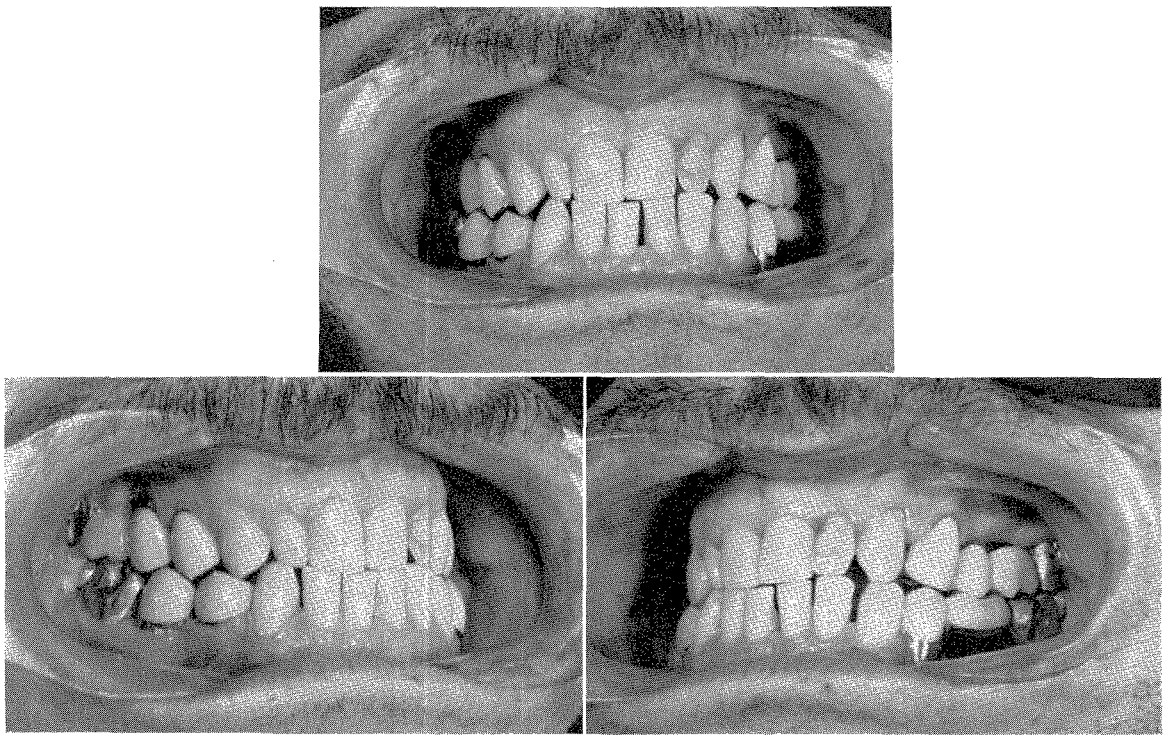


Fig. 1244. Three views of the completed work in the mouth. These were taken in June, 1953.

Fig. 1245. Roentgenograms taken at the start of the reconstruction in October, 1952.

Fig. 1246. Roentgenograms taken at the completion of the reconstruction in June, 1953.

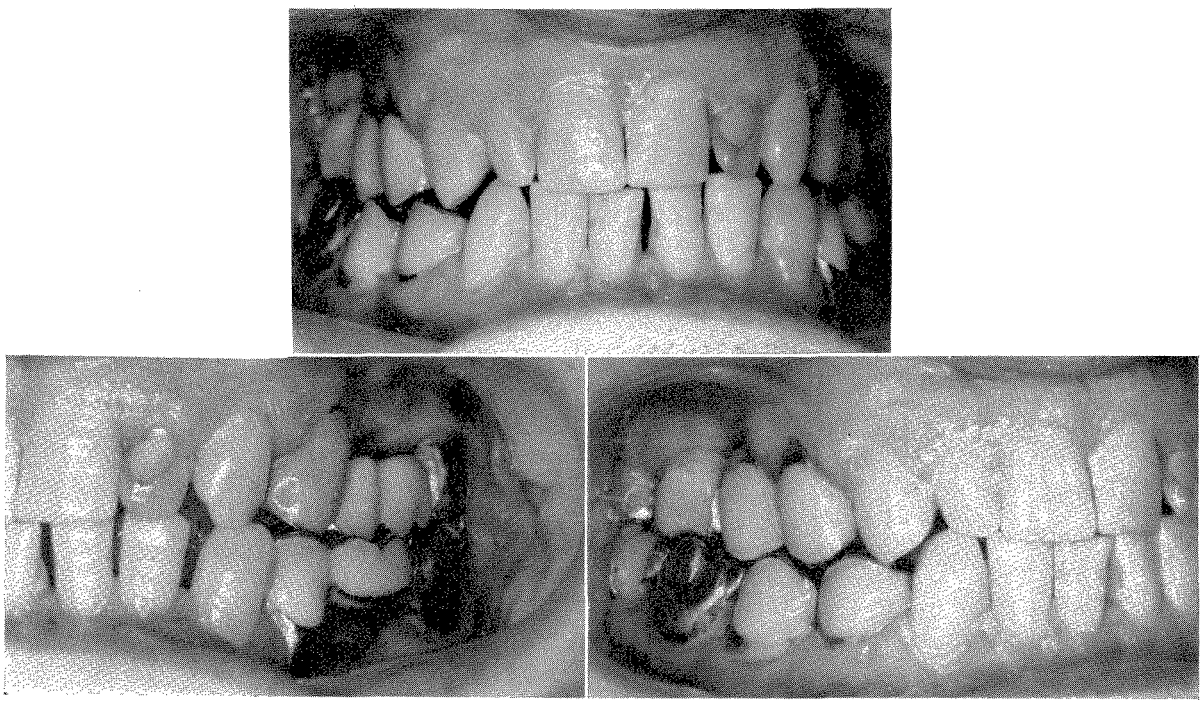


Fig. 1247. Three views of the mouth taken in 1962. The patient was then 54 years old.

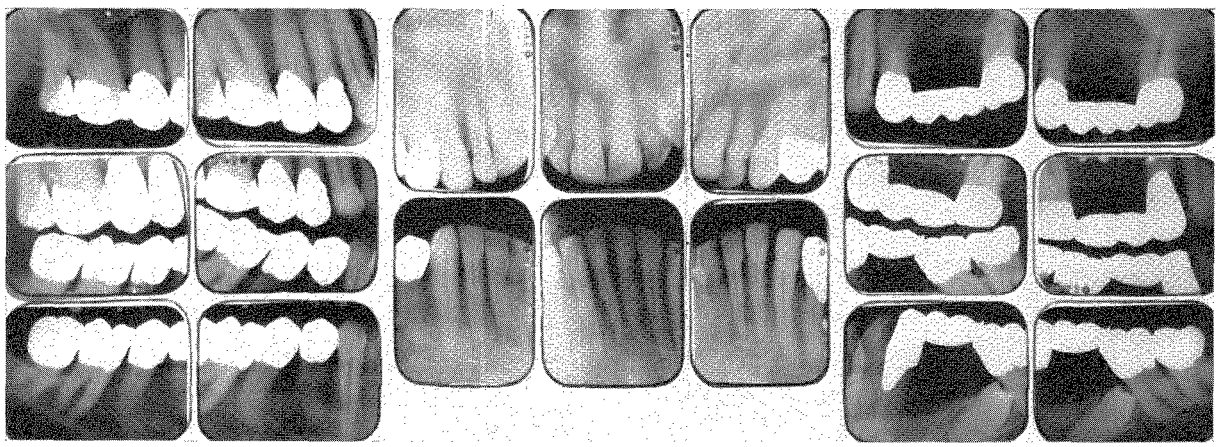


Fig. 1248. Roentgenograms taken in 1962.

Postinsertion events

Nine years after completion, what was predicted had happened to a small degree on the right side where it was not possible to provide enough room for the tongue thrust. The interproximal contacts opened in the lower bicuspid area and had to be closed. They may continue to open. Cases of this nature must be recorded and documented carefully so as to provide references for the future treatment of similar cases.

Conclusions

In retrospect, it may be said that perhaps the interocclusal contacts on the right side should have been omitted in more extensive areas. Perhaps even the interproximal contacts between certain teeth could have been eliminated. If the space were made large enough, it would have prevented vertical food impaction. This, however, is only conjecture and serves to bring the "limitations of treatment" again into focus. (Figs. 1239 to 1248.)

INDIVIDUALS DIFFER IN SENSITIVITY TO MALOCCLUSIONS

On p. 561, Fig. 1189, a particular type of anterior open bite was shown. Inasmuch as such patients were already handicapped by the omission of all the anterior teeth from their usual occlusion, it is important that their remaining occlusion be as functional as possible, especially if it were in need of being reconstructed. It was stated previously that while some of these individuals were not aware of their malocclusions, regardless of how incorrectly their jaws were related, there were others who were extremely sensitive to the slightest discrepancy in their interocclusal relationship. For these patients, great care must be exercised especially when occlusal reintegration is undertaken.

When we are confronted with the type of case of open bite just described, care must be exercised not to destroy the delicate equilibrium of the entire organ. Some of these patients require only the establishment of the correct relational and

interocclusal cuspal positions. The open bite may be maintained. This is especially true in patients over 60. With the inclusion of temporomandibular symptoms, the approach to reconstruction should be one of extreme caution. The temporomandibular symptoms may be due to an occlusal problem or may be arthritic in origin.

Case 17

Present condition

In 1961 a middle-aged woman presented herself for dental consultation. Actually she did not know where to chew. In her true centric relation or hinge bite there was only unilateral limited interocclusal contact on the two upper right molars and no contact elsewhere in her mouth. This made it necessary for her to shift her mandible continually in order to attain a comfortable position. The mandible was never at rest. A palatal bar removable partial denture replaced the two upper left molars. Inasmuch as all her posterior teeth had already been restored by means of large gold inlays or crowns, the decision was made to rebuild the entire posterior occlusion.

Past history

Her case history revealed that several years previously her bite had been raised in an effort to relieve her temporomandibular joint symptoms and that she had suffered great discomfort until it had been lowered again by another dentist. The history was vague, and details were missing. It was impossible to obtain any previous records.

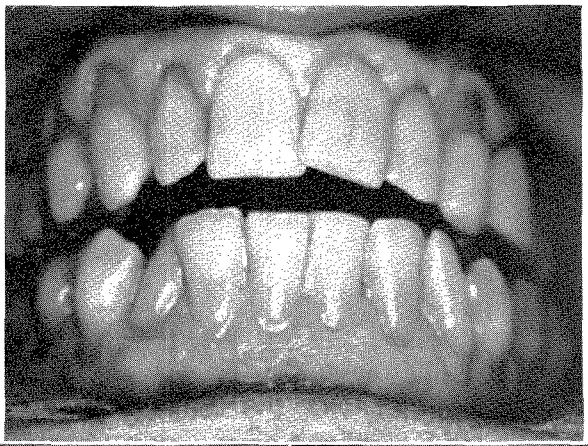
Treatment

Eleven posterior teeth were prepared, and low-fusing metal transfers were made. When all the temporary crowns were removed from these teeth, the patient was able to close her teeth with what seemed like normal contact from her cuspids posteriorly, but she did not seem comfortable in this position. In fact, after listening attentively to her story, the decision was reached to establish the future vertical dimension at the level at which she felt comfortable. This entailed leaving the left cuspids out of contact. This decision would be difficult to substantiate physiologically, yet clinical experience dictated that it was the one of choice.

The work was constructed on a Hanau kinoscope. Comparison of the completed vertical dimension with the original one indicated that the two were nearly identical. The great difference in the completed work was that the patient had a definite maxillomandibular centric relational position of maximum contact. In addition, the anteroposterior occlusal curve was harmonious, and the original flat occlusal surfaces were replaced with ones that possessed anatomical details. The temporomandibular roentgenograms deviated from what would be considered a normal picture. They revealed an enlarged condyle, eroded superior condylar surfaces, and perhaps a bone spur. These deviations from the normal may have resulted from faulty occlusal contacts, arthritic changes, or perhaps both.

Text continued on p. 594.

A



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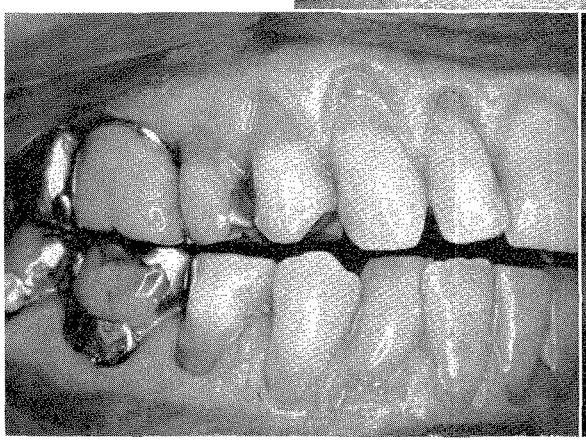
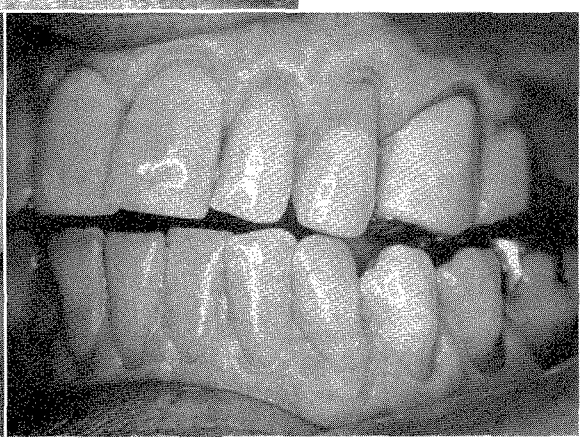
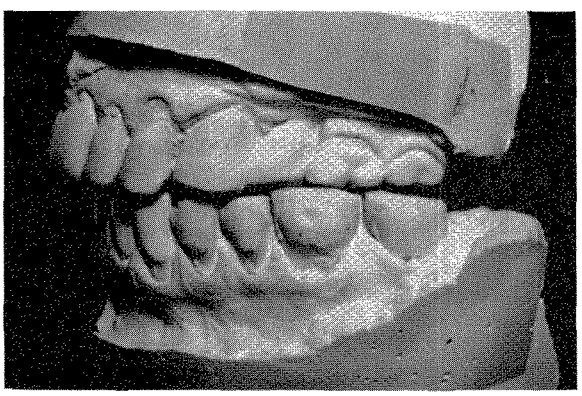




C

Fig. 1249. A, Front view. In centric relation only the last molars contact. The removable partial denture is in position. **B,** Right side. Removable partial denture in position—only the last two molars contact. The mandible is in its centric relation position. **C,** Left side. Removable partial denture removed. The mandible is in its centric relation position. Only the molars on the right side contact. (Figs. 1249 to 1258 are of the same case.)

Fig. 1250



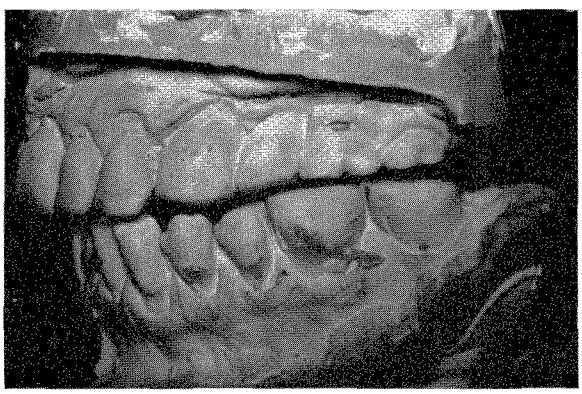


Fig. 1251

Fig. 1250. Original study casts, left side, with the upper removable partial denture in place. Observe the irregular anteroposterior occlusal curve and the lack of contact of the upper second molar on the partial denture. These casts were only related by guesswork.

Fig. 1251. The casts shown in Fig. 1250 were attached to the Hanau Model H articulator by means of a face-bow and wax records. They disclose an entirely different interocclusal relationship than that shown in Fig. 1250. Now, in centric relation, there is no interocclusal contact on the entire left side.

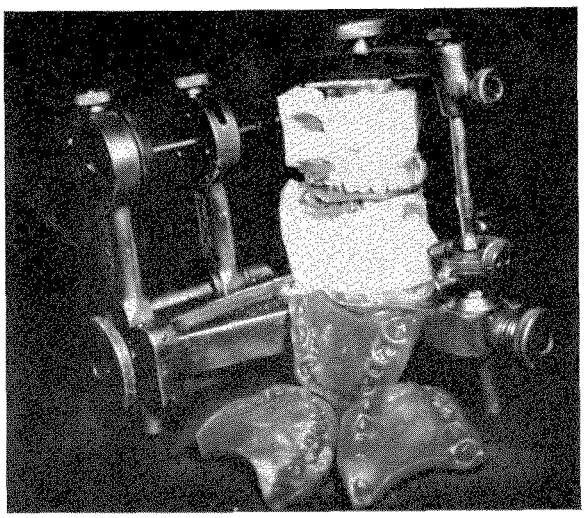


Fig. 1252. The final prosthesis was constructed on a Hanau kinoscope. The wax records in the foreground are those of protrusion and right and left lateral movements. The crowns and inlays are constructed and tried in the mouth. Then new records are taken and new work casts made. Upon these latter the final work is completed.

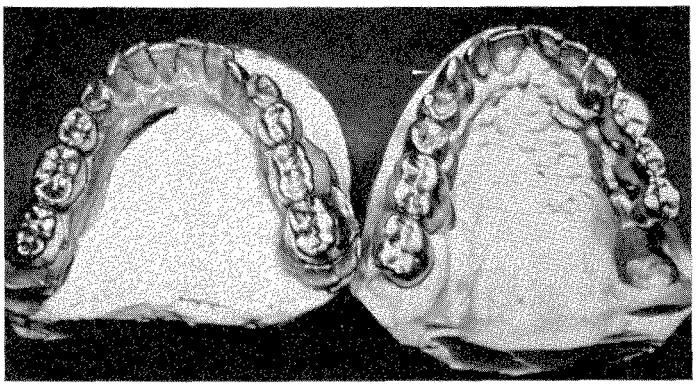


Fig. 1253. An occlusal view of the final work just prior to its insertion in the mouth.

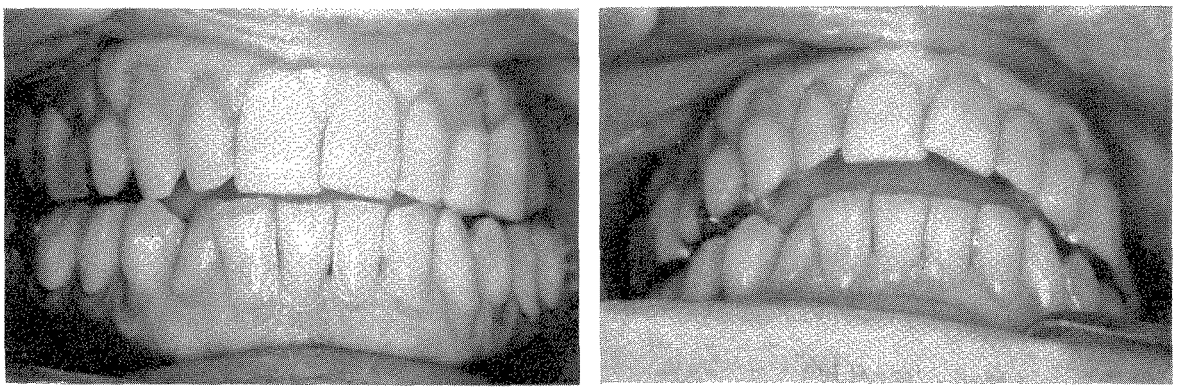


Fig. 1254. Two views of the mouth. These were taken in January, 1962. In centric relation all the posterior teeth contact, whereas the six upper and lower anterior teeth are out of contact. The patient attained comfort for the first time in several years.

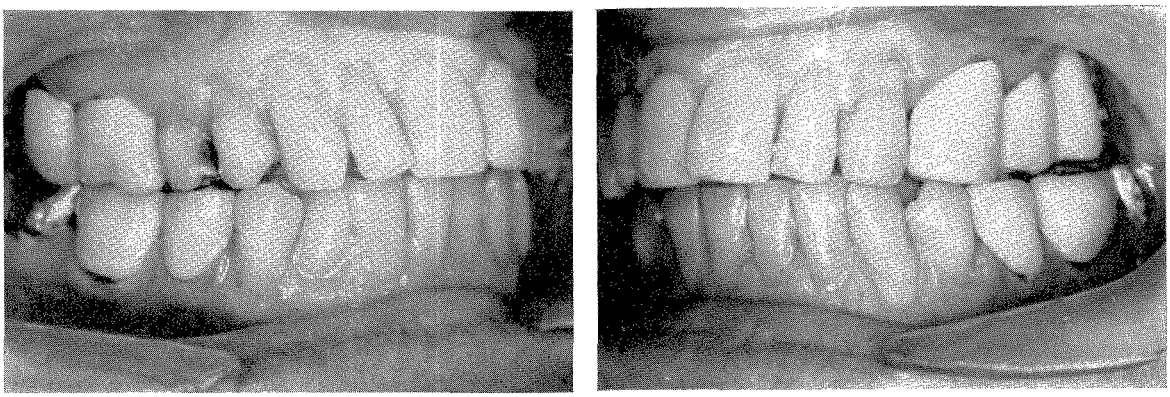


Fig. 1255. Right and left sides of the completed work. Contact was obtained on all the posterior teeth in centric relation. Compare these with Fig. 1249.

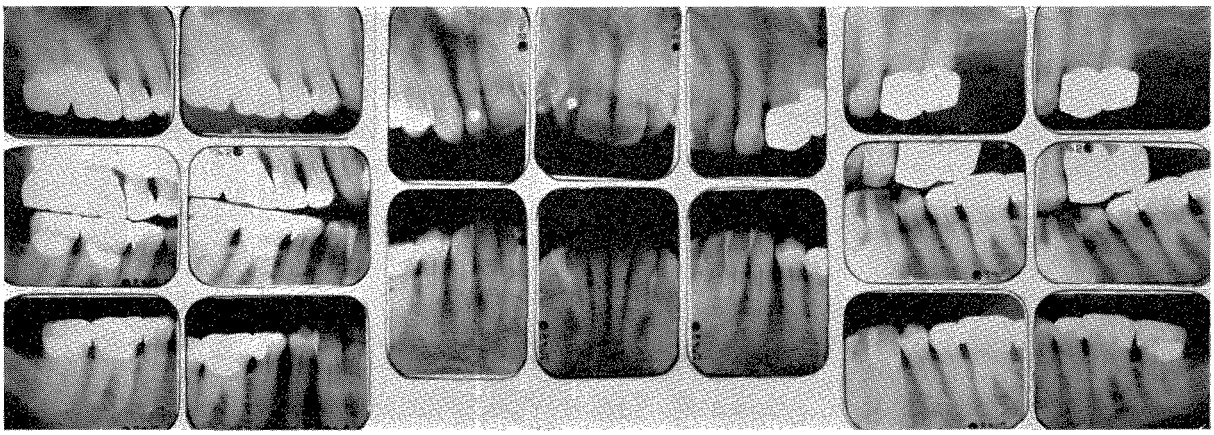


Fig. 1256. Roentgenograms taken before treatment was started (1961).

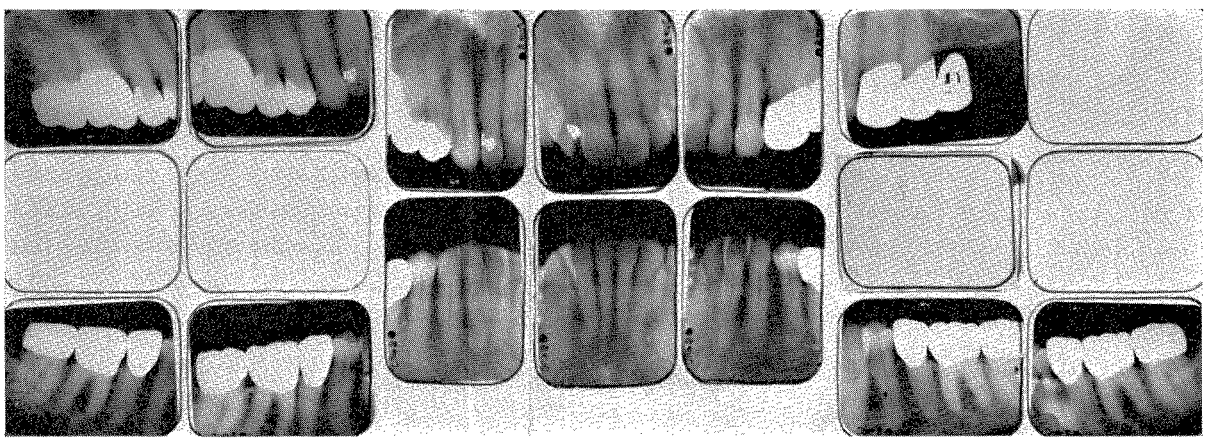


Fig. 1257. Roentgenograms taken after treatment was concluded. These were taken in 1962.

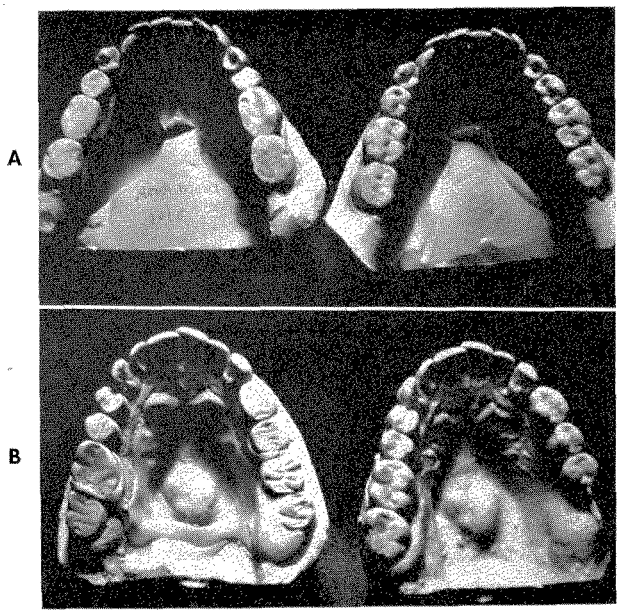


Fig. 1258. A, Study casts of the lower teeth, on the left, before treatment and on the right, after treatment. Observe the original flat surfaces. **B,** Study casts of the upper teeth, on the left, before treatment and on the right, after treatment. The removable partial denture had been eliminated.

Summary

Oral reintegration resulted in the following: (1) no disturbance in the existing open bite, (2) no change in the vertical dimension, (3) maximum interocclusal contact in her centric relation or hinge position, (4) normal anatomical contours in the restored teeth—temporomandibular joints given due regard but not overemphasized owing to our inability to change their existing contours. (Figs. 1249 to 1258.)

DUAL BITE

Case 18

Present condition and past history

In 1939 a 40-year-old woman presented herself for treatment with an anterior open bite. Her skeletal structures were large. The teeth were long. The posterior teeth had been ground flat during function. She was able to slide her mandible forward or backward almost the width of a bicuspid. The malocclusion may have been due to a distorted growth pattern. Overlaid upon this was a tongue thrust and a false swallowing habit. In 1941 four porcelain jacket crowns were inserted on the upper incisors. The open bite was maintained.

This patient had emotional problems and would neglect her mouth for long periods, but probably due to a favorable systemic bone factor her oral structures stood up reasonably well. Sporadic emergency treatment was given until 1959,

when finally it became apparent that total oral reconstruction was necessary. The alternative was to remove a number of cariously infected teeth. The alveolar bone and soft tissues were still normal, but from continued neglect caries had invaded the crowns.

The patient finally agreed to have her mouth rehabilitated. The work began in April, 1959. Due to many postponements, the posterior prosthesis was not inserted until March, 1960, and the upper porcelain jacket crowns were inserted eight months later, in November, 1960. The lower incisors were not completed until March, 1963.

Treatment planning

Reconstruction of this type presents many problems, among which are the difficulty of obtaining balance and the problem of the open bite.

Balance: When dealing with a mandible that can be moved the distance of almost one entire bicuspid anteriorly or posteriorly and still not extend anteriorly beyond a tip-to-tip relationship, a balanced occlusion is exceedingly difficult to attain. There must be interocclusal coordination with the mandible in its retruded position and in its anterior position. The anterior position is short of extreme protrusion. When the mandible moves laterally either from its retruded position or from its several anterior positions, there should also be interocclusal harmony. Flat surfaces should be avoided if at all possible, though by providing some occlusal anatomy to increase efficiency, balance is even more elusive.

Open bite: When the mandible is in its retruded relational position, the original anterior open bite should be maintained so that if by chance there is a tongue thrusting and false swallowing habit, it will be able to be performed without endangering the completed reconstruction.

Procedure

The work was constructed upon a Hanau kinoscope. Several of the teeth had become nonvital from neglect, and root canal therapy was required. The majority of the others needed rebuilding as there was very little left of their clinical crowns. This was not the type of patient to provide the best cooperation, so that with the great amount of preliminary work necessary before the coordination of the bite was undertaken, the task was strenuous and required great discipline to continue.

Method of providing for dual bite

The original vertical dimension was maintained throughout the procedure and in the final work. When the wax-up of the entire posterior occlusion was undertaken on the kinoscope, the condylar balls were maintained in their position against the metal anterior stops. In order also to provide for a balanced occlusion when the mandible was slightly protruded, a plastic strip was inserted between the condylar balls and the anterior end of the metal slots. The wax-up was again coordinated with the mandible in this advanced position. Later on, metal stops replaced the plastic strips, and the castings were coordinated in the various man-

Text continued on p. 606.

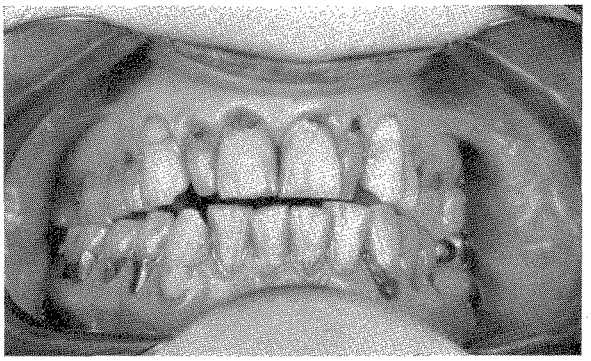


Fig. 1259. Anterior open bite in the mouth of a 40-year-old woman. This photograph was taken in 1939. (Figs. 1259 to 1282 are of the same case.)

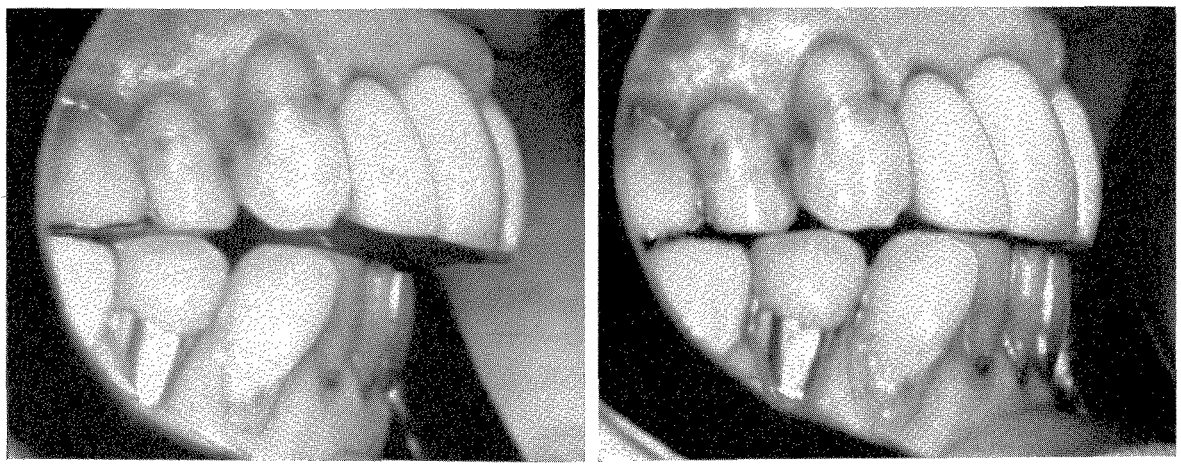


Fig. 1260. Two lateral views of the anterior and posterior positions of the mandible. This may be called a dual bite.

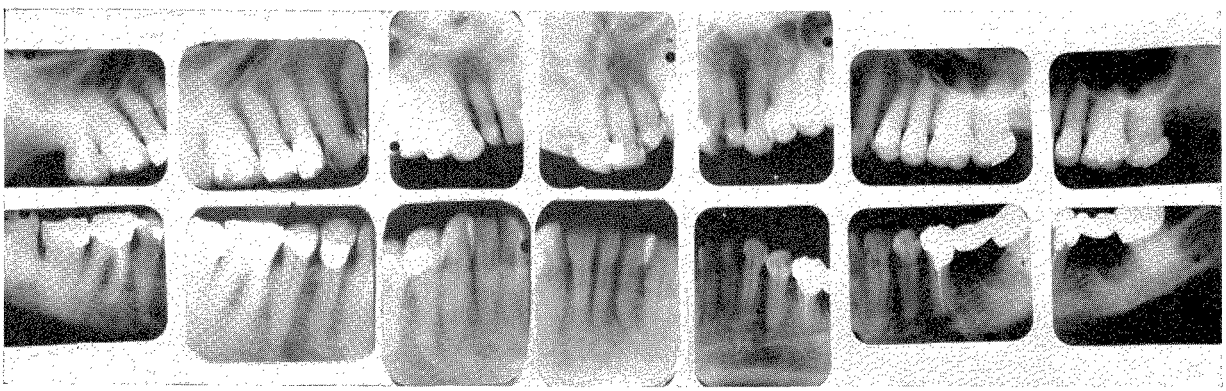


Fig. 1261. These roentgenograms were taken in 1939 before treatment was started.

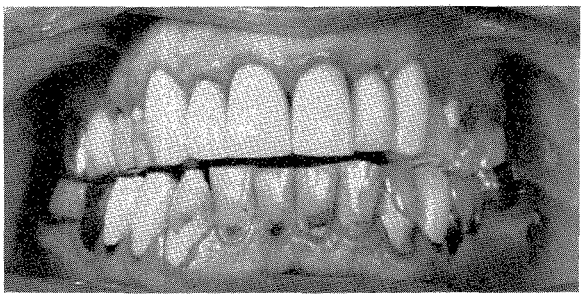


Fig. 1262. Porcelain jacket crowns were inserted in 1943. This photograph was taken in 1953. The jacket crowns had been inserted ten years previously.

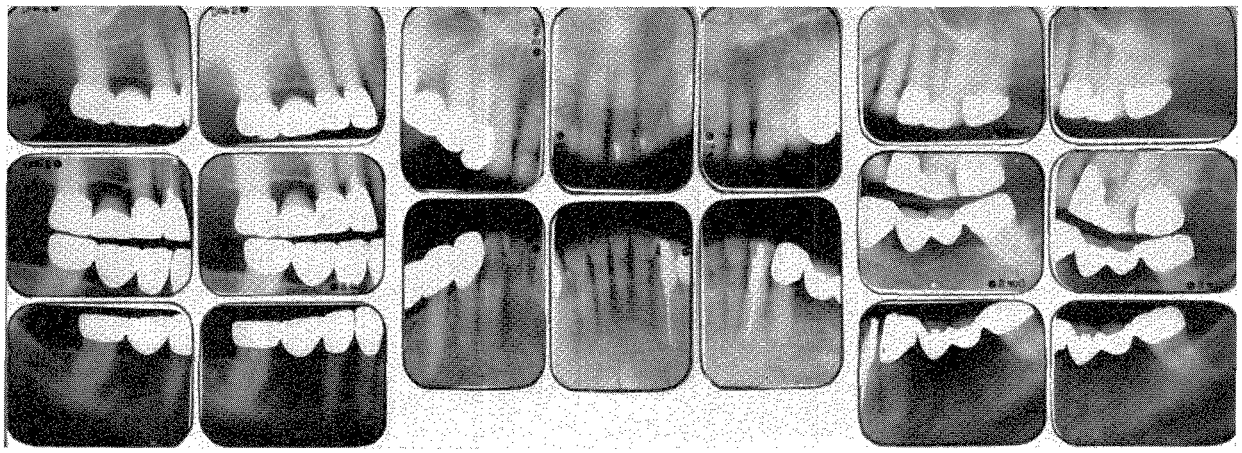


Fig. 1263. Roentgenograms taken in April, 1959.

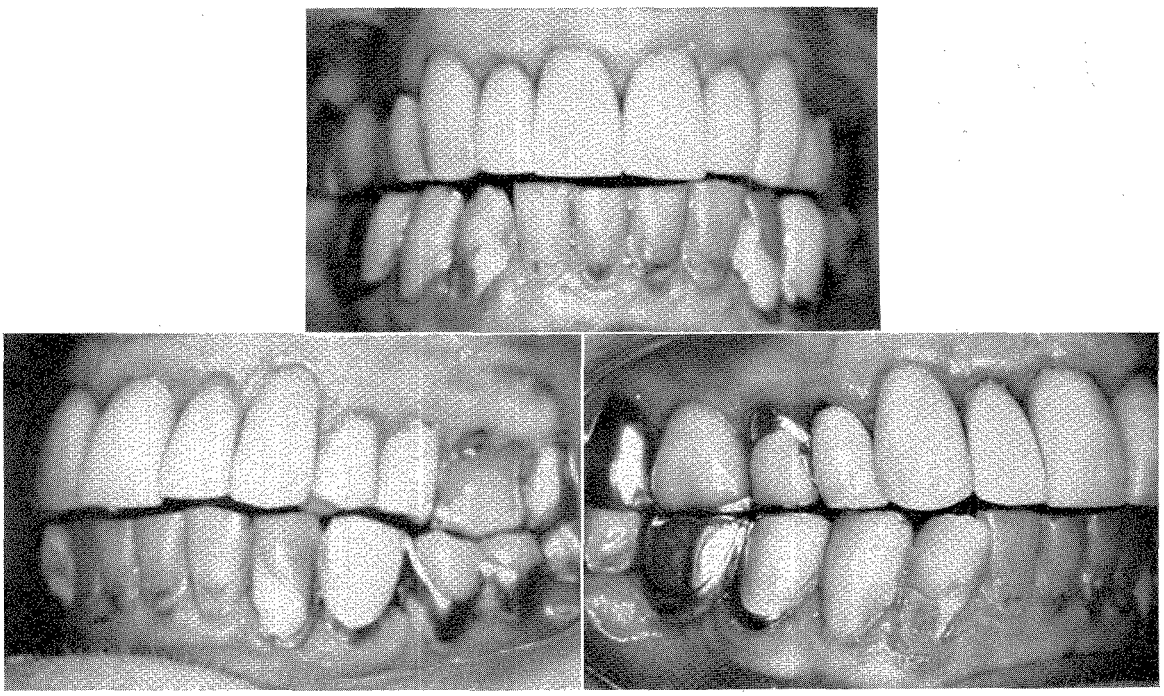


Fig. 1264. Three views of the mouth that were taken in April, 1959. Gross neglect had caused severe oral disintegration. The patient was then 60 years old.

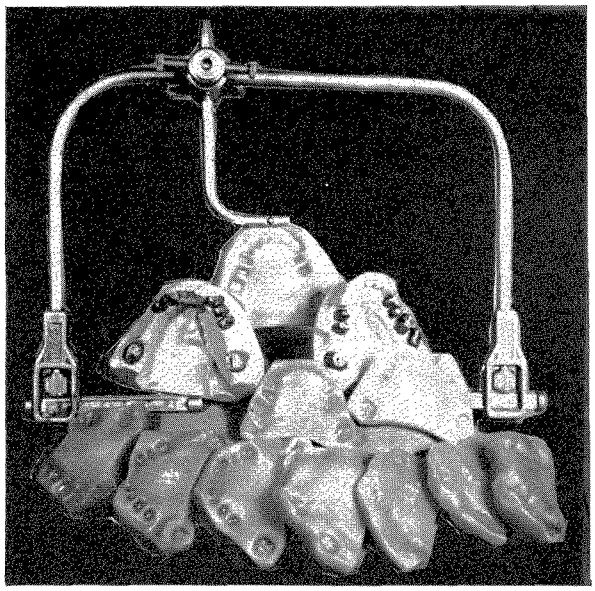


Fig. 1265. The mouth was prepared for rehabilitation in 1959. The work casts with the copper-plated dies and the face-bow and wax positional records are shown in this photograph.

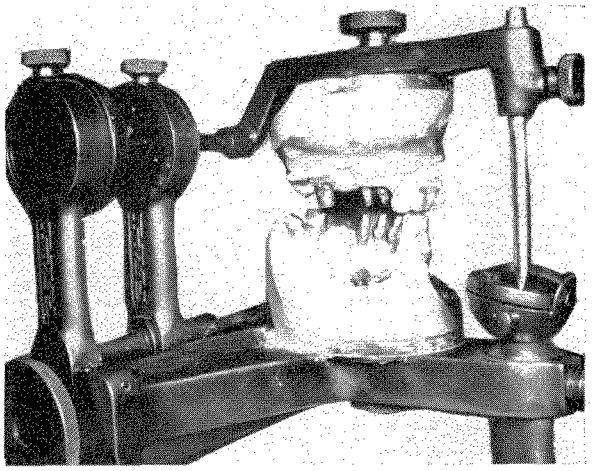


Fig. 1266. The articulator that was used for the reconstruction was the Hanau kinoscope. The casts were attached by means of the records shown in Fig. 1265.

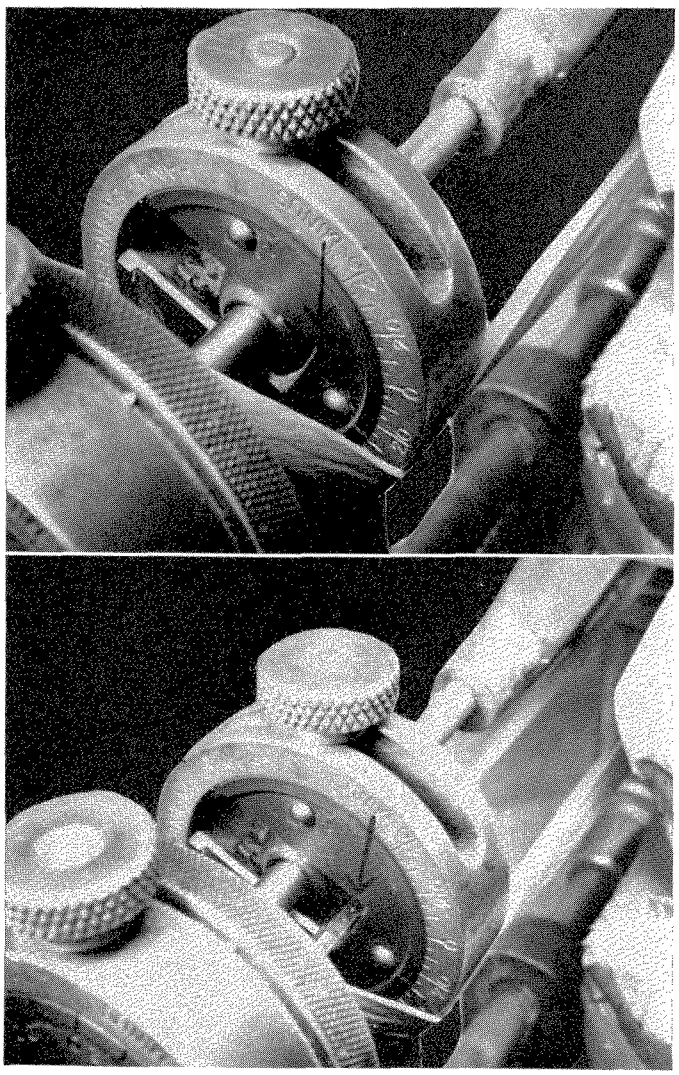


Fig. 1267. A, The posterior mandibular interocclusal relational position was worked out with the condylar ball against its anterior stop as shown here (see arrow). **B,** The anterior mandibular interocclusal relational position was worked out by placing a strip of plastic between the condylar ball and its anterior stop as shown here (see arrow).

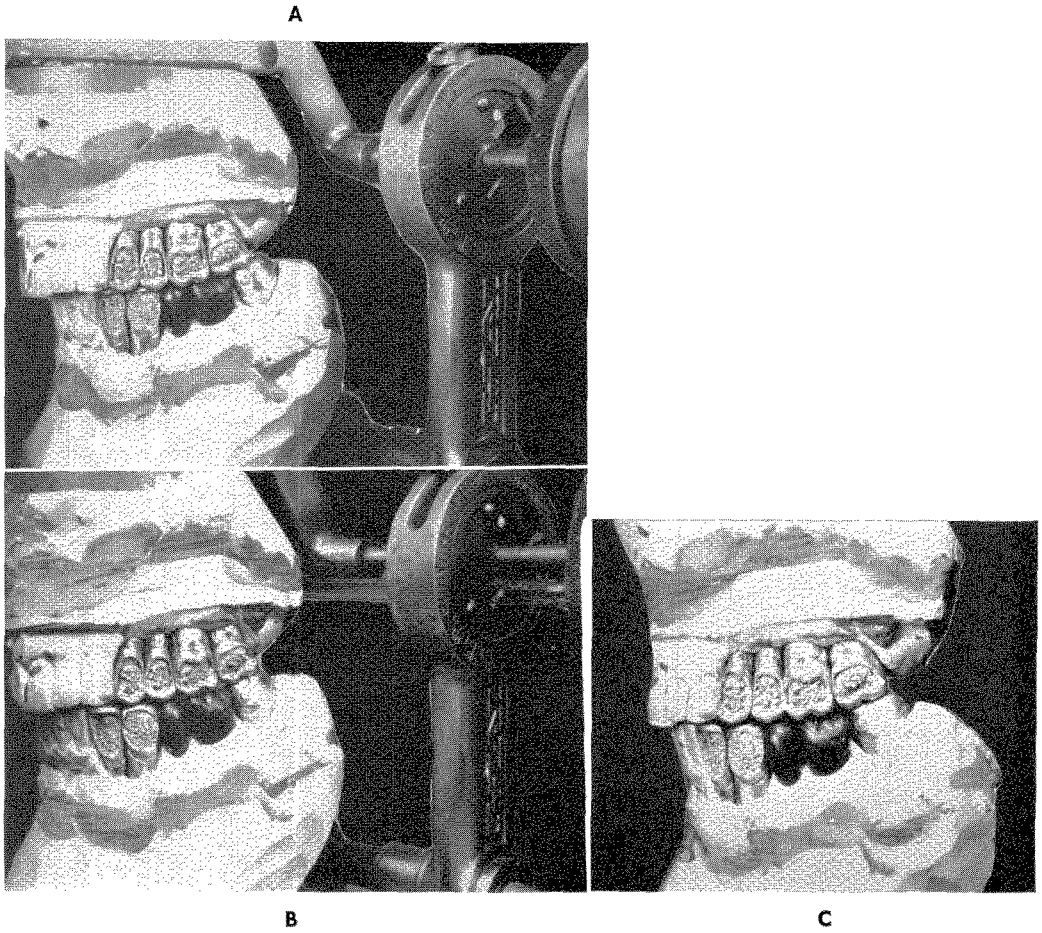


Fig. 1268. **A,** The mandible is in its retruded position. This is equivalent to hinge occlusion. The condylar ball is against its anterior stop. The final castings are in position. This is the left-side view. **B,** The mandible is in its anterior position. The plastic strip was inserted in the anterior part of the condylar slot. The interocclusal relationship was coordinated in this position. **C,** The mandible is in midway between its anterior and posterior positions. The occlusion has also been coordinated in this position.

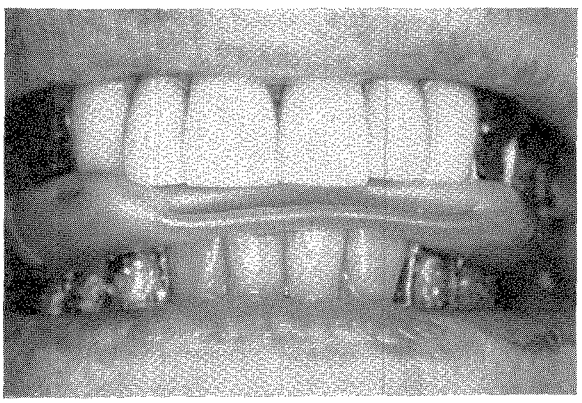


Fig. 1269. With all the castings assembled in the mouth, new wax records were taken. One is shown here. New upper and lower plaster impressions are also taken, and another face-bow record is made.

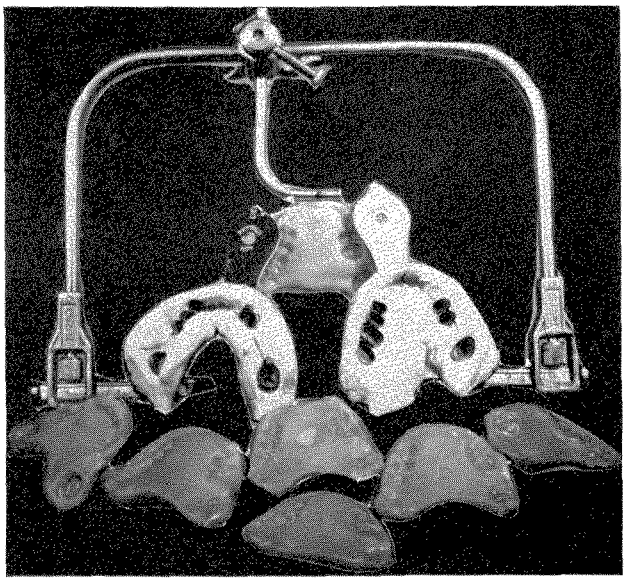


Fig. 1270. These are the new mounting records in order to proceed with the final prostheses. The final work will be completed on the new casts and tried in the mouth.

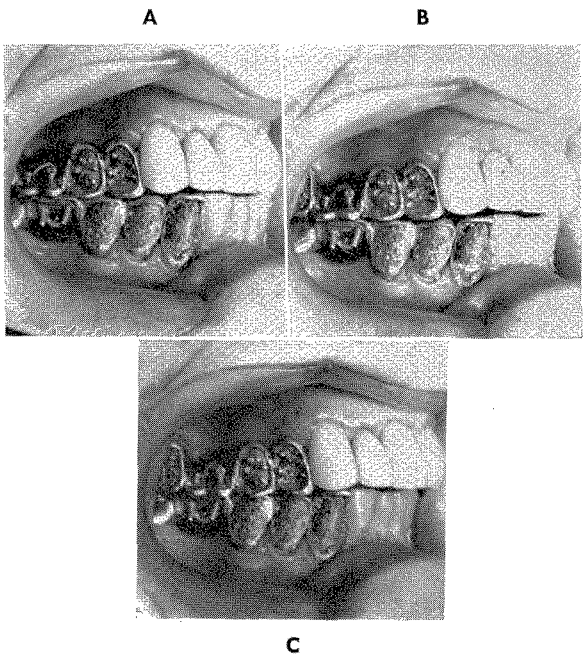


Fig. 1271. **A,** Final prostheses being tried in. The mandible is in its anterior position. **B,** Final work being tried in. The mandible is in its midway position. **C,** Final work being tried in. The mandible is in its posterior or hinge position. New wax records will now be taken and the occlusion rechecked for the final coordination of the bite. Then the prosthesis will be completed.

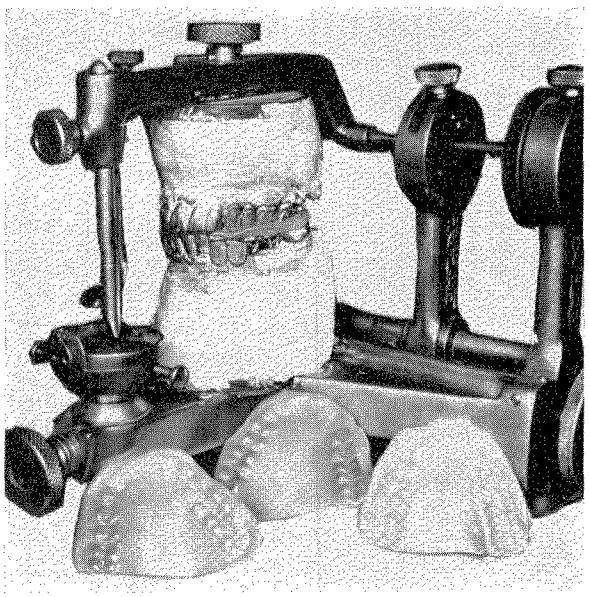


Fig. 1272. Final wax records. A wax checkbite is being tried on the articulator. The final prostheses will now be completed.

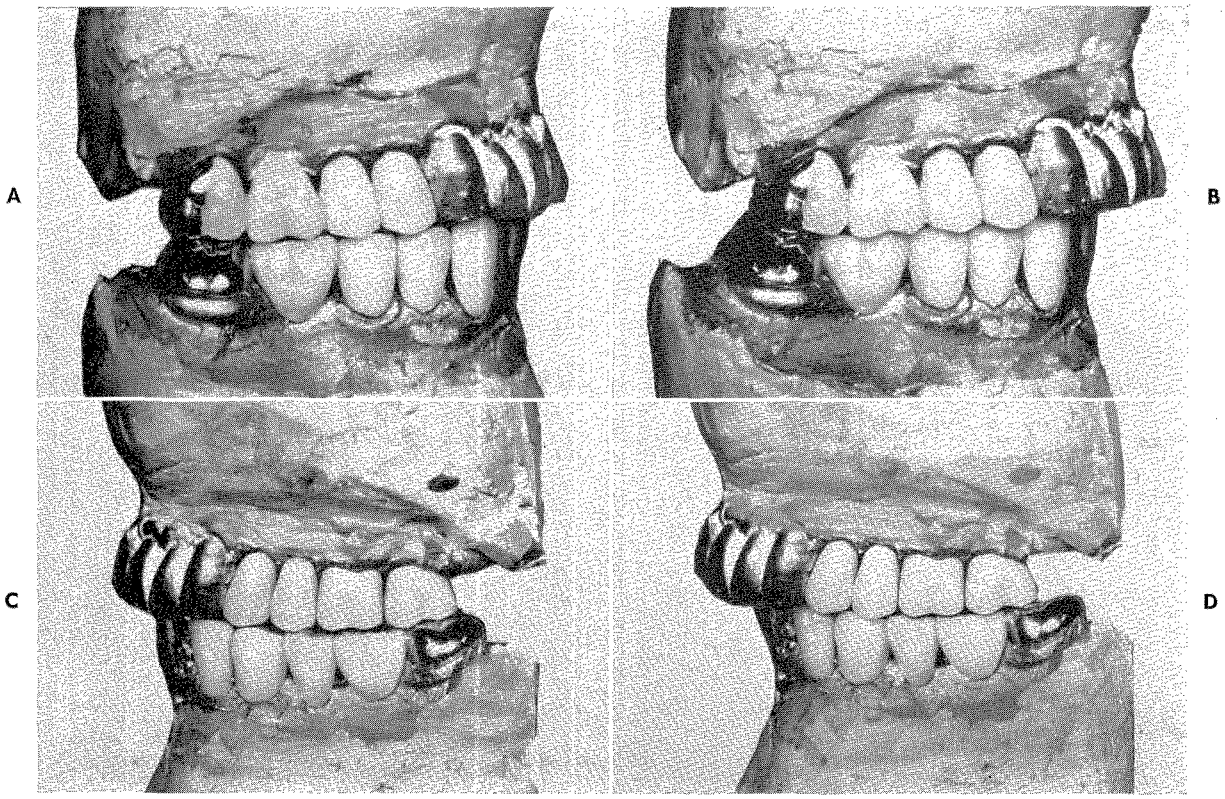


Fig. 1273. Four views of the completed prostheses on the articulator. **A** and **B,** Right side with the mandible in its anterior and posterior positions. **C** and **D,** Left side with the mandible in its anterior and posterior positions.

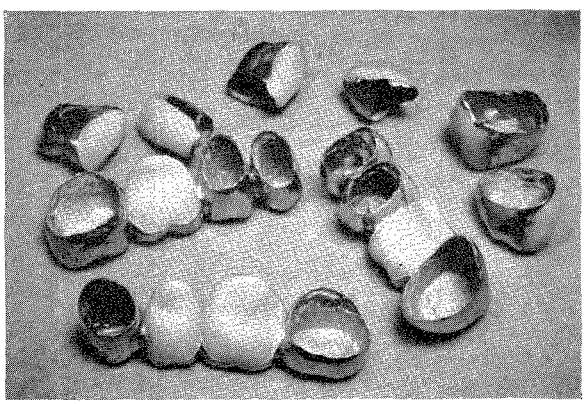


Fig. 1274. Completed posterior prostheses just prior to their insertion in the mouth.

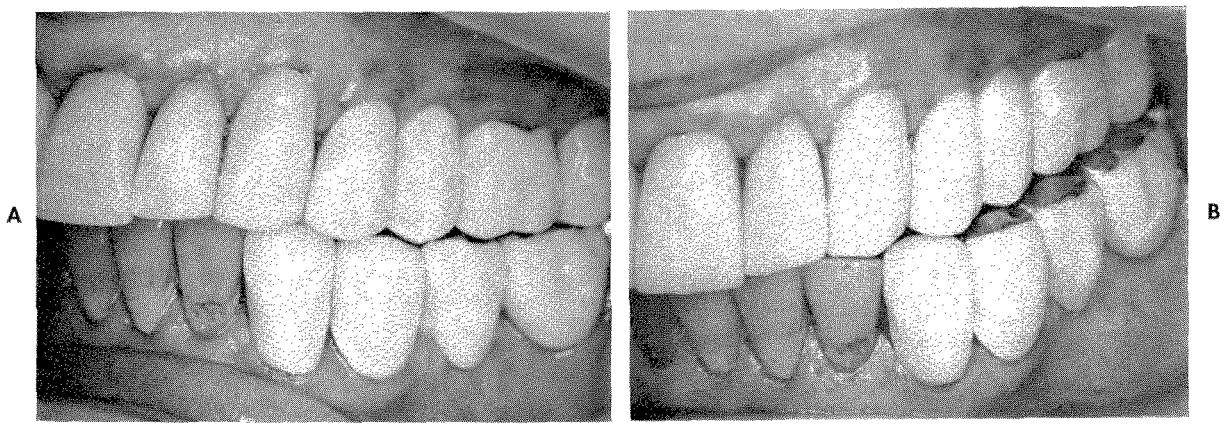


Fig. 1275. Completed work, left side. **A,** Working bite. **B,** Balancing bite.

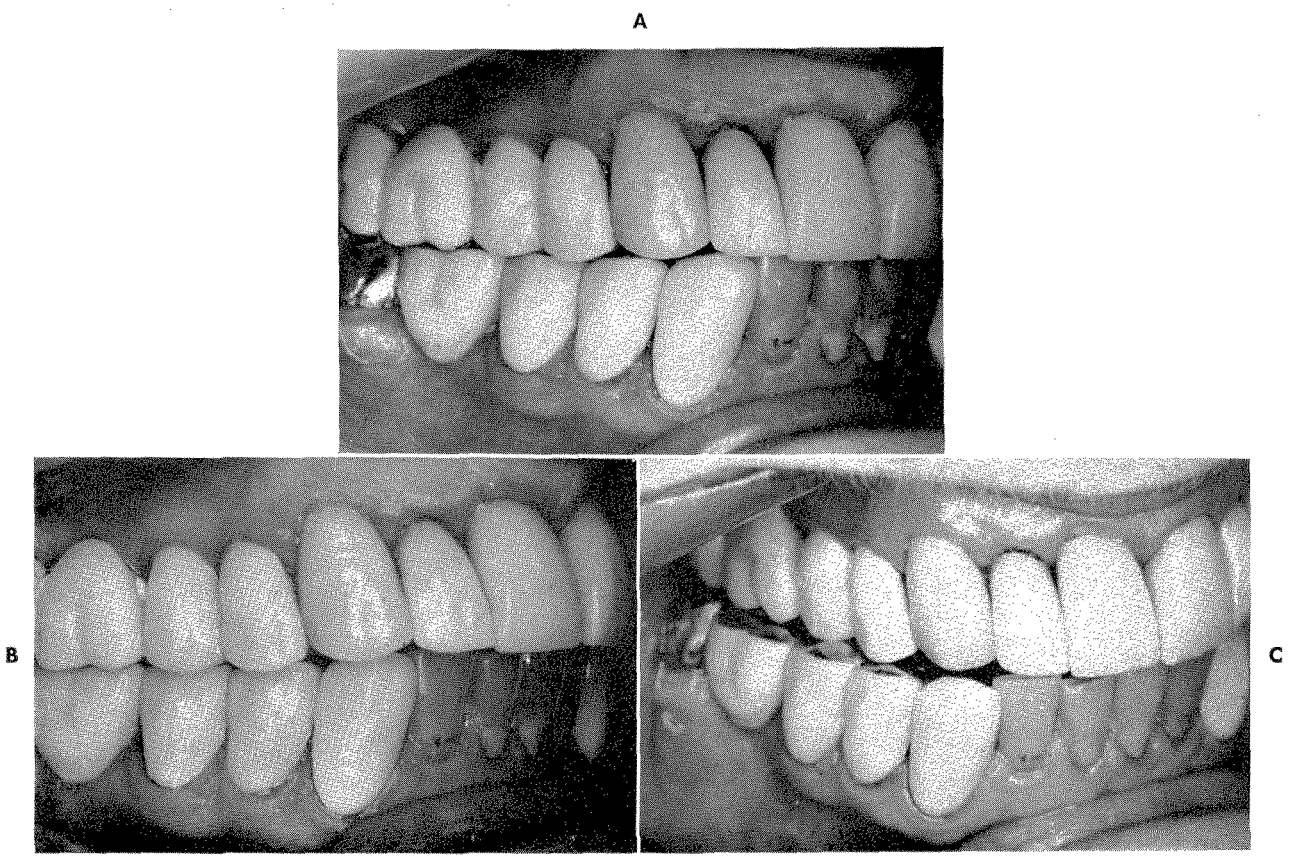


Fig. 1276. Completed work, right side. **A,** Mandible in its anterior position. **B,** Mandible in its posterior position. **C,** Balancing bite.

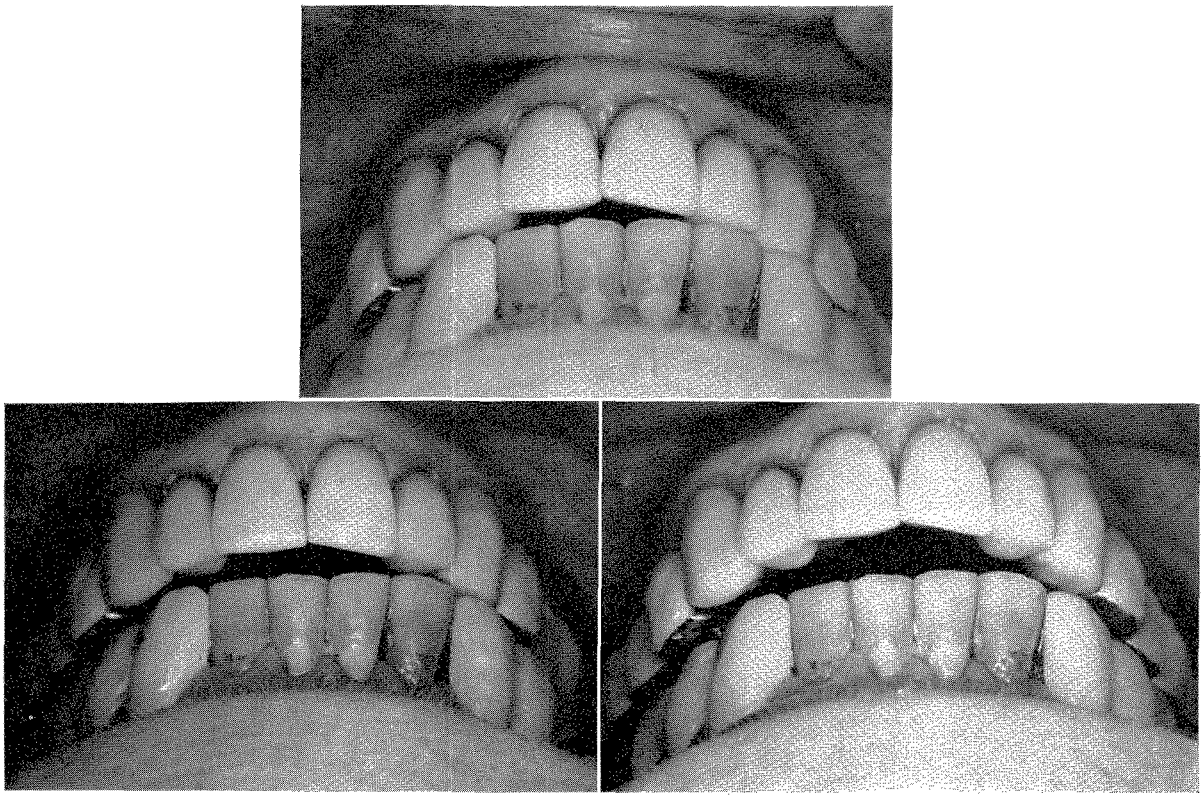


Fig. 1277. Three views from beneath looking upward at the horizontal overjet. These show the various degrees of anterior and posterior mandibular interocclusal position. The color of the lower natural teeth was made lighter when they were covered with porcelain jacket crowns. (See Fig. 1282, **C**.)

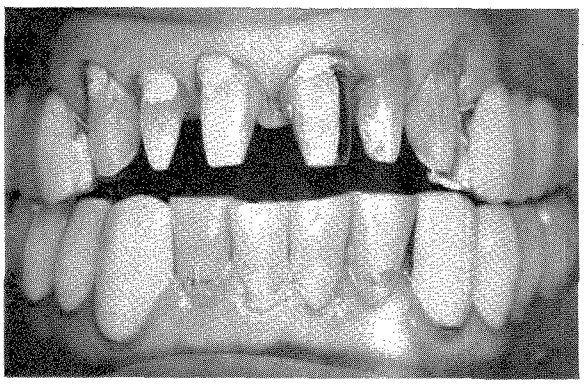


Fig. 1278. The porcelain jacket crowns were removed from the upper anterior teeth. They were inserted in 1943. The teeth were rebuilt as shown in this photograph, and new porcelain jacket crowns were inserted.

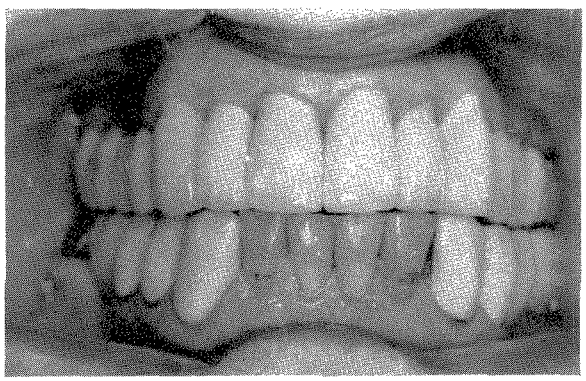


Fig. 1279. Anterior view of the completed work taken in 1961. The lower incisors have still not been treated.

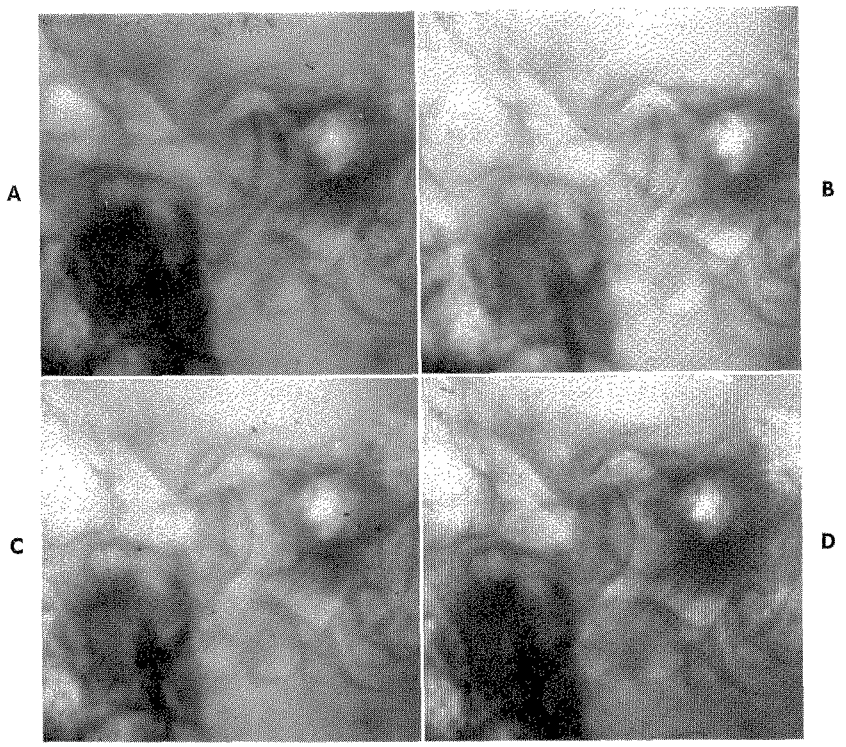


Fig. 1280. The right temporomandibular joint of the patient shown in Figs. 1259 to 1282. **A,** Right posterior contact. **B,** Right lateral contact. **C,** Right anterior contact (midway). **D,** Right anterior contact (small overjet).

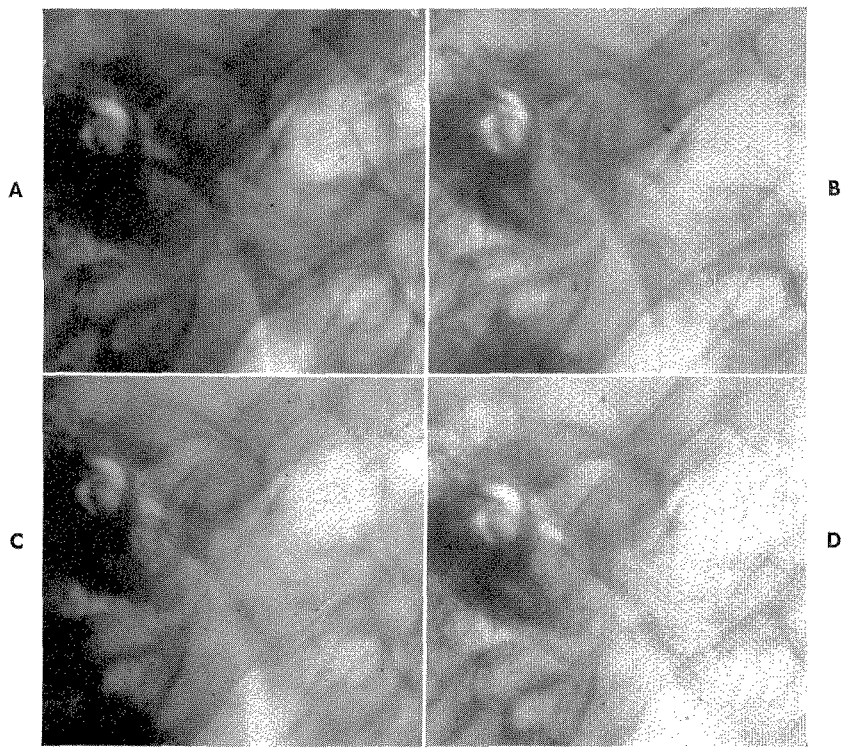
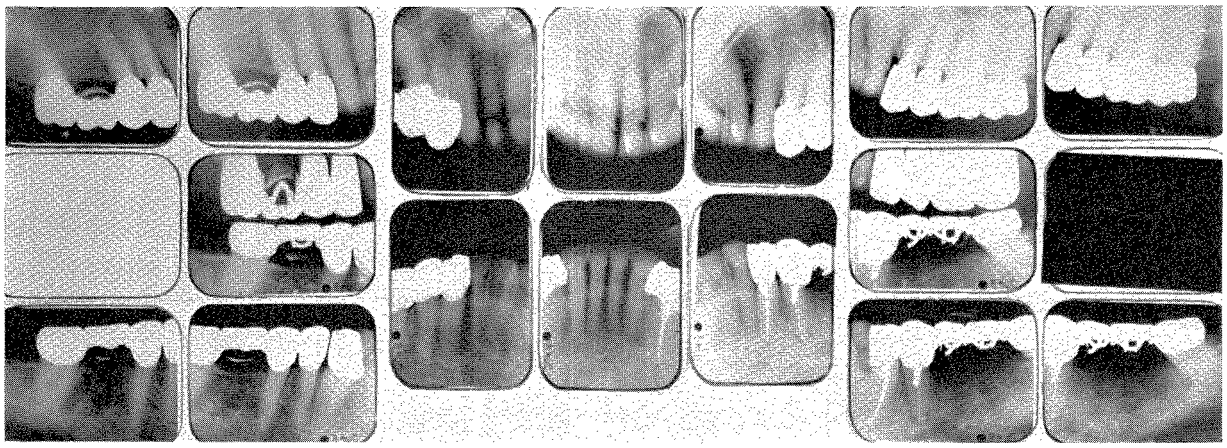
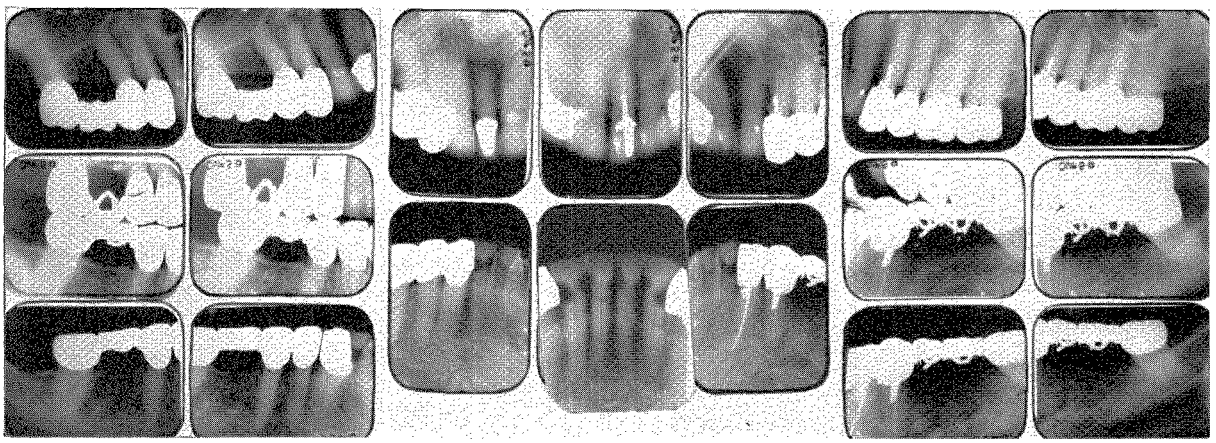


Fig. 1281. The left temporomandibular joint of the patient shown in Figs. 1259 to 1282. **A,** Left posterior contact. **B,** Left lateral contact. **C,** Left anterior contact (midway). **D,** Left anterior contact (small overjet).

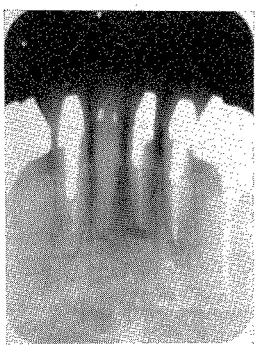


A



B

C



D

Fig. 1282. A, Roentgenograms taken in March, 1960. The upper anterior teeth were not completed until November, 1960. **B,** Roentgenograms taken in October, 1962. The patient had not been seen for two years. The lower anterior teeth were deeply involved in caries. This patient had an emotional problem. Compare the lower anterior teeth in March, 1960, and in October, 1962. **C,** The lower incisors were finally completed in March, 1963, by the insertion of four porcelain jacket crowns that are shown in this photograph. **D,** This roentgenogram was taken in March, 1963. Metal posts were constructed for three of the lower incisors. The porcelain jacket crowns are in position.

dibular positions using these as guides. There were several try-ins in an effort to check the accuracy of the articulator. (Figs. 1259 to 1282.)

This patient was not seen for two years after the upper anterior teeth had been restored in November, 1960. The October, 1962, roentgenograms revealed lower anterior teeth that were deeply involved with caries. She was questioned carefully regarding her dietary habits. The only information she gave that could shed any possible light on the extensive caries found was the taking of a certain brand of lozenge for a scratchy throat. She took about two a day and very often one at night after brushing her teeth. These dissolve slowly in the mouth. Operative work on these teeth was not started until January, 1963. Three of the four lower incisors required pulp removal. This work was not completed until March, 1963. It took so long because of the emotional problems that this patient suffered from. It took great understanding and a fine patient-doctor relationship to accomplish what was shown in this case.

On pp. 351 to 356, Figs. 753 to 760, and on pp. 440 to 446, Figs. 956 to 968, two cases were reported that began as deep overbites and ended as dual bites. Each patient was able to advance or retrude the mandible a considerable distance anteroposteriorly and still maintain a favorable interocclusal relationship. Although these cases differ from the one just described in that their vertical dimension was greatly increased, still the similarity of all three cases remains. With the mandible retruded, all three had an extensive horizontal overjet. The vertical overbite and the horizontal overjet were another interesting facet of these three cases. The first patient, pp. 351 to 356, a 35-year-old woman, had the bite raised and the upper anterior teeth restored by means of a fixed splint. No recurrence of the original vertical overbite could take place unless the entire six-unit bridge moved down en masse. In addition, because of the uncomfortable posterior position, she probably kept the mandible forward frequently enough to make contact and to prevent the recurrence of the old vertical overbite.

The second patient, a middle-aged woman whose case was reported on pp. 440 to 446, came for treatment in 1932. She suffered a relapse of her vertical overbite after the bite was raised. This relapse often takes place when an occlusion that originally possesses anterior interocclusal contact is opened and the incisors are removed from contact. To prevent this relapse of the vertical overbite, anterior interocclusal contact should be provided in the finished case.

In the third case (pp. 590 to 594) no extrusion is apt to take place even though there had been no provision for anterior contact. This is probable because originally there was no contact and there was no increase in the vertical dimension of the completed work. In the first two cases the relapse could have been avoided by constructing an upper lingual platform in the completed work. This would create a definite stop for the lower incisors to engage as the posterior teeth contact. The reader is referred to pp. 422 to 439, Figs. 917 to 955, and to pp. 452 to 464, Figs. 975 to 999 where the use of such lingual platforms on the upper anterior teeth is discussed. The original deep vertical overbite does not recur in these cases. Actually the over-all vertical dimension of the entire arch might become smaller and the bite close, but it would be impossible to detect owing to the interocclusal contact of all the teeth including the anterior ones.

There is a possibility that in function the anterior teeth continue to contact with such frequency that this in itself suffices to prevent the closure of the

anterior opening even if the original teeth contacted. This is rarely the case clinically.

PROVIDING ANTERIOR CONTACT IN COMPLETED WORK

Case 19

An example of this may be seen in the report of the following case. In 1932 a 52-year-old man presented an extreme anterior overbite and overjet and had definite contact between his upper and lower anterior teeth.

In 1943 his occlusion was reconstructed, and his vertical dimension was in-

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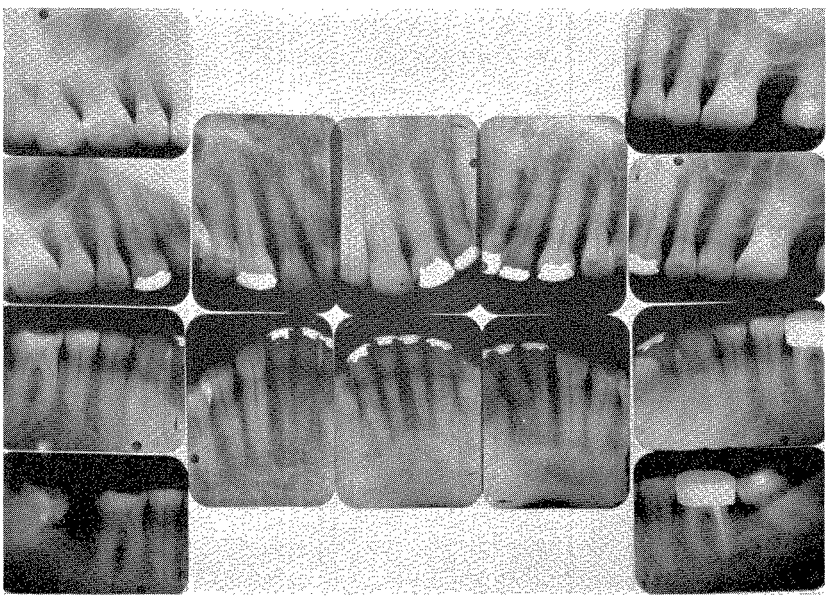

Fig. 1283. Roentgenograms taken of the teeth of a 52-year-old man. These were taken in 1932. (Figs. 1283 to 1289 are of the same case.)

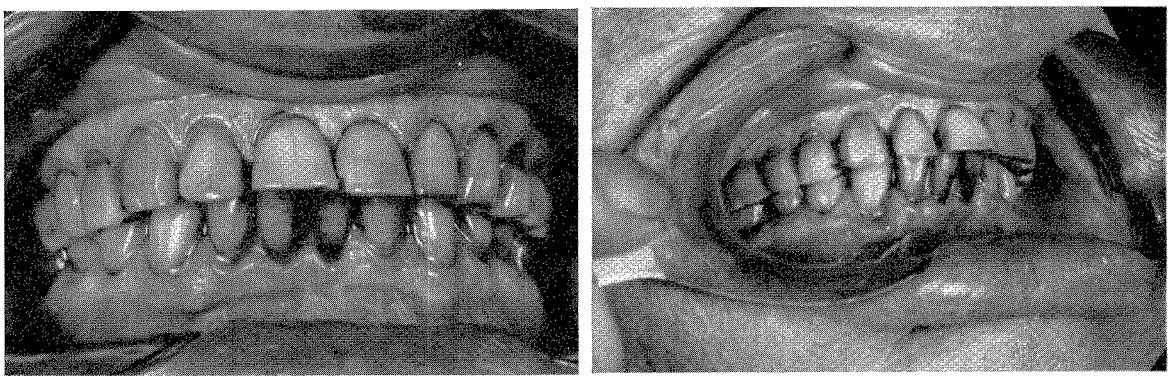

Fig. 1284. Front and right views of the mouth taken in 1940 at the age of 60. There are deep vertical and horizontal overbites, but all the anterior teeth contact in centric occlusion.

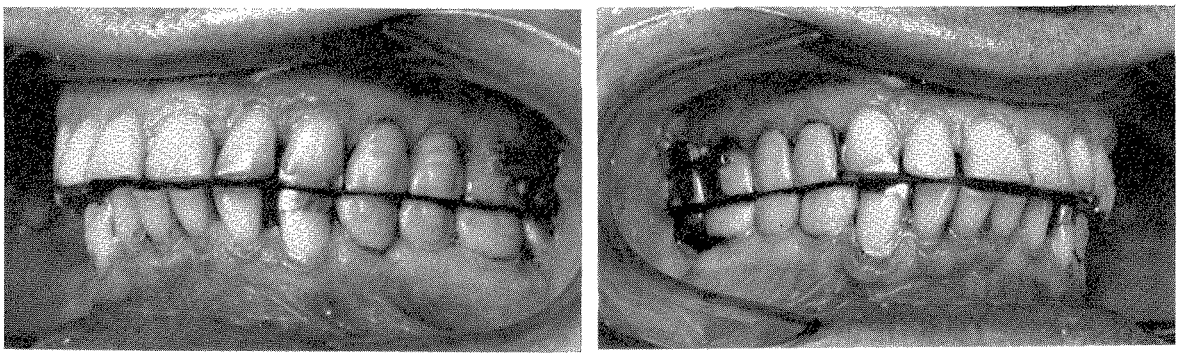

Fig. 1285. In 1943 the occlusion was reconstructed and the vertical dimension increased as shown in these illustrations. The anterior eight incisors were removed from contact. His centric relation or hinge occlusion is shown here. Compare the right side with Fig. 1284.

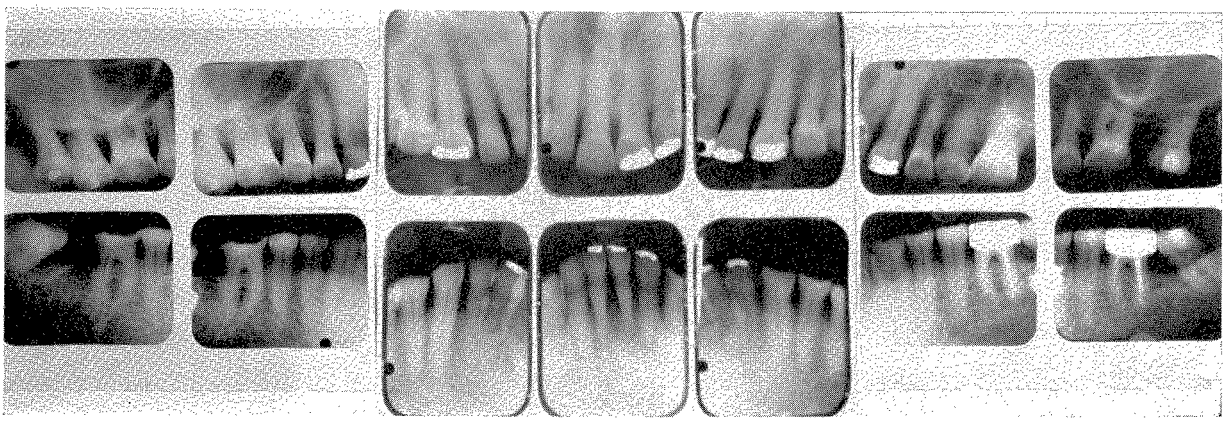

Fig. 1286. Roentgenograms taken in March, 1943, just prior to the reconstruction.

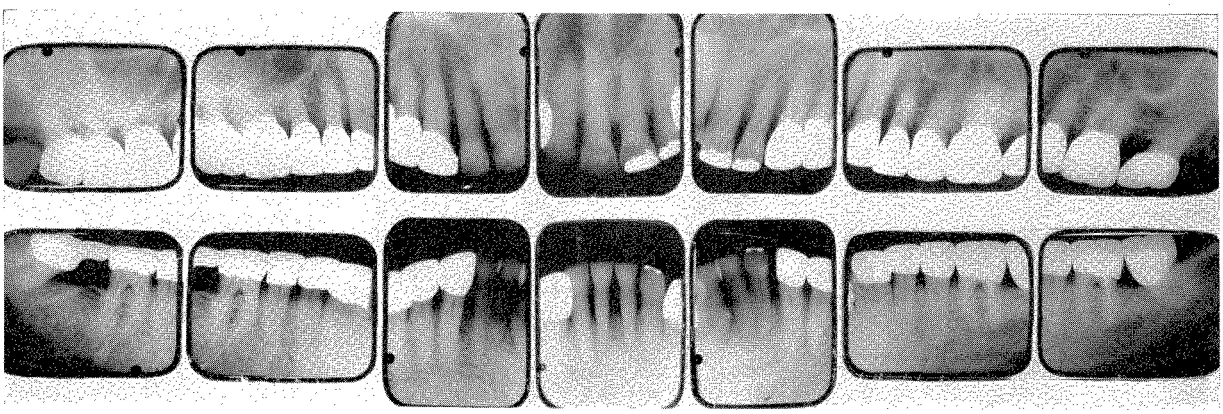

Fig. 1287. Roentgenograms taken in May, 1943, just after the completion of the reconstruction.

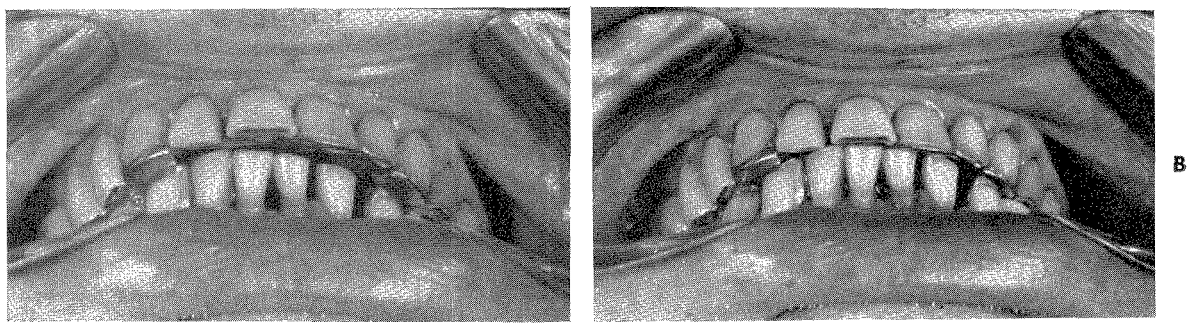

Fig. 1288. A, Photograph taken in 1950 showing the lack of contact of the incisors in centric occlusion. This is seven years after the completion, and the anterior teeth still do not contact. **B,** In protrusion, contact is attained.

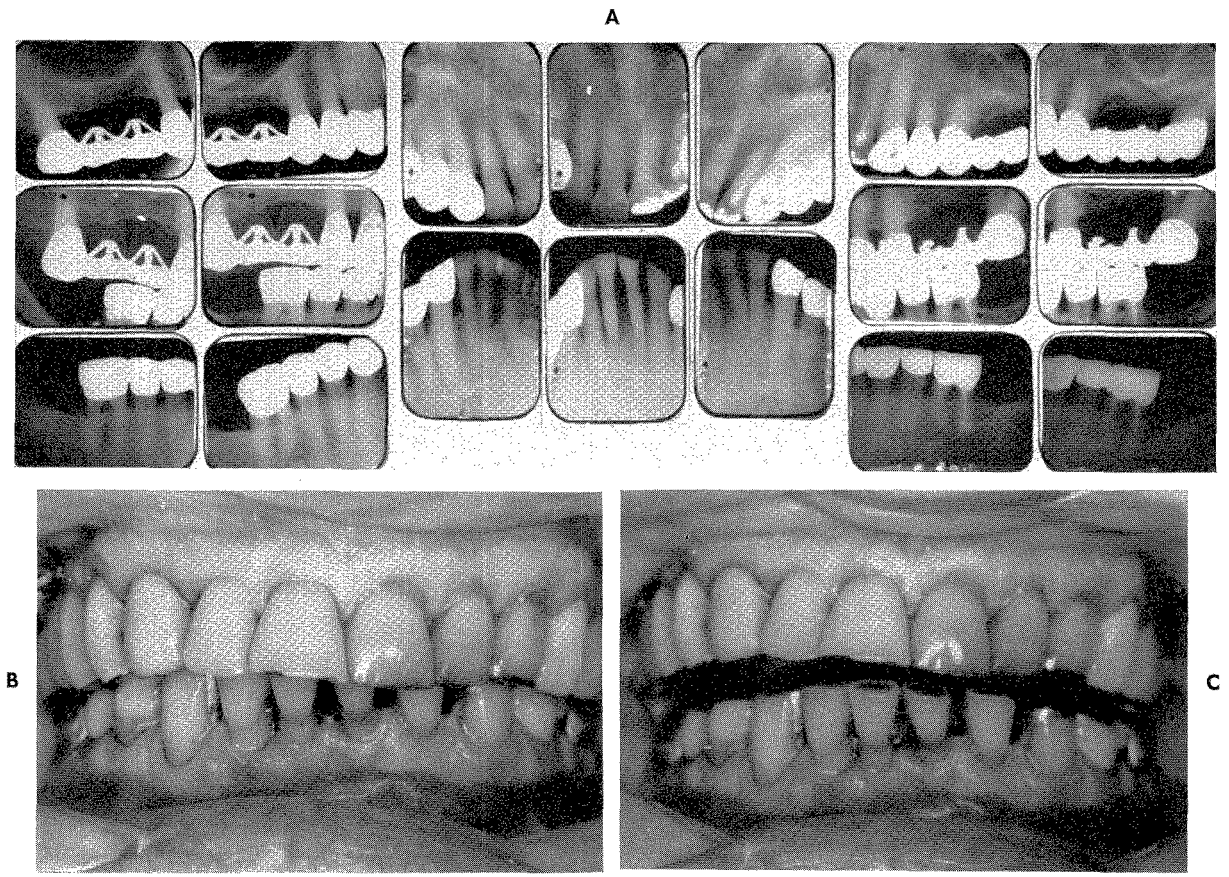

Fig. 1289. A, Roentgenograms taken in 1962. The patient was then 82 years old. **B** and **C,** Two views of the mouth taken in 1962. Compare these with Fig. 1284. The bite closed considerably in the nineteen years after the completion of this reconstruction. This patient died in June, 1963, at the age of 83.

creased. In the completed work no contact was provided for his anterior teeth that had formerly contacted. Contrary to what was expected to take place, namely, the extrusion of the anterior segments or the intrusion of the posterior segments, or both, until the anterior teeth again made contact, this did not happen. This patient at the time of writing was 83 years old. His anterior teeth were still open in centric relation and could make contact only in a functional protruded bite.

Apparently his continual protrusive function, aided by the possibility that his tongue was kept between his anterior teeth in addition to the further possibility of unusually dense bone to provide ankylosed teeth, serves to maintain the anterior open bite. He died in June, 1963, at the age of 83. (Figs. 1283 to 1289.)

OPERATION TO REDUCE SIZE OF TONGUE

Operations to reduce the tongue size were suggested,* but this should be undertaken only in unusual cases. The tongue reaches a very large size in early childhood and is much further advanced in growth than the surrounding tissues. Usually these tissues catch up with it, but if they lag behind in their growth spurt then the large size of the tongue often caused malposition of the teeth. A long, narrow tongue may cause mechanical abrasion of all the teeth and is sometimes seen in severe cases of tooth wear. Lemon juice in warm water or cola drinks of various kinds may cause an erosion that allows the tongue to scour the softened tooth structure and reduce its size.† This can cause complete lack of occlusion at normal levels.

SUMMARY

The problem of the open bite when it is present in an adult patient presents just as many difficulties for the prosthodontist, the surgeon, and the general practitioner as it does for the orthodontist when he encounters it in a child. Most of these patients are better treated in childhood. Some open bites are due to growth and endocrine abnormalities whereas others are caused by faulty habits, diseases, tongue and tissue abnormalities, and incorrect methods of deglutition. Some of these causes and treatments have been discussed. The tongue has been accused of being the most serious etiological factor and the most difficult one to treat in adults as well as in children. When the tongue factor is present, the results of treatment are usually unstable. This, once again, asserts the domination of muscle over bone.

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*Stockfisch, H.: Reduction of the size of the tongue, Internat. D. J. **7**:411, 1957.

†Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., p. 601.

Chapter 11

NEUROSIS—EFFECT UPON PATIENT-DENTIST RELATIONSHIP AND UPON HARD AND SOFT TISSUES OF ORAL CAVITY

INTRODUCTION

Many of our patients have psychosomatic disturbances. The majority of them are able to be cared for along ordinary lines and present no major difficulties. Some have had nervous breakdowns and have received some form of mental therapy, including shock treatment, psychiatric therapy, and the administration of the various drugs used to combat mental illnesses. There are others in this group who have received no form of mental therapy whatsoever.

All of us have had varied experiences with this group of patients. The psychomatic undertones have manifested themselves in various ways, sometimes affecting the oral structures and other times affecting only the patient-doctor relationship.

Inasmuch as our dental undergraduate or postgraduate background has not prepared us to recognize or to cope with patients who are emotionally disturbed, I present the following discussion based on dental clinical experiences.

DEFINITIONS

psychology The science of observation and classification of facts concerning the mind and mental processes

somatic Having reference to the body

psychiatry That branch of medicine which deals with the recognition and treatment of diseases of the mind

psychosis Deep, far-reaching, and prolonged behavior disorders which include anxiety psychosis, exhaustion psychosis, manic depressive psychosis, situation psychosis, etc.

neurosis A functional nervous disorder characterized by complaints or ills without demonstrable organic lesions—accident neurosis, anxiety neurosis, fatigue neurosis, occupational neurosis, etc.

psychosomatic derived from psyche—the mind and soma—the body, therefore a relationship between the mind and the body; bodily disorders caused by mental conditions.

EMOTIONAL STRESSES AFFECT ALL PEOPLE IN VARYING DEGREES

All of us are affected in many ways and to varying degrees by our environment. If we are able to maintain an emotional stability, in the presence of problems that are difficult to solve, our friends and colleagues consider us to be "well adjusted." That does not necessarily imply that we are able to solve these problems; it simply indicates that they do not set up stresses within our nervous systems which create mental disturbances and upset our normal responses to the external environment. Regardless of whether our own personalities come within the classification of "well adjusted," all of us, at some time or other, are emotionally upset by many of life's situations but are able to cover up these experiences with a personality bravado that has fooled even those very close to us. It sometimes happens that even well-adjusted people, if subjected to constant or frequent stresses, finally succumb and suffer from what we know as a "nervous breakdown."

BRUXISM AS SYMPTOM OF EMOTIONAL DISTURBANCE

There are many diverse ways provided by nature to combat these emotional disturbances and neutralize their traumatic effect upon the total being. Many years ago the attention of the dental profession was called to the deleterious consequences of continual grinding or clenching of the teeth.*† This habit was termed bruxism and has been continually studied by our profession. Some believe that it is one of Nature's way of relieving pent-up emotions and that an attempt to check this outlet might lead to another outlet and cause a disturbance of a more serious nature in some other important organ of the body. These habits of grinding may occur in very young children, such as the 5-year-old child shown in Fig. 1290. Their effect can also be seen in teen-agers. The patient shown in Fig. 1291 had already worn the cusps of his teeth flat in his late teens. This patient is now 34 years old. At present, I would not consider rebuilding the occlusal surfaces because of the excellent condition of the soft and hard tissues. However, the future may reveal some conditions that may cause me to reappraise the problem.

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*Lambossy, A.: Hints and queries, D. Cosmos **24**:502, 1882.

†Davenport, J. N.: Teeth grinding during sleep, D. Cosmos **24**:556, Oct., 1882.

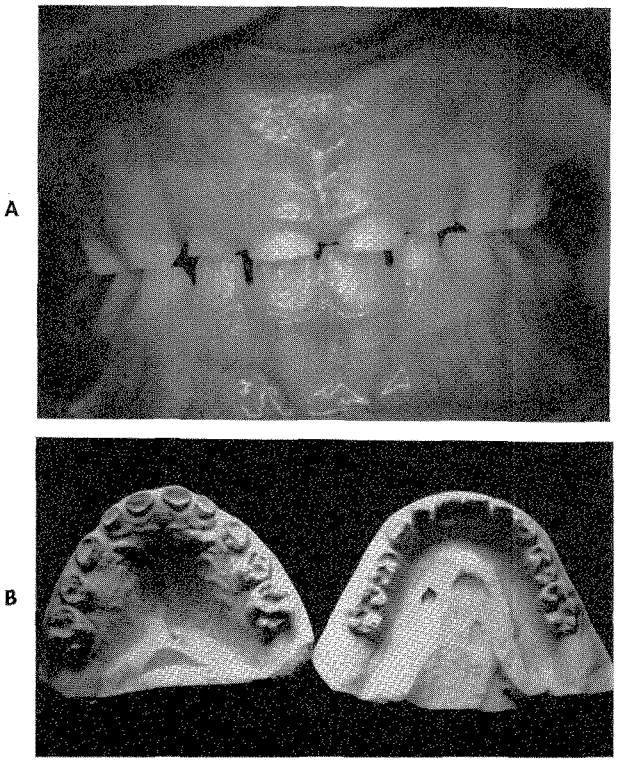

Fig. 1290. A, The mouth of a 5-year-old boy who had severely ground down his temporary teeth by bruxing. **B,** Occlusal view of the stone casts of the teeth of the child shown in **A.** The severe attrition and abrasion are evident.

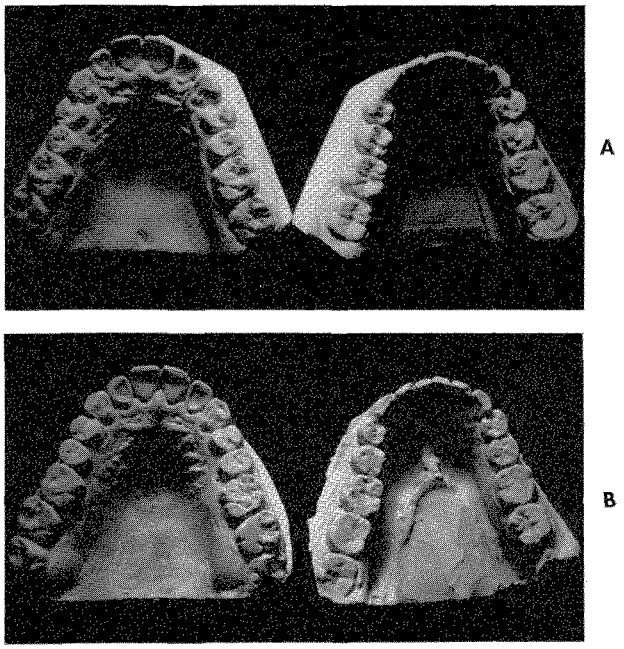

Fig. 1291. A, Casts of a 17-year-old boy who had already abraded the cusps of his posterior teeth by bruxing. These casts were made in 1945. **B,** Casts of the patient shown in **A,** taken in 1959 at the age of 29. The advanced stage of the occlusal attrition and abrasion is clearly seen.

We may conjecture as to why these patients grind their teeth together at such an early age. The very young child and the teen-ager just mentioned both had intelligent parents who extended love and intelligent parental guidance. Insofar as I know, nothing was lacking in their correct upbringing. It seems that the 5-year-old child should have no emotional problem that would cause the severe bruxism evident in his mouth.

Another young male patient gave evidence of severe bruxism in his early teens. His I.Q. was very high. He excelled in everything he undertook, including music, tennis, and finance. Now, at the age of 25, he is enjoying success in the business world. His parents are middle-class, conservative people, who have given him whatever they felt he needed; however, they do not understand him. He continues to wear his anterior teeth down and is difficult to treat because of his nervousness. Having treated him since he was a child, I have established a rapport which enables me to give him the care he needs and makes him willing to come regularly for treatment.

Although this understanding and sympathy are very necessary in treating the average patient, they are so much more necessary in emotionally involved patients. The patient has voluntarily submitted himself for psychiatric treatment and goes regularly and is very grateful for the understanding I have given him.

On the other hand, would you suggest that the first two patients mentioned be

referred for psychiatric consultation? Personally, I would not consider this wise or necessary. Many studies have been made on the subject of bruxism. Most of these have been on adults.

So far, this discussion has been confined to recognizing some emotional disturbances whose effect has been primarily felt by the hard tissues of the tooth, namely enamel and dentin. In 1951, I reported the case of a man whose caries index was extremely low until he suddenly was subjected to emotional stress and suffered a nervous breakdown.* His caries index immediately increased out of all proportion to his usual rate, and in a short time many fillings had to be inserted into an otherwise unsusceptible mouth (see Figs. 1307 to 1309). Although no chemical tests of his saliva or blood were made, the inference is that his emotional disturbances could have caused some changes in the salivary pH and in the contents of the blood and the glands of internal secretion. These, in turn, could cause a change in his degree of susceptibility to caries.

This patient is also under psychiatric treatment. During the past five years, his caries index has leveled off, and there have been fewer caries. In examining this case, we must also be aware of the possible side effects of the various drugs these patients are taking for their mental illness. These drugs can have noxious influences on both the hard and soft tissues. In fact, we are told that mental disease will eventually be traced to chemical imbalance within the body and that tranquilizers are now being produced "to calm the violent, psychic energizers, to pep up the depressed; and hallucinogens to produce artificially, for psychiatric study, the weird visions of the mentally deranged."† If this is true, then the effect of these drugs upon the oral tissues should be given consideration, because some of them diminish the flow of saliva by their diuretic effect and thus inhibit the anticariogenic organisms.

The effects of the emotional disturbances upon the oral tissues in general are frequently seen clinically. I have treated one of my middle-aged patients ever since she was a young girl. Her neuroses took place early in her life, directly after World War I, when she was befriended by an American family and brought to the United States (see Case 2 on p. 630 and Figs. 1302 to 1305). Her sister was about the same age. She was well adjusted and married early in life. She had three healthy children and a contented home life. Her dental roentgenograms revealed normal structures (see Case 3 on p. 632 and Fig. 1306).

DISTURBANCES OF SOFT TISSUES

We are now concerned with disturbances in the soft tissues, which, we believe, have an emotional background. Here, again, we are in the realm of the unknown. If laboratory research were necessary to prove the assumption that emotional disturbances can cause periodontal pathology, our position would be considerably weakened. Yet, clinical experience can also prove to be an adequate research tool provided it is backed up by a sufficient number of cases and no other more plausible etiological cause can be advanced. I have treated a middle-aged woman for over thirty years. When she was a young woman, all her upper molars were involved in

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*Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., p. 686.
†Ratcliff, J. D.: World's most bountiful store of drugs, Reader's Digest, July, 1963, pp. 97-101.

deep periodontal pathology to such an extent that they finally had to be removed. This woman has always been under emotional tensions as a result of having to cope with life's problems with inadequate physical and emotional equipment (see Case 1 on p. 625 and Figs. 1292 to 1301).

In these cases, I would suspect the hormones associated with the glands of internal secretion. If this delicate system were thrown out of balance, the entire chemical regulation of the body would be upset. The periodontists still do not agree as to what is the major cause of periodontal disease. They suspect that emotional stress may exert its noxious influences on body metabolism and thereby be an exciting cause. This is certainly plausible and, if it were so, it would clear the occlusal factor from being accused of occupying the number one position in the etiology of periodontal disease. The reader is referred to Chapter 12, pp. 721 to 752 and Figs. 1445 to 1508. Three additional cases of periodontal disease with an emotional background are reported.

FORM OF MENTAL DISTURBANCE THAT AFFECTS HARMONIOUS DOCTOR-PATIENT RELATIONSHIP

Up to now we have considered those patients who have emotional stresses, which we suspect have been responsible for altering the body chemistry to the extent of causing pathology of the soft and hard tissues. In such patients the doctor-patient relationship is not any more difficult than with the average patient.

I am now going to describe an entirely different type of patient who presents a more serious problem, the nature of which often has strained, if not ruptured, the necessary cordial doctor-patient relationship. I do not wish to infer that, with the former types of patients, the dentist is not confronted with some baffling causes of dental disease. This, of course, is so, and makes his work more difficult, but their type of emotional disturbances do not affect the dentist-patient relationship. Our only problem is one of treating the tissues and perhaps trying to make the patients understand to some degree the elusive nature of the etiological factors involved without inferring that they are mental cases.

Even as I write this, I become more and more aware of the difficulty of trying to classify and to separate these various types of neuroses. The lines are not as clear-cut as they should be. As soon as you have to tell a patient that his dental problems stem from some form of neurosis or that there is a psychosomatic background for his dental problem, the usual response is one of resentment. The result has been that we, as dentists, could not afford to openly discuss this aspect of the problem with our patients. With some of them we have made some slight suggestions, but certainly the subject has hardly ever been pursued.

I have no doubt that most of us understand the implications. It would not clarify the problem to attempt further explanations other than to state that even those cases which are considered simple have very complicated areas. Neurotic patients are much more difficult to treat because many of their dental complaints are unreal or fancied. I refer to a young man, whom I treated many years ago, who had been under psychiatric treatment for a considerable period prior to his initial visit to me. He insisted upon orthodontic treatment to correct an overlapping upper lateral incisor, and nothing I could say or do prevented him from undergoing this extensive treatment to correct a fancied malocclusion. This same patient had a

small pigmented patch surgically removed from his back and continued to undergo various other operations for minor nonconsequential conditions.

Another young patient with similar tendencies was examined in 1960. He also had been under psychiatric treatment. His case (Case 13) is reported on pp. 668 and 670, Fig. 1385.

DANGER IN NOT RECOGNIZING EMOTIONAL DISORDERS EARLY IN TREATMENT

The danger in some of these cases lies in our accepting the patients without suspecting the nature of their mental illness and suggesting large-scale restorative procedures. With the limited background for recognizing emotionally disturbed people, the dentist may innocently accept such patients and cripple his practice. All of these patients who give evidence of their neurosis with a fixation in the oral cavity or associated structures, such as the facial musculature and the temporomandibular joint, as complex and as varied as their symptoms may be, still have a great deal in common. Very often their difficulty starts with some operative procedure associated with only one tooth. It may even be a single clasp which broke on a small partial removable denture and was repaired. Changes as minute as these are capable of initiating a vicious cycle which may never end. It seems logical to assume that the neurosis was present, but not suspected, and that the simple, uncomplicated dental procedure acted as the initiator. Many of these people give the dentist no evidence of the nature of their illness. In fact, from their case histories, it is the dentist who is responsible for all the trouble.

EMOTIONAL INVOLVEMENT OF DENTIST

Speaking of the effect of this type of neurotic patient upon the dentist, we must be made aware of our own emotional involvement, especially in major dental problems. Not only do we lack the ability or training to recognize the signs and symptoms of severe neuroses, but we also are not able to handle these patients. Furthermore, we become deeply involved and sometimes refuse to admit treatment failure even though the work involves factors that are beyond our ability and skill to solve. In some cases we are motivated by competitive strivings because often colleagues previously have also met with failure in the same case. We are likely to develop a guilt complex because of our inability to terminate the case. In addition, there is the matter of fees. If these cases cannot be terminated, what does the dentist do when his original fee has been exhausted? And unless the patient has financial resources, how can he meet the interminable expense?

SOME RECOGNIZABLE SYMPTOMS OF EMOTIONALLY DISTURBED PATIENTS

What are some of the symptoms that the dentist may recognize early in the disturbed patient? Most of these patients are very loquacious and give extensive histories. The majority prefer that you do not communicate with their previous dentists. They all usually blame the previous dentists for the oral disintegration which is evident upon examination. This complaint is made regardless of the fact

that these dentists may have superior skills. Almost all of these patients have had several to many dentists attempt to solve their problems. All were unsuccessful. The length of time which these patients have undergone treatment is extensive—from two to ten years, or even more, judging from the known records. Some of these patients are accompanied by a member of their family or an interested friend, who is often more aware of the nature of the patient's problem than they are willing to admit.

These patients complain of bizarre symptoms that are usually difficult to track down, such as their cheek is pulled to one side or another, they have to hold up their jaw with their hand because of a heavy feeling, their teeth are moving, their eyes and ears are affected, their facial muscles are sagging. There is usually no difficulty with the operative procedure. They tolerate that type of pain very well. The slightest tooth adjustment, sometimes even talking to them while making an insignificant mechanical adjustment, will relieve their complaints. They are happy when they leave, but almost invariably their symptoms start all over in the same or adjoining areas upon their return home.

In some patients the subjective symptoms are so fanciful that the mental nature of their illness may readily be established. In others, this becomes more difficult, but the continued shifting from one complaint to another, before the final insertion stage, is significant. In fact, so many adjustments are necessary that what started out to be a well-constructed prosthesis ends up with a mediocre or poor result when judged by acceptable standards of mechanics and physiology. For this reason it is often unfair to judge a colleague by the dental prosthesis which these patients present.

If a neurosis is suspected on the patient's initial visit or even during the early stages of treatment and the patient is asked if he has undergone psychiatric treatment, this implication is usually resented. Furthermore, many of these patients deny the existence of neuroses and refuse to consider psychiatric consultation. Very often it is of considerable help to call some of their previous dentists and obtain an evaluation from them. Extremely helpful information can be obtained in this manner. Although not all of the symptoms mentioned are present in every patient, and although these symptoms may vary somewhat, they should serve to alert the dentist.

The criteria set up by Griggs may be helpful in determining whether or not we are dealing with an abnormal mental pattern:

"1. Neurosis must be included in the diagnosis whenever the patient uses any aspects of the illness to escape from or to excuse himself from his appropriate responsibilities, opportunities or relationships. This mechanism is an unconscious device which usually deceives the patient himself. Thus, it is in sharp contrast to the malingerer's conscious intent to deceive other than himself. The neurotic is the first to be deceived about himself and the last to believe what he is doing. Disabled neurotics who are unable to perform certain duties are often efficient and conscientious about other obligations which do suit them, for example, entertaining or keeping up a large correspondence or advising their grown-up children.

"2. Neurosis may be included in the diagnosis if the patient uses the illness to obtain other satisfactions extraneous to the disease and its symptomatology. This includes using unnecessary doctor's visits to substitute for social life, friend-

ship, love; to impoverish a hated husband or to obtain sympathy; to attain fashionable status; to lean on a father figure, or to 'adopt' a bright young man—the physician.

"3. Neurosis may be included in the diagnosis if the patient repeatedly sabotages effective treatment. When an ailment is somehow precious to the patient he finds some reason to change doctors or to stop treatment at the point when he sees that therapy is about to require him to behave or perform like a healthy person.

"4. Neurosis may be included in the diagnosis if the patient displays an intractable disability due to fears or lack of stamina so deep-seated in the personality that hope of cure has been abandoned by all concerned. This condition is probably better included among the psychoneuroses. It has also been referred to as psychasthenia and constitutional inadequacy.

"5. Neurosis is not justified as the medical diagnosis when the aforementioned criteria are not satisfied, nor is it justified simply because the physician cannot diagnose an organic disease, or because the patient gives an unsystematic and dramatic history with bizarre symptoms, or because of numerous surgical operations and multitudinous diagnoses in the past, or any similar superficial suspicion of a neurotic state. 'Where the illness is providing no escape from life and work, it is not a neurosis.' Patients with organic illnesses and persons with certain psychoses can keep working to the edge of exhaustion for years, but the neurotic patient is the one who has the 'exhaustion' and the illness in order to avoid, unconsciously, the work or other responsibility.

"6. Even when a neurotic reaction pattern is identifiable, a diagnosis of neurosis is not sufficient if it is not competent to explain the entire clinical picture. When a patient fails to recover from a somatic disease within the usual prognosticated period of time one should consider whether the disability is being prolonged by the patient's discovery of some neurotic satisfaction in it. But when the past history of such a patient shows singular freedom from neurotic behavior prior to the attack, one should suspect a persistence of the organic disease rather than a basic neurosis, or in addition to a reactive neurosis. Hundreds of patients in my experience have been rehabilitated by new therapeutic attacks on old ailments which other doctors considered cured long ago. Many of these patients were thought by family and friends to be merely neurotic and 'frail' or were diagnosed 'postinfectious neurasthenia' by their doctors for so long a time that they came almost to believe it themselves and to behave neurotically to some extent, with appropriate guilt feelings, resentment, or both. The clue to these patients was that they were really doing their best to carry on, not to escape their duties. They had chronic disease or sequelae of some illness whose termination is not demonstrable objectively and which is merely assumed to be 'self-limited.' These are cases of iatrogenic neurotic reaction superimposed on an unrecognized persistent somatic disturbance.

"By making an unwarranted diagnosis of organic disease on mere suspicion, iatrogenic neurotic reactions can also be superimposed on a patient who has simple anxiety without organic disease. This can be a serious disservice to a patient who is already basically neurotic, because it confirms him to his delusion of disability. However, in persons who are not basically neurotic, this reaction is temporary and easily disspelled. In contrast, a really neurotic patient is not

cured by the physician's authoritative reassurance that there is no organic disease present, and neither is the patient whose organic disease has been missed."*

In 1961 Lesse reported a study of two hundred twenty-five patients with facial pain symptoms covering a ten-year period. These were seen at the Neurology Clinic of the Columbia Presbyterian Medical center in New York City. Of these, one hundred ninety-eight had no discernible lesions to account for their atypical pain patterns. Most of this group were women between 35 and 55 years of age. They presented a "typical and predictable personality. They were very intelligent, hard working and ambitious. They were driving, domineering and critical. Meticulous, perfectionistic, obsessive compulsive patterns were seen in all. They were intolerant of any of their own failures and critical of the failures of others. They had to dominate their environment and usually did."†

Interestingly, almost half of these patients were referred by dentists. These patients went from dentist to their general practitioners, otolaryngologists, neurologists, oral diagnosticians, radiologists, and others. Along the line, one consultant would perform some service which would seemingly help them, if only temporarily, with some therapy. However, "all mechanical manipulations or injections added to the patient's facial fixation."† These patients submitted to extensive dental procedures which included full-mouth rehabilitation, extraction of their teeth, and, finally, full dentures. No relief was found and "indeed aggravated the initial treatment."†

The evidence of this report points to the fact that the onset of these symptoms followed simple dental procedures, and the symptoms were localized to specific dental areas. "The pains were commonly described as being aching in nature and appeared for long periods with some 'spontaneous remissions. . . . Rarely were trigger points described."† In the history of these patients with their facial pains, somewhere along the line, the dentist is consulted. As time goes on other areas of the mouth and face become involved. "Often the entire side of the face becomes involved, together with the eye, ear, and dorsal cervical and supracapular regions. . . .

"There was gradual but progressive interference with function. Initially, it was described as interference with chewing, talking, cleaning the face or tooth brushing. The patient gradually retreated from social relationships and working became increasingly difficult."†

Usually, the patient is not seen by the psychiatrist until at least a year after the onset of his original pain. Some of these people had been ill for one to ten years and under various forms of treatment during this period. The psychiatric pattern here "is the classical description of an agitated depression which is commonly seen about the involutional period of life."†

Lesse stressed prompt psychiatric help for these people. Sometimes the patients are able to provide a good clue to their emotional problems while relating their histories. Their story should be heard carefully, and conclusions should be formed as to whether or not their problems have mental implications.

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*Griggs, Joseph F.: Differentiation of neuroses from organic disease, Postgrad. Med. **29**:301-308, 1961; D. Digest **67**:347-350, 1961.

†Lesse, Stanley: Neurologic aspects of facial pain, D. Times **4**:3, 1961; Bull. New York State D. Soc. Anesth. **6**:5-11, 1963.

ALL PROBLEM PATIENTS SHOULD NOT BE CLASSED AS MENTAL CASES BECAUSE OF DENTIST'S INABILITY TO SOLVE THEIR DENTAL PROBLEMS

One of the great difficulties that confronts the dentist because of his inadequate training along these lines is to include in the category of the mentally disturbed patients those patients who have difficult dental problems that have not been solved. This is an unfortunate dilemma in which we may sometimes find ourselves. If the issue is confusing, an intelligent approach would be to request consultation with a competent colleague. If the result fortifies your suspicion of emotional disturbance, then your procedure is clarified to the extent that at least you do not blame yourself. It may be, however, that your treatment planning needs some modification. Consultation with competent colleagues have several virtues, among which are clarification of the treatment planning as well as legal protection in case of a lawsuit. And while on the legal aspect, careful documentation is of great importance. Without good records, it may be impossible to defend yourself against a malpractice suit.

ORAL REHABILITATION AS A CONTRIBUTING FACTOR IN CAUSING MENTAL DISTURBANCES

It would seem to me that there has been a great increase in dental neuroses since oral rehabilitation has become so popular. Oral reintegration is a complex and complicated procedure. It has mechanical, physiological, biological, and psychological implications. To reintegrate the stomatological system can prove to be a dangerous undertaking for both patient and dentist. Many of us become involved in these cases without adequate preparation and find out, too late, that once the interocclusal relationship has been altered, it is impossible to relocate the former comfortable relationship. I again wish to repeat what I have said in the past—namely, that unless there are definite plausible reasons for undertaking this hazardous procedure, some patients are best left alone or treated by simple, effective conformative dentistry. Although I realize that many cases have been benefited by complete reintegration, there is a lengthy list of those who have been mentally and physically harmed by this procedure.

It is possible that some of these patients who are now classed as emotionally disturbed could have had this condition initiated by complete occlusal reconstruction. Those of us who have seen many of these people after their delicate oral structures have been unbalanced will testify to the anguish they suffer. Is it any wonder that from among this group of patients come a percentage of the type of patient I am describing? Not all start their neuroses this way, but it is not often clear-cut as to which stems purely from a general neurosis and which was initiated by dental treatment. This only serves to further complicate the problem under discussion. Many of these patients go from dentist to dentist, each one giving different advice and perhaps condemning his fellow colleague. As a result, the mouth may

suffer further oral disintegration and they become further confused and begin to wonder whether their mental aberrations preceded their dental illness or vice versa.

PATIENTS IN THIS CATEGORY SHOULD BE ADVISED TO SEEK PSYCHIATRIC ADVICE

Assuming that a dentist is convinced that he is dealing with a psychologically disturbed patient, how does he handle the situation? None of us knows all the answers. In the greater majority of these patients, it is not the dental work that presents the problem; rather, it is the mental disturbance. If these patients would accept psychiatric therapy, I believe that we would be able to resolve their dental problems much sooner than otherwise possible, because although the dentist may be quite knowledgable and understanding, he still is reaching far out into a dangerous area with which the greatest majority of us are totally unequipped to deal.

Only on occasion are we able to relieve these psychosomatic disorders, and then only for a short time. The symptoms lie dormant until activated by the underlying emotional distress, conflict, or anxiety which are the well springs of the patient's suffering. The suffering is real and not imaginary, just as peptic ulcers are real. Some peptic ulcers are the outgrowth of an archaic survival fear so deep that the patient is not even aware of it.

If we are persuaded by these emotionally disturbed patients to perform dental operations that we know to be contrary to their best interests, are we not doing them a grave injustice? Would it not be decidedly to their best interests first to tell them that while there is nothing crazy or imaginary about their symptoms, still it is only possible for us to correct the physical condition of their mouths while our most expert dental skill cannot cure their psychic symptomatology? I am aware that many of these patients will feel hostile toward us for this honest expression of our opinions and will continue their rounds from one dentist to another, finding no relief, but perhaps following each disappointing failure they will realize the truth of what we told them.

Once the patient entertains the idea that he might be helped by a competent psychiatrist, who will deal with his emotional problem first, and then have this therapy coordinated with dental treatment by a competent dentist, the psychic symptoms will be given a better chance to abate or even to disappear. When such patients undergo psychiatric treatment, the chances for success are greatly enhanced.

Those many patients who refuse psychiatric consultation go from dentist to dentist, only to have their emotional problem intensified and more deeply embedded. Each successive dentist, some of whom do not recognize the problem, cause further disintegration in the oral cavity. In a study of thirty-five cases over a seventeen-year period, Polsky reported that the psychiatric patients who exhibited the most cooperative behavior with the dentist were those originally handled by the psychiatrist. Regardless of the degree of complexity of the oral rehabilitation, the transference relationship with the dentist was much less severe than in those cases first handled by the dentist and finally referred to the psychiatrist when the dentist realized the mental implications of the problem.*

*Polsky, Murray: Personal communication, June 27, 1963.

RECOMMENDATIONS

The following recommendations are made relative to the education of dentists in this branch of therapy:

1. Dentists should receive psychiatric instruction and courses from the beginning of their education.
2. Dental specialists should receive more intensive psychiatric education in their postgraduate training to enable them to recognize mental patients.
3. Dentists should request psychiatric consultation in major dental procedures if the patient seems to manifest more than average anxiety or hostility.
4. Postgraduate instruction should be encouraged which would enable the specialist to recognize his limitations and tell him when a case must be terminated.

At the present time I am aware of no dental school, certainly at the undergraduate level, that gives instruction in this important area of medicine and dentistry. There are courses in hypnosis, but this is only a fragmented portion of the total discipline. There are a few dentists who are both willing and able to undertake the dental treatment of these patients, but I wish to emphasize that the actual dental involvement is not nearly so complex or important as the mental involvement.

There are factors in our society which tend to breed emotional disorders, and it is mandatory that every doctor be oriented by training, if not by instinct, to an understanding and deep sympathy for those of his patients who so suffer. I would suggest that the dental schools invite a number of psychiatrists to go through their files and select those cases which have a particular interest for dentists. These cases should be analyzed in some detail and not be mere vignettes with footnote commentaries. The best of the material could be published in book form and be required reading for every student planning a career in dentistry.

SUPPORTIVE THERAPY

All dentists supply the necessary supportive therapy in the treatment of patients requiring extensive prosthetic restorations. This involves the usual sympathy and understanding. We give our patients confidence in our ability and assurance of the outcome of treatment. They are better able to tolerate the various procedures if we establish contact with them at their level of understanding. We should take their side. With this supportive therapy, plus a normal patient and a skillful and experienced operator, we are able to successfully complete even complex cases of oral reintegration. When, however, we are dealing with psychiatric patients, it is often impossible for even dentists of superior skills and experience to bring even less complex cases to a satisfactory outcome.

DANGERS OF BECOMING INVOLVED WITH EMOTIONALLY DISTURBED PATIENTS

Those dentists who are willing to undertake the case must function both as a dentist and as a psychiatrist, and they must be prepared to become involved in the

emotional life of the patient as well as in the treatment of his dental problems. I have given this matter considerable thought and have decided that when it becomes necessary for me to become the dental psychiatrist as well as the dentist to a patient requiring oral rehabilitation, I would not accept the patient. As one gets older and better known, many of the emotionally disturbed patients find their way to your office. If you accept even two or three, your entire schedule may be unbalanced. Even in those patients whom I have accepted, not suspecting the nature of their illness, I prefer to terminate treatment when I am convinced I can no longer contribute to their dental health.

I wrote the following letter to a patient I felt was in this category:

Dear Mr. _____:

Inasmuch as I don't believe I am making a worthwhile contribution toward solving your dental problem, I must withdraw my services. You may have any records which I have. While I am aware that you are willing to compensate me adequately for the dental services which I render, under the circumstances I don't feel they are worth what I must charge you.

I do hope you will understand and also that you will find someone who will bring your problem to a successful conclusion.

My kind regards and very best wishes,

Sincerely,

(Signed) _____

There are only a few who wish to undertake the double role of mental therapist and dentist. A sufficient number of such dentists well qualified along these lines would provide one of the best answers to this problem.

When it is suspected that a patient is emotionally disturbed, a paragraph should be inserted in the contract letter stating that, should the dentist find he is unable to further contribute toward solving the patient's dental problem, he be permitted to discontinue his services and also that he be reasonably paid for the services which he rendered. Where the dentist has good reasons at the start to suspect he will not be able to withstand the emotional pressures, a letter may be written in which he establishes a time limit within which he is willing to make every effort to complete the work and in which it is stated that if this becomes impossible, then he be permitted to discontinue his services and the recompense for this be established at the start of treatment. Several letters of this type will be found in the case reports.

Another danger which confronts us when dealing with the psychodynamics of this problem is the danger of the psychotic patient to regard the dentist with veneration out of all proportion to his ability and knowledge. Although this worship is not entirely confined to this class of patients, it is especially found here. Veneration of this type can sometimes be harmless, but it should be generally discouraged because the patient becomes too dependent upon the dentist. There is no magic ingredient in our approach to our patients. If it is at all possible, a realistic attitude should be encouraged and fostered and the patient taught independence, self-sufficiency, and the recognition of their problems.

WITH NO TERMINATION IN SIGHT, WHAT ARRANGEMENTS SHOULD DENTIST MAKE?

I would certainly agree that these patients may be better off having their mental fixation focused in their mouths rather than in some more important area, such as the heart, stomach, or lungs. If a dentist does decide to retain one of these patients, inasmuch as the dental problem may never be resolved or terminated there should be an understanding between him and the person responsible for the patient. In such instances the dentist would actually be acting as a mental therapist, and the fees could be worked out to the satisfaction of both parties. I am suggesting that in some of these patients it is better not to complete treatment. However, there are complications which these cases create, among which are (1) finances and (2) the difficulty of the dentist to recognize the severity of the psychotic condition. Besides these complications, the patient's relatives and friends must be sympathetic and understanding of the problem, and the dentist must be willing to remain in the case in spite of its interminability.

IF OUTCOME UNCERTAIN IN EMOTIONALLY DISTURBED PATIENTS, POSTPONE TREATMENT

In every practice there are patients with pronounced psychotic tendencies. For them we must carefully weigh our words because what is said is often misconstrued. It is easy to establish contact with some patients, whereas with others we never seem to totally win their confidence.

In order to avoid becoming involved, their case histories should be carefully appraised before undertaking treatment. Although there may often be no distinguishing hallmarks to identify mentally disturbed patients, their criticism of all their former dentists, regardless of their known skill and ability, should alert you. Establishing contact with their medical advisors can also be of considerable assistance. Refusing to be guided by this advice very often places you at the end of a long list of dentists who have been unsuccessful.

If you are doubtful as to whether to undertake treatment, especially if no form of restorative work has yet been undertaken, it is wise to postpone the starting date. For the past two and one half years, I have been postponing extensive restorative work for a middle-aged woman, whom I suspect has more of a mental than a dental problem. Although I do not deny the existence of a dental problem, as long as several able colleagues and I have not been able to identify it, it seems more intelligent not to subject her to any extensive restorative therapy. At present she manages to live with her symptoms, which I suspect are unreal. However, if some form of oral rehabilitation is undertaken and her interocclusal relationship is altered, these fancied symptoms could become real and this patient may become another unhappy victim of our experimentation without controls. We have no controls when these patients are launched on a major rehabilitation program.

The complexities which arise are endless. Some of these patients are able to analyze their own problems and even rationalize with themselves. During the period of the menopause or the climacteric, emotional disturbances often manifest

themselves. If there is any reasonable doubt, abstain from becoming involved in extensive prosthetic procedures at such a time. Remember that the same form of mental therapy may be necessary that the emotionally disturbed patient receives from a psychiatrist, and I repeat again that the overwhelming majority of dentists are totally unprepared to deal with these patients.

CONCLUSION

I have attempted a broad consideration of the subject, presenting some theories and many clinical facts. The approach has been entirely a dental one. There are about 4500 accredited psychiatrists in the United States, but there are more disordered lives than they can treat. Deep-seated emotional problems may be regarded as a constitutional disease for which the patient may not be responsible.* There is so much to be said about these emotional imbalances and their effect upon the oral tissues that I have only been able to bring this delicate subject from the shadows closer to the light. Much more can and will be done by you to expose it to further research at the clinical and laboratory level. If a prosthodontist has gone through his professional life without encountering such patients, he can consider himself fortunate. I recently listened to a colleague tell an audience that he would never again permit his patients to transfer their problems to him because they already had caused him to have two heart attacks. I wish it were as simple as that. As professional men, we are responsible for their dental problems and these are always tied, to some degree, with their neural responses. Although it would hardly seem fair to permit some few patients to absorb an unfair proportion of your precious time and energy, still the dividing line between the mechanical, physiological, and psychiatric areas is not easily defined. Until it is, we must continue to expose ourselves to these dangers in order to help others to a better understanding of the situation.

Case 1

Past history

In 1940 a young woman in her late thirties was treated. She was receiving injections for various ailments and was very tense. The upper molars had deep periodontal pockets. Except for these pockets there was no pathology disclosed by either clinical or roentgenographic examination. During the next four years the periodontal pathology became more advanced, and the pockets became vertical in outline. In 1944 the upper first molars were removed and replaced by means of two fixed partial dentures. By 1952 the remaining molars had to be removed because of continued periodontal pathology. No other area of her mouth was involved. She was still under medical care. Her condition was also made more difficult by a financial problem.

In December, 1952, a removable partial denture was inserted that replaced the upper right and left first and second molars. The work was executed carefully, and precision attachments were used as retainers. A mucostatic impression was

*Fosdick, Harry Emerson: Inner peace and how to build it, Reader's Digest, July, 1963, pp. 110-113.

taken in a specially constructed tray. The fixed and removable castings were related by means of separate impressions. Multiple abutments were used.

In 1959 a deep periodontal pocket developed associated with her right second bicuspid. Subsequently a periodontal abscess occurred. This had been incised and evacuated and the gums resected in an effort to retain the bicuspids. The prosthesis was removed and, with the approval of the patient, never again inserted. To the time of writing no further trouble had developed. The remaining portions of her mouth were in good condition.

Discussion

She was still under emotional stress. Her life had been disappointing. It was necessary for her to be employed because of continued financial pressures. There seemed to be some connection between her emotional background and her dental difficulties. However, why had pathology set in only in definite areas?

When first seen in 1940, she stated that a dentist had advised oral reconstruction in 1933. At that time it would have been unwise. Even now, it did not seem necessary. Although it cannot be denied that the periodontal pathology associated with the bicuspid abutments may have been caused by the traumatic pressures exerted by the removable prosthesis, still the emotional background could very likely have augmented the severity of the disease.

The molar periodontal pathology started long before the introduction of the removable partial prosthesis. In addition, her continued nervous tension and anxiety undoubtedly caused her to clench and brux. These noxious influences aided the destructive processes.

In retrospect it appears that the bicuspids would have been further strengthened by the inclusion of the canines as additional abutments. However, as these canines were already carrying small dummies to close original spaces between the lateral incisors and the cuspids, they were not available for use. The palatal design would also have been more extensive if there had been greater anterior coverage. This may have given indirect stabilization to the removable prosthesis and may have relieved the bicuspids of some of the occlusal load. These thoughts, however, are conjectures.

With the removal of the removable partial denture in 1959, the patient lacked the use of four upper molars. Although the loss of these teeth undoubtedly diminishes function, still the continued use of the prosthesis would result in the loss of the natural bicuspids. I feel reasonably sure that good judgment and good mechanical skill were exercised in the construction of the removable prosthesis. Therefore, of the two evils, the far lesser one seemed to be to leave out the prosthesis. Since its removal, the bicuspids fully recovered and were in good health. The patient was able to maintain adequate function without the molars.

Whether the lower molars will now extrude remains to be seen. In all probability this patient's emotional background played an important part in allowing the dental pathology to exert its noxious influence. (Figs. 1292 to 1301.)

No tangible proof is made available to buttress the position when one states that he believes dental deterioration takes place because of some psychosomatic condition. However, we are all aware that individual reactions and adjustments to life's situations vary greatly from person to person, despite the same or similar

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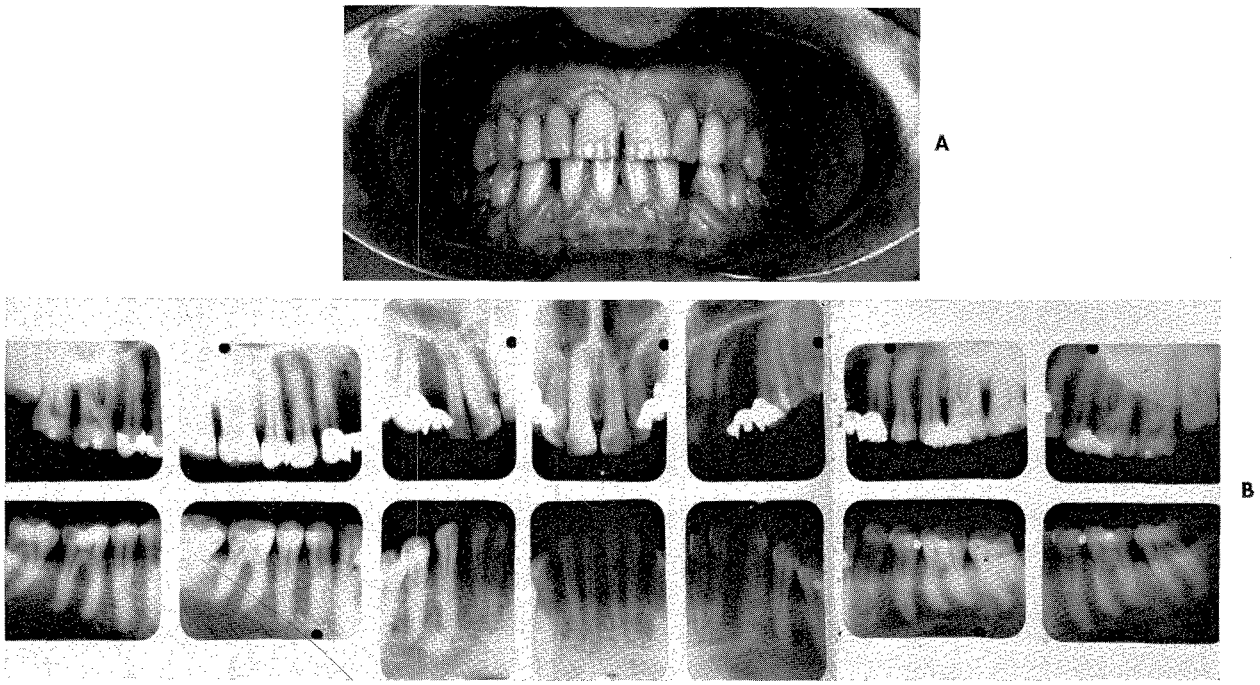


Fig. 1292. **A,** Front view of the teeth of a young woman. This photograph was taken in June, 1942. **B,** Roentgenograms taken in February, 1942. These were deep pockets associated with the upper first molars. The trifurcations were involved. (Figs. 1292 to 1301 are of the same case.)

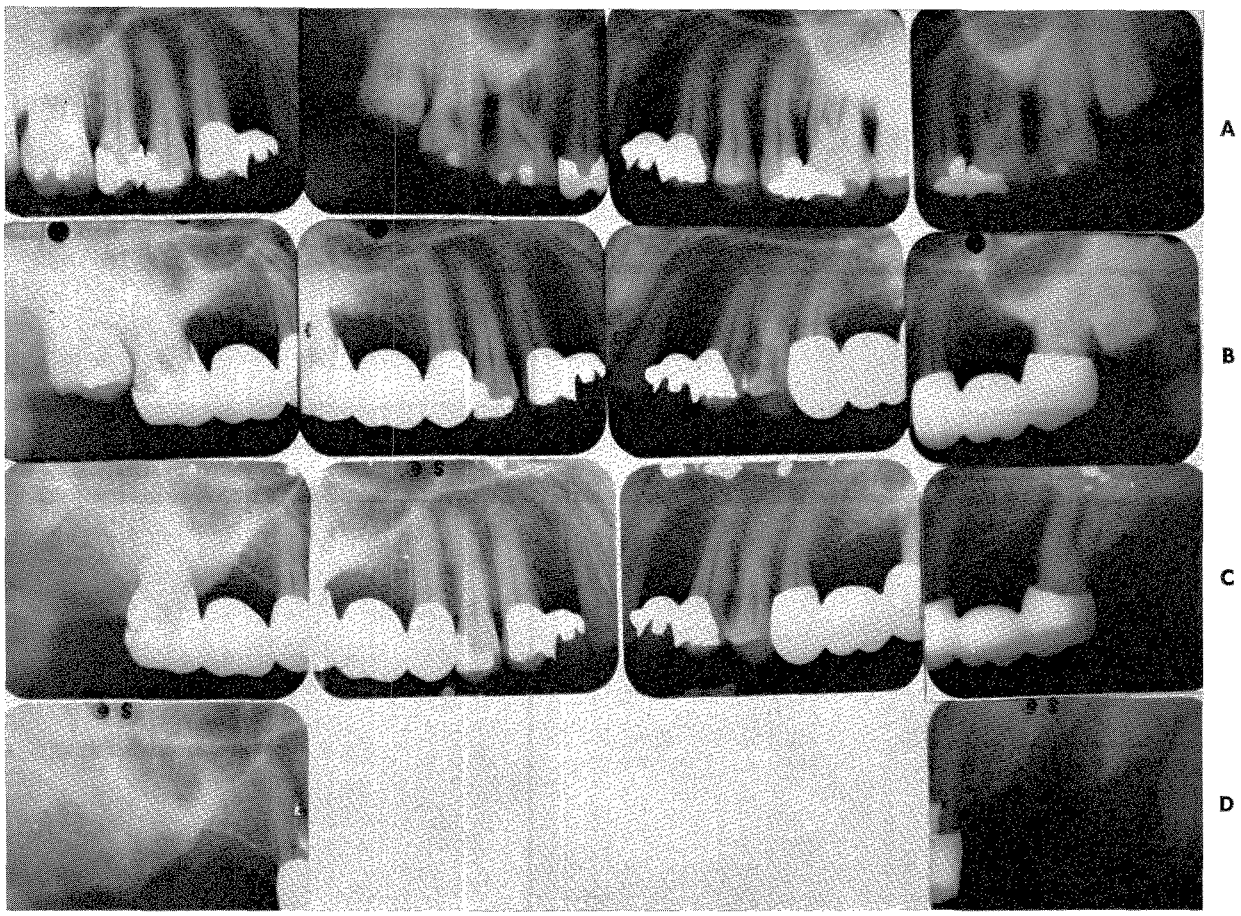


Fig. 1293. Roentgenograms showing the loss of the upper molars over an eight-year period. First the upper first molars were removed and replaced by fixed partial dentures. In 1952 the second molars were removed due to faulty periodontal tissues severely complicated by her systemic factor. **A,** May, 1944. **B,** September, 1945. **C,** September, 1952. **D,** October, 1952.

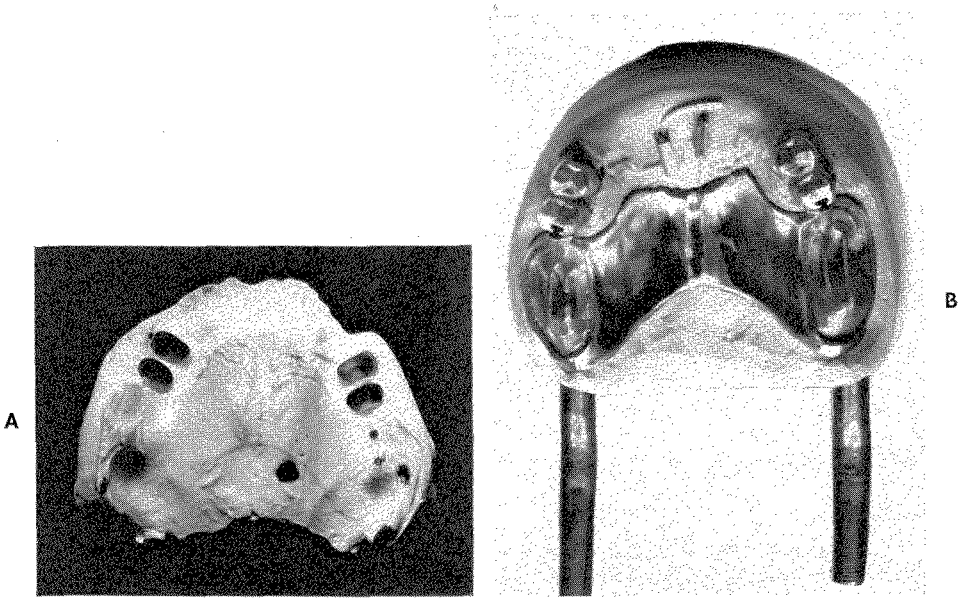


Fig. 1294. A, In November, 1952, the upper molars were replaced by a removable partial denture. This was made utilizing a modern technique. Double abutments were resorted to, and a mucostatic impression technique was employed. The special tray and the two-stage impression are shown here. Ackerman's impression paste acts as the lining. **B,** Precision attachments were used as retaining devices. The precious metal casting is shown here. It has not yet been related to the fixed parts.

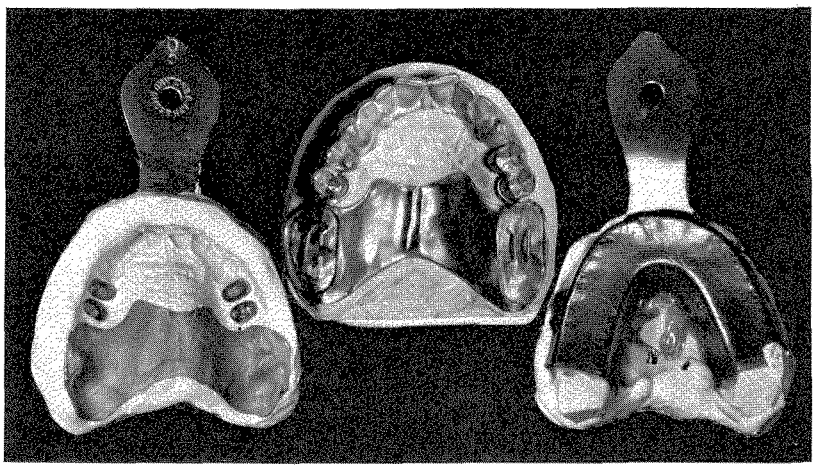


Fig. 1295. A, The plaster impression which serves to relate the fixed and removable parts. This is taken by placing the removable partial denture casting in the mouth together with the bicuspid splinted veneer crowns. A lower tray was used in order to permit the finger to hold the removable casting in position snugly against the palatal tissue while the plaster over-all impression is taken. **B,** This is the other side of the lower impression tray which is shown in **A. C,** The male attachments are now added. This shows the new working model. Lingual wire arms have been added to serve as tightening devices, making it unnecessary to open the male attachments in order to provide greater retention for the removable partial denture when it becomes necessary.

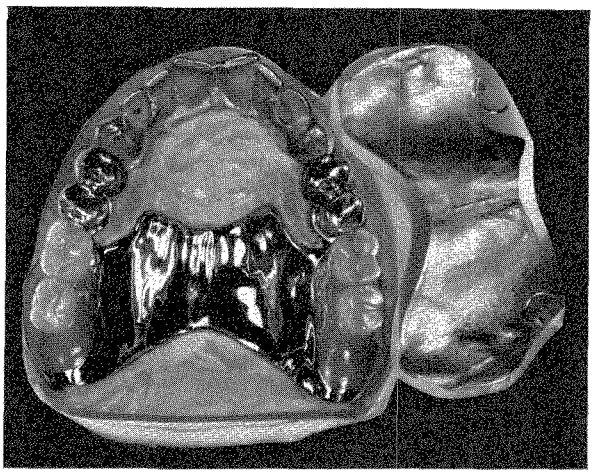


Fig. 1296. Tissue and tongue surfaces of the completed work. The tissue side remains unpolished.

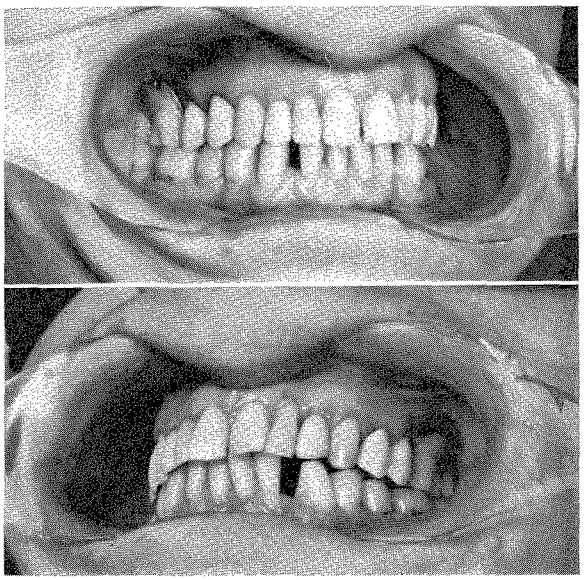


Fig. 1297. Right and left views of the completed prosthesis in the mouth. This was inserted in December, 1952.

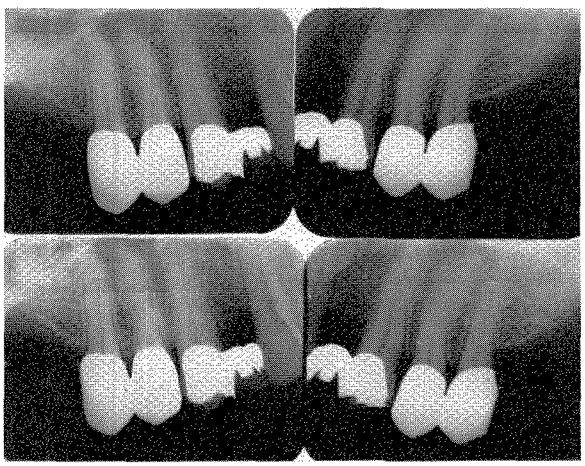


Fig. 1298. Roentgenograms of the fixed bicuspid abutments taken in December, 1952.

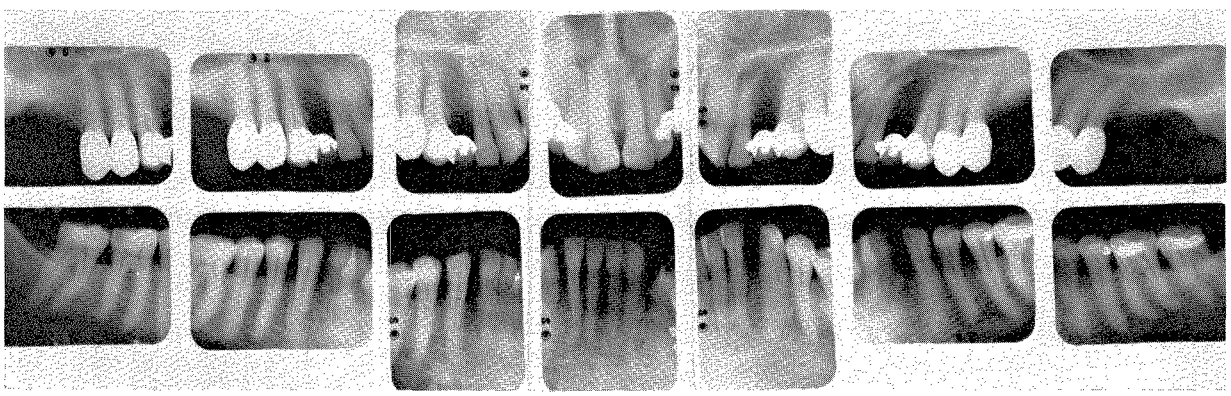


Fig. 1299. Roentgenograms of the mouth taken in May, 1953.

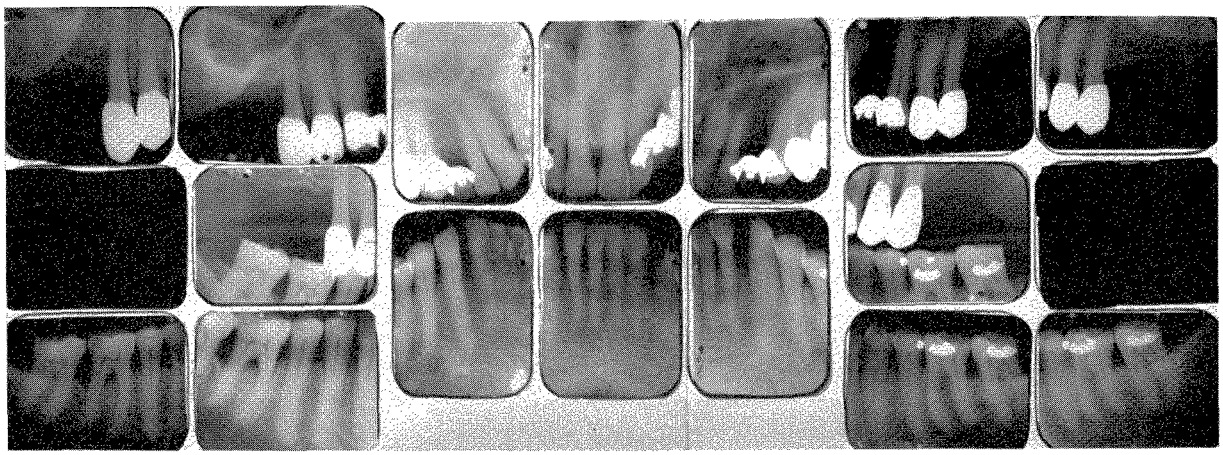


Fig. 1300. Roentgenograms of the mouth taken in April, 1962.

Fig. 1301. Front view of the mouth taken in 1962.

stimuli. Such ability to make adjustments is controlled by, and depends upon, the nervous system and the glandular secretions. Such secretions may cause caries if they are present in disproportionate flow or quantity for the normal needs of a given individual. Periodontal pathology may also be caused by a faulty blood supply to the oral tissues. It is in this area that definite knowledge is lacking. In many cases in which psychosomatic factors are involved, the formulation of suitable dental treatments and procedures is most difficult. For the present, our efforts to rehabilitate have not been entirely adequate to arrest the continued breakdown in cases dominated by psychosomatic factors and origins.

Case 2

A young woman came for dental treatment in 1936. She and a brother and sister, born in Europe, had been adopted by an American family. Her adjustment was never complete. She was nervous, timid, extremely sensitive, and afraid to assert herself. At the age of 47, she was unmarried and still unadjusted. Both her sister and brother were happily married. The extent of her dental deterioration is clearly demonstrated in the accompanying photographs and roentgenograms. At no time did she neglect her teeth. This seems to be clearly a case in which the psyche dominates the soma. (Figs. 1302 to 1305.)

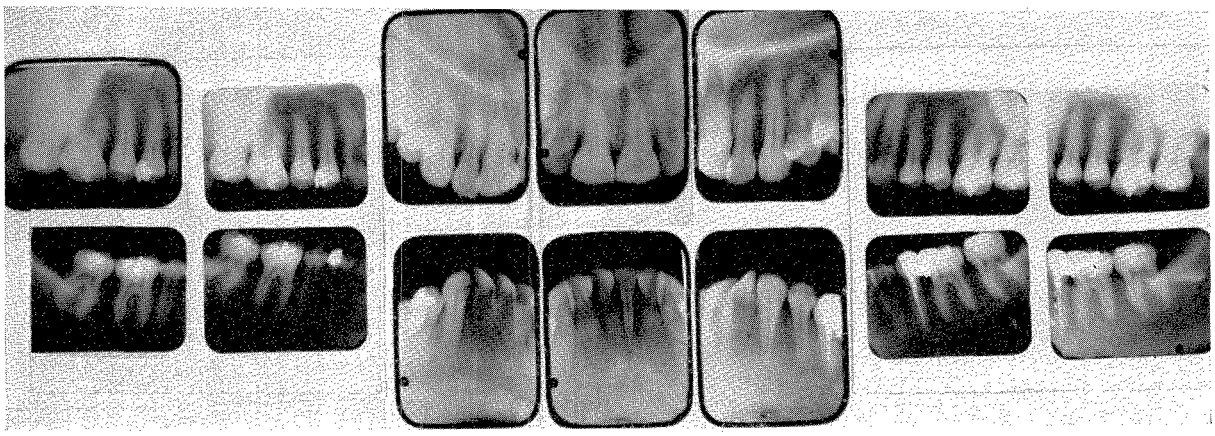


Fig. 1302. Roentgenograms of a 22-year-old female patient. These were taken in October, 1936. (Figs. 1302 to 1305 are of the same case.)

Fig. 1303. Roentgenograms taken in 1950. The patient was 36 years old. Observe the deterioration since 1936. (See Fig. 1302.)

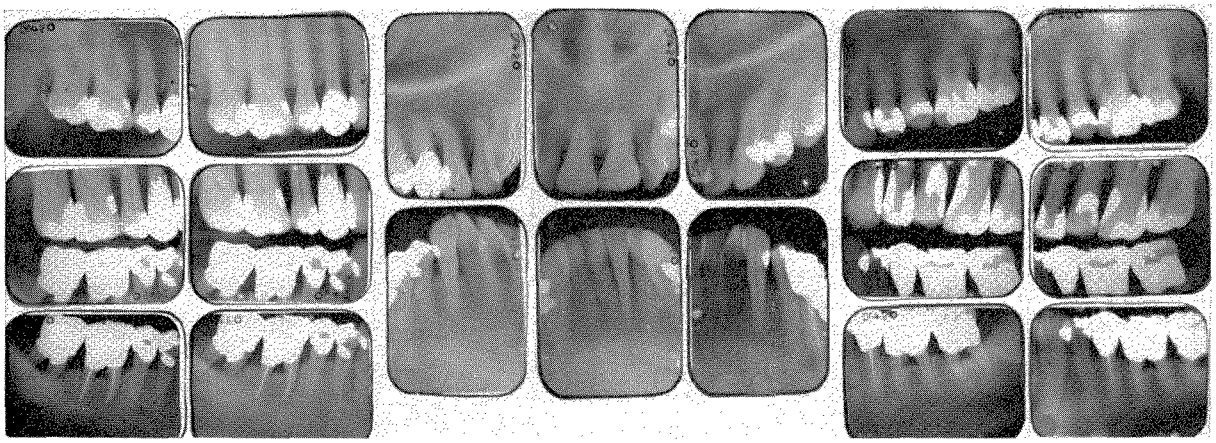


Fig. 1304. Roentgenograms taken in July, 1963. The patient is now 49 years old.

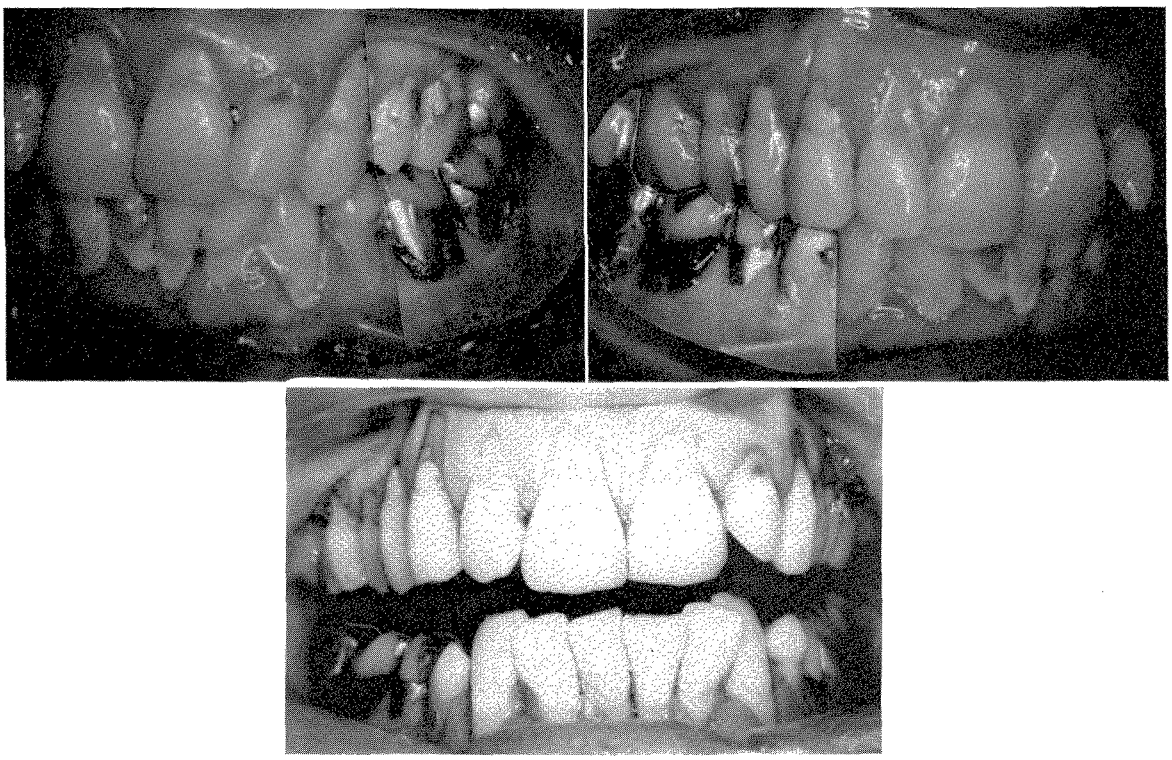


Fig. 1305. Left, right, and anterior views of the mouth taken in 1963.

Case 3

By contrast, the roentgenograms of her sister are shown. She was 50 years old (1963) and had excellent teeth and supporting structures. (Fig. 1306.)

Case 4

These different manifestations of neurosis can cause alterations in the glandular secretions and in the oral fluids. The glands of internal secretions can be espe-

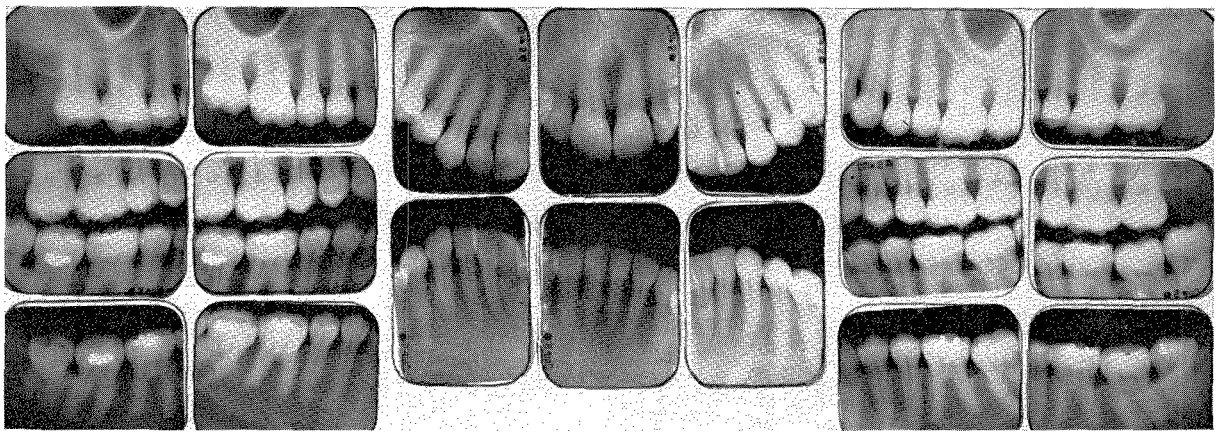


Fig. 1306. Roentgenograms of the sister of the patient whose photographs are shown in Figs. 1302 to 1305. She was 50 years old and had excellent structures.

cially affected. A case of caries due to emotional tension was reported in 1951.* In 1944, at the age of 40, this patient's teeth and bone structures were in excellent condition. No caries was evident, and no fillings were present. Four years later there were many inlays in the posterior teeth, and several incipient carious lesions were still present. During these four years the patient had been in a state of high emotional tension and under medical care which included shock treatment.

At the time of writing he was 58 years old and had recently had another serious problem of illness in his immediate family which had added to his already strained emotional state. We should expect subnormal results from these highly involved and complex mental conditions and should realize that our attempts at oral restorations were adversely affected by them. (Figs. 1307 to 1309.)

*Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., p. 686.

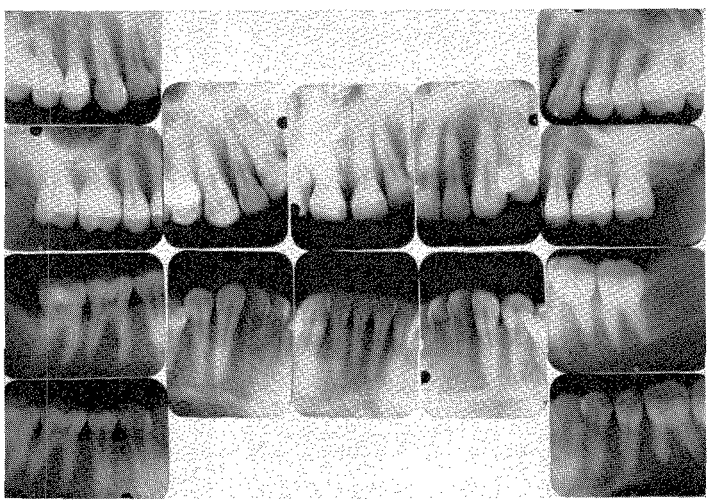


Fig. 1307. Roentgenograms of the teeth of a 40-year-old man taken in 1944. The teeth and bone structures are in excellent condition. No caries or fillings are present. (Figs. 1307 to 1309 are of the same case.)

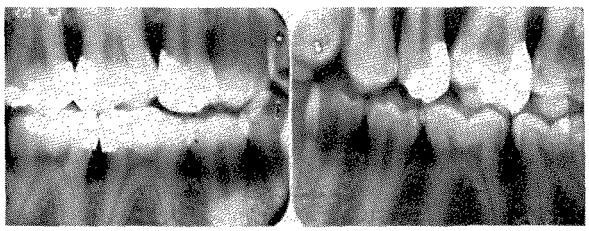


Fig. 1308. Roentgenograms of the teeth taken four years later revealing many fillings. The patient was in a state of high emotional tension and was under medical care. No other cause could be ascribed to this sudden active caries.

Fig. 1309. Roentgenograms of the teeth taken in 1962. The patient was 58 years old.

INADEQUATE ORAL HYGIENE AS RESULT OF NERVOUS BREAKDOWN

In cases of nervous breakdown, the dental hygiene is sometimes completely neglected. Where the teeth have been reconstructed, this absence of adequate oral hygiene may cause a disintegration of otherwise normal structures. Failure in these cases is unavoidable because of lack of patient cooperation.

Case 5

In the case that follows, treatment was started and completed in 1939. The structures remained healthy until 1950 when the patient suffered a nervous breakdown and had to be institutionalized. He received shock treatment and other forms of mental therapy. He was subject to long periods of depression. As a result of the psychoses, his oral structures had been subjected to deteriorating influences. His dental hygiene was completely neglected, and active caries rapidly destroyed the tooth structure. In delving deeper into the cause of the dental deterioration, the various drugs that these patients are given must always be considered as an etiological cause of the rampant caries. Some of these drugs act as diuretics and cause a lack of saliva. This, in turn, may affect the properties of the saliva to in-

hibit bacterial growth. Certainly, a dry mouth induces many patients to suck upon the many forms of tablets that contain concentrated refined sugars. Although this fact has been mentioned previously, it bears repeating because it becomes an insidious and dangerous destroyer of teeth. The result was a failure of the prosthesis after ten years of good hygiene and normal function. (Figs. 1310 to 1312.)

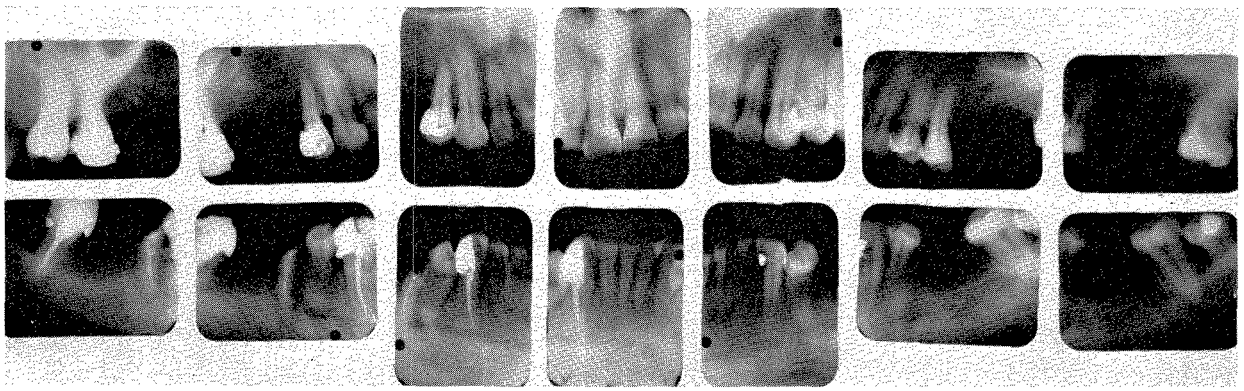


Fig. 1310. Rontgenograms taken before treatment was instituted in 1938. (Figs. 1310 to 1312 are of the same case.)

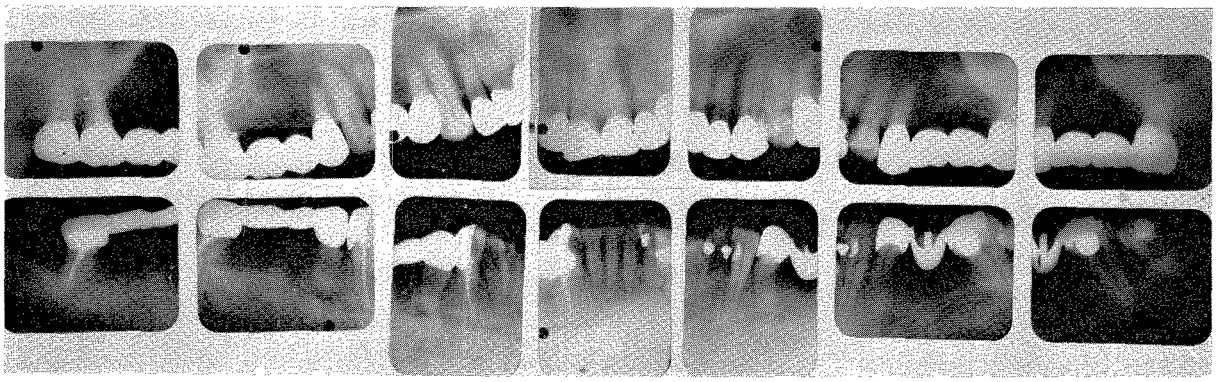


Fig. 1311. Roentgenograms taken after partial reconstruction was completed in 1939.

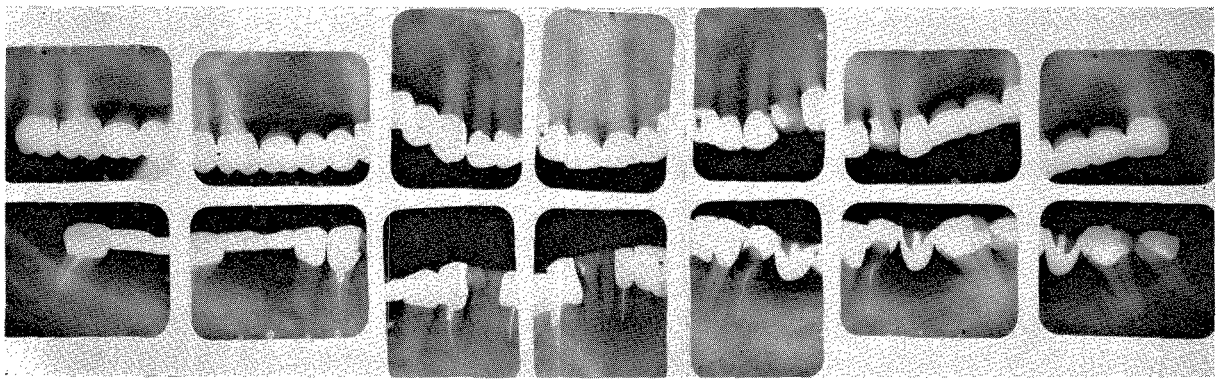


Fig. 1312. Roentgenograms taken in 1955 showing severe deterioration of the oral structures following mental depression and a lack of oral hygiene.

Case 6

There are people whose emotional problems have become so severe that the care of their mouth is unimportant. In 1949 a woman in her early sixties was treated by me. She had a clean mouth and had always taken good care of it. In spite of poor dental structures, her former dentists had maintained adequate function by the continued application of good restorative dentistry.

In 1954 she suffered a severe emotional shock due to the sudden death of her daughter. Whereas previously she had come regularly for dental treatment, now long periods would elapse without her paying any attention whatsoever to her teeth. In 1961 roentgenograms were taken. These revealed great deterioration. She insisted that all her teeth be removed. It was only by great diplomacy that this was avoided, even though many teeth had to be removed. Because of the emotional problem, only temporary work could be inserted.

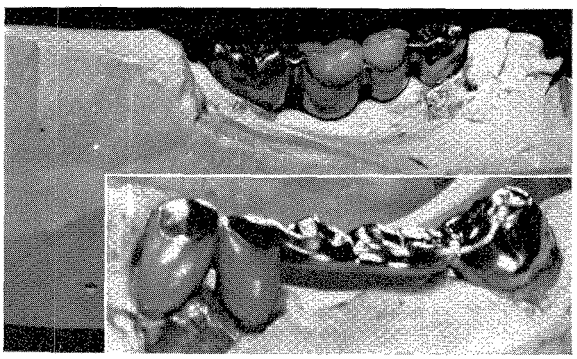
In May, 1962, she again sought relief of severe dental pain. Once again teeth had to be removed. The deterioration had made further inroads in the few teeth that remained. Her mental depression was apparent. She was totally indifferent to the care of her mouth. This patient in 1963 was in her mid-seventies. In February, 1963, the final lower tooth required removal. Its pulp was exposed by deep-seated caries. Pulp therapy was rejected. This is another case in which the deterioration of the dental organ was brought about primarily by emotional problems.

During her state of depression, this patient was placed upon the miracle drugs. For the previous eight years she had been taking a tablet daily of one or another brand of miracle drug. For the previous two years, she had been taking another drug three times a day. These or similar drugs were mentioned previously with respect to their possible effect upon tooth decay.

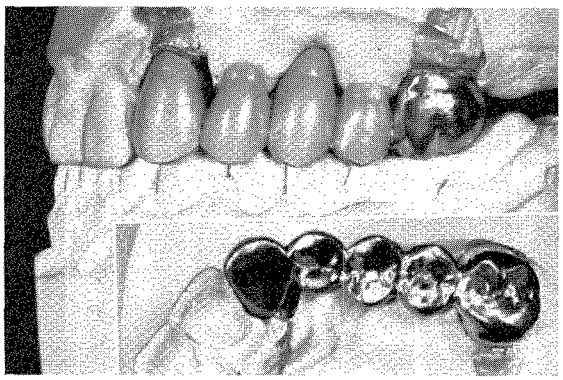
There is another important factor which must be considered in this case. It was discovered quite inadvertently that she consumed at least one roll of a certain type of lozenges daily in an effort to combat her dry mouth. This habit was now about five years old. Whether the absence of the normal amount of saliva came as a result of her depression is difficult to find out. The high refined

Text continued on p. 639.

Fig. 1313. Roentgenograms taken in September, 1949, when the patient first came for treatment at the age of 62. Her mouth gave every evidence of good dentistry and a great deal of care. (Figs. 1313 to 1320 are of the same case.)



A



B

C

Fig. 1314. In the following three years four fixed partial dentures were inserted. This provides additional proof of the care this patient took of her teeth. **A,** Two lower left bridges that were inserted, one in 1949 (upper), the other in 1954 (lower). **B,** This upper left fixed partial denture was inserted in 1951. **C,** This lower right fixed partial denture was inserted in 1953.

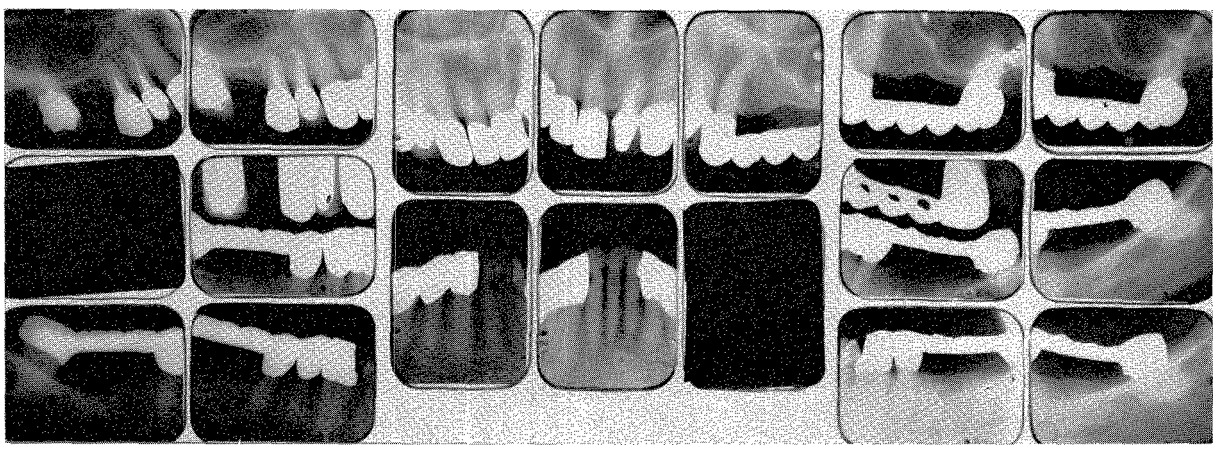


Fig. 1315. These are the 1957 roentgenograms. This patient was not seen from 1954 until June, 1957. The mouth had been neglected during this interval.

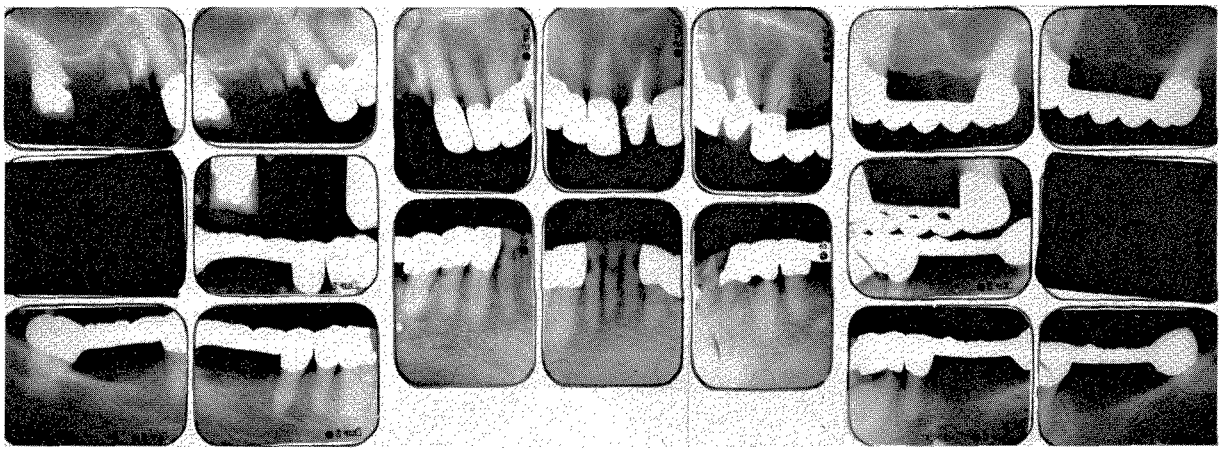


Fig. 1316. These are the 1961 roentgenograms. The patient was not seen from May, 1958, until March, 1961. The deterioration had progressed rapidly during this interval.

Fig. 1317. View of the mouth taken in March, 1961. This revealed the severe deterioration.

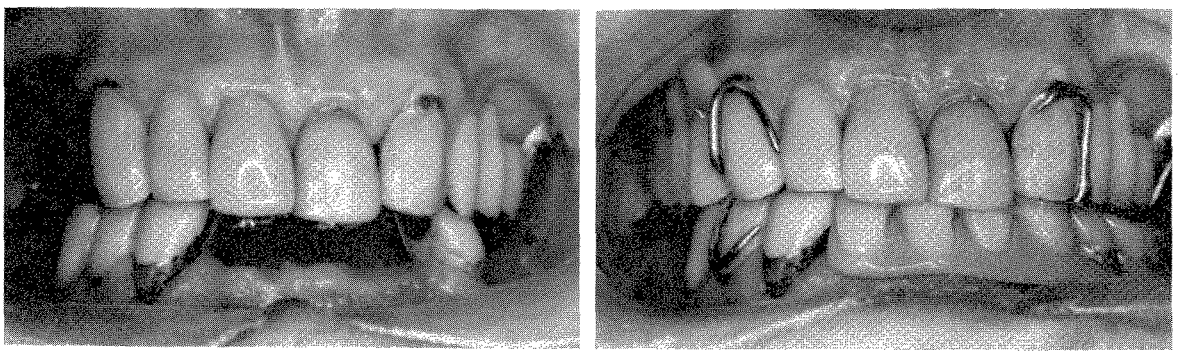


Fig. 1318. Many teeth were removed, and temporary removable partial dentures were inserted.

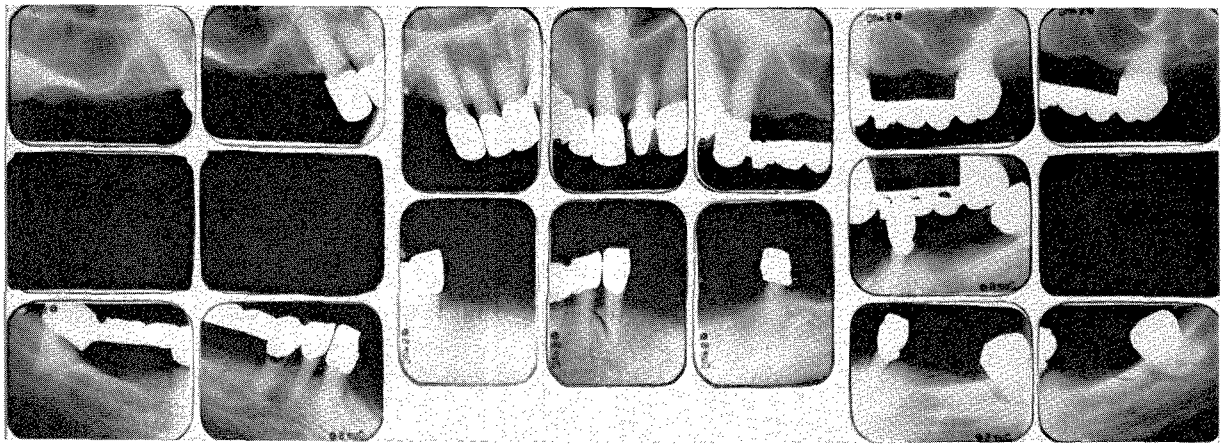


Fig. 1319. Roentgenograms taken in May, 1962, showing the continued deterioration.

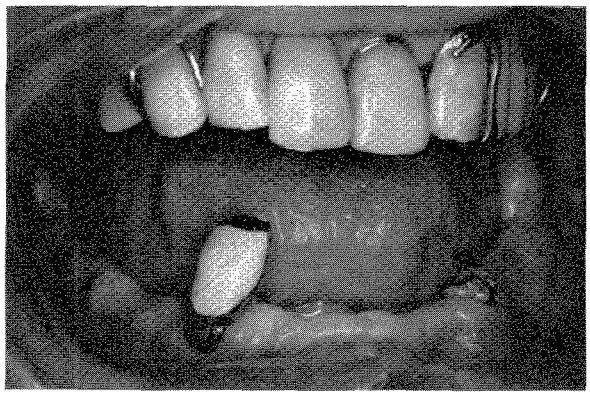


Fig. 1320. In 1962, all but two lower teeth remained, and these required removal. The temporary removable partial dentures were added to. The patient was 75 years old at this time.

sugar content of these lozenges, when dissolved slowly, seems the most likely cause of the rampant caries. The drugs helped by their diuretic action. Other cases in which the slow consumption of similar tablets in the mouth had also caused rampant caries have been reported (pp. 846 to 852, Figs. 1688 to 1700). There are undoubtedly many others. The patient is apt to place so little importance upon these apparently inoffensive lozenges that this pernicious habit escapes detection. (Figs. 1313 to 1320.)

Neurosis may be augmented by nutritional imbalance and, in women, by the menopausal reactions. There probably is no one cause but rather a series of interrelating determinants.

Case 7

In 1951 a case was reported in which a lingual bar with a flat posterior acrylic surface was employed to depress the right saddle area and provide sufficient room to replace the lower right posterior molars.* The work was undertaken and suc-

*Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., pp. 829-831. (Also refer to Figs. 701 to 707, pp. 323 to 325 of this book.)

cessfully completed in 1946. Her 1948 roentgenograms show healthy normal structures.

In 1952 this patient suffered from mental depression. She received shock treatment and other forms of therapy. Unlike the previous patient, she was acutely aware of her oral hygiene and gave it daily attention. The result is that although the caries was severe during the ten-year period from 1952 to 1962, still the teeth were cared for by inserting fillings, gold inlays, and crowns during her normal periods. The patient was in her mid-fifties at the time of writing. In cases such as these the altered salivary secretions and blood constituents attack the most accurate margins of all of the restorations. Where the hygiene is poor, these altered blood and glandular secretions cause rapid deterioration because they are able to act upon an already weakened organ. (Figs. 1321 to 1330.)

Fig. 1321. Roentgenograms taken in 1946 before treatment was started. (Figs. 1321 to 1330 are of the same case.)

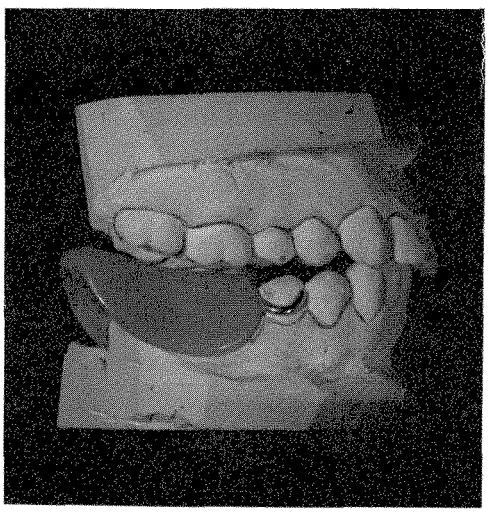


Fig. 1322. Right-side view of the models of the teeth of a 40-year-old woman. The space for the replaced molars was too short vertically to replace them. A bite plate was made in the form of a lingual bar with an acrylic saddle that was supported by the right second bicuspid and the left second bicuspid and molar. The occlusal surface of the right saddle was flat and engaged only the upper two molars. The rest of the teeth were not in contact. This bite plate was worn at night and during the day when possible, but not during meals.

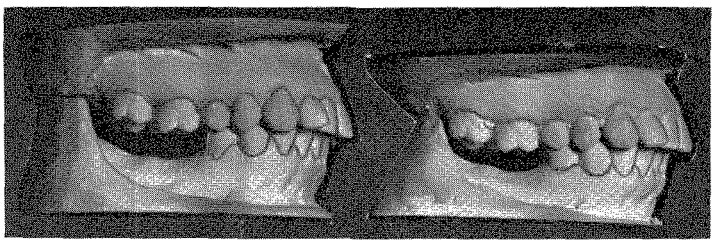


Fig. 1323. In two months' time the amount of tooth and tissue depression is indicated in these two models at the start of treatment (right) and two months later (left).

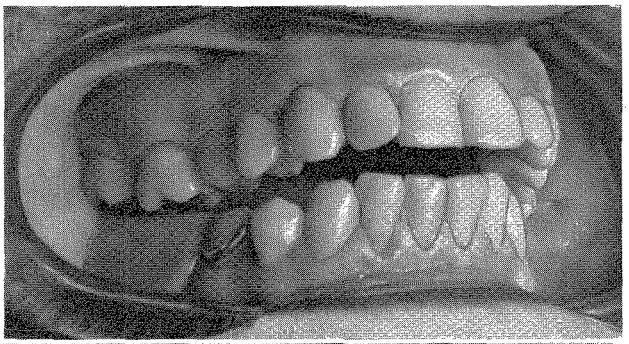


Fig. 1324

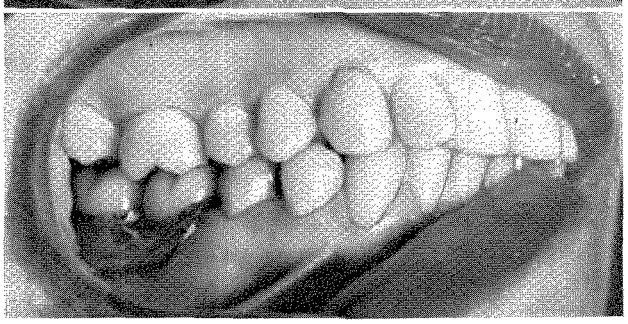


Fig. 1325

Fig. 1324. Here the lingual bar is shown in the mouth only contacting the upper right molars. By sloping its surface the direction of the molars can be guided.
Fig. 1325. A lower precision removable partial denture was then inserted. The upper molars did not have to be ground back (1946).

Fig. 1326. Radiographs of the mouth two years after the completion of the work (1948).

Fig. 1327. Roentgenograms taken in March, 1952. These were taken just prior to the patient's suffering from mental depression.

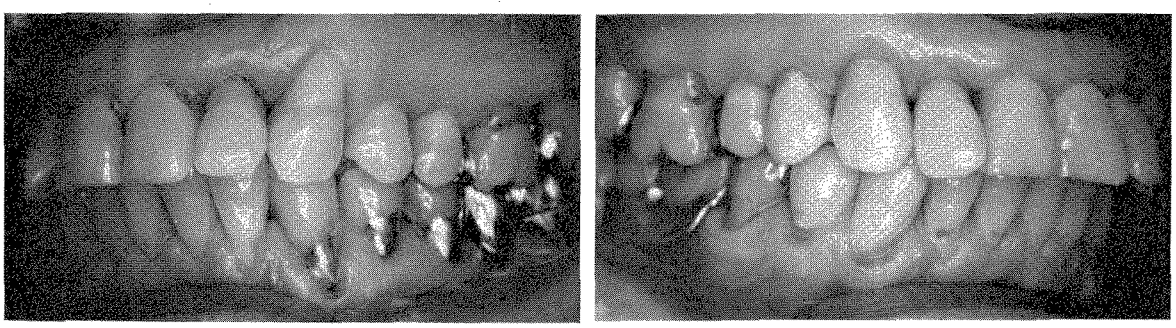


Fig. 1328. Two views of the mouth taken in 1962. Observe the numerous fillings.

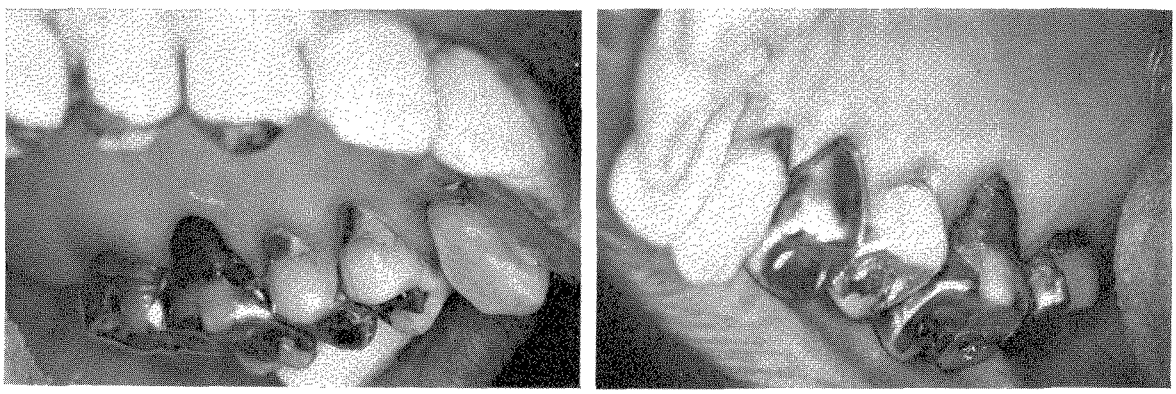


Fig. 1329. Right and left upper posterior teeth showing their lingual surfaces to demonstrate the cervical fillings due to rampant caries. (Read text.)

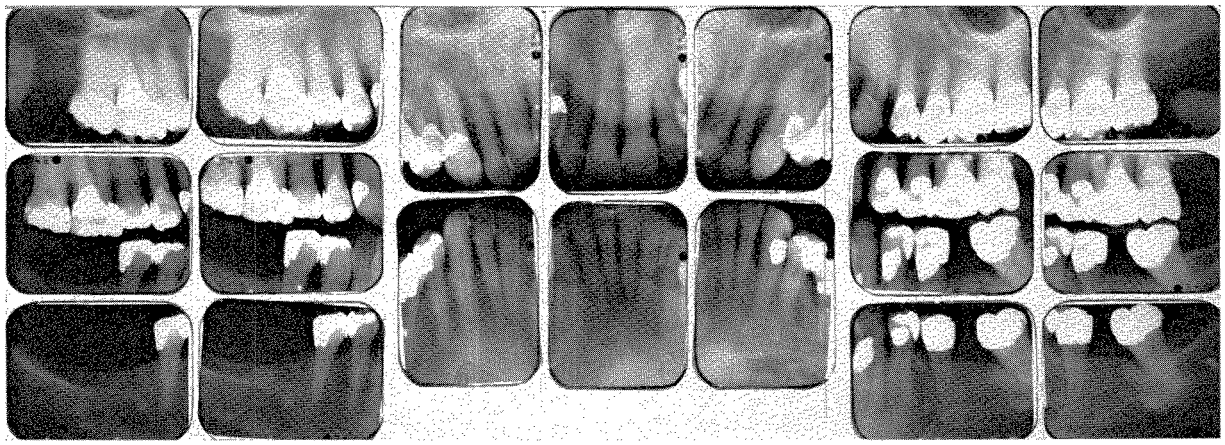


Fig. 1330. Roentgenograms taken in 1962 showing the large amount of fillings. Compare this with the radiographs that were taken in 1946 to 1952.

EFFECTS OF NEWER DRUGS AS TOOTH DESTROYERS

Another important factor that must be considered in this case is the drugs which this patient consumed during her illness. Of the tranquilizers, she took 1 mg. of one brand and one half tablet of another three times a day for at least one and one half years. She also took two tablets each day of two other drugs.

Since her depression there had been a decided lack of saliva. This may be caused by the drugs she had been taking. This lack of saliva caused the patient to resort frequently to mint-flavored and fruit-flavored lozenges. At least one half of a pack a day of these lozenges had been consumed. This concentrated refined sugar was also responsible for the decalcification and subsequent decay of so many teeth.

The drugs may act as diuretics and as such may cause excessive urination. In doing so sodium and potassium may be removed and the body left acid. The excretion of more calcium than would otherwise take place may also be a factor in causing the rampant caries.

These drugs which inhibit the flow of saliva also destroy the power of the oral bacteria to act against the organisms responsible for caries. Elfenbaum stated that "the buffering action of saliva against the cariogenic activity of oral bacteria is hindered."* Rampant caries of the soft type is the result. We now have three causes for the extreme caries seen in many of these patients:

1. The dry mouth induces the patient to suck upon some form of lozenge which contains refined sugar.
2. The bacteria that form part of the oral defense in the saliva are absent.
3. The dry mouth makes the moistening of food with saliva difficult. Swallowing is also hard to perform. As a consequence, more food sticks to the teeth, with the resulting decay. Atropine sulfate, which is administered by dentists and medical doctors, also causes a dry mouth and indirectly is responsible for excessive caries. Some of the drugs prescribed for high blood pressure cause a dry mouth with caries as a side effect for the reasons stated above. Patients who have been

*Elfenbaum, Arthur: Medication taken by your patient may produce deleterious side effects involving the teeth and oral tissues, Oral Hyg. **52**:38-41, 1962.

irradiated for therapeutic purposes may have the salivary glands affected. This may produce not only a dry mouth but also a softening of the tooth structure. This form of softening affects the root and the crown, and the caries produced by it is difficult to treat.

Cortisone and its related drugs, if continually used, cause an osteoporosis. This can affect the oral tissues and make the treatment of periodontal disease difficult if not impossible. Osteoporosis is a softening of the bone.

DENTAL PROBLEMS CREATED BY THE AGING PROCESS

Aging has its problems, but we are all aware that some people age more gradually than others. Their changes are more subtle and less drastic. In women the problem of aging can be greatly influenced by the menopause. This, in turn, can cause mental depression. Therefore, when generalized dental breakdown becomes apparent, it may be from a combination of causes.

Case 8

The following case report will serve as a demonstration. The difference in the time element is thirty years. Mental depression played some role during the previous ten years, as this patient lost her parents, a young brother, and her husband during this period. Her sister had been institutionalized with schizophrenia. She felt alone and unprotected. This case is somewhat similar to the one just reported except that this patient had no definite mental breakdown. In both cases rampant caries were present, including palatal cervical erosion caries. This subject was more neglectful of her mouth than the previous one because of a fear of dental treatment. At the time of writing she was 66 years old (1963).

In this patient's history report the following facts were disclosed. In 1955, during a period of depression, she took ¼ gr. phenobarbital three times a day for several months. This patient also ate a great deal of candy, especially chocolates. In addition, for many years she had been eating sour balls and peppermints on

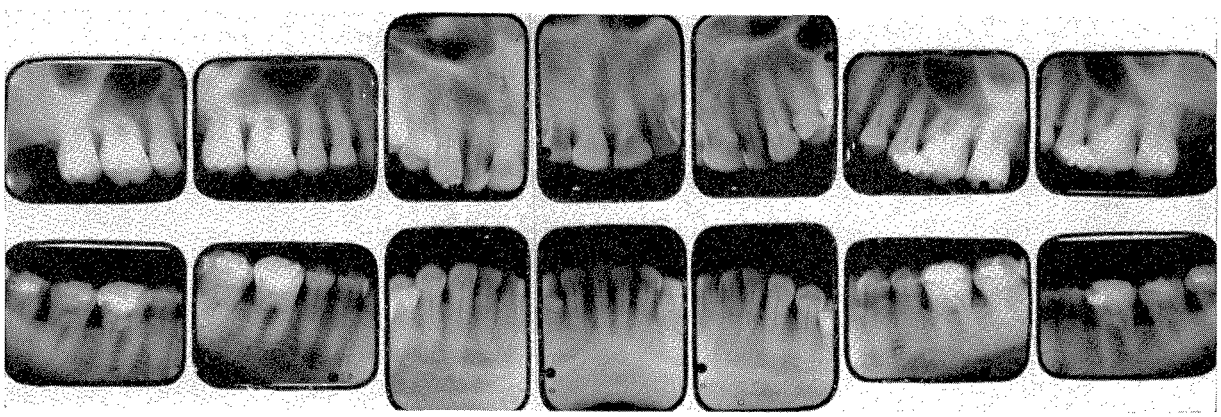


Fig. 1331. Roentgenograms taken in 1934 of a 37-year-old woman. (Figs. 1331 to 1334 are of the same case.)

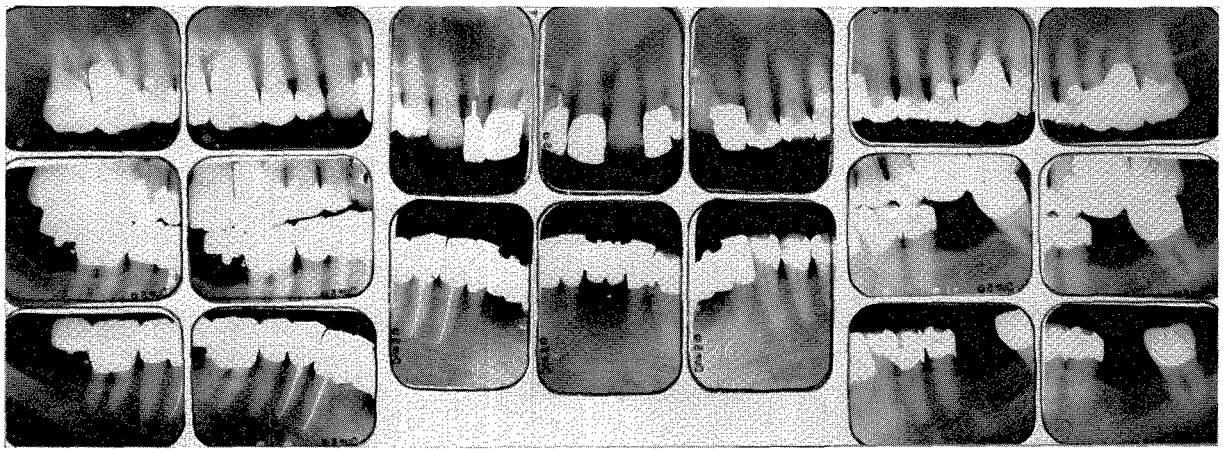


Fig. 1332. Roentgenograms taken in December, 1962, at the age of 65.

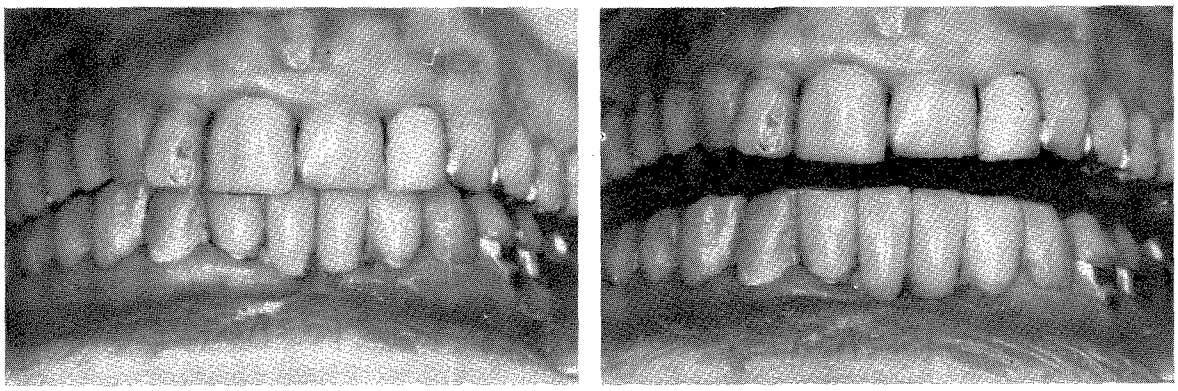


Fig. 1333. Two views of the mouth taken in 1961.

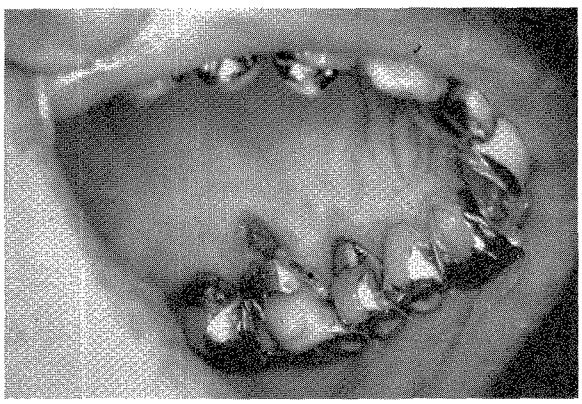


Fig. 1334. The lingual aspect of the upper left posterior teeth indicates the type of cervical caries that this patient presents. This was taken in June, 1962.

an average of two a day. These are kept in the mouth until they are dissolved. When a final appraisal of the causative factors of the insidious form of caries which is present is made, all of these things must be given serious consideration. (Figs. 1331 to 1334.)

Any experienced dentist can tell when he is dealing with a patient who is emotionally disturbed and unduly tense. Some of these patients have periodontal disease, whereas others are free from this pathology but display acute caries. Acute caries should not be present in adults over 30 unless some distinct change has taken place in their modus vivendi. A complete change of diet or a specific disease may be a cause. In other patients, when active caries occurs in the forties and fifties, some reason for it may be found in emotional disturbances. Such disturbances are not always evident on the surface, but constant dealings with this particular type of patient will usually reveal the hidden undertones.

Case 9

Past history

In January, 1958, a 28-year-old woman presented herself for dental treatment. Her parents were patients of many years' standing. They always had a difficult time with their daughter trying to solve her emotional problems. Psychiatric treatment was started at the age of 6. She had difficulty in school and had been sent to several schools which specialized in treating emotionally disturbed children. At one period during her teens she lived at the home of a psychiatrist for two and one half years. At the age of 20 she married against the wishes of her parents. She continued to have psychiatric treatment during her marriage. In 1958 she separated from her husband and lived alone with her daughter. From 1958 to 1960 she was again under psychiatric treatment.

Present condition

When she was first examined in 1958, her teeth were in very poor condition. The lower left bicuspids had been removed. The lower anterior teeth were crowded. Several teeth were carious, and a deep vertical overbite was present. The lower anterior teeth gave evidence of a chronic Vincent's infection which the patient's history verified. She recalled having been treated for a Vincent's infection in her late teens.

Treatment planning

Realizing the difficulties of undertaking a case of this nature, the first step was to win the confidence of the patient. This was accomplished by sympathy and perseverence. One never knows at what stage in the treatment patients with this type of emotional background simply discontinue. A very fortunate aspect was the support and confidence of the parents. To add to the disturbed emotional background further was the fact that the patient had already been married and divorced and had a young child to care for.

The decision was made to do this rehabilitation in sections with a minimum of trauma. The patient was anxious to have the best esthetic result and favored

the straightening out of the lower anterior teeth. The lower left central incisor had a large portion of its labial root surface exposed. In the course of treatment this tooth was to be removed and the remaining anterior teeth moved into more favorable positions.

Treatment

Treatment was undertaken in January, 1958. The vertical dimension was not changed. Her former occlusal pattern was followed, making those modifications that were possible during the construction of the fixed partial prosthesis and individual restorations. The right side was completed first. The anterior irregularities were corrected by extraction and orthodontic treatment. The left side was then completed. The retainer was not removed until eight months after the insertion of the original orthodontic appliance. The work was finished in November, 1958.

Discussion

If the original photographs are examined closely, evidence of a chronic Vincent's infection may be detected. What part the emotional disturbance may have played is not certain, but this also must be considered. In the completed photographs taken in November, 1958, and also in March, 1959, more definite evidence of periodontal disturbance may be detected.

Even though the case was carried out by means of a comparatively simple technique, the results compare favorably with those attained by a more elaborate technique. A well-coordinated working bite was obtained on both sides. The protrusive bite had simultaneous contacts between the four upper and the six lower anterior teeth.

Although the anterior vertical overbite seems to be the same before and after the reconstruction, actually it may have been increased a small amount. However, it was so small as to be negligible.

Postinsertion events

The patient came regularly until September, 1960. Although she tried to maintain good hygiene, the results were unsatisfactory, and she had to be reminded constantly to do her dental homework more effectively. In 1960 she was referred to a periodontist. However, even with the cooperation of her parents, it was impossible to get her to start treatment.

From September, 1960, until June, 1962, this patient was not seen, although every effort was made. Only in June, 1962, was she persuaded to return for examination. The deterioration progressed much further, and the periodontal pathology made large inroads into the alveolar bone.

Many factors enter into a case of this nature, and several intelligent questions may be asked. Should her bite have been raised at the time the orthodontic work was done in order that the anterior vertical overbite be reduced? Would that have been effective in arresting the periodontal disease? Had her emotional background been instrumental in the dental breakdown? Should more elaborate means have been employed to rehabilitate this mouth?

The following statements were taken from a recent letter from her psychiatrist:

"I have known _____ since August, 1957, and all her illnesses have been primarily psychological ones.

"I saw her again after a long lapse of time, namely, from 1958 to when I saw her on Aug. 15, 1962. At that time she came with the problem of recession of the bony structure in her jaws and a loss of fourteen pounds in the last three months. The details of the jaw recession, I am sure are well known to you. The loss of weight in the past three months has been on the basis of her marked emotional disturbance due to her current emotional problems.

"The only other complaint was a marked sense of fatigue associated with the weight loss, but fatigue, of course, is one of the hallmarks of emotional disturbance.

"In summary, I feel that the dental problem with which she presents is not a metabolically based one and have suggested the possibility of reintroducing psychotherapeutic care for which there are quite strong indications."*

Present treatment planning

After considering all factors involved in August, 1962, the following prescription was decided upon. The vitality of the lower left second molar would be checked. If this tooth were still vital, then the lower left first molar would be devitalized and its mesial roots filled. Its distal root would be removed. A new fixed bridge would be constructed to extend from the lower left cuspid to the lower left second molar. By removing the distal root of the first molar, there was some slight possibility of the deep vertical periodontal pocket being eliminated.

On the right side the lower first molar would be removed. A fixed partial denture would then be inserted to replace this molar, using the bicuspids and second molar as abutments. In this manner the deep vertical pocket between the molars would be eradicated. An alternate method would be to remove the second molar and to cover the eroded and carious distal surface of the first molar by means of an inlay or a crown. Although the vertical periodontal pocket would be eliminated by this latter method, the second molar would not be replaced.

There were the usual delays which were encountered in the previous treatment. This time, although treatment was recommended in midsummer, nothing was done until late November, when the left first molar was devitalized. In December its distal root was removed.

In January, 1963, the second molar and the mesial half of the first molar were prepared for full crowns. The gum was cauterized around the second molar to provide more room for the clinical crown. The alveolar ridge between the first and second molars was contoured. The cuspid was prepared for a full crown. In April, 1963, the bridge was inserted (see Fig. 1348). In February, 1963, the following letter was sent to her parents:

*Personal communication, Nov. 2, 1962.

Dear Mr. _____:

I think it proper to confer with you relative to _____ dental treatment. We are not having an easy time due to her emotional problems, which I believe are being triggered in her mouth. I have consulted with her psychiatrist and was informed that he also felt that her dental trouble stems from her emotional stresses. At present I have undertaken the restoration of her lower left side. At first an attempt was made to salvage a part of the old bridge which was inserted a little over four years ago, but this is not possible. She suffers from a deep-seated periodontal problem (gums). Since we started in August, 1962, we already spent fourteen sessions on this section of her mouth. _____ tries very hard, but keeping her appointments on time and sometimes keeping them at all is not easy for her. We are progressing slowly. My associate is helping me in order to expedite the work. The bridge will be fixed and extend from the left cuspid to the last molar, restoring in effect the entire lower left side.

What concerns me is the future prospect of her mouth under the prevailing conditions. I have suggested a periodontal specialist as long as four years ago, but _____ has never accepted this suggestion. The lower right side is still to be considered, as is the upper right and left sides. I can only consider these areas when I have completed the work on hand.

Please call me if you wish to further discuss this problem. We get along with _____. We try to be sympathetic and understanding. It is the only possible way to accomplish anything in her mouth. I can't be sure of the longevity of my restorative work because we are dealing with insidious etiological factors about which we are not too familiar. I can only promise my best efforts, and you may be sure I will make every effort in that direction.

Sincerely,

(Signed) _____

Text continued on p. 654.

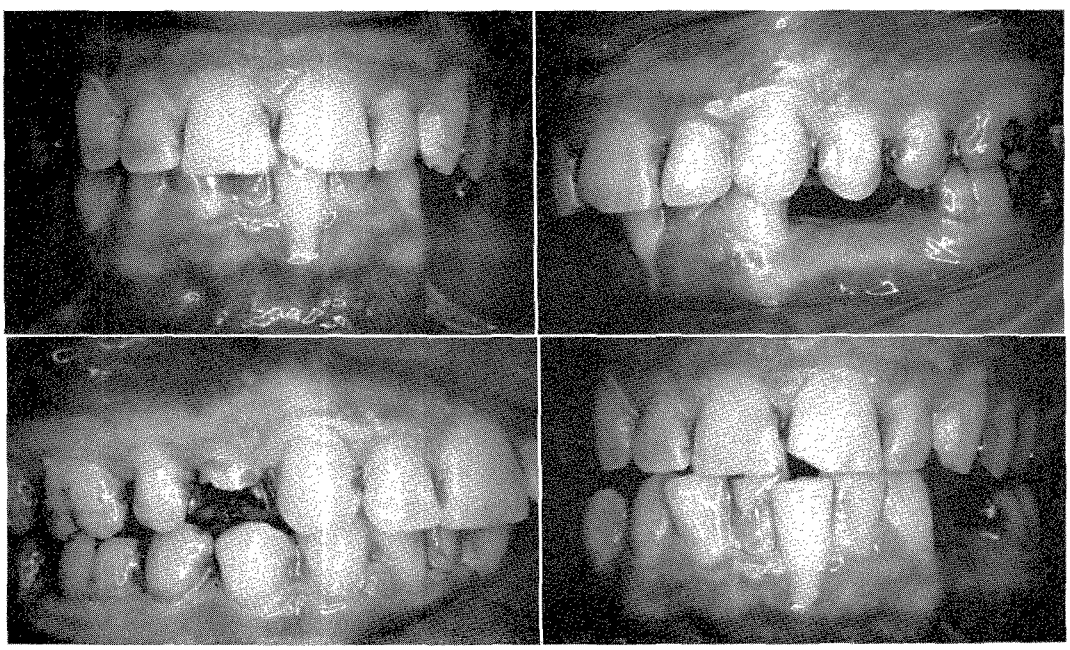


Fig. 1335. Four views of the mouth of a 28-year-old woman. These photographs were taken in January, 1958. (Figs. 1335 to 1348 are of the same case.)

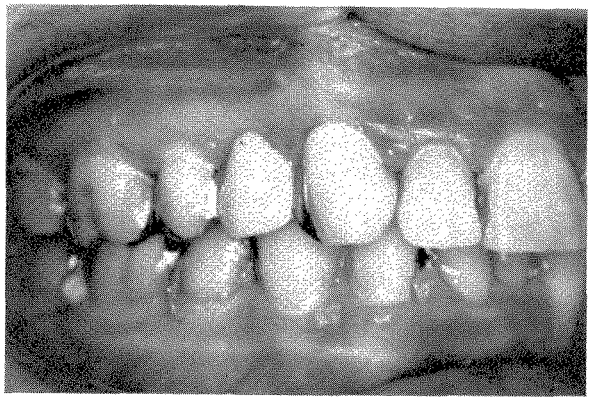


Fig. 1336. The upper and lower right side were completed first. The lower teeth were restored by gold inlays, whereas the upper teeth were restored by gold inlays and a fixed bridge to replace the first bicuspid. Observe the unhealthy condition of the periodontal tissues due to poor hygiene and a former Vincent's infection plus the emotional factors.

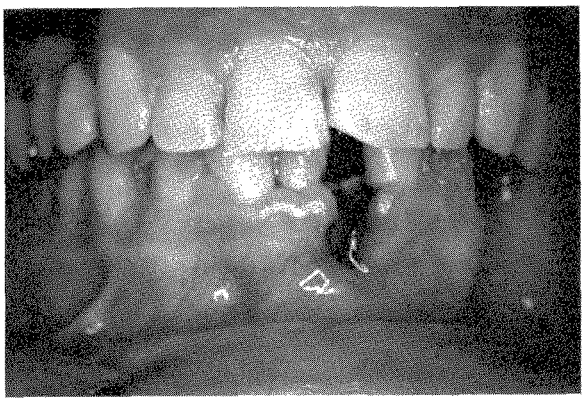


Fig. 1337. The lower left central incisor was removed.

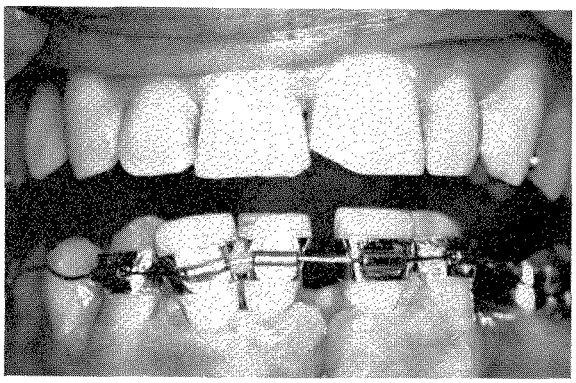


Fig. 1338. An orthodontic appliance was inserted immediately, on July 26, 1958. The orthodontic treatment was performed by Dr. Alexander Sved, New York, N. Y.

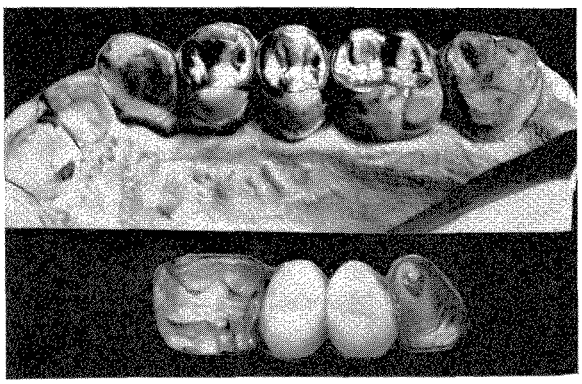


Fig. 1339. Four gold inlays were inserted in the upper left teeth. The fixed partial denture shown in the lower photograph was inserted to replace the missing lower left bicuspids.

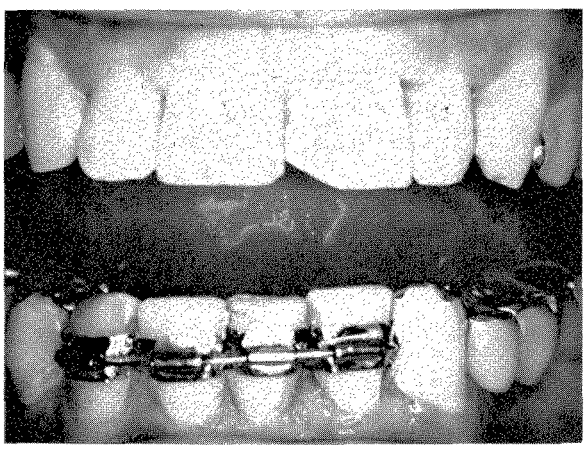


Fig. 1340. By Nov. 20, 1958, the orthodontic treatment was completed. The retainer is shown in this photograph.

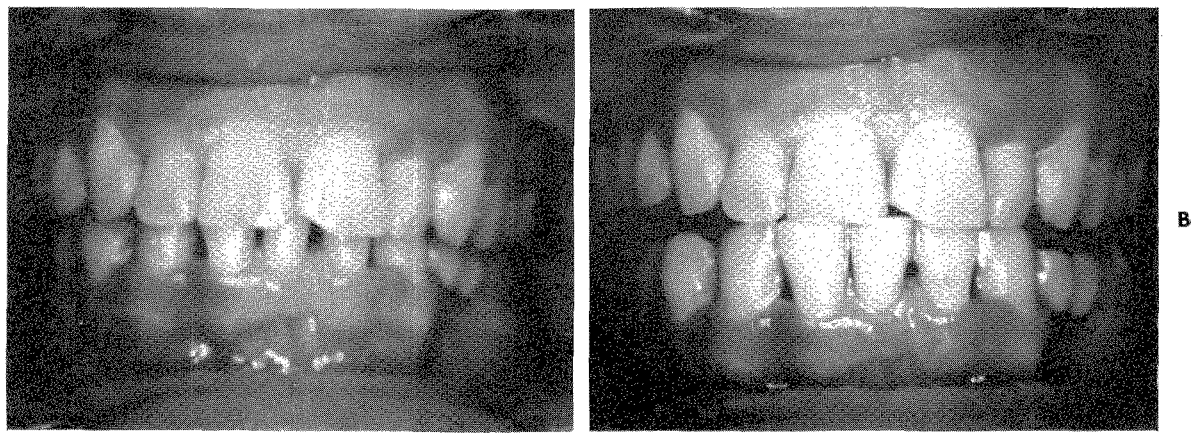


Fig. 1341. In March, 1959, the entire work was completed. **A,** Front view, centric occlusion. **B,** Front view, teeth parted.

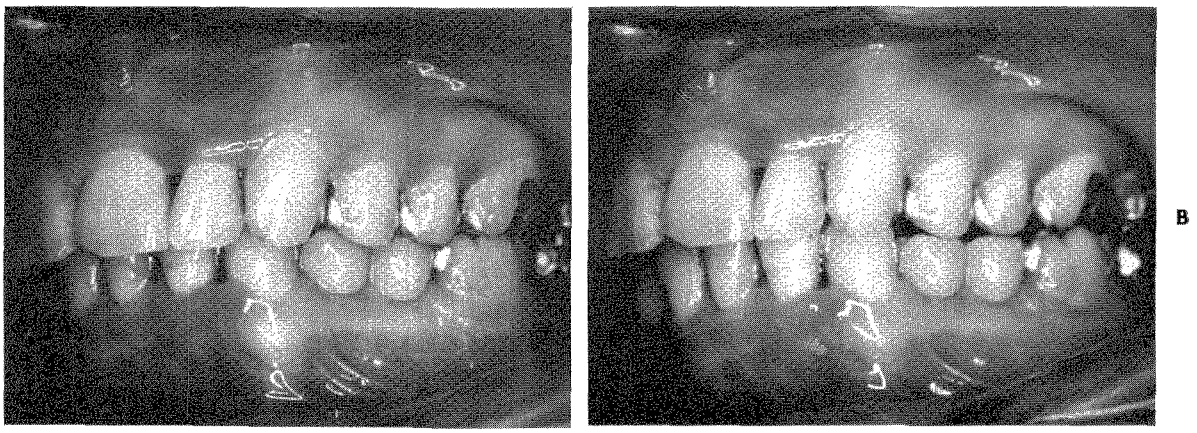


Fig. 1342. A, Left side, centric occlusion. **B,** Left side, working bite.

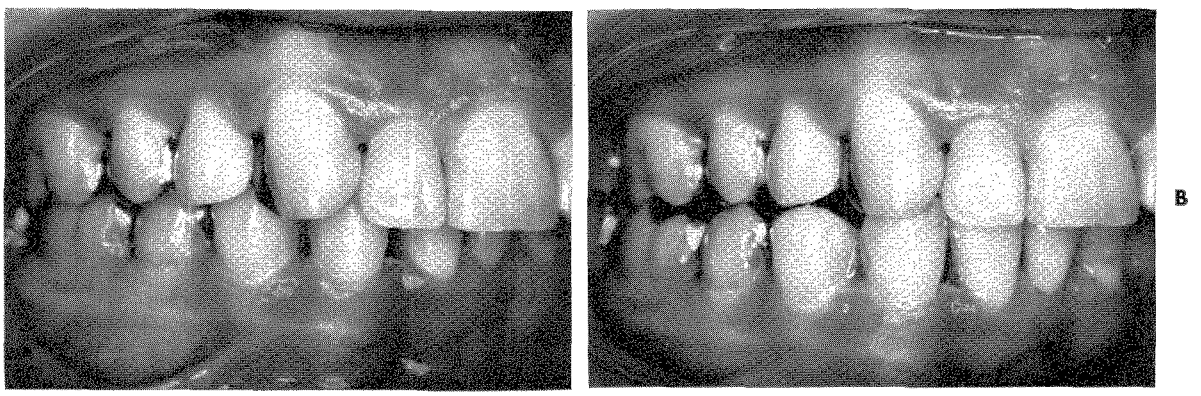


Fig. 1343. A, Right view, centric occlusion. **B,** Right view, working bite.

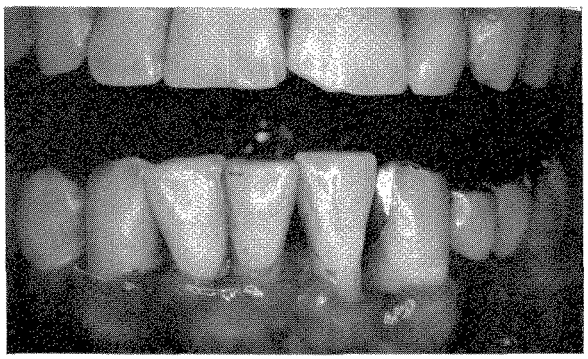


Fig. 1344. In September, 1960, a chronic Vincent's infection was evident. It was also present in January, 1958. (Refer to Figs. 1335, 1336, and 1341, **B.**)

Fig. 1345. Two views taken in June, 1962. The patient had not returned for a checkup in two years.

Fig. 1346. Roentgenograms taken in January, 1958, before treatment was started.

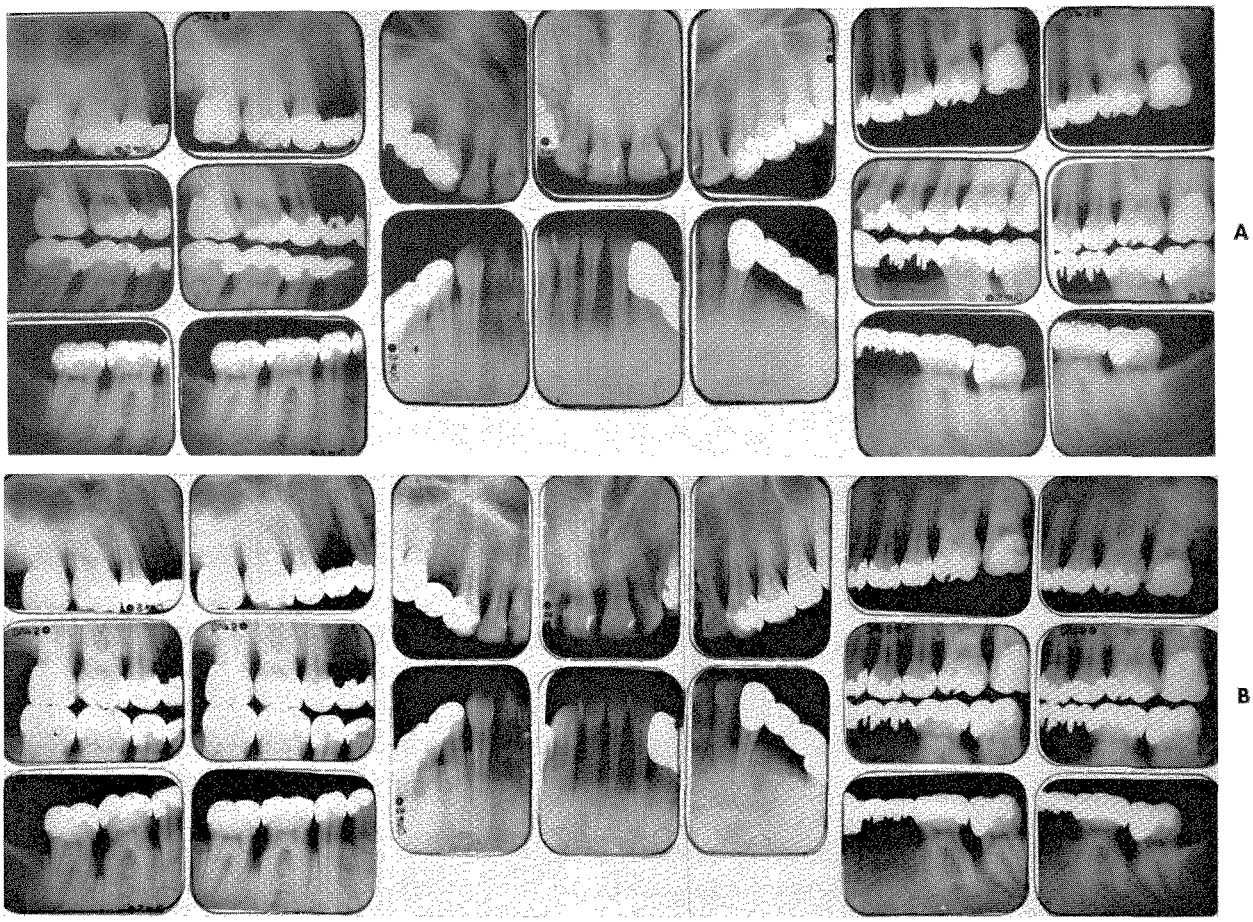


Fig. 1347. A, Roentgenograms taken in December, 1959. This was thirteen months after completion of the reconstruction. **B,** Roentgenograms taken in June, 1962.

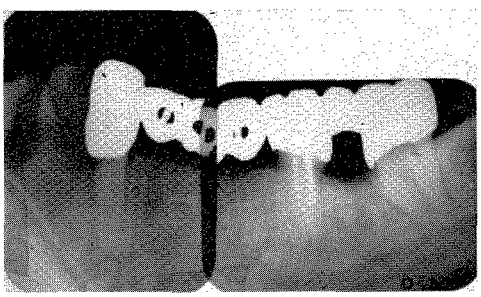


Fig. 1348. Roentgenogram of the left side after the insertion of the fixed partial denture. The first molar was devitalized, and the mesial roots were filled. The alveolar ridge and the soft tissue were reshaped. The new bridge extended from the cuspid to the second molar. This was inserted in April, 1963.

In April, 1963, she voluntarily committed herself into a mental institution in order to receive additional therapy. This was done with the help of her parents. When she is able I will continue to do whatever I can to combat her dental problems. Her emotional conflicts always played a serious role in her daily life and must continue to be considered as an important etiological factor in her oral pathology. To patients in this category our sympathy and patience must be given. (Figs. 1335 to 1348.)

Case 10

In November, 1947, a middle-aged man was referred for dental treatment. In 1946 his mouth had been fully reconstructed in Europe. Complete reconstruction was once again necessary. This in itself should be sufficient to alert the dentist. Twelve teeth were missing. The safe procedure would have been to remove all teeth with problematic futures. The patient was unwilling to have this done, and although he was aware that the advice to have several teeth removed was undoubtedly correct, he was perfectly willing to take his chances with root canal therapy. A signed statement to this effect was obtained, and the reconstruction was started in February, 1948.

Retention of problematic teeth

Today we are faced with many similar patients determined to retain their natural teeth regardless of the fact that these teeth may be far from ideal. The dentist must adapt himself to this type of thinking even though the problematic teeth may last only a few years. Sometimes it may defer the wearing of a removable partial denture while these doubtful teeth are being retained. Naturally it becomes the duty of the dentist to make the patient aware of his responsibility should these problematic teeth need to be removed. On the other hand, if it is at all possible, the dentist should also anticipate the removal of these teeth and provide for their replacement with the least possible amount of effort and expense to the patient.

Postinsertion events

The case was reported in 1951.* The work was completed in April, 1948. This patient had very little saliva, with the result that his mouth was always dry. He had been tense and had emotional problems involving his children. In spite of his lack of salivary secretions, his skin was often moist and clammy. In 1950 his upper central incisors were crowned. In 1953 a McCollum stressbreaker was inserted on the lower left side of his lingual bar because of his continual habit of bruxing and clenching. In 1955 the root of the upper right lateral incisor was resected, and an amalgam filling was inserted in the apex. Cavities continued to form around margins of the crowns very shortly after their insertion in 1948. It was difficult to control the continued marginal caries even though they were watched carefully.

In 1958 the lower lingual bar was remade. This time all seven remaining lower teeth were crowned and joined together in one rigid splint. The desirability of

*Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., pp. 951-956.

removing all or some of his upper remaining teeth and of inserting either a full upper or a partial upper removable denture was often discussed. He continually refused this advice, yet it was clearly understood by him that the responsibility was his and not mine. In March, 1960, another extensive compromise was made with his left maxillary teeth. This time it became necessary to remove the left lateral incisor and first bicuspid. Caries had also undermined the upper left third molar. All the past and present pulp therapy had been done by endodontists. In April, 1960, an eight-unit fixed partial denture was inserted supported by four natural teeth. In 1962 the upper right fixed partial denture was replaced by one that extended from the right lateral incisor to the right third molar.

Discussion

This patient never had a periodontal problem. The number one offender was caries. Tensions and emotional factors played equally important roles. He was acutely aware of his dental problems and was willing to live with them. It is inevitable that he will wear an upper removable partial or full denture, but he intends to enter into this phase of his dental life in his own good time and will not be precipitated into it.

An interesting observation on this case deals with vertical dimension. Over the past decade his bite had closed so that when his teeth contacted his face gave every indication of a closed bite relationship. Even so, his free-way space was small, and if an attempt were made to restore his bite, it would only meet with failure. The harmful effects of the constant habit of bruxing and clenching would be augmented if the vertical dimension were increased to one that would produce facial harmony by our standards of esthetic values. What part the lack of saliva plays in the formation of caries deserves further investigation. He stated that he did not take any of the miracle drugs although three years previously he had a mild coronary attack. He also maintained that he seldom sucked upon mouth lozenges. He had one of the driest mouths I had ever seen. (Figs. 1349 to 1361.)

Text continued on p. 660.

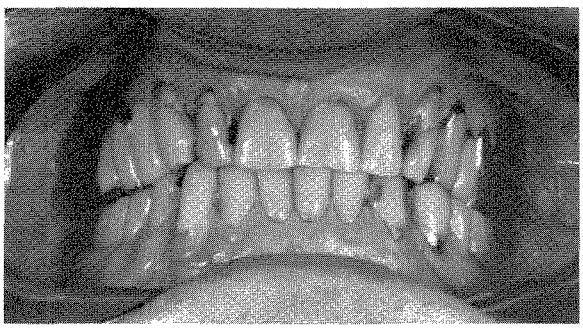


Fig. 1349. Anterior view of the mouth of a middle-aged man. This photograph was taken in January, 1948. This mouth had been reconstructed only fourteen months previous to the patient's visit to my office, but the teeth were in very poor condition at this time. The two upper right bicuspids and the second molar were infected. The left first molar was infected, and several teeth had caries. (Figs. 1349 to 1361 are of the same case.)

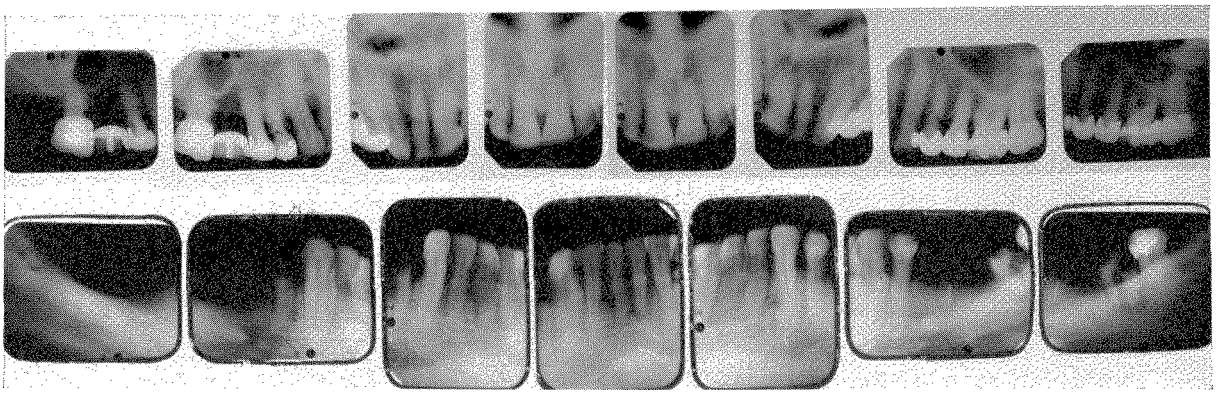


Fig. 1350. The patient brought these roentgenograms with him. They were taken on Jan. 21, 1946.

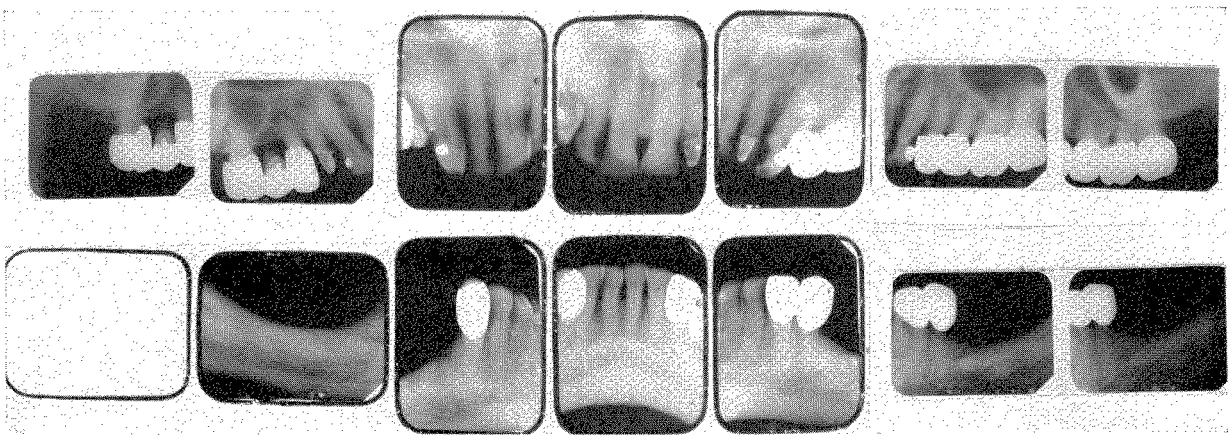


Fig. 1351. These roentgenograms were taken in November, 1947, just prior to the start of the reconstruction.

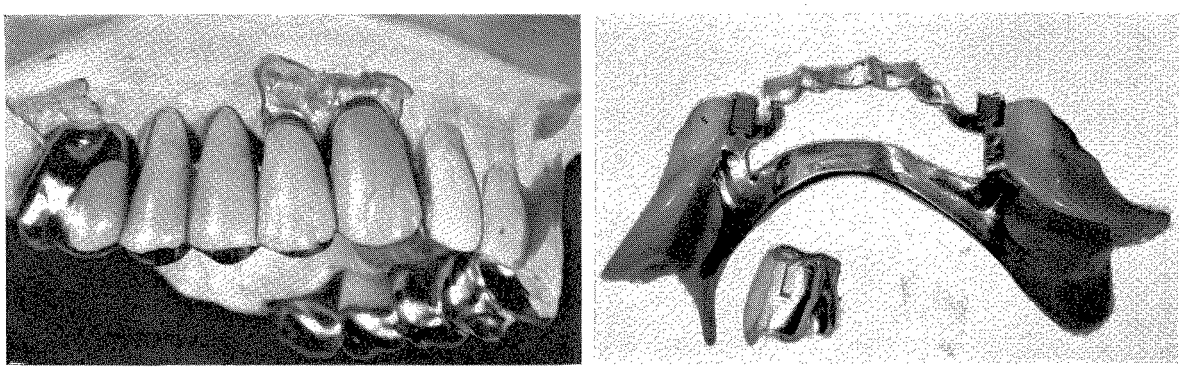


Fig. 1352. The reconstruction was carried out on a Hanau Model H articulator. The upper and lower completed work is shown in these two illustrations.

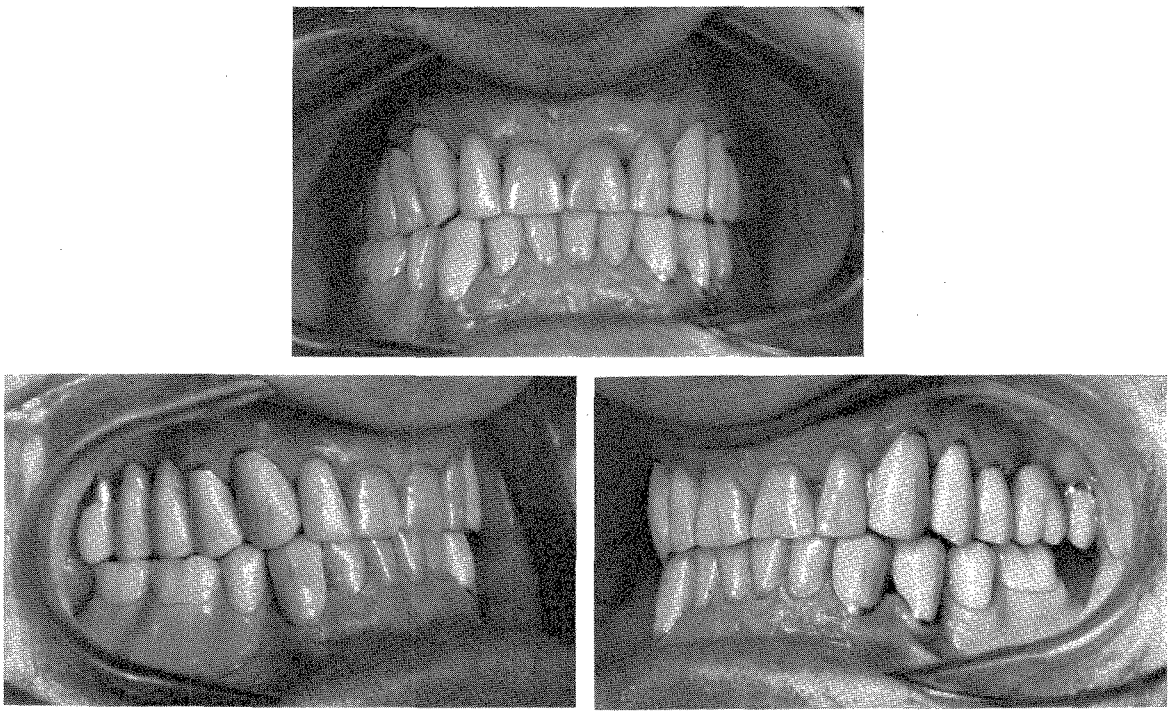


Fig. 1353. Three views of the completed work in the mouth. The work was completed in April, 1948.

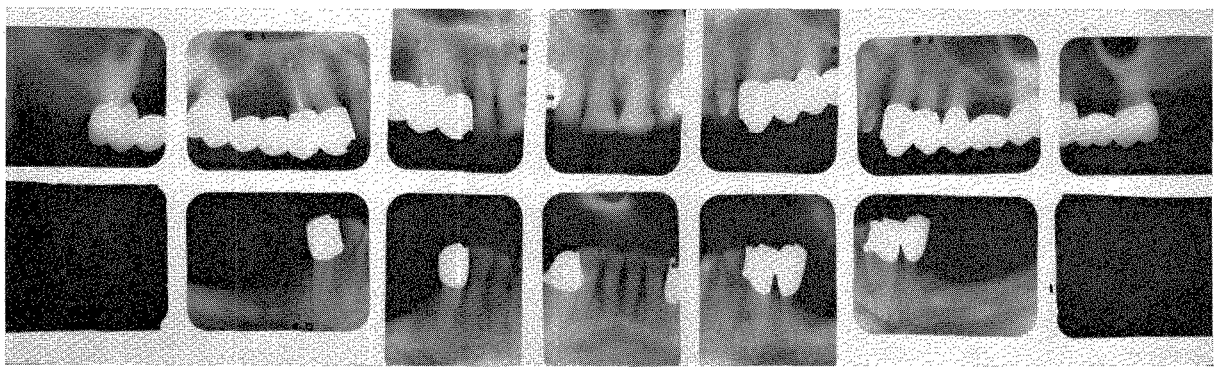


Fig. 1354. Roentgenograms of the completed work. These were taken on April 26, 1948.

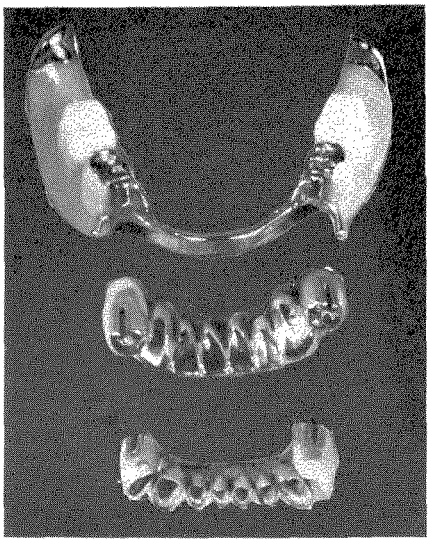


Fig. 1355. This new lower lingual bar was inserted in May, 1958. Two views of the fixed partial denture are shown in the foreground.

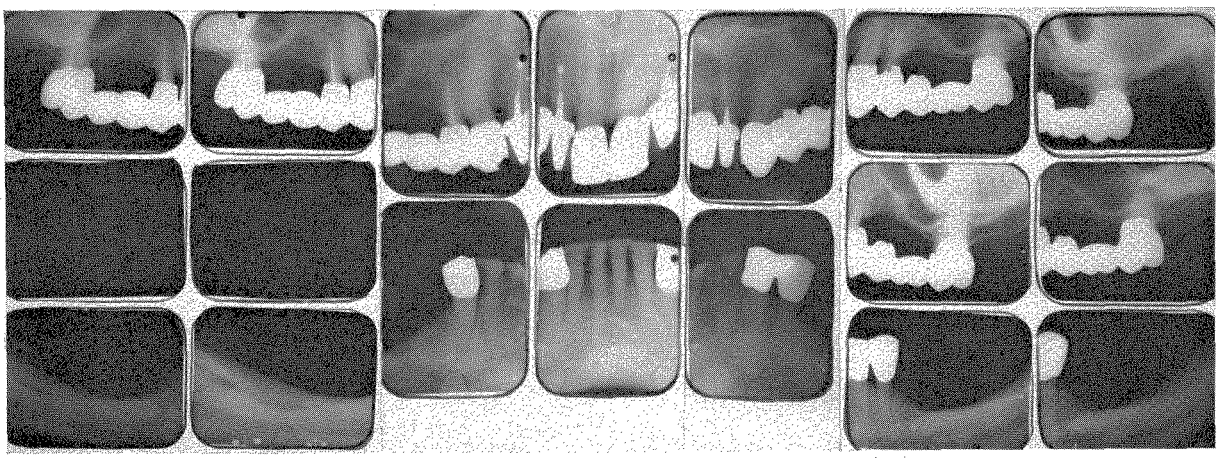


Fig. 1356. Roentgenograms taken in 1956. The upper left second bicuspid had been removed.

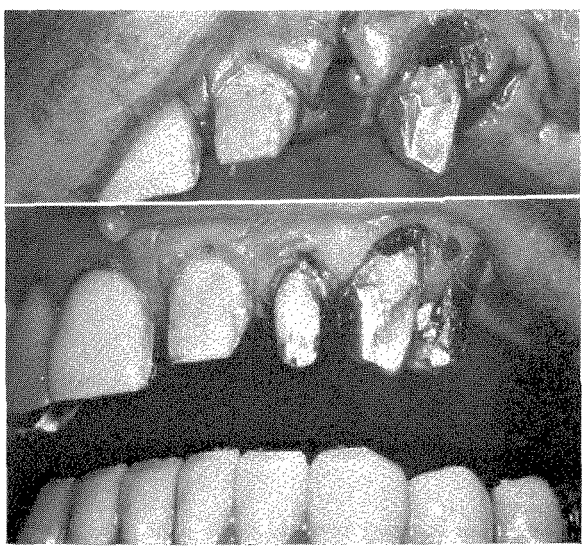


Fig. 1357. In March, 1960, the upper left prosthesis was removed, and the lateral incisor and first bicuspid were extracted.

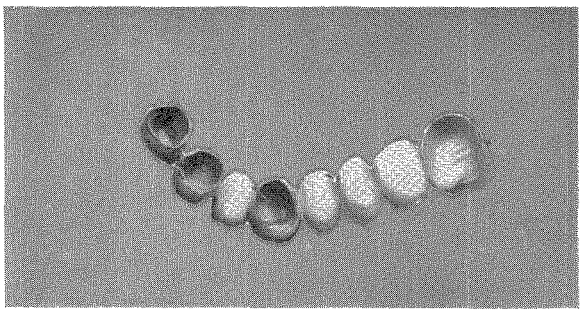


Fig. 1358. An eight-unit bridge splint was constructed to replace the one that was inserted in 1948.

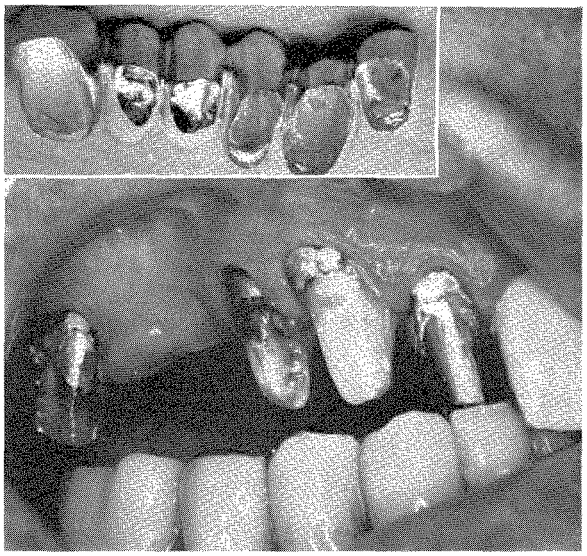


Fig. 1359. In April, 1962, the upper right bridge was replaced by the one shown in this photograph. It contained six units.

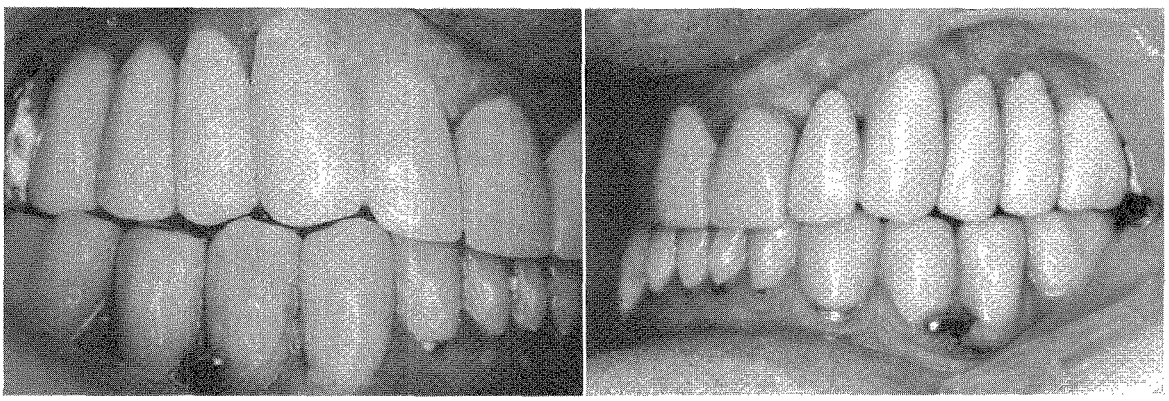


Fig. 1360. These two views of the mouth were taken in April, 1962.

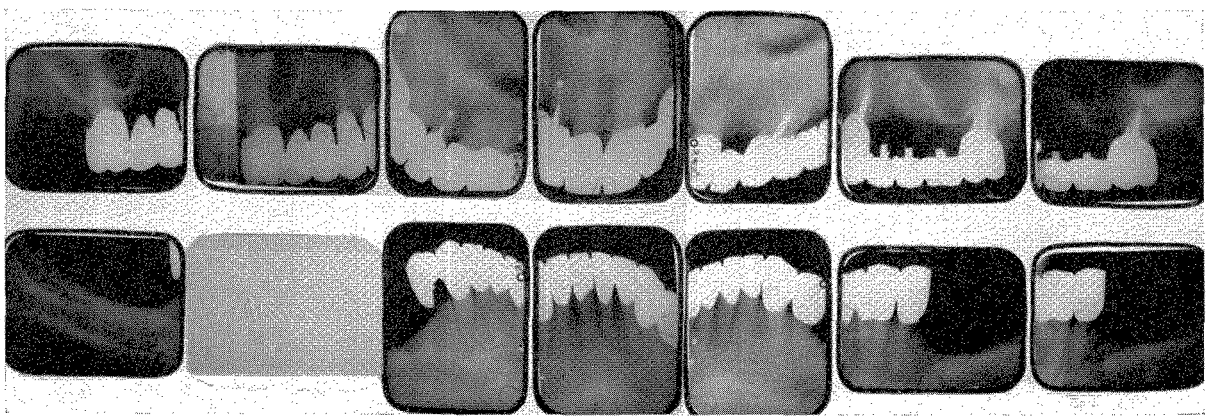


Fig. 1361. Roentgenograms taken in October, 1963.

Although rampant caries is not the rule in adults, still occasionally be prepared to cope with such a situation. It has been stated previously that these people usually present a complex emotional background.

Case 11

Past history

In 1958 a middle-aged woman was treated. She had lived in Europe during World War II and had nothing but unpleasant memories. She was under medical and psychiatric care and had been taking the new so-called miracle drugs. She had married late in life and had no children.

Her oral condition may have been aggravated by the emotional background for, although she was most cooperative, her dental work proved extremely difficult to execute. She dreaded the thought of wearing a removable partial denture and insisted upon the retention of her remaining teeth at any cost. Although she visited a dentist periodically for cleaning and checkup, her mouth presented a picture of extreme neglect. There were fifteen missing teeth. Most of those remaining were nonvital and deeply carious. The correct prescription would have been to remove all the upper teeth and perhaps retain at most three or four lower teeth. A full upper denture and a lower removable partial denture could have then been inserted, and the patient would have been best served from the point of view of health, expense, and energy. The patient, however, was not yet prepared for what she considered to be such a drastic step, and both her attending physician, the psychiatrist, and her husband advised against this procedure.

It is difficult to find a case in which caries was more rampant while the periodontal tissues remained normal. Could the administration of the miracle drugs have caused this rapidity of tooth destruction? This patient had been taking these drugs. She had experienced a dryness of the mouth. She took fruit lozenges and other forms of sugar pastilles to create moisture in her mouth. Here, again, was concentrated refined sugar dissolving slowly in the oral cavity. This could have been the cause of the rampant caries. The same pattern has been detected in too many patients not to consider its dangerous implications.

The previous dentist indicated that the patient had been nervous and difficult to treat. He insisted that there was no more he could do under the circumstances and seemed greatly relieved not to have any further responsibility.

Treatment planning

Clinical judgment is important in oral diagnosis. This is based upon knowledge and experience. Competence in evaluating a case and in prescribing treatment requires more than a mechanical collection of facts. There must be a serious consideration of the relative value of the facts collected. Although it can be safely predicted that full dentures will be worn by this patient sometime in the not-too-distant future, still it is equally certain that this was not the time. Both her physicians and her husband believed the suggested compromise treatment was correct.

Treatment

With all of these facts in mind the complete oral reintegration was undertaken in November, 1958. The pulp therapy was performed by an endodontist. No teeth were removed, but every remaining tooth had to be reinforced by gold cores or castings of some form. Of the seventeen remaining teeth, fourteen were nonvital.

This was a case in which the operative work required building up all these remaining teeth was much more difficult than the coordination of the interocclusal relationship that followed. It is to be observed that when a case is planned and treated with unsuccessful results, there is sometimes a tendency to remark that the patient had been uncooperative and was partly to blame for the failure. We are all guilty of this unfair accusation. Although there are uncooperative patients, this patient was not one. If anything, she made a very difficult case easier to perform.

The completed upper work consisted of one eleven-unit splint. This contained nine natural teeth and two throw-offs. The completed lower work consisted of one large splint made up of fifteen units. There were eight natural teeth and seven dummies. This lower fixed partial denture was divided into three sections that were joined by precision attachments.

Because upper molars are not replaced, the temporomandibular joint may be

Text continued on p. 667.

Fig. 1362. Three views of the mouth of a middle-aged woman. These photographs were taken in October, 1958. An upper removable partial denture is being worn. (Figs. 1362 to 1380 are of the same case.)

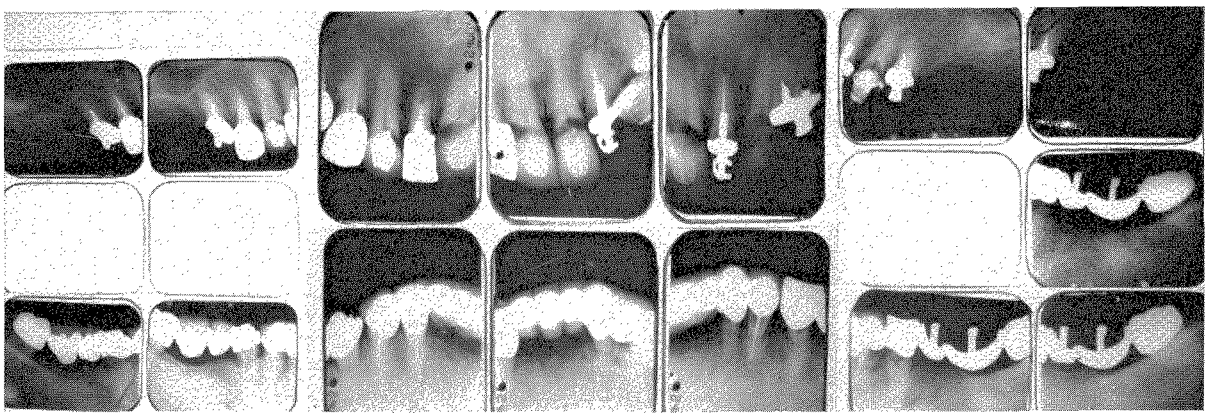


Fig. 1363. Roentgenograms that were taken in October, 1958, at the start of treatment. Generalized rampant caries is discernible.

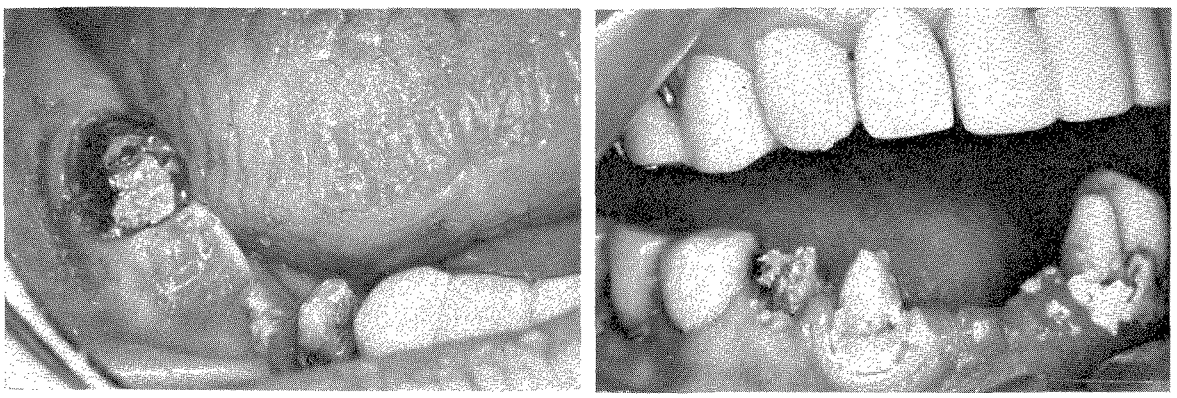


Fig. 1364. When the bridges and crowns were removed, the abutment teeth were in very poor condition. Deep-seated soft decay was the rule.

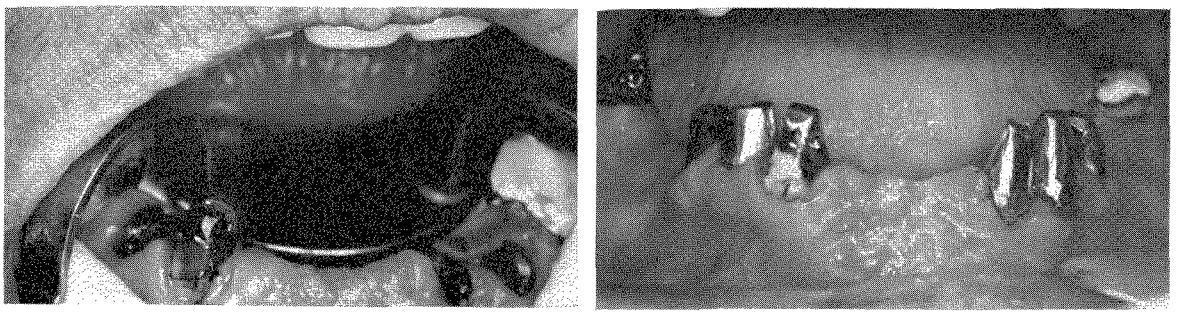


Fig. 1365. The root canals were treated and filled. The roots and crowns received applications of silver nitrate. Gold castings were used to rebuild the crowns, as shown in these photographs.

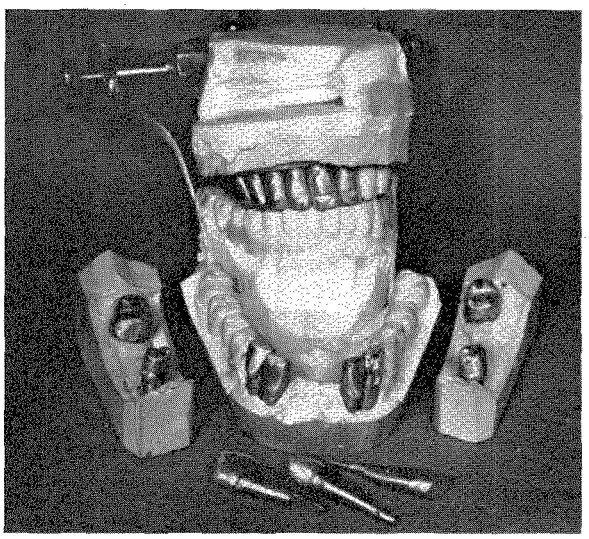


Fig. 1366. Low-fusing metal transfers were made for each preparation.

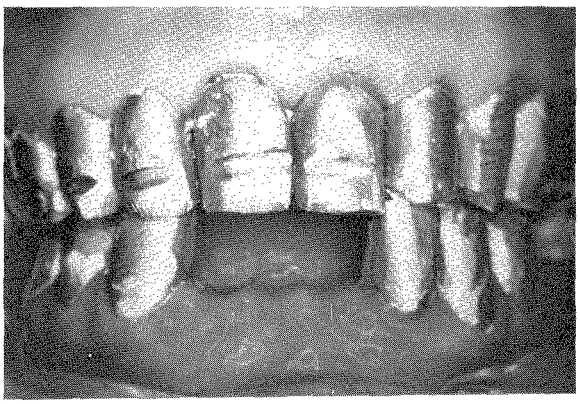


Fig. 1367. These were inserted in the mouth, and centric relation was established by means of these transfers.

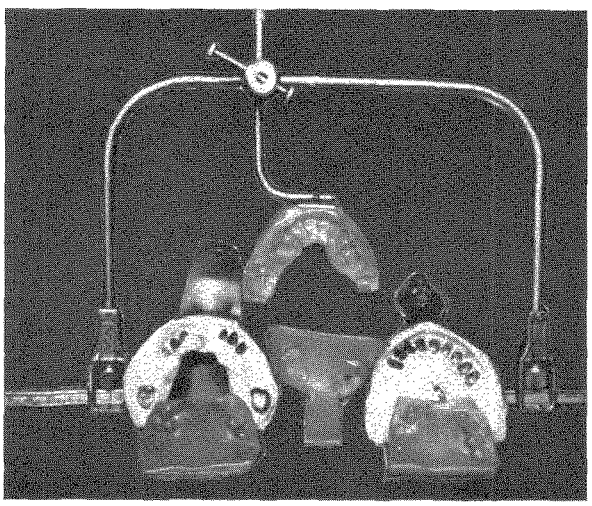


Fig. 1368. Records were taken to pour stone work casts and to attach them to a Hanau Model H articulator.

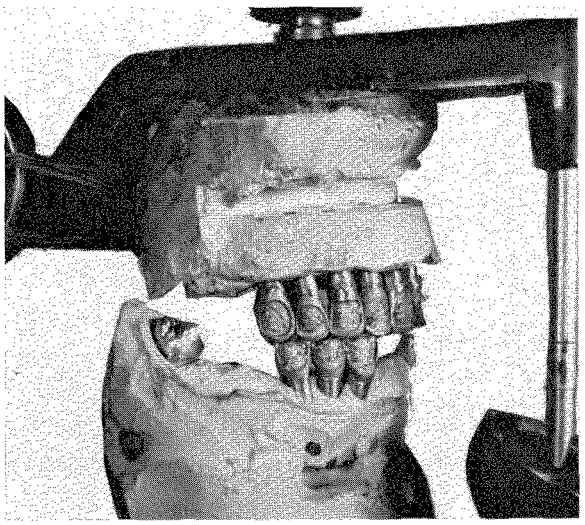


Fig. 1369. The final castings were placed on the articulator. Interocclusal coordination was established.

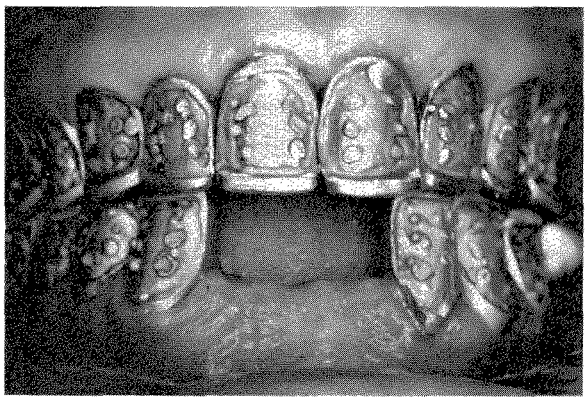


Fig. 1370. The castings were tried in the mouth. Vertical dimension and centric relation were established. The vertical dimension was kept at the same level as the transitional work. New wax records, plaster impressions, and a face-bow record will now be taken.

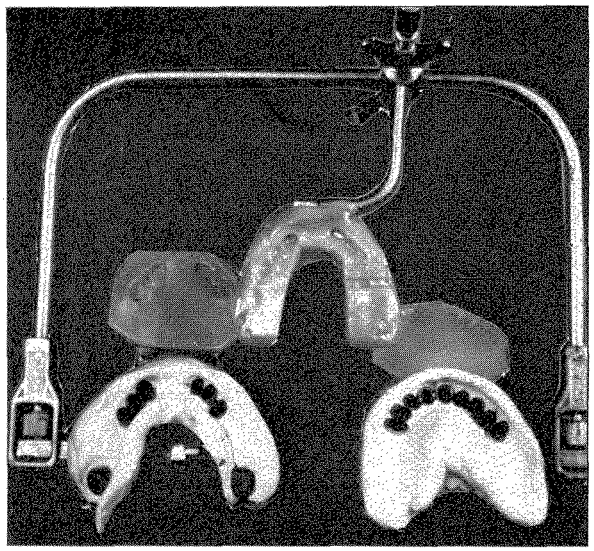


Fig. 1371. New records for new work casts and for remounting are shown here.

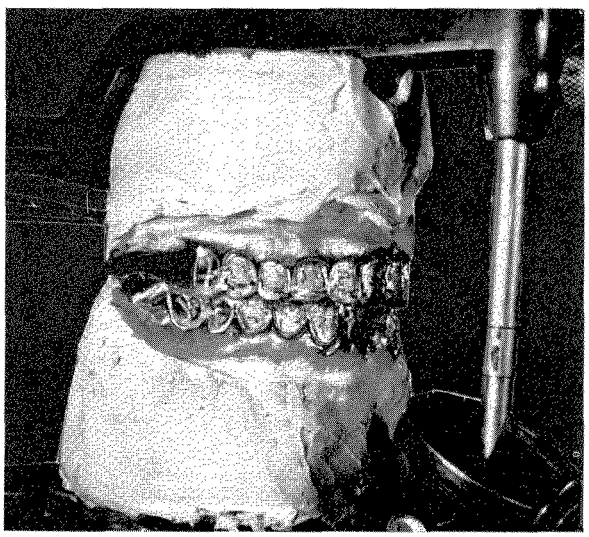


Fig. 1372. The final work has been completed and is ready to be tried in the mouth.

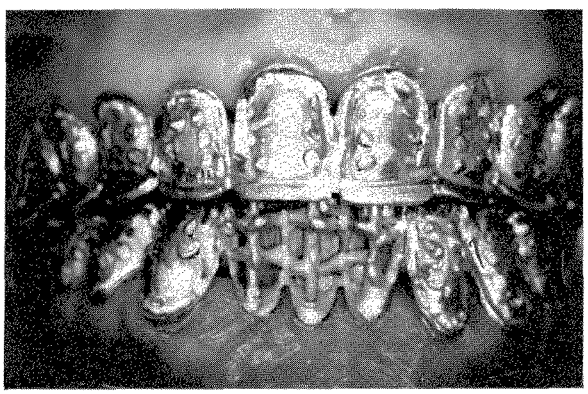


Fig. 1373. The try-in of the final work. Centric relation and vertical dimension will again be checked. Cervical fit will be examined clinically and by means of roentgenograms. Wax checkbite records will be taken.

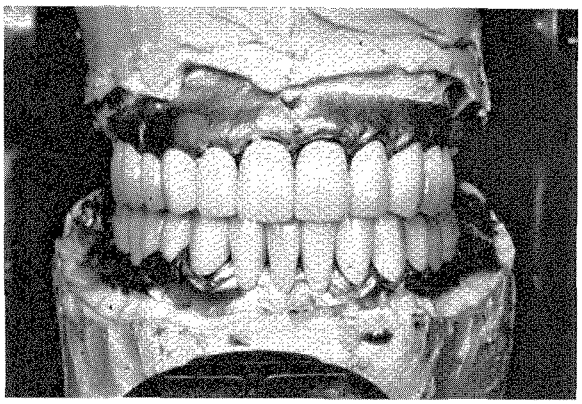


Fig. 1374. The completed work is shown on the articulator.

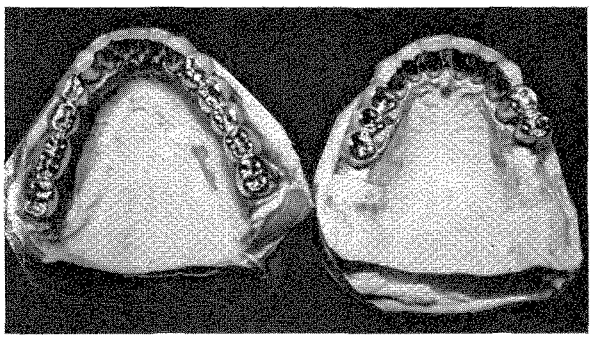


Fig. 1375. Occlusal views of the completed work.

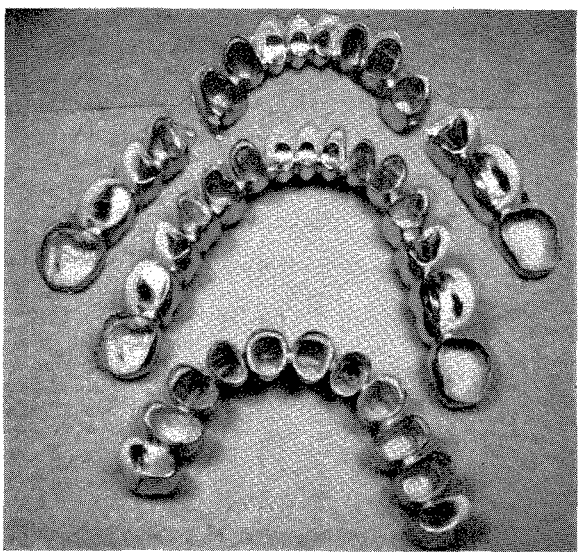


Fig. 1376. In the foreground, the completed upper eleven-unit splint with two throw-offs, one at either end. In the center, the completed lower bridge splint, all connected together. There are fifteen units. This splint may be separated into three parts that are united by precision attachments. This is shown on top in the photograph.

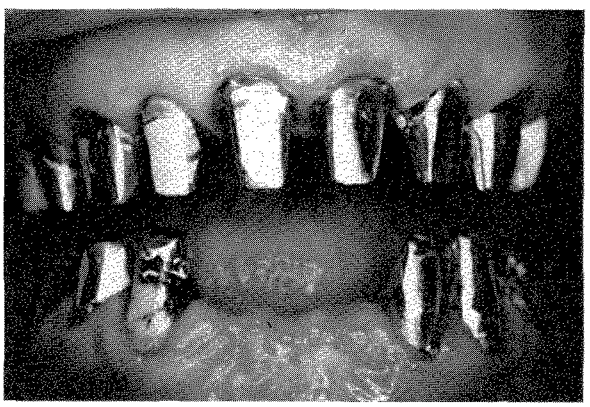


Fig. 1377. This is how the mouth looked just before the final work was inserted. The upper and lower teeth were built up with gold castings. All the upper teeth and the majority of the lower teeth were non-vital.

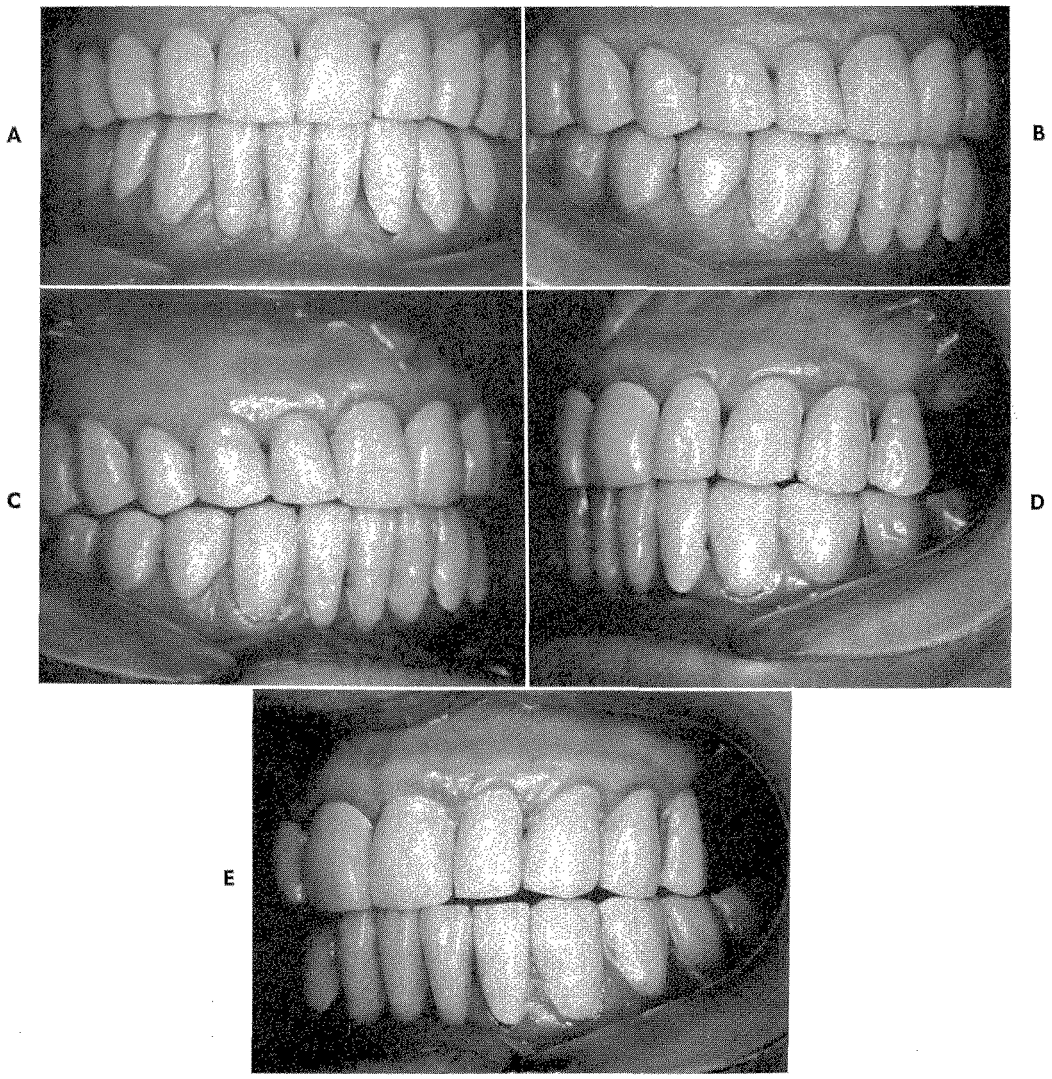


Fig. 1378. Five views of the completed work. **A,** Front view, centric occlusion. **B,** Right side, centric occlusion. **C,** Right side, working bite. **D,** Left side, centric occlusion. **E,** Left side, working bite.

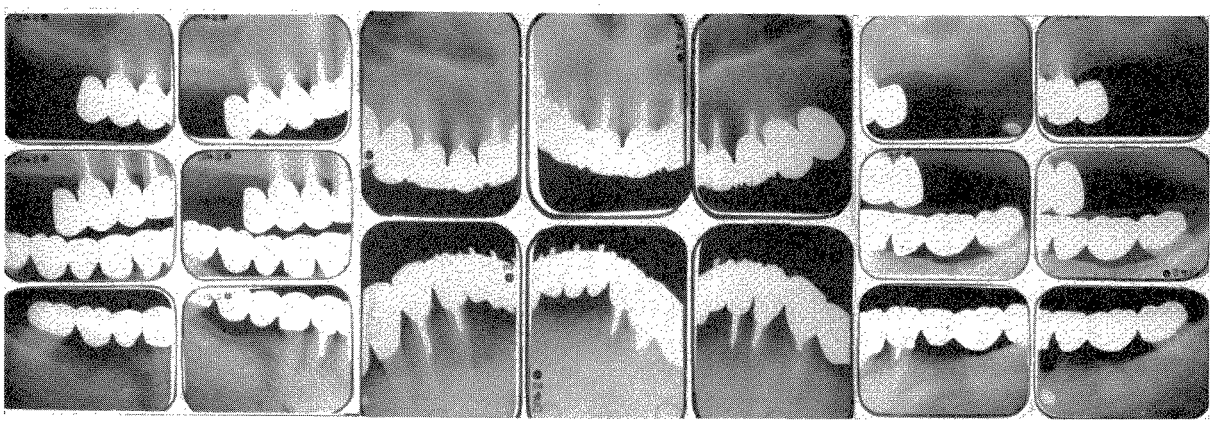


Fig. 1379. Roentgenograms taken at the completion of the work in May, 1959.

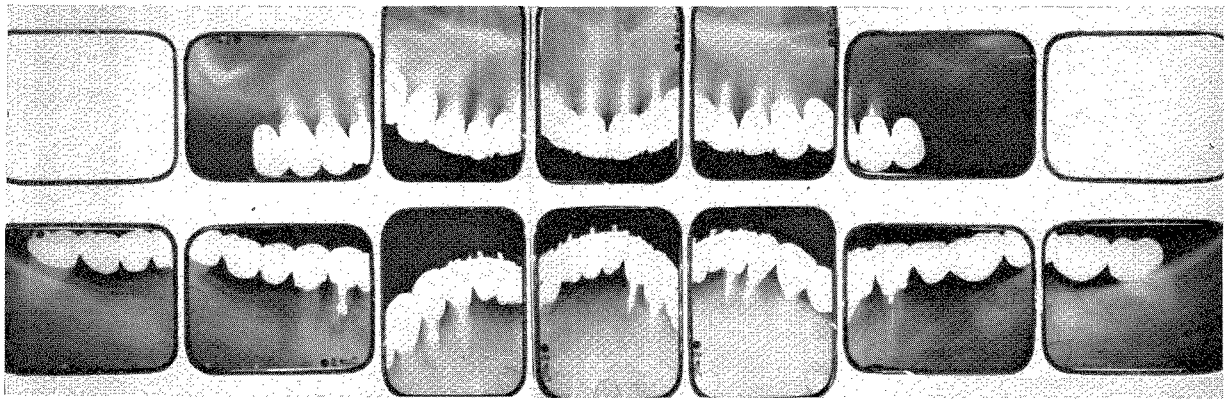


Fig. 1380. Roentgenograms taken in October, 1961.

subjected to trauma, as the greatest force exerted upon the mandible is said to be in the region of the first and second molars. However, in this case, the patient had worn the provisional prosthesis long enough to evaluate this before the final work was inserted. She was made aware of this possibility. The endodontist was unwilling to attempt pulp therapy on the upper left or right bicuspids but strongly urged their retention. These teeth had been nonvital for many years, with incomplete root fillings.

The articulator upon which the final work was constructed was a Hanau Model H. The prostheses were inserted in May, 1959. Three years after insertion there was some difficulty with a lower right bicuspid root. It had to be resected because of an accident in operative procedure, but it is still in position. Needless to say, this patient was delighted with the result. She was perfectly aware of her continued risk. Her mouth must be observed carefully for evidence of caries because there is no reason to believe that all the causes have been removed. She comes for periodic examination every two and one-half months. Roentgenograms are taken whenever necessary. Although the life of the prostheses cannot be predicted, all concerned feel that the compromise treatment given was the method of choice. (Figs. 1362 to 1380.)

ADVERSE EFFECT OF INCORRECT HABITS ON ORAL STRUCTURES

In cases of severe maladjustment coupled with the noxious influences of bad habits, the oral structures may be adversely affected. As an example of this, the following report of a male patient observed over a period of thirty years is presented.

Case 12

There was no financial pressure to compel him to find work. He found it impossible to choose a suitable vocation. His marriage had ended in divorce. He was a chain smoker, drank excessively, and was under psychiatric care during several periods of his adult life. At the time of writing he was in his mid-forties and was

under specialized periodontal care. The roentgenograms of his teeth from 1933 to 1962 are presented. In cases such as these, local causes for dental breakdown are probably not nearly so significant as the emotional and systemic ones. (Figs. 1381 to 1384.)

PATIENTS MAY FOCUS THEIR MENTAL NEUROSIS IN THEIR MOUTHS

Case 13

Young and old suffer alike from emotional disturbances. A 17-year-old boy was examined in 1960. He had an occlusion that was much better than average. The structures were in excellent condition. This patient had been under psychiatric treatment for several years. His attention was now focused in his mouth. To him his teeth were malrelated and in malocclusion. An upper right terminal molar was in cross-bite position. At my suggestion, this was corrected by a competent orthodontist in order to placate the patient as well as to correct a small segmental malpositioning of two teeth. The treatment was purposely

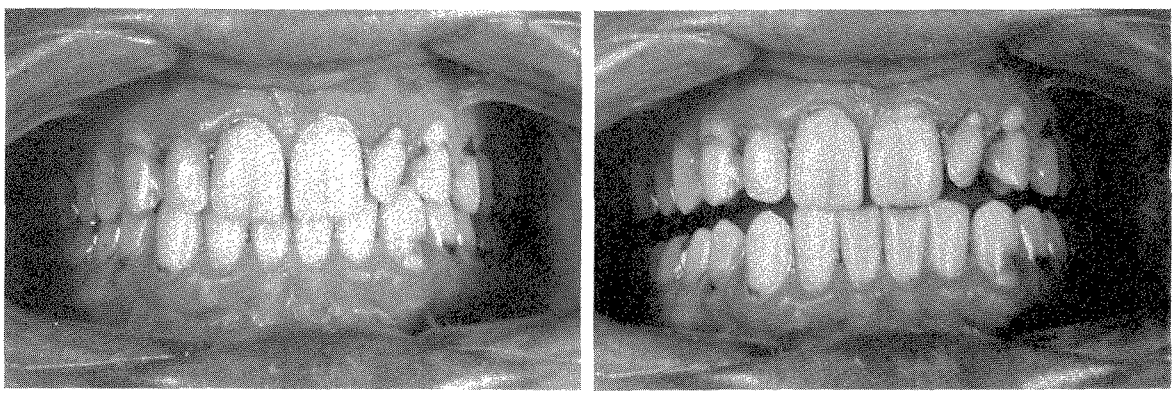


Fig. 1381. Two views of the teeth of a man that were taken in 1953, at the age of 36 years. (Figs. 1381 to 1384 are of the same case.)

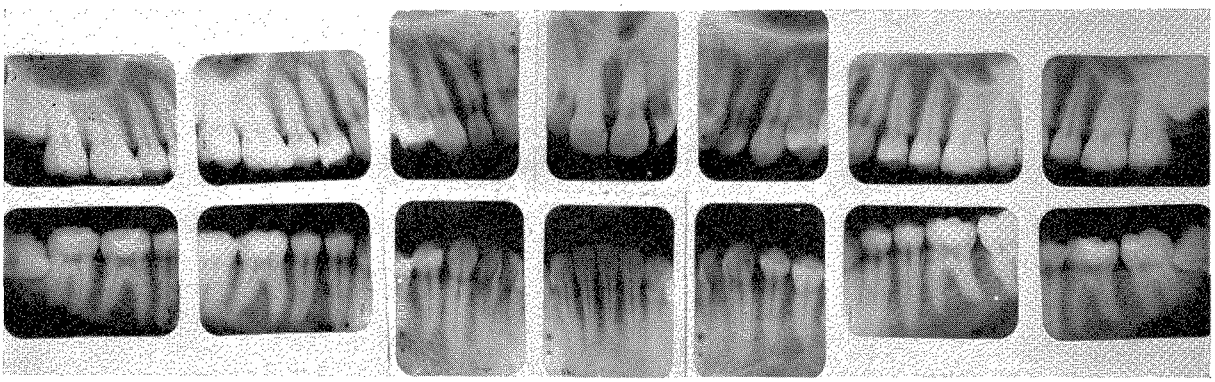


Fig. 1382. Roentgenograms of the patient shown in Fig. 1381. These were taken in 1933 when he was still in his teens.

Fig. 1383. **A** and **B,** Right and left views taken in May, 1955, just before the anterior six teeth were covered with porcelain jacket crowns. The large number of cervical cavities is evident. **C** and **D,** Two views of the teeth that were taken in 1962. The upper anterior teeth were jacketed with porcelain in 1955.

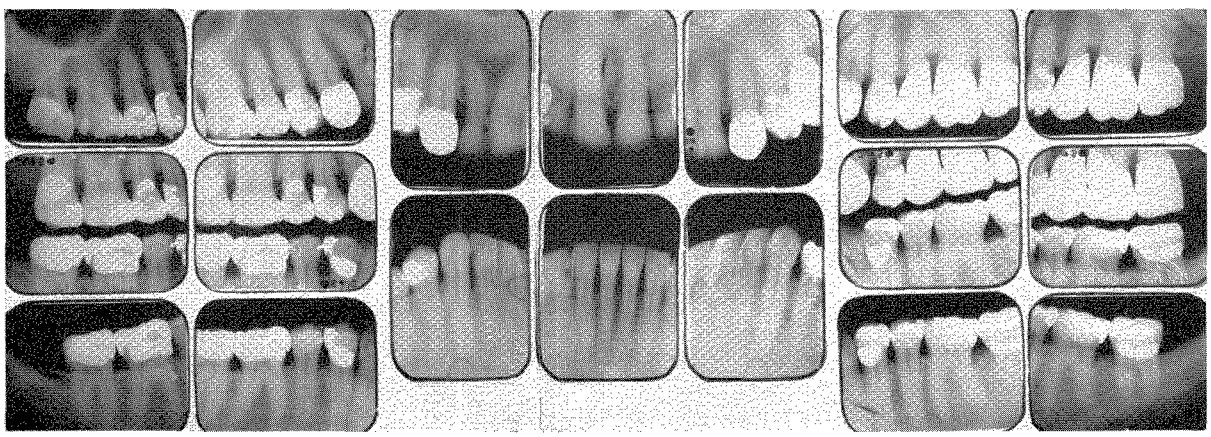


Fig. 1384. Roentgenograms that were taken in September, 1961. Compare them with those that were taken twenty-eight years previously (Fig. 1382).

drawn out to assure the patient that he was being treated and cared for. However, when treatment was terminated and the local condition corrected, the patient was not satisfied.

He sought other advice and finally succeeded in finding another dentist who was willing to introduce extensive orthodontic treatment. The mother had confidence in my advice in having persuaded her to have her son examined by another competent orthodontist. The original orthodontist who had corrected the molar cross-bite and the new orthodontist to whom I referred the young man were in complete agreement that this occlusion should not be disturbed. His present dentist does not practice orthodontics exclusively. Up to now extensive orthodontics had been prevented, but in January, 1963, his dentist inserted upper and lower arch wires with intermaxillary elastics. During the three months that these appliances were in place, the young man was very unhappy, and only by my insistence were they kept in place. However, in April, 1963, the appliances were removed. Nothing had been accomplished except to convince the patient that there was nothing much wrong with his former occlusion. Fortunately the original occlusion had not been disturbed.

Fig. 1385. A-C, Front and side views of the teeth of a 17-year-old male patient. Although not perfectly related, these teeth are better than average, yet this patient continually insists that his occlusion needs correction. **D,** In January, 1963, a dentist inserted orthodontic braces to correct the occlusion shown in **A** to **C.** This was how the mouth looked in March, 1963. The periodontal tissues were markedly irritated and bled readily. The teeth were being moved into undesirable interocclusal relationships. In April, 1963, the braces were removed. Fortunately the former occlusion was not disturbed.

The following are the letters that were written by the previous orthodontists who examined this young man:

Dec. 4, 1962

Dear Dr. Schweitzer:

Thank you for sending the 1960 casts of _____. I compared them with the casts we made last month and as far as I can see there has been little if any change in his occlusion. I think we are on sound ground in recommending no orthodontic interference at this time. I am returning the casts to you as you will probably want them for future reference.

Very truly yours,

(Signed)_____

Dec. 24, 1962

Dear Dr. Schweitzer:

Under separate cover I am returning to you the casts of _____. A thorough reappraisal of this case reaffirms my belief that no further treatment should be instituted, notwithstanding the patient's desire to "have something done."

Sincerely yours,

(Signed)_____

These people who are mixed up emotionally often feel that they have complicated dental problems and wish to engage in complicated forms of dental treatment. As respected professional men, we must be sympathetic and understanding of their problems, yet we must prevent them from having any forms of dental treatment other than that which is actually necessary. To do less than this would be a disservice to both our patients and our profession. (Fig. 1385.)

ATTEMPT SHOULD BE MADE TO DIFFERENTIATE BETWEEN PSYCHOLOGICAL AND PHYSIOLOGICAL CAUSES OF DENTAL DISEASE

A careful oral examination of many patients often fails to reveal any physical basis for their dental complaints. These may be in the nature of temporomandibular joint dysfunction or problems involving their occlusions. These symptoms may be associated with one or more teeth or there may be difficulty in swallowing. At times some indefinite oral pain is present.

These patients should not be dismissed as "mentally disturbed" without a serious mechanical and physiological appraisal of their oral condition. Only if known diagnostic procedures prove negative should mental distress be considered as a cause. If the symptoms do not result from local pathology, these patients may sometimes obtain relief from appropriate psychotherapy. At other times it is not possible for the dentist to give these patients relief.

Fig. 1386. Anterior view of the mouth of a young woman 21 years of age treated for a temporomandibular joint neurosis. At times she was unable to swallow. She expressed worry and fear over this. She had a long and severe dental history and was referred to me as a case of traumatic occlusion. Observation of this illustration would indicate a normal occlusion in a patient so young. (Figs. 1386 to 1388 are of the same case.)

Case 14

One such case, reported in 1951,* is reviewed here. In 1945 a 21-year-old female patient came for examination because of an inability to swallow.

She experienced temporomandibular joint symptoms and expressed worry and fear concerning her swallowing difficulty. She was referred because of suspected traumatic occlusion. A careful examination of the mandibular joints and occlusion was undertaken. Splints were inserted to reposition the mandible. She was referred to a roentgenologist and to a neurologist. She learned to depend upon the two gold removable splints that seemed to relieve her fear. As a consequence, they were worn for several months, but it was difficult to be convinced that the pains were of dental origin. There was the vague feeling that the treatment was more psychic than dental. Her medical advisor was consulted, and the final diagnosis was schizophrenia with very doubtful outcome. She was treated at the Psychosomatic Clinic of the New York Hospital. The following are passages from her physician's letter dated Jan. 29, 1947:

"Mrs. _____ was readmitted Jan. 11, 1947. At that time, she was confused, depressed, very restless and fearful, with many delusional experiences, such as having seen a man whom she thought to be Rocco, the Gangster, looking in her window.

"Before her admission, she had been confused, unable to find the subway, and felt that people misdirected her. Here she was seclusive and preoccupied with her ideas. Electro-shock treatments were started, and after the third treatment, she appeared to be very much improved. She was elated, erotic, and overactive.

"One feels now that there is no question about the diagnosis of schizophrenia in this case. She will probably improve markedly and attain a good remission after the electro-shock treatments, but one feels that she will probably not be able to maintain it."

*Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., pp. 437-439.

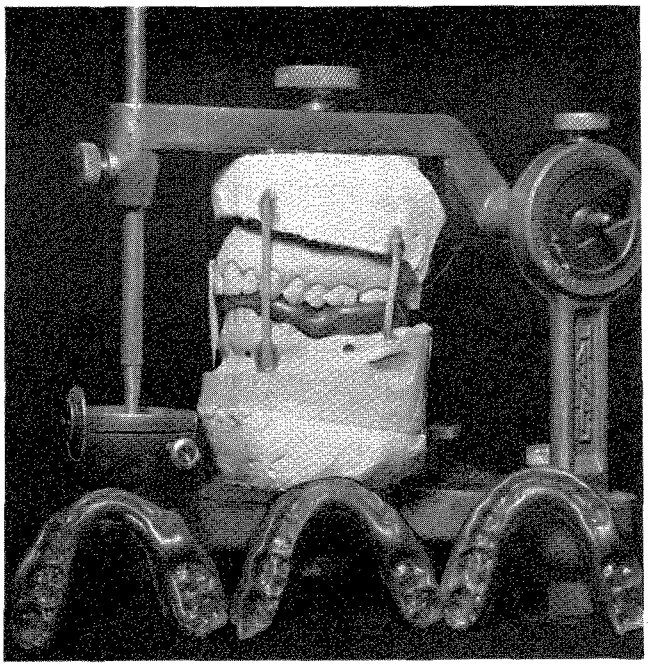
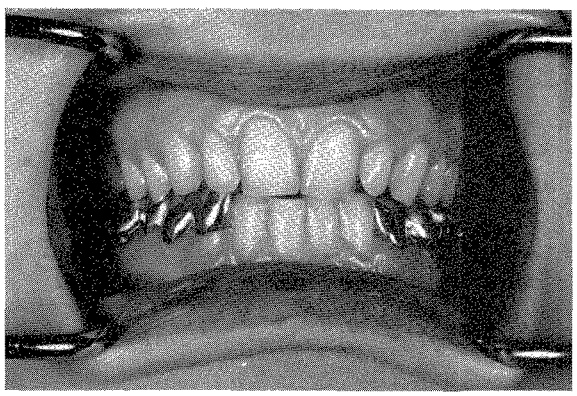


Fig. 1387. The case was studied carefully by oral examination and radiographs as well as by mounted models. The patient was also referred to a roentgenologist and to a neurologist for consultation. Temporomandibular joint radiographs were taken.

A



B

Fig. 1388. A, After study and consultation the prescription was to raise the bite by means of two gold removable splints covering the lower right and left posterior teeth. These splints would also serve to reposition the mandible toward the left. Compare **A** and **B** in this illustration with Fig. 1386. The splints were not cemented but could be removed at will by the patient. The patient reported some relief. She was able to swallow better with the splints in position and would never go anywhere without taking the splints with her. They seemed to relieve her fear. **B,** The splints were remodeled in order to keep the mandible over toward the left side by adding gold stops on the right side. These splints were worn for several months, but I was not satisfied as to the cause of the temporomandibular joint symptoms and the inability to swallow. I was also uncertain as to how much good, other than allaying the mental fear, the splints were doing, although the patient would not be without them. Her family and her physician were consulted, and the final result was that the case was diagnosed as a mental case and she was institutionalized for shock treatment, etc. Here was an example of mental illness causing an occlusal neurosis.

Case 15

Another case of a similar nature was treated in 1955. The patient was a middle-aged woman. She had already been to many capable dentists, but none had been able to solve her dental problem. When she was first examined, there were many missing teeth.

Some of her claims were fantastic—for example she stated that her teeth moved inside the gold crowns. Calisthenic exercises were prescribed to prevent this. She could stop the tooth movement by performing these physical exercises in the dental office. She frequently made use of the telephone during the day and night to discuss her dental symptoms. Calisthenic exercises were also prescribed for her at her home. There was no difficulty in inserting upper and lower temporary removable partial dentures. She wore these with no apparent discomfort during an entire summer, but it must be recognized that the dentist was acting as a psychiatrist rather than as a dentist and that to continue treatment on this basis was not satisfactory.

These cases are quite demanding of your time. Actually, their emotional distress has a focal point in the mouth, and there can be no end to your dental treatment. Neither is it a matter of finance because many of these patients are able to compensate the dentist adequately for his services. It is extremely important to the people who are responsible for their well-being that they continue to receive understanding and sympathetic medical and dental care. In this case it was the husband who undertook the supervision. He probably was pleased that the focal point was now dental rather than some other more difficult somatic area.

Believing this patient's dental treatment would never be completed and not being willing to continue along the described lines, a paragraph in the original contract which stated that the dentist had the right to withdraw from the case at any time without having to give any reasons and was to be reasonably compensated up to the date of his withdrawal, was exercised. This was accomplished in spite of the protests of the referring dentist and the husband. Dentists are not full-time psychiatrists, nor do they have the available time which is needed in these special cases. (Figs. 1389 to 1395.)

Fig. 1389. Middle-aged woman. The mouth at the start of treatment in September, 1954. (Figs. 1389 to 1395 are of the same case.)

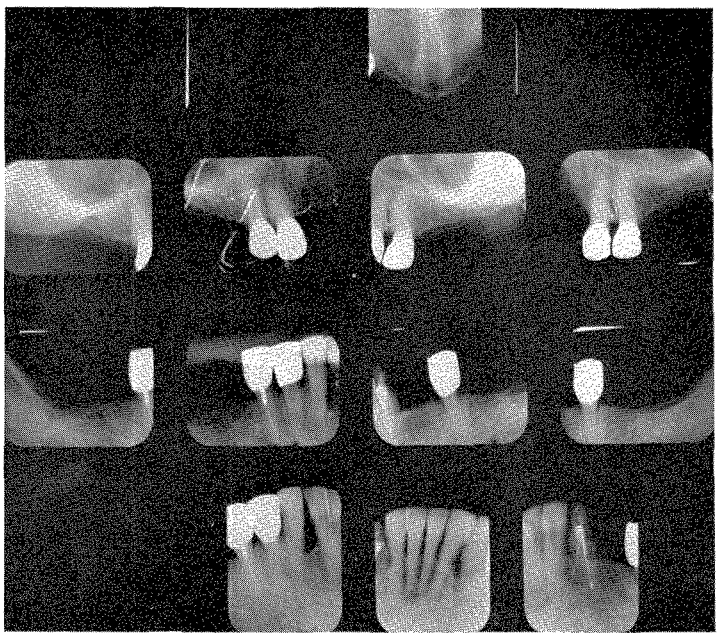


Fig. 1390. Roentgenograms at the start of treatment.

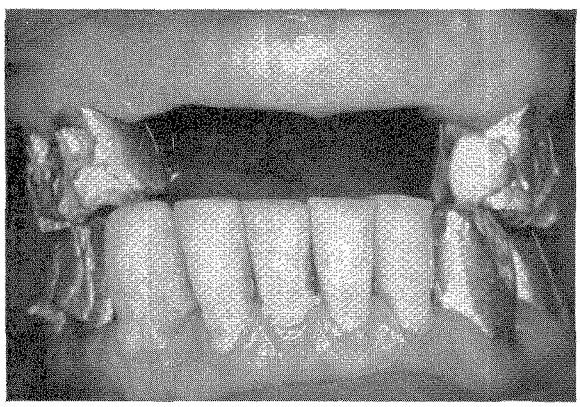


Fig. 1391. Low-fusing metal transfers were used to establish vertical dimension and centric relation. They were soldered together in the mouth. Wax records of mandibular positions as well as a face-bow record were obtained in order to mount the work casts on the Hanau Model H articulator.

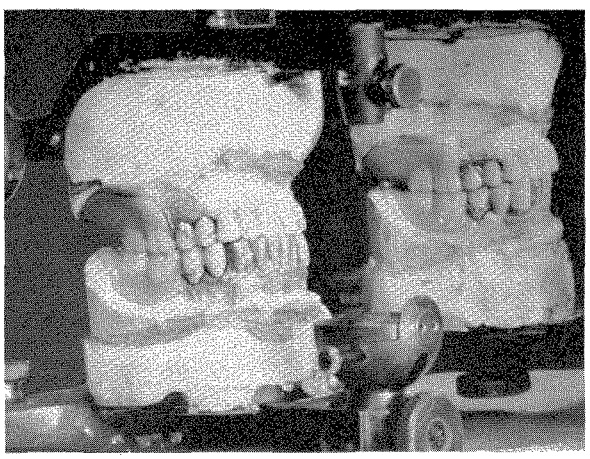


Fig. 1392. After several try-ins, the transitional work was completed. Two views are shown in this photograph.

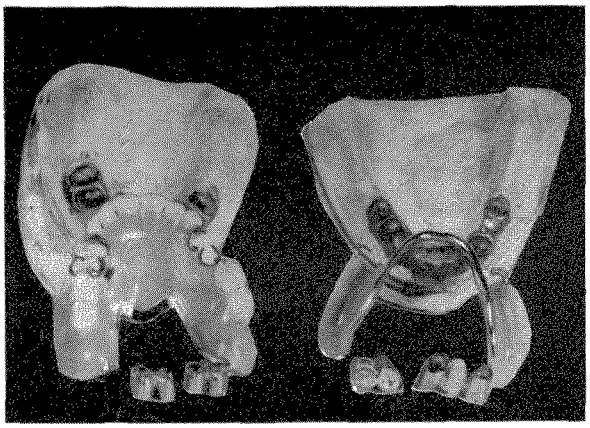


Fig. 1393. The temporary prosthesis has been removed from the articulator. Both upper bicuspid veneer crowns were splinted together. Double abutments were also used on the lower teeth.

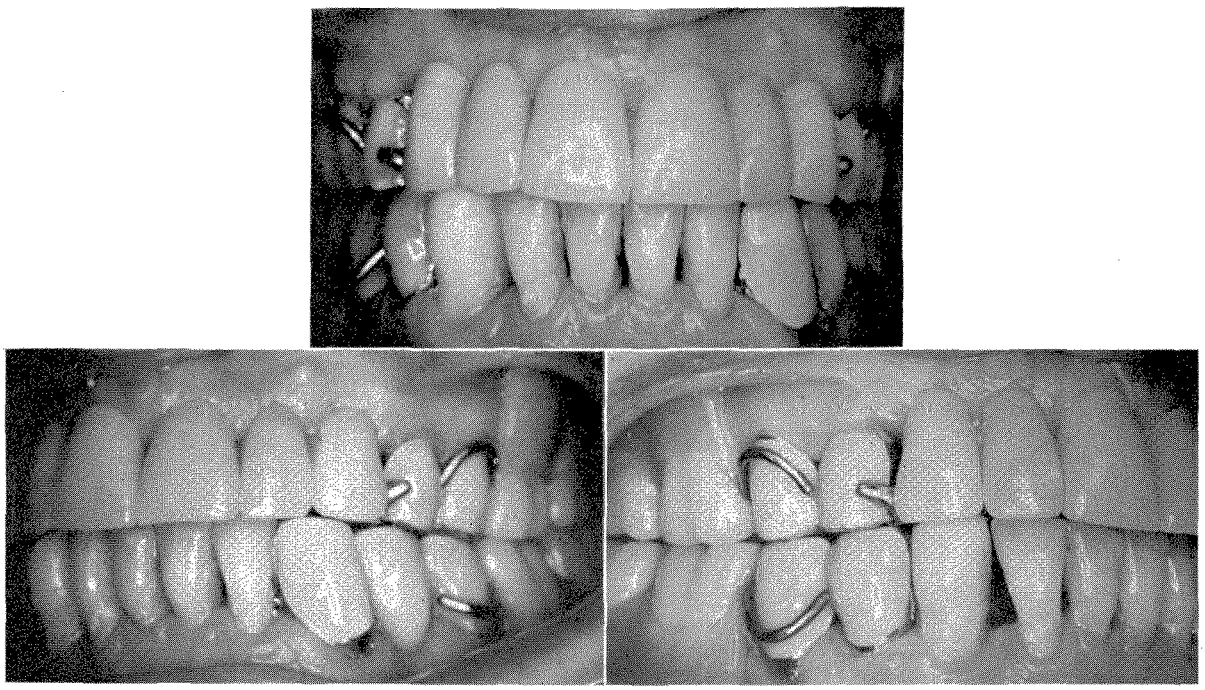


Fig. 1394. Three views of the temporary work in the mouth. This was inserted in July, 1955.

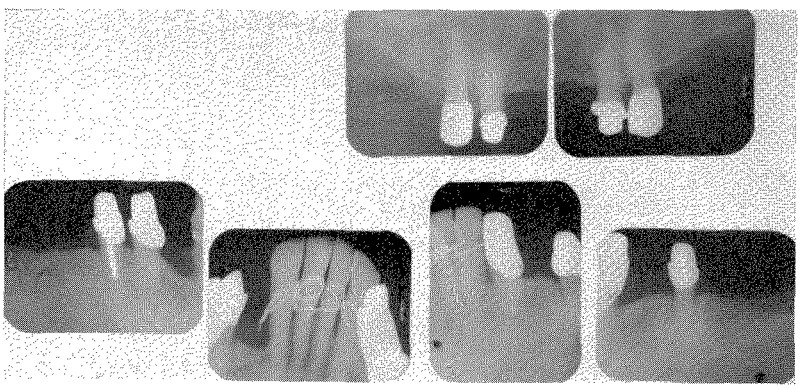


Fig. 1395. Roentgenograms taken in June, 1962. (Courtesy of her present dentist.)

The following are quotations from a letter from one of her former dentists replying to some questions:

"1. *Question:* Why was treatment so difficult?

Answer: Treatment was not difficult. What was difficult was to get her to accept the treatment prescribed.

"2. *Question:* Did you suspect a neurosis?

Answer: Not at first because when we first saw the patient the occlusal vertical dimension employed in the mouth rehabilitation was excessive. She appeared not to have any free-way space. Naturally, this led us to believe that if she were given a free-way space, this would solve the problem. With provisional restorations, this was done, with no relief that the patient would acknowledge. At this point we suspected neurosis.

"3. *Question:* Why have so many good dentists refused to treat her after they started?

Answer: Probably because they discovered that regardless of what they did she was not going to be pleased. The symptoms were most bizarre; it was so difficult to relate them to a mouth dysfunction.

"4. *Question:* Why has she left so many others?

Answer: Perhaps, because they failed to evaluate the gamut of all the physical, biologic and psychologic factors unsolved in her case. The treatment they prescribed as a consequence failed to meet all the physical, biologic and psychologic demands."*

The following are quotations from a letter from her present dentist:

"This is the type of case where many dentists failed to evaluate during the diagnostic phase of case management the exact nature of the female and her problems. She has been successfully treated from the standpoint of supplying partial dentures which she is willing and happy to wear except when they are removed for the few minutes required to clean them. Her present oral reconstructive units have functioned for approximately four years and will continue to do so, as long as her delusionary states are recognized and confined to certain channels. This is the type of case which must be handled through dental channels. Today's psychiatric methods and concepts, in my experience, have proven utterly useless."† (Figs. 1389 to 1395.)

By comparing Fig. 1390 with Fig. 1395, it can be observed that the lower right cuspid has been removed and that the lower incisors are now supported by wiring them together. In the transitional prosthesis which I inserted (Fig. 1393), splinting was resorted to. The present abutment castings are being employed as single units. The conclusion of this case report is on pp. 718 and 719.

Case 16

A middle-aged woman came for treatment in November, 1955. Because of her history and the fact that she had already been treated by several able colleagues,

*Personal communication, Dec. 27, 1961.
†Personal communication, Aug. 21, 1961.

suspicion was drawn to causes other than dental. A full upper denture and a lower lingual bar were required. The work was undertaken with the provision that the dental services could be discontinued should the dentist feel that no progress was being made, and fair remuneration was to be given for his services up to date.

Chief complaint

The comments of the patient were interesting and revealing. She reported that her jawbone was dropping and that she felt that she had to hold it up by putting bobby pins high on her scalp. She also stated that one side of her face "fell" down and that the tissue of the left cheek pushed into the left eye. She claimed to have lost her ability to sing and that the tissues of the face were closing in on her nose. According to her the natural teeth moved and rolled. When she cleaned her teeth, she was able to push them around. She remarked that her spine stretched and bent according to the position of the teeth.

Treatment

Treatment progressed no farther than the insertion of a temporary prosthesis. After an extended trial period that proved most disheartening and unsatisfactory, a consultation was held with the patient's husband. With as much kindness and sympathy as was possible under these trying circumstances, he was told that it was not possible to complete the work for his wife. He seemed very depressed but acted as though he had expected this to happen. (Figs. 1396 to 1399.)

One of her previous dentists wrote a letter to me describing his experiences with this patient. The letter follows:

Oct. 3, 1961

Dear Dr. _____:

In regards to Mrs. _____ whom you wrote me about, I remember her case well as I had quite a time with her.

I do not know who treated her previously to myself. When I first met her and discussed treatment, she seemed fairly reasonable and felt that I could fulfill her requests.

During the interval of the construction of her dentures, she was personable, pleasant and cooperative. After insertion of the dentures her reaction to the dentures, her criticisms and requests for adjustments were still not highly unusual. Then after a state of reasonable mouth comfort had been attained, a gradual worsening of her attitude and reaction to the dentures set in.

She was pleasant and normal enough before sitting in the dental chair. However, once she sat down and began explaining to me what her mouth and teeth felt like and what she would like me to do, I found her request unreasonable, unsound, and impossible to fulfill. I would do a little adjusting, a lot of explaining and reasoning, and then dismiss her.

However, she continued calling for adjustment appointments and the same pattern repeated itself. Her complaints became more and more irrational, and her explanations of her discomfort became incoherent. I tolerated this situation because outside of the dental chair she was very pleasant and personable and I felt sorry for her.

Finally, feeling that she was prejudiced and conditioned against the dentures, I remade them and changed the original design of the lower partial denture from a lingual plate to a simpler design that had two terminal clasps and a lingual bar. During the construction of the new dentures again she was personable, pleasant, and cooperative.

After completion and insertion of the dentures, however, the same reaction pattern repeated itself, only this time it was worse. In desperation I gave up on the case and told the patient I could do nothing further for her.

I heard nothing from her for a short time and then her husband called up and requested an appointment for her. I only granted it on the condition that he accompany her to the office. When she came, I observed that her appearance was not normal. She appeared bewildered and highly nervous, and her conversation was more irrational and incoherent than ever. I called her husband into my private office and told him that I did not think that his wife was in her right mind. He told me that she had been under mental treatment but he felt that since her complaints about her mouth and dentures were so strong that perhaps seeing me would help improve her mental condition. I requested her physician's name and telephone number and called him. He bluntly told me that I was wasting my time treating her as she had paranoidal symptoms and should be institutionalized and given shock treatment. When I told this to her husband, he broke down and cried and implored me to treat her, to listen to her complaints, to fake adjustments as both of them did not wish to follow her physician's recommendations. Naturally, I refused and strongly insisted that he follow through on her physician's advice.

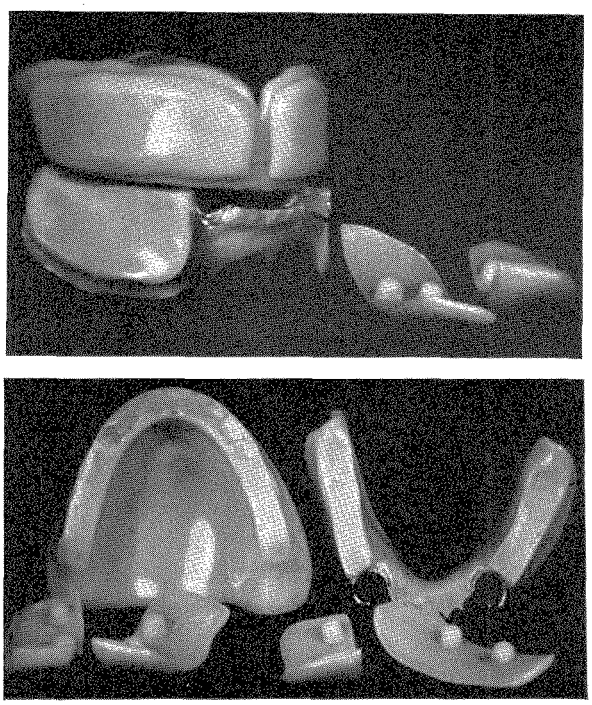


Fig. 1396. A great deal of trouble had been taken previously in order to obtain the correct vertical dimension and centric occlusion. These appliances had been used with no success whatsoever. (Figs. 1396 to 1399 are of the same case.)

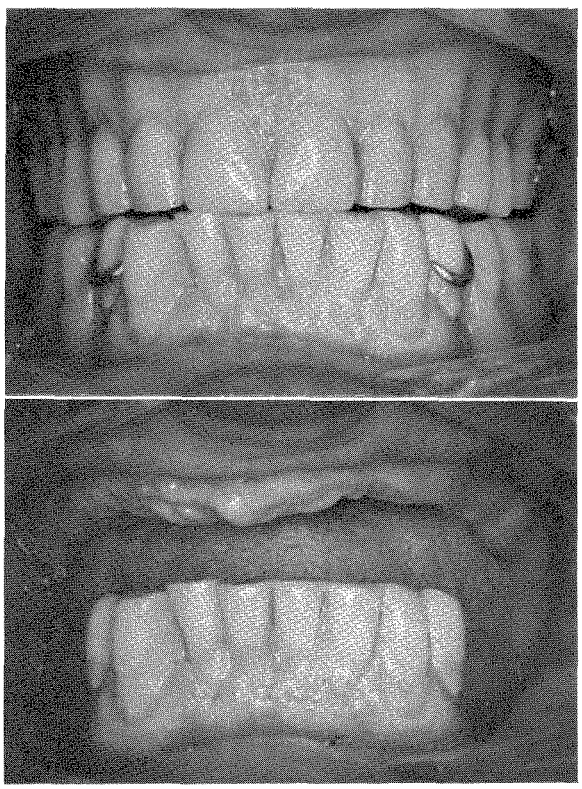


Fig. 1397. A, This set of a full upper and partial lower lingual bar was also worn with no success. Her protrusive bite is recorded in this photograph. **B,** There was nothing that could be called abnormal in the soft or hard structures of the oral cavity.

Fig. 1398. The patient made all sorts of facial expressions in an effort to convey her difficulties to the dentist.

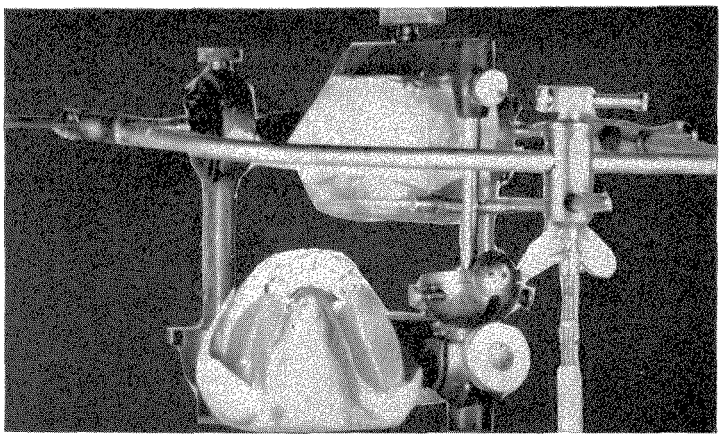


Fig. 1399. I made careful records and employed an accepted technique in making a new set of trial prostheses.

I did not see her again for another short period of time and then she again returned to the office. She was much improved when I saw her. In fact, she spoke and acted fairly normal. I believe she had been institutionalized and treated satisfactorily. I tried to correct some minor complaints she had and then dismissed her. In a short time the old pattern began to reappear and repeat itself. Calls for adjustments became more frequent and complaints and conversations became more irrational and incoherent. Again, I gave up on the case and refused to do anything further. The last I heard about her was when I met you at one of the meetings of the Prosthodontics Section of the First District Dental Society and you mentioned to me that you were attempting treatment for her.

I believe that this is definitely a case in which psychoneurotic symptoms were transferred to the oral cavity. Deep psychoanalysis would probably tie significant occurrences and facts together and arrive at a satisfactory explanation of the patient's behavior and symptoms.

Cordially,

(Signed)_____

The pattern is similar in many of these cases that present a psychosomatic background. You continue to treat elusive symptoms until you either become the patient's psychiatrist or, finally, discontinue your services. Treatment is rarely ever completed for these patients because the neurotic symptoms are manifested in their dental problems.

Case 17

Past history

In February, 1955, a 40-year-old woman was referred by a periodontist for an occlusal problem. She had recently left another periodontist and prosthodontist who had been treating her. It was discovered sometime later that although both of these dentists were very competent and the work was well executed, neither one had satisfied her. She was a spinster and always came accompanied by her mother and her sister.

Treatment

With a background such as this, one should be apprehensive of his ability to bring this case to a successful conclusion. There was no financial problem. She was missing a total of fifteen teeth. The transitional work consisted of a ten-unit splint on her upper anterior teeth with the upper posterior teeth replaced by means of a removable partial denture. The old lower anterior fixed prosthesis was retained, and a lower lingual bar was inserted to replace the lower posterior molars. The work was constructed on a Hanau Model H articulator and was inserted on March 29, 1956. There were constant postinsertion adjustments. By maintaining a sympathetic, persevering attitude, the adjustments were continued on a very amicable relationship. The old familiar pattern of the dentist assuming the role of a psychiatrist was again asserting itself. There was a premonition that final work would never be inserted.

In August, 1956, a second transitional set of prosthetic appliances was constructed. This included a new upper fixed splint. A face-bow and conventional wax records were taken to register her various mandibular relational positions. In January, 1957, the saddles of the lower lingual bar were rebased. Very little progress was being made. Fortunately, the patient solved the problem. She went elsewhere. Luckily the final work had not been inserted. It is certain that the next dentist would have had to remove it and construct another prosthesis for her. During all this time she continued to have frequent periodontal treatments, although the previous periodontist stated that he had completed her periodontal therapy in 1955.

An interesting sequel to this case came about in 1961 when it was discovered that since 1957 she had been treated by a colleague. Upon inquiry, he was kind enough to supply the following information as to the subsequent treatment this patient received since 1957:

"Miss _____ first consulted me in early 1957. She manifested temporomandibular symptoms which we treated with ethyl chloride spray and we made her a night guard, which we hoped would eliminate her bruxism.

"Dr. _____ has been taking care of her periodontal needs since that time. However, in May, 1960, the extent of her caries necessitated my provisionally splinting her entire upper jaw. Next month or so, we are going to carry her case to completion, with great trepidation and caution I might add."

This dentist had been treating her for almost five years, and she was still in transitional work. He was going to attempt final work "next month or so" and "with great trepidation and caution." An interesting and informative letter was obtained from the dentist who had treated her prior to her being referred to me. The following is a copy of what he wrote relative to this patient:

"This is a case report of a dental patient, a female, over 40 years of age, single, and never married, rather garrulous but generally in good spirits, and a bit overstimulated (manic?). She had several hospitalizations, one for a severe trichinosis, the other for spinal trouble. She is now enjoying good health and is apparently anxious to have her teeth treated. She has no occupation and lives in a large private home with her widowed elderly mother and a slightly younger sister in the suburbs.

"The patient was referred to me by an eminent periodontist who described her case as one of periodontal disease marked by gingival recession, some bone loss, a number of teeth with bifurcation involvements, improper method of brushing the teeth, etc., and in need of replacements for missing teeth. From here on her dental history contains such complaints as 'soreness deep in her mouth,' an upper right bicuspid fixed bridge that 'altered her mouth and is giving her a wedging sensation.' She also complained of 'sensitiveness all over her mouth and a deep (oral) soreness generally.' The history concludes with 'the patient has nail biting and clenching habits; also T.M.J. discomfort and subluxation of the left side.'

"In the six months of periodontal therapy that included conservative curettage, localized gingivectomy, toothbrush instruction, and equilibration of occlusion, the patient was made comfortable, had no T.M.J. discomfort, and her vague symptoms of oral soreness were no longer mentioned. But, the patient still clenched her teeth, bit her nails, and had left T.M.J. subluxation and clicking when she presented to me for restorative work.

"This required an upper and lower removable precision attachment partial denture, each with bilateral extension saddles, there being no molars in the mouth, with no upper left second bicuspid. Some bone loss and mobility of teeth required using splinted multiple abutments. There was no evident loss of vertical height, and therefore no change in this was indicated.

"In the course of rendering the above-outlined restorative services, several notes must be made. First, my relations with this patient were in the best tradition of pleasant professional relations, up to the last visit when I advised her that I could not help her any more at this time and why. Second, in the course of my work, several unusual 'accidents' occurred, some of them timed suspiciously close to the completion time of important units of splint work. Examples: Once she came in with her completed lingual bar precision attachment case so badly bent, one had to wonder how it could have happened by merely dropping it. The bar had to be severed and rejoined. At another time, she came in with her upper precision attachment case so badly smashed, —she said 'it fell out of my pocket on my driveway and I ran over it with my station wagon.' It, too, had to be remade. A few months later she returned to the office reporting her purse was stolen with her lower attachment case in it. It had to be remade again.

"Each time that a precision attachment case is remade, or repaired with a new set of males (the abutment castings having been previously cemented—they have lingual shoulders to house cast auxiliary clasp arms), the new case just never fitted as well as the original case.

Many fittings of the framework with new males and clasp arms were required, the time consumed was considerable and so was the additional expense to the patient. It was noted there was never a complaint about this. Why? Perhaps, she had insurance coverage for this. At any rate, one could not escape a possible thought that this patient never wanted her dental work to be finished. As I neared completion she began to describe pains of a vague and intractable nature in her mouth and teeth, similar to those listed in the periodontist's history. General soreness in her mouth and sensitiveness in her teeth were terms noted in her dental record. Neither this operator nor her periodontist could find any reason for her complaints. Finally, it was suggested that the patient absent herself for a month or so, with the understanding that these pains have obscure causes at this time; no clearly defined dental cause is now apparent.

Text continued on p. 686.

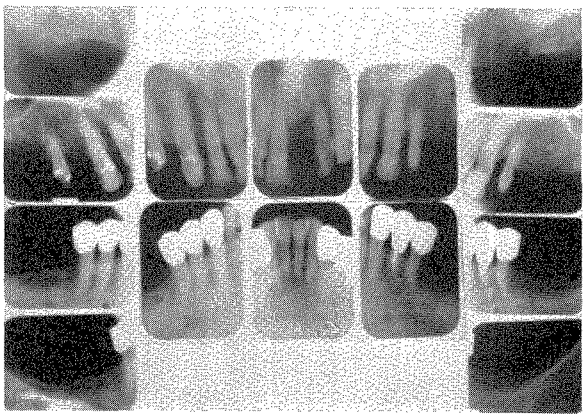


Fig. 1400. Roentgenograms of a 40-year-old female patient that were taken at the start of treatment in February, 1955. (Figs. 1400 to 1407 are of the same case.)

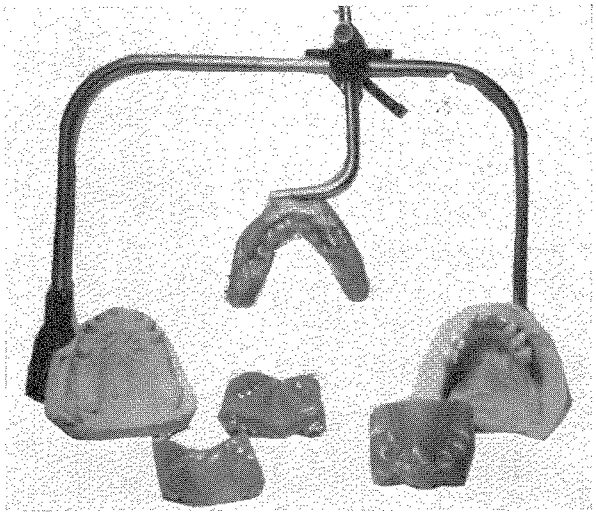


Fig. 1401. Records were taken with great care in order to construct her trial prostheses.

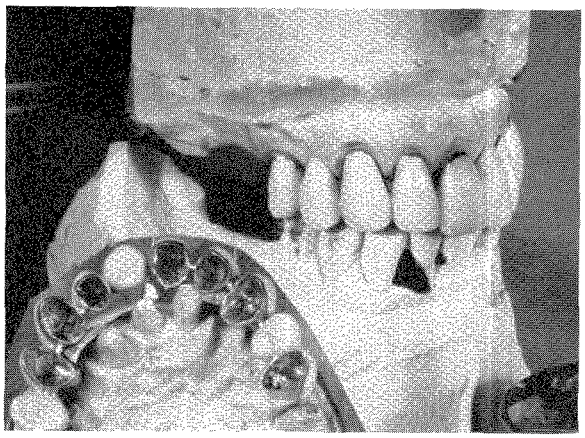


Fig. 1402. A ten-unit splint was first made using the seven remaining upper teeth. It may be seen in the lower left foreground. It was a one-piece casting. This was fitted in the mouth, and then new records were taken and new upper work casts poured. Upon these casts removable partial trial dentures were constructed.

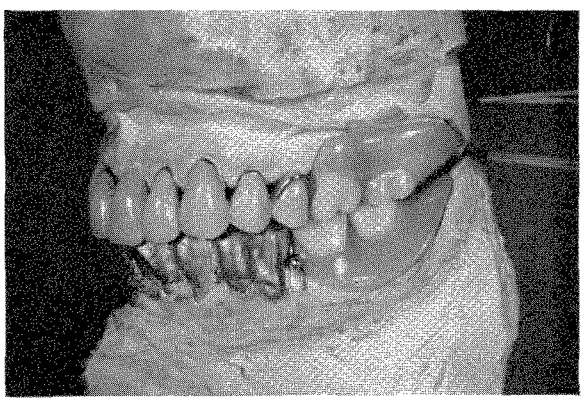


Fig. 1403. The completed prosthesis is shown on the articulator.

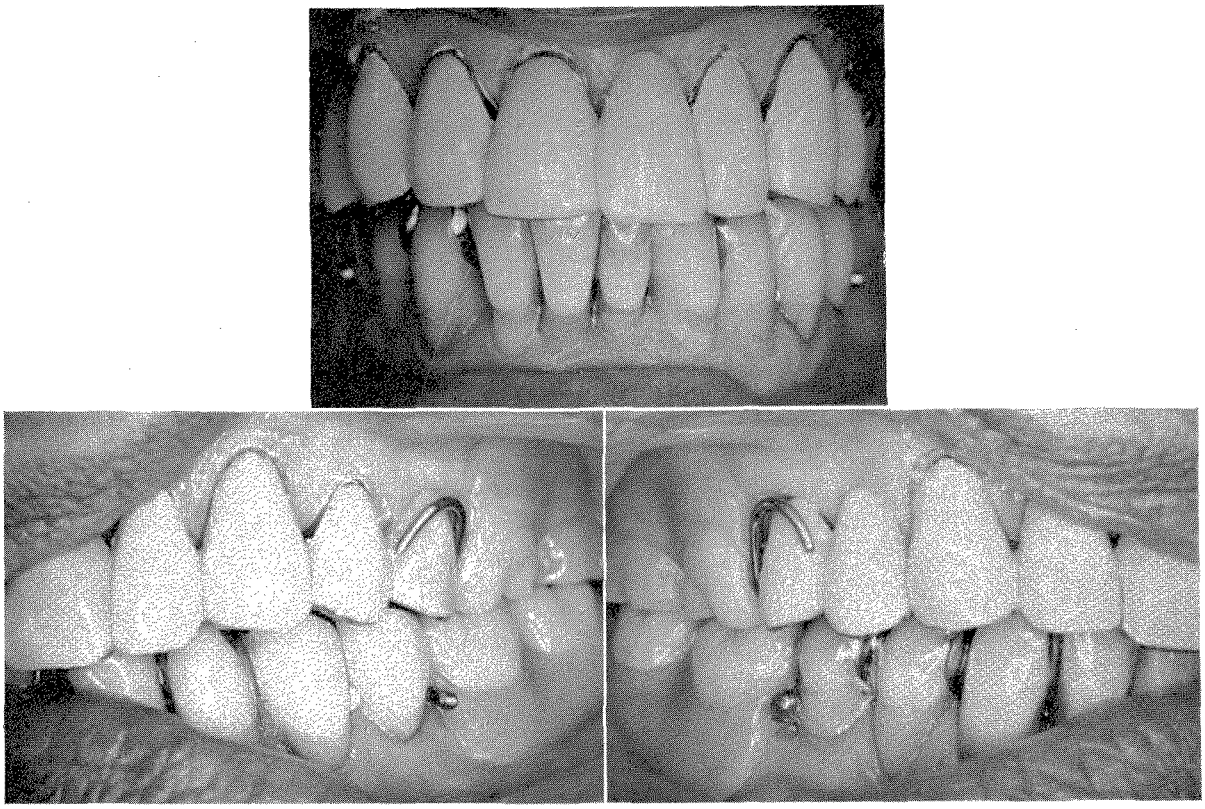


Fig. 1404. The first temporary trial fixed and removable partial dentures were inserted on March 29, 1956. Three views of the work are shown here. The upper fixed partial denture was retained by means of a temporary cement.

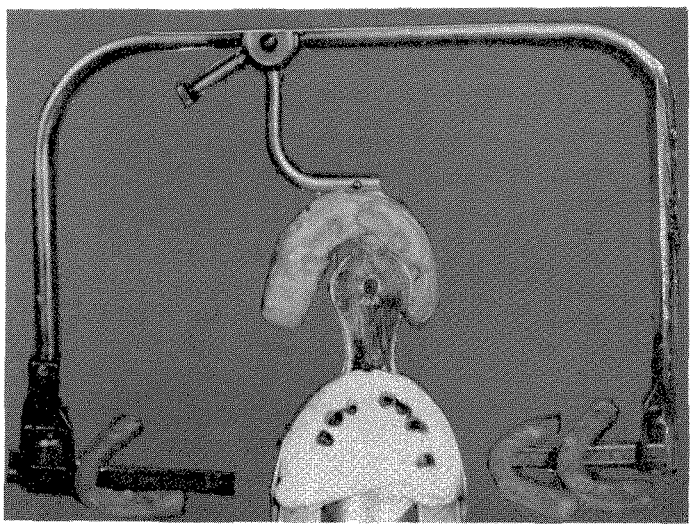


Fig. 1405. On May 23, 1956, new records were made from which to construct another set of temporary trial restorations. This time, instead of a one-piece upper anterior casting, the crowns were individually made and soldered together after being fitted. They are shown here in the plaster impression.

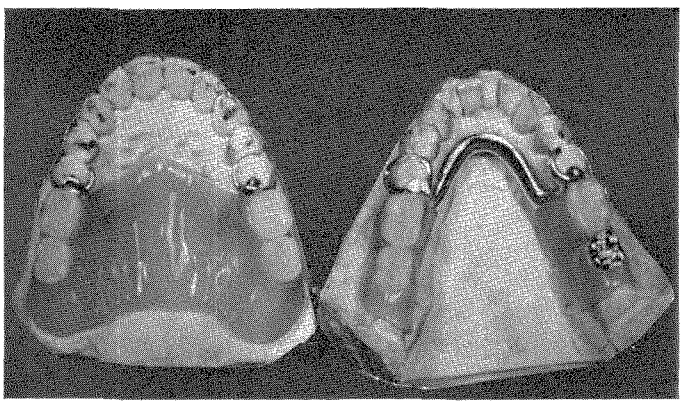


Fig. 1406. The completed trial removable partial dentures are shown here.

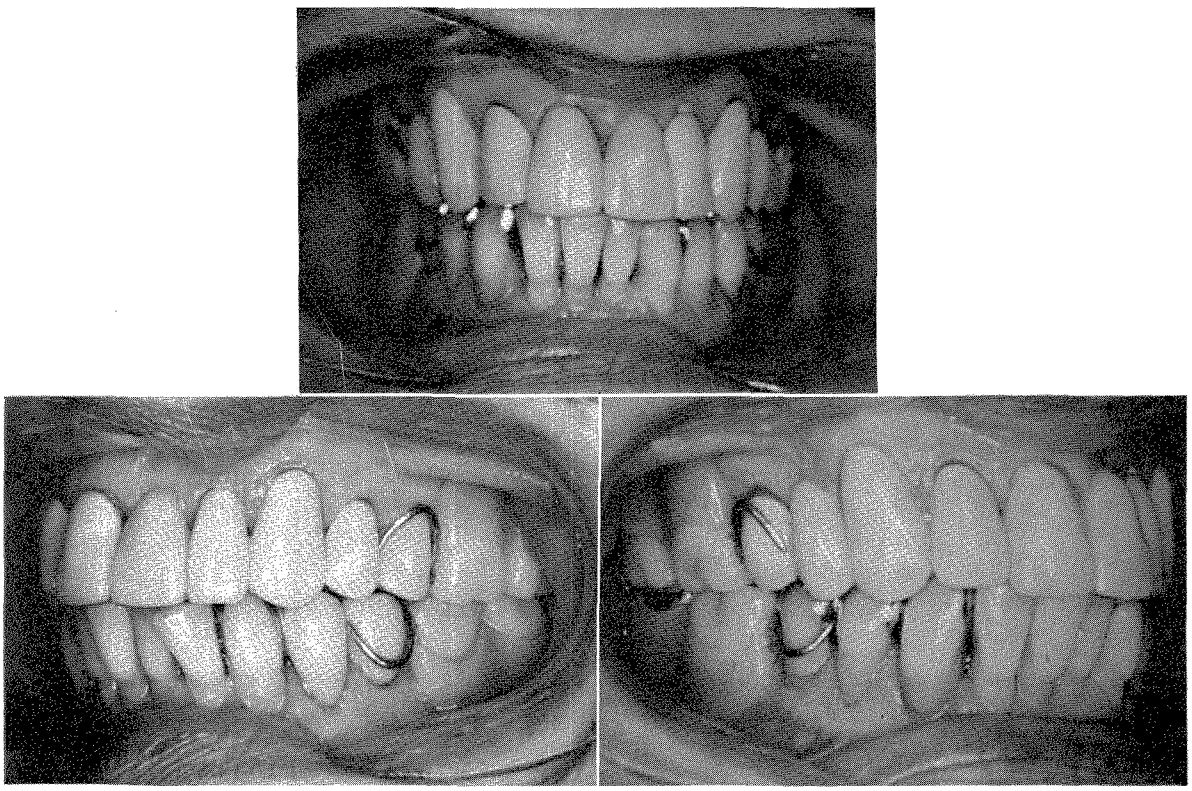


Fig. 1407. Three views of the new trial bridges in position in the mouth. These photographs were taken in August, 1956.

Perhaps the picture would be clarified in that time by some clearly delineated clinical symptom, and/or by roentgenographic evidence. The patient would not accept this approach, and abruptly left my service. I have not heard directly from her since that day.

"Whenever all the available dental means of checking out reasons for dental complaints are exhausted, and no help to the patient (any patient) results, have we the right to blame psychogenic factors? Our own personality make-up also could influence the picture. One recommendation must certainly be made— a dental history should be complete in all details, emphasizing not only general and dental health but also trends in mental health. A positive knowledge about the patient's emotional status might prevent many unhappy, useless hours for both the patient and the dentist. We should be better informed to understand patient's reactions and the reasons for such. If we were that learned, we might recognize those patients that we could not treat successfully, and we might know beforehand why this is so. The rendering of good dental service is indeed complex."

In December, 1962, I had the opportunity of again meeting the patient's present dentist. At this time he had been treating her for nearly seven years. He was again asked what progress he had made. His answer was that he had just finished the upper work. His answer was hurried and evasive, as though he was unwilling to discuss it further, so nothing more was said. (Figs. 1400 to 1407.)

A SMALL, APPARENTLY INSIGNIFICANT DENTAL OPERATION MAY TRIGGER OFF SEVERE PSYCHOLOGICAL REACTIONS

In Chapter 10 on open bite the statement was made that there are patients for whom the insertion of a single filling served to alter their entire occlusion and cause no end of trouble. It is also possible for the insertion of a malfitting filling to set off a series of psychosmotic reactions that can become difficult if not impossible for the dentist to control. There may have been an underlying neurotic pattern that was triggered by this occlusal disturbance.

Case 18

Past history

In 1961 a 70-year-old woman was referred for treatment of a difficult occlusal problem. She wrote her own history, which follows, and admitted that she was "now self-conscious about this tooth trouble." She came from an unusually long-lived family. She had no ailments other than her teeth. She had "no chronic dental symptoms" and was pleased with "my sound nice looking front teeth." Her trouble started in the following manner: "Just before I went to . . . two and a quarter years ago, this third dentist put in an inlay in a tooth (not a front tooth) and I complained at the time that it felt much too large—I returned several times to tell him it seemed to hit the tooth below."

She was away for about six weeks. She returned, and her history continues: "When I got back from . . ., I was having something I had never in my life

had heretofore; I was having toothache in my apparently perfectly sound upper incisors. I went back to my dentist—he said my x-rays were normal—he could find absolutely no reason for the supposed toothache—and he, finally, said that if I would like to have his diagnosis checked by another dentist he thought it would be a good idea."

The next dentist wanted to take out all her back inlays and raise her vertical dimension. She then went to still another dentist to check the contrary opinions. Meanwhile, during these two years she neglected her usual regular dental attention. She stated, "I cannot see either that this is my fault, nor do I think I am a hypochondriac; most people of my age have all sorts of ailments and aches and pains; I have nothing other than my teeth." She was not satisfied with the opinion of the third dentist and went to still another. He inserted several different types of bite plates on her upper posterior teeth. Gold occlusal splints were also inserted on her lower posterior teeth. These were made in order to relieve her anterior upper teeth from the severe pressure she complained of. In addition, she also had her upper third molars removed as part of the corrective treatment. (See Fig. 1408.)

She obtained some relief from the splints insofar as her upper anterior teeth were concerned, but she stated that the bite plates altered her interocclusal relationship, caused frequent irritations of her gums, and caused spaces between her teeth so that now "I am forced to the horrible (and for me, new) experience of having to use a toothpick." In addition, the six months that she wore the bite plate at night "was so really very uncomfortable that I started on my new sleeping pill jag— . . ., which, to my complete disapproval, I am now an absolute addict." She also writes that "the plastic upper jaw plate has positively changed the shape of my mouth."

All day long she kept shifting her "jaws about to attempt (unsuccessfully) to find a comfortable occlusal position. I am unable to find such a position—this inability to close my jaws so that they are in a normal rested position makes me wake up to find myself clenching my teeth badly (I am quite sure that the clenching is a newish habit, for example, I am positive that I did not do it five or six years ago)."

Relative to her pain, she tells of the "misery, discomfort and pain I have been in and further, it is my opinion, that one way and another, my entire physique has deteriorated—I have active pain symptoms in my upper front teeth more than 50% of the time." She feels dull pins and needles in the incisor gum region which, although unpleasant, still is bearable.

Occasionally the pain becomes intense, sudden, darting, and in the region of the upper left incisor. "The pain can be so intense that I think a wave of gooseflesh swerves over me; for example, my arms—its as though my teeth were the consistency of soft butter and with no warning a red hot, tiny corkscrew suddenly is jabbed up into the root of the tooth. Its about the duration of a flash of lightning, but, while it lasts, its as bad a pain as I have ever had, for any reason whatsoever, childbirth, etc., in my life."

This patient had been to a neurologist who affirmed that it was not tic douloureux. She had been to her own medical doctor many times. According to her husband, she had never exaggerated and never unduly complained of any illness

or pain. She was very sensitive about being told it was possible that she needed psychiatric treatment.

Discussion

With a history such as this, it is difficult for the dentist to attempt treatment without apprehension. She may never have been a psychiatric case, but with her history since the insertion of the posterior gold inlay in 1958, she certainly was not normal dentally. The dentist fears to undertake treatment less he be added to the long list of the many previous operators. What must be considered in its true light is that the origin of this was the insertion of a single gold inlay in a posterior tooth. It sounds incredible, but there are many who will testify to the veracity of this statement.

In treating this type patient, only our best efforts based upon knowledge and experience can be promised. If these tools are inadequate, it is not just to be condemned or criticized. Sufficient time must be allowed to pass, and if no beneficial results have been obtained from the treatment, the dentist should be permitted to withdraw from the case without having to give lengthy explanations that may prove embarrassing. In addition, the dentist should receive adequate compensation for his efforts even if they are unsuccessful. All this should be written and signed beforehand by the responsible parties.

Treatment planning

The treatment phase of such a case consists of an attempt to obtain a comfortable position of the mandible by whatever means possible. The patient's medical advisor should be conferred with in order to obtain his diagnosis and cooperation. The report of the neurologist should also be verified. In the above case, it was evident from the history that the upper incisors should be relieved from the occlusal pressure. Careful planning would be necessary to eliminate the deleterious symptoms caused by the other bite plates. Excellent records of her oral structures had to be obtained. This included mounted casts, photographs, roentgenograms, and a history report. It would be impossible to treat this case by re-establishing the original occlusion. Equilibrating the occlusion would not solve the problem. The entire interocclusal pattern had to be changed.

In essence, the maxillomandibular intercuspal relationship had to be coordinated at the correct centric relational position. The patient had been very comfortable before the insertion of the posterior inlay. It should be emphasized that the solution did not depend upon any intricate articulator or special concept of interocclusal relationships. Simple articulators can be just as effective providing the dentist is aware of his problem.

There is one factor that can now be of great help to the patient. By this time, the patient has been to many dentists, each of whom has suggested or performed some manner of treatment. The patient has become fearful and confused while the dentists are more wary of undertaking the work. A point is reached when even the able and experienced operator is doubtful as to whether he will be able to accomplish anything. If this is all explained to the parties concerned before the case is undertaken, the patient will undoubtedly be more cooperative, and this in itself will afford the dentist a greater chance of success.

Proposed treatment

In the case being described, a lower plastic occlusal guard splint was inserted covering all her lower teeth. Her upper incisors did not contact this splint. This afforded some relief. The roentgenograms had disclosed ten missing teeth and three posterior fixed bridges. There were also open interproximal contacts. The program decided upon was to replace all the old prosthesis. The vertical dimension was to be increased just enough to relieve the pressure from her upper anterior teeth. The posterior occlusion was to be coordinated. These recommendations were discussed with the patient and her husband. They both agreed to the procedure.

Final disposition of case

In August, 1961, a contract letter was sent. For the benefit of the reader, it has been printed in full. The patient's husband refused to sign the contract. His letter has also been printed. Under these circumstances, the case was rejected. It would not have been intelligent to enter the phase of extensive treatment without complete cooperation.

Correspondence

Dear Mr. _____:

In accordance with my agreement during our several consultations with Mrs. _____ and you relative to her dental problem, I hereby submit the following outline of treatment which I prescribe for Mrs. _____. Both my associate and I have been carefully examining her records since her first appointment on May 17, 1961. These records were those which were given to me, having been made by previous dentists, and those which we made. They included study casts and roentgenograms of her teeth. In addition, I have carefully considered her dental history which she has written out for us and which she has added to verbally in her several visits.

Where her dentistry is concerned, Mrs. _____ is emotionally upset, having been to several dentists. Each one did something for her. She has worn several kinds of appliances to relieve the pains and irritations which have affected her ever since she had an inlay inserted in a back tooth about two and one-half years ago. She was referred to us by Dr. _____ who felt that they could do no more for her and that, perhaps, we might be able to help her.

Very often cases of this sort present a confused picture which takes time to unravel. I agreed to try. She has neglected her mouth during this interval and as a consequence a great deal of her bridgework and fillings need replacement. This will be done and at the same time we will try to remove the pressures from her upper front teeth. You will recall that this pressure is extremely uncomfortable and objectionable to Mrs. _____.

Transitional work will be made when necessary in order to keep the patient reasonably comfortable during the procedure.

There is one point which I wish to make clear. If, during the procedure, we find that our efforts are not showing beneficial results for whatever reasons there may be, we must be permitted to step out of the case without having to offer any excuses. In addition, we will expect fair compensation for our efforts up to that time. This compensation is to be decided by us in consideration of the time spent and the charges for the complete work which now follows.

I will appreciate your check for _____ now as the first payment of this contract. When we are half-way completed, we shall ask for another payment. The final payment will be upon completion of the work.

I am enclosing this letter in duplicate. Kindly sign one copy and return it for my files. The original is for your files. If there are any further questions, please ask them. Otherwise, I will await your call to arrange the appointments. A good start can be made now and the work continued during the summer.

Assuring you of my earnest desire to carry this case to a successful termination, I am

Very truly yours,

(Signed)_____

The patient's husband's letter in answer to the above follows:

Aug. 3, 1961

Dear Dr. _____:

You are aware of my deep anxiety for my wife and of my longing to have her dental problems fully and satisfactorily resolved. You will, therefore, understand how reluctant I am to abandon any proposal which offers hope, however tenuous.

Nonetheless, I feel that I cannot agree to the terms outlined in your letter, particularly the provision that you may drop the case any time you wish "without having to offer any excuses." I have never before been asked by any doctor or dentist to pay in advance, but I could swallow my pride on that point if there were merely reasonable assurance that the job would be done. Far from furnishing such assurance, the statements in your letter are clearly to the contrary.

In view of the foregoing, I must decline to accept the agreement which you suggest and, accordingly, should be glad if you would return to me immediately the X-ray pictures, casts, etc. which you have in your possession and for which, as you know, you have been paid in full.

Very truly yours,

(Signed)_____

And, finally, the reply to his letter reads as follows:

Dear Mr. _____:

I am in receipt of your letter of August 3. My associates and I have spent a great deal of time and effort in arriving at the conclusions which we have presented to you. I am truly sorry, but there is no other way that we could accept the case.

I shall be pleased to send Mrs. _____'s records to your . . . office.

Very truly yours,

(Signed)_____

Patient responsibility

It is to be emphasized that the patient's husband has made a logical reply based on conditioned expectations of diagnosis and treatment planning. For a patient to put such complete trust in a dentist, who is not intimately known, is contrary to human nature. Where questionable mechanical and physiological

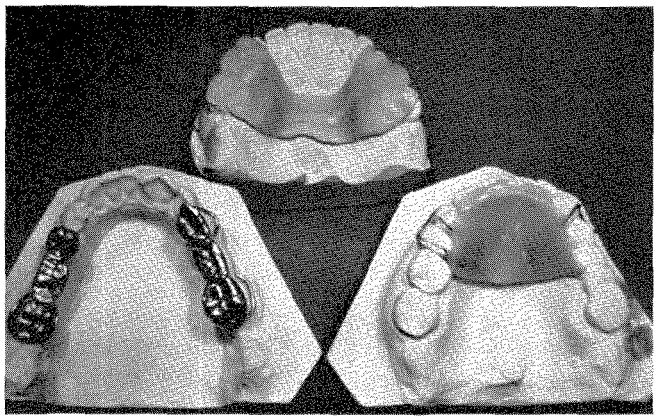


Fig. 1408. Various forms of bite plates and occlusal splints used by some of the previous dentists to correct the interocclusal relationship of a 70-year-old female patient. (Figs. 1408 and 1409 are of the same case.)

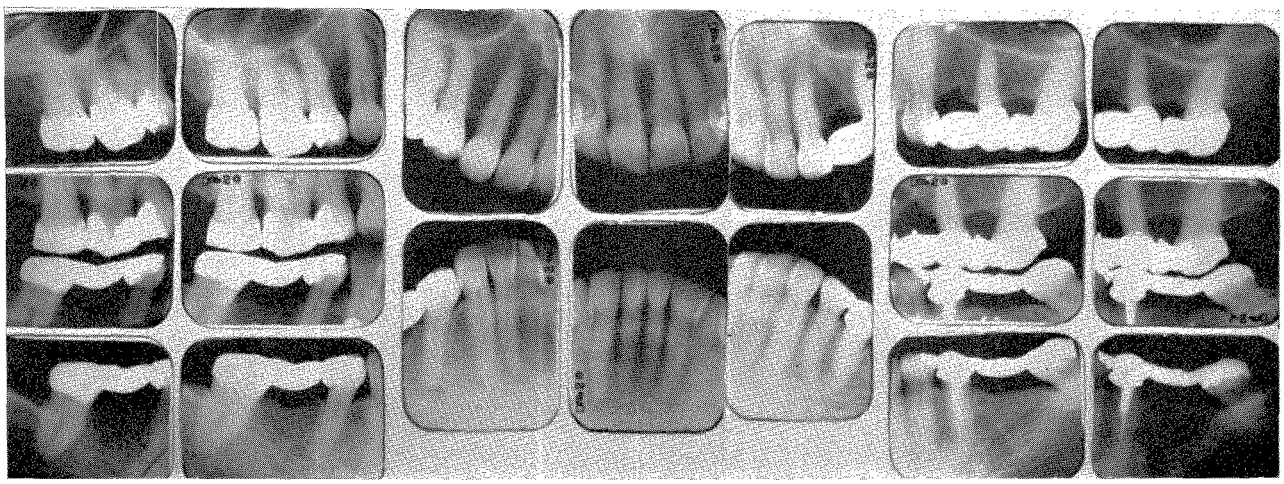


Fig. 1409. Roentgenograms that were taken in May, 1961.

procedures are contemplated, it is not difficult to establish rapport with a patient, and have the patient assume a portion of the responsibility. However, where psychic disturbances are present, there are often insurmountable barriers to success, but the patient finds it impossible to assume the responsibility of giving the dentist discretionary powers of case termination. Though it is difficult to demand such powers, it is completely unethical to commence treatment without both parties cognizant of the possibility that the case may never be completed. (Figs. 1408 and 1409.)

Case 19

In December, 1947, a 43-year-old woman was referred for treatment of a malocclusion. Her history contained the information that was reported in 1951.* In September, 1946, a dentist had devitalized a lower right second molar. Ever since the devitalization, she had trouble with her bite. Several dentists had attempted

*Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., pp. 926-931, Figs. 791-803.

to equilibrate her occlusion. An upper third molar had also been removed. Finally, it was suggested that she see a psychiatrist.

When this patient was first examined, an open bite and an excentric interocclusal relationship were present. With the aid of intraoral central-bearing plates, the open bite was closed, and maximum contact was obtained in her centric relation position. She continually complained of soreness of the mucous membrane of her cheeks and of cheek biting.

Upon careful questioning it was discovered that she and her husband had been under psychiatric treatment. Under these circumstances, it was entirely possible that the dental problem had acutely disturbed the emotional problem. The dental problem was real, but in a field of emotional tension, both it and the psychic illness became more aggravated. When patients are not able to cope with the many difficult situations which life presents and a dental disturbance is added, often all their emotional difficulties become concentrated in the oral problem, allowing this area to become the focal point.

The equilibration was completed in January, 1948, after which the patient left for . . . . The restorative work was to be completed by the referring dentist, who was also to refine the interocclusal coordination by means of fixed prosthesis.

On March 6, 1948, the following letter was received from . . . :

Dear Dr. _____:

Since talking to you long distance about six weeks ago, I have been on a veritable merry-go-round; not a pleasurable ride at all. The very good news, however, is that Mr. _____ has vastly improved in this mild climate and is well enough to be left alone; so I am returning to . . . on the 17th.

When I left . . . , you told me to send you a Night Letter if I had any trouble and that you would know what to tell me to do. I felt that I could not express my troubles so clearly by telegram as over the telephone—that is why I called. You told me to go to a local dentist—well, I went not only to one but to three dentists and to one physician. Now, I am convinced that if you will take one look into my mouth you will know exactly what it is all about and will be able to help me.

First Dentist—'Oh, it is a nerve condition which sometimes is caused by filing down teeth. Take ten grains of aspirin daily and you will be fine.'

Second Dentist—(with a horrified expression) 'What, you had your teeth filed down? That's terrible. I never do this. Once you start it, you file a little here and a little there and there is no end to it. Here, take this 'rope' and place it in your mouth to relieve the soreness of your cheeks.' I tried this rope but it irritated the soreness even more so I stopped using it. This same dentist said: 'besides, I think you have trench mouth.'

Laboratory test—'Several areas loaded with spirilla. Other areas 10-40 spirilla/hpf—many fusiform bacilli.' Does this mean trench mouth I asked? 'Well, go to a doctor.'

Doctor—Again, I asked, does this mean trench mouth? 'Well,' the doctor said, 'all people have spirilla germs in their mouth but, in your case, as long as you have this soreness on your cheeks, it would be advisable to take a couple of penicillin injections to safeguard you against infection.' I did this—had 600,000 units of penicillin and his report read 'on examination for Vincent's angina, smear negative.'

Third Dentist—In . . . . 'You have a soreness and heat sensation on your cheeks?' 'How old are you?' I replied that I am 42 and, lo and behold, he said '42 years old, then it must be due to the beginning of the menopause.'

The only good advice this last dentist gave me is that I should go back to . . . to the dentist who filed down my teeth and let him finish the job. I know that you will be able to help me or, at least, tell me what to do.

I shall contact you upon my return. In the meantime, accept my best wishes for your good health.

Sincerely,

(Signed)_____

This patient had not been seen since January, 1948. She continued to be treated by her old dentist, who later referred her to a periodontist. The following is a letter which the periodontist wrote in October, 1948.

Oct. 19, 1948

Dear Dr. _____:

Mrs. _____ was diagnosed at my office for an increasing discomfort with throbbing on the left side. The ridging of the buccal mucosa has also been investigated.

The complaints although based on local irritating factors are enlarged by emotional tension especially in the past two years during which the medical treatment and home problems have mounted to create a strong background of attempted resistance causing clenching, sucking and tongue thrusting habits. With the understanding that only limited relief can be given from local treatment, oral care may be given as follows:

1. Check centric occlusion with pink baseplate wax to reduce the high spots that are creating a centric rocking.
2. Round off the buccal cusps of the left bridge abutments and the lingual of the left pontic to create less cheek biting and allow slightly more tongue room. The restoration is very nicely made.
3. Construct a stationary bridge for the right first molar space rigidly held to both abutments by soldered joints. The pulp therapy of the lower right second molar, although not ideal, is satisfactory and safe.
4. The Charters' method of brushing the teeth is to be taught to be performed after each meal whenever possible. A carbamide-dibasic ammonium phosphate dentifrice has been prescribed to be used in dilute solution. Milk of magnesia dentifrices are especially to be avoided.
5. Thorough subgingival curettage for the anterior pockets. If any do not respond completely they should be resected.
6. The diet is too fortified and corrected as already taught.

Accompanying are the roentgenograms which you so kindly submitted for this session in addition to three films that were taken today.

Discussion

In retrospect, it is possible that the case is similar to another one which was reported earlier in the text (pp. 364 to 369, Figs. 776 to 784). The opening of the mouth in order to permit the dentist to do the root canal therapy could have caused a temporomandibular disturbance which in turn could have caused a distorted occlusal pattern. The immediate result might have been a muscular trismus. If this were not recognized by the many dentists who had been called upon to treat her, each one of them would have attempted to correct what seemed to be an incorrect centric relation. When the casts were mounted by means of a centric re-

laxation wax record, they resembled what was seen clinically. If, however, the casts were related in the hand, normal intercuspation was present.

There are no records of the temporomandibular roentgenograms having been taken. In looking over her history, no mention was ever made of her having received shock treatment for her neuroses. Had she received such treatment, her mandibular joints may have been injured at that time.

In December, 1961, by good fortune the dentist who referred this patient in December, 1947, was located. The patient was 56 years old at this time. According to his history, she had always been a problem. If there were no problems, she created them. Although she continually returned to her old dentist, she thought nothing of obtaining advice or even treatment from several others. In 1948 she had the feeling that after her occlusion had been equilibrated, I no longer wished to see her.

If any problem arose, no matter how slight, she communicated with her old dentist by long distance phone and received an infantile type of reassurance. She visited him at infrequent intervals if only to receive sympathy and consolation. This dentist felt that he had become her psychiatrist and resented it. He stated

Text continued on p. 699.

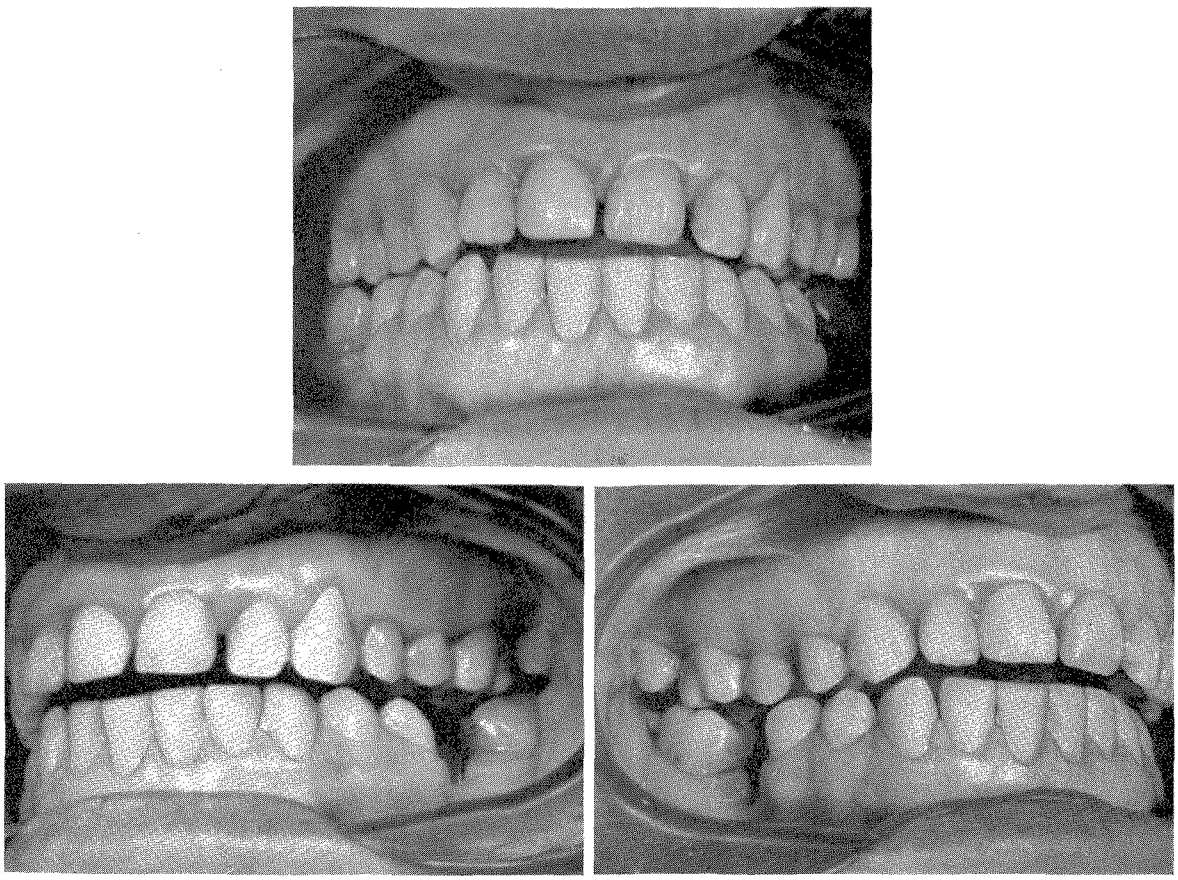


Fig. 1410. Anterior, left, and right views of the teeth of a 43-year-old woman showing the alteration in the occlusion. (Read text.) The teeth are in contact, and the entire mandible seems to have changed its position. These photographs were taken in 1947. (Figs. 1410 to 1420 are of the same case.)

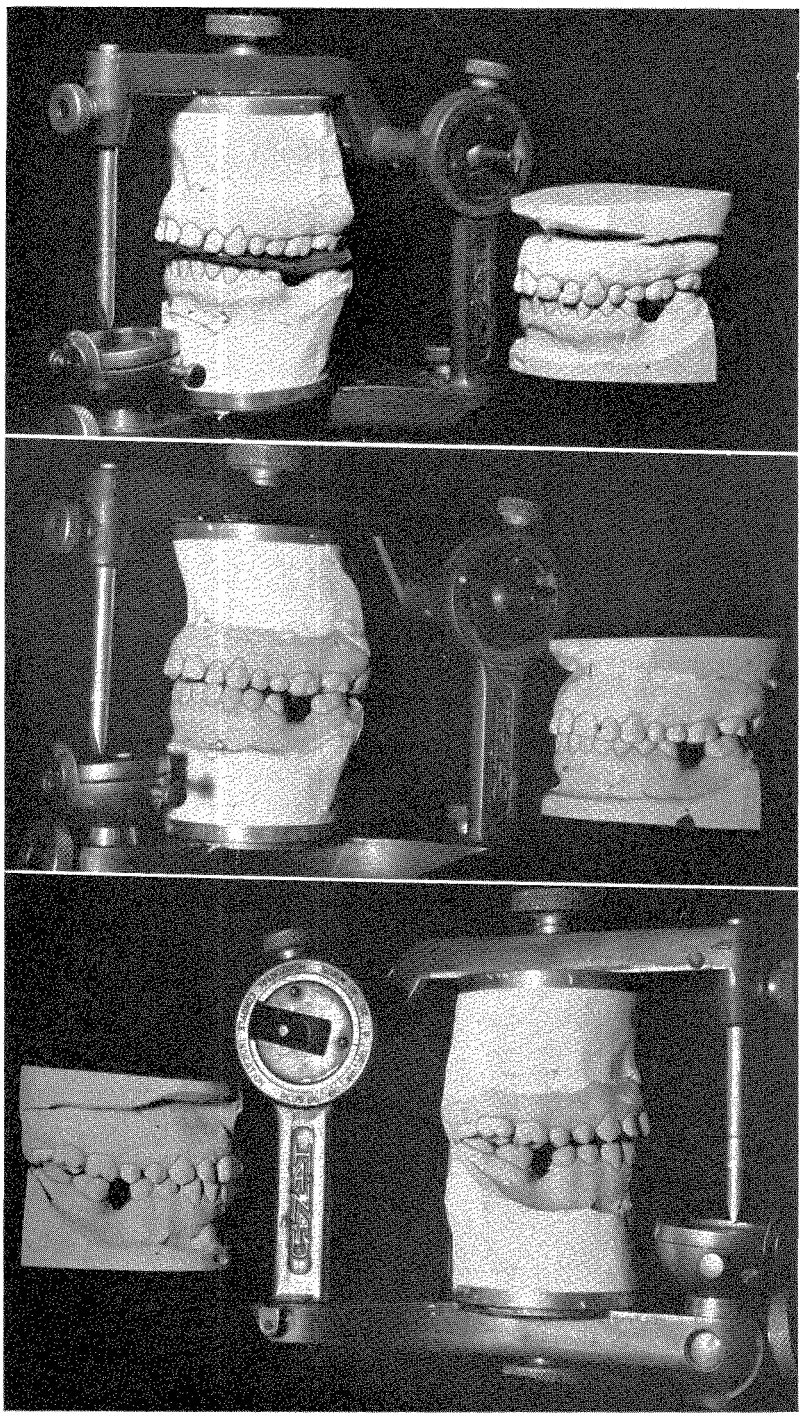


Fig. 1411

Fig. 1412

Fig. 1413

Figs. 1411-1413. Three views of the models mounted upon the articulator. The duplicate models are shown beside the articulator. If the casts are held in the hand, the intercuspation seems correct. The articulated casts, however, show the same relationship as is seen in the mouth. (Refer to Fig. 1410.)

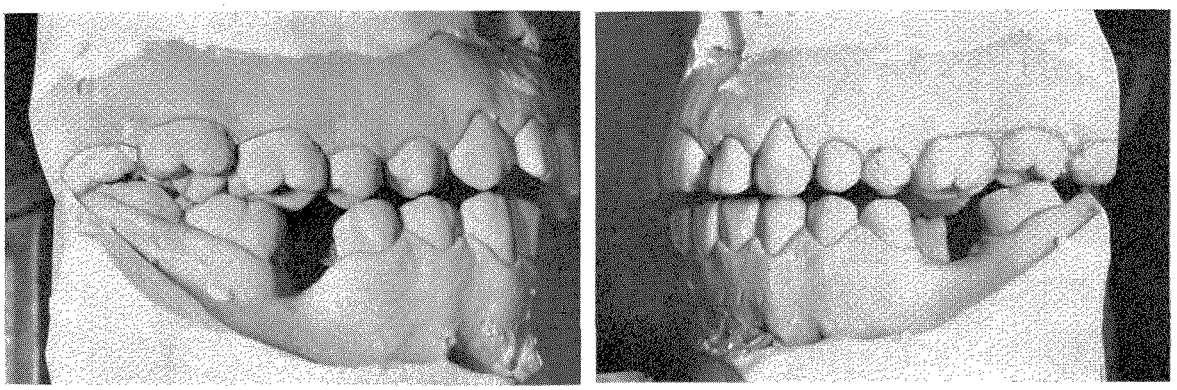
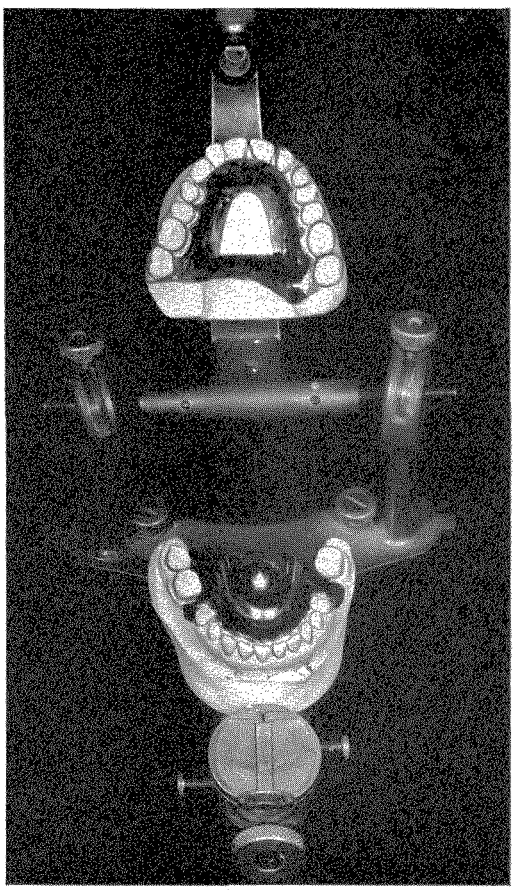
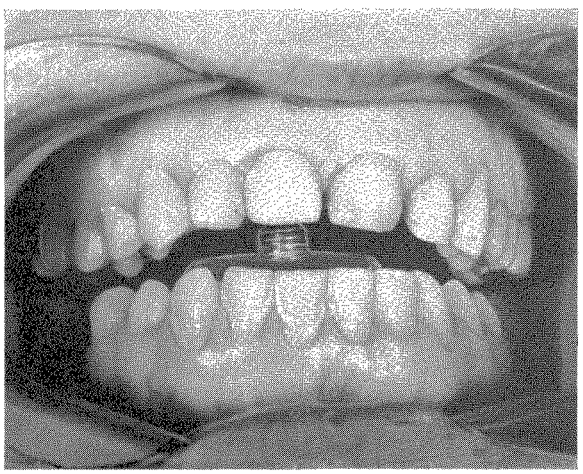


Fig. 1414. Close-up views of the models to show the right and left posterior premature contacts in the molar areas.

A





B

Fig. 1415. A, The central-bearing instrument has been mounted on the models. **B,** The central-bearing instrument in the mouth.

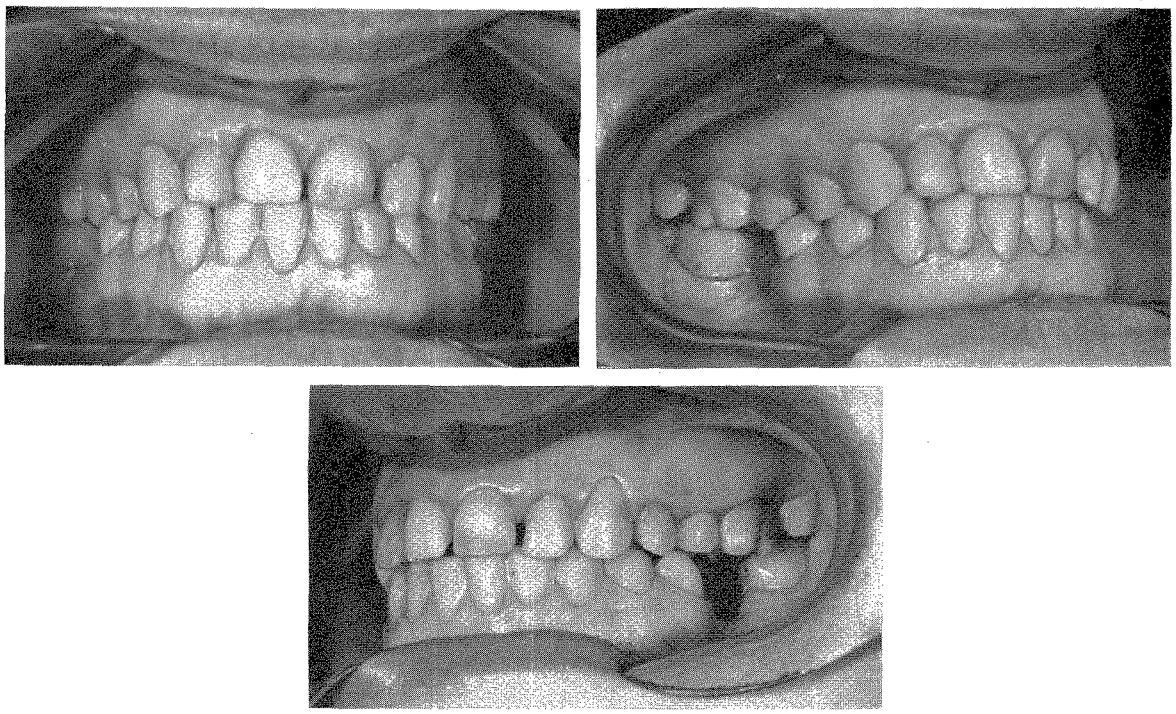


Fig. 1416. After the occlusion had been ground, the mouth looked like this. Compare these illustrations with Fig. 1410.

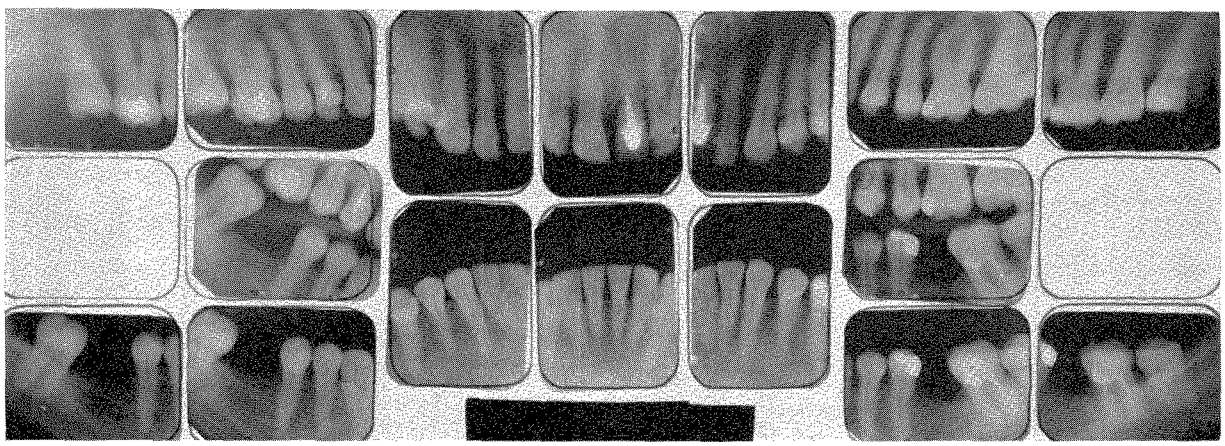


Fig. 1417. Roentgenograms of the teeth shown in Figs. 1410 to 1416. These were taken in January, 1947.

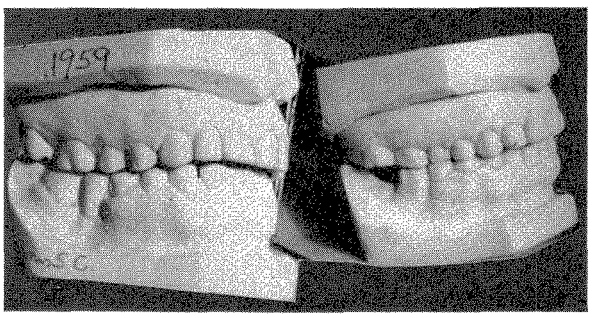


Fig. 1418. Casts taken in 1959.

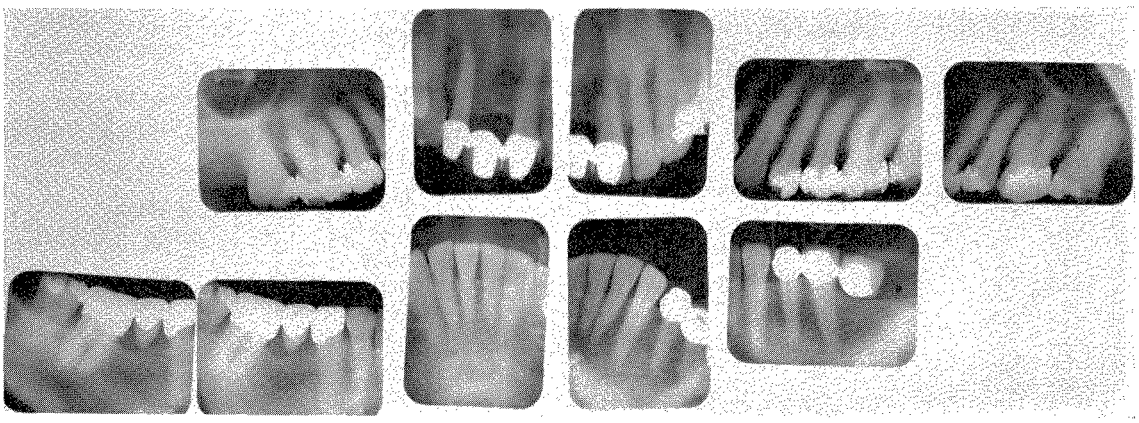


Fig. 1419. Roentgenograms taken in 1960.

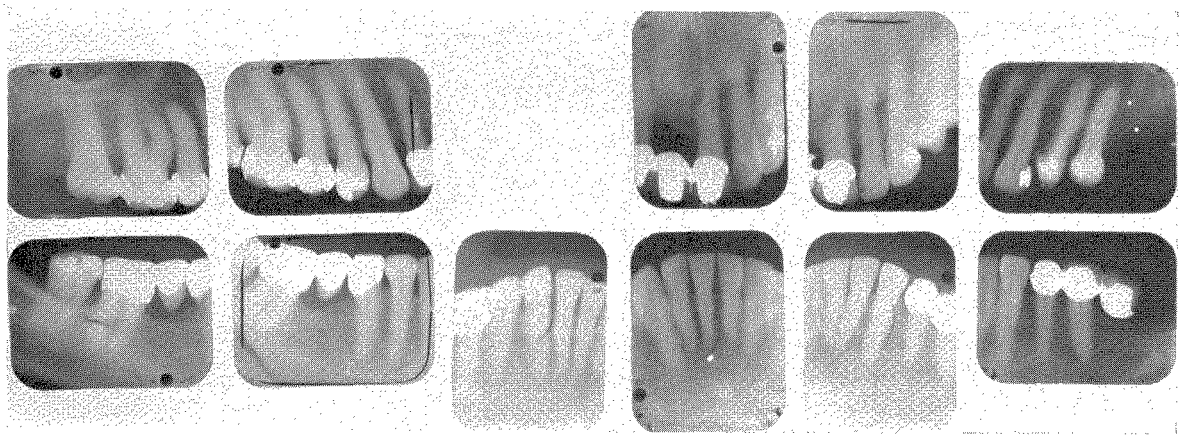


Fig. 1420. Roentgenograms taken in 1961. Compare these with those taken in 1947 (Fig. 1417).

that for a long time he had wished to remove himself from her case, but it had become too difficult to do so. After the simplest dental operation she needed constant reassurance. Her original complaint of cheek biting still was a source of annoyance.

In 1960 she developed pain in the upper left molar area. Although there were no positive findings, the nonvital first molar was removed. The pain persisted, and pulpstones were then discovered in the upper left second molar. This tooth was also extracted and without any relief. A diagnosis was then made of the possibility of temporomandibular joint syndrome. Splints were constructed, and the symptoms were relieved for ten days. Then an earache developed. Now there is again an occlusal problem with no upper left molars present. The temporomandibular joint was then treated with an ethyl chloride spray, and stretching exercises were prescribed. As of February, 1961, the examining dentist did not feel that the occlusion of her teeth played a significant role in the etiology of her symptoms. The symptoms disappeared, and if they returned the suggestion was made to consider the treatment of her occlusion. The patient was also complaining of general gum inflammation and some enlargement of the soft tissue in the upper right molar area. This had become inflamed and was treated symptomatically.

All kinds of medication were prescribed. It is fortunate that since 1948 only four teeth had been removed. Most likely this patient will always find something unsatisfactory because there is a decided psychosomatic background in her report. (Figs. 1410 to 1420.)

Who is to assume the responsibility for the treatment of this type of case?

When these problem patients present themselves for treatment, someone must undertake to do the work for them. If the able and experienced dentists refuse to accept them because of the uncertain outcome, who is to do the work? These patients need sympathy and require time. Although they are unable, for the most part, to compensate the dentist adequately for the effort put into solving their problems, they still must have dental care. Neither can problems of this nature be treated adequately in an institution.

Case 20

Past history and present condition

In June, 1961, a 51-year-old woman was examined relative to a dental problem. She was a spinster. The 1958 dental casts disclosed a full complement of teeth. At that time the upper bicuspids and molars were fanned out buccally, and the buccal cusps of the lower bicuspids and molars contacted the upper lingual cusps only. The upper arch showed a disparity in size in this region, being much wider than the lower arch. This may have been caused by a tongue thrusting and false swallowing pattern. The roentgenograms disclosed normally healthy structures with the exception of a nonvital lower right first molar and upper left lateral incisor. The history report disclosed that the teeth had been in this condition for many years.

The patient had always taken good care of her teeth. Although she stated that they never really bothered her until the previous two years, her history revealed many conflicting statements. She had previously had dental difficulty and even

temporomandibular joint symptoms. She had also been under the care of a periodontist. In her opinion the trouble started upon his death, and although she claimed that she had little or no difficulty with her occlusion, the casts indicate that she had previously been equilibrated by the periodontist. Careful questioning also brought out the statement that she had always been greatly concerned about the health of her mouth.

In June, 1960, the lower right molar crown had been removed, and a porcelain bonded-to-metal crown was inserted by a new dentist. This relatively simple procedure set off a train of symptoms which have made her life miserable. The molars, according to her report, were forced posteriorly. Since then several periodontal and prosthetic specialists were consulted in an effort to obtain relief from what was described as an unbearable situation.

She was emotionally disturbed and confused relative to her dental problem. When first seen, fourteen posterior teeth had been prepared for gold inlays, and the anterior teeth had been ground down. This took place just prior to her first visit to me. All the previous dentists were attempting to reintegrate her occlusion to a position of comfort. She was frightened, and tears came readily when she discussed her dental problem. Consulting with six of the previous dentists who treated her since June, 1960, produced varied reactions. Inasmuch as they were all competent and experienced, their remarks are worthy of serious consideration.

Most of them felt that she was mentally confused. The majority expressed sympathy but would refuse to treat her if she returned to them. One was a gnathologist who had been treating her for the previous six months. He had recorded her occlusion by means of the gnathograph and was going to restore her interocclusal relationship by means of those records. She underwent extreme discomfort during the preliminary treatment, although he claimed absolute lack of cooperation on her part.

Her brother, a psychiatrist, was questioned concerning her previous emotional status, but no help was obtained from this source. It was two years since she completed her menopause, and according to her own remarks she had no difficulty. She seemed entirely rational and well satisfied with the work in which she engaged. There did not seem to be any acute financial problem. When the suggestion was made that she return to any one of the many former dentists, she would not think of it.

Difficulty of treatment planning

It was not simple to institute treatment for a case of this nature because of the original malocclusion. The upper posterior teeth flared out. The upper lingual cusps contacted the lower buccal cusps only. Even with this so-called malocclusion, she maintained that she was perfectly comfortable and had been unaware of her teeth. It must also be remembered that her oral structures were normal roentgenographically. If a somewhat similar interocclusal relationship could again be established, she might be satisfied. During the previous year she claimed her teeth were incorrectly ground by various dentists, and her original anterior bite, that was previously open, now contacted because of the shortening of her posterior teeth.

When first examined she was extremely uncomfortable. Two of the temporary gold splints made for her posterior teeth were not being worn, and the cavities were open. Several conferences were held with her before consenting to undertake the case. She was made aware of the difficulties involved, and her full cooperation was sought. She readily agreed to all the conditions imposed, including the clause in the contract letter "that I reserved the right to discontinue my services if no progress was being made after a reasonable length of time and that fair compensation was to be given for the services rended up to the date of withdrawal." With the above as a background and with trepidation, the case was accepted.

The actual work began in late August, 1961. In an effort to correct the occlusion, the previous dentists had cut her posterior teeth in such a manner as to enable them to create a more normal interocclusal relationship from that presented in June, 1960. The present plan was to attempt to restore, as closely as possible, her June, 1960, occlusion, bearing in mind her continued statements that she had been comfortable at that time. A malocclusion had been present, but apparently her structures were in equilibrium. The plans also included removing the anterior teeth from contact.

Treatment

The initial efforts were directed toward constructing provisional splints for the four posterior segments of the mouth. Individual inlays were first constructed. These were finally soldered together in splint form to avoid the possible pressures resulting from shrinkage of a one-piece casting. The vertical dimension was raised just sufficiently to remove the anterior teeth from contact. A simple articulator was used. Although it was not possible to imitate identically the occlusion revealed by the 1960 and 1958 casts, still it was closer to that pattern than anything that had been inserted during the previous sixteen months. The two left posterior splints were inserted on Sept. 27, 1961. Although there were no startling results, she did feel some amount of comfort sufficient to give her a degree of confidence in the future outcome.

The upper and lower right splints were inserted in the early part of October, 1961. Once, again, a slight improvement was noticed. Her remarks were always couched in caution as though she was afraid to admit that she obtained some de-degree of comfort.

Postinsertion adjustments

During October, 1961, she visited another periodontist to have gum treatment in conjunction with the prosthetic work. The periodontist was cautious and tried to cooperate as much as possible. Each visit would disclose new small premature contacts on different teeth. Various means of discovering them were used, such as disclosing wax and the functional chewing of food with thin wax covering the teeth on the opposite side. Several weeks after their insertion, the left upper inlays had to be separated because of alleged pressures. Then the right lower splint had to be raised slightly. These variations of vertical height could be disclosed only by sensitivity of the patient.

Because of the continued annoyance of the lower right splint, a new one was

made and inserted on Nov. 17, 1961. The occlusion was constantly adjusted by means of small stones and rubber wheels. The slightest rubber wheeling was noticeable to the patient, and it soon became apparent that the prematurities were being chased from one area to another with a simultaneous lowering of the bite. The patient had now been wearing the four posterior splints for a period of time. Although there was a slight improvement, the treatment became more difficult and discouraging. The inlays in the upper right splint had to be separated and used individually.

In October, 1961, temporomandibular roentgenograms were taken, although at no time were there any symptoms. A posterior positioning of the left condyle was found. The patient then admitted that some years previously she had had difficulty with the mandibular joints. However, no effort had been made to disturb the present nonsymptomatic mandibular joints. During November and December, 1961, and January, 1962, treatment had been given on an average of two to four times a month. The peridontist began equilibrating the occlusion during his treatment. This further confused the picture and almost initiated temporomandibular symptoms. He was requested to do no further grinding. Prematurities had always been present in different areas. These were adjusted but reappeared. The patient seemed relieved at the end of a treatment but always had symptoms reoccur in another area. The splints had gradually been separated, and each inlay was now used individually.

The suggestion was made to the patient to replace the set of transitional work with one which would be constructed on traditional concepts. This would mean the lowering of the buccal cusps and raising of the lingual cusps of the posterior teeth. This would eliminate the Monson curve. She would not consider this plan, nor was she willing to have her anterior teeth contacted. It is reasonably certain that an emotional curtain was shading the entire picture. Great patience and understanding were practiced in the treatment of this patient—still conditions such as were imposed by this problem case would tax the endurance of the most able operators. An explanation was made to the patient that compromises were necessary and that an interocclusal relationship must be tested for at least a month in an effort to help solve her problems. Psychiatric consultation had been advised, but whenever this was suggested the patient was unwilling to consider it on the grounds of its being entirely unnecessary.

Often there was a desire to exercise the contract's withdrawal clause, but the possibility of being able to contribute further help acted as a stimulant for additional effort. The patient was aware of these feelings.

How does one complete a case such as this one? If relief is attained by the treatment prosthesis, then the occlusion may be copied replacing one quarter of the arch at a time until the entire posterior occlusion has been completed. But, will relief ever be obtained if her complaints are unreal? If they are, then one dentist after another will be consulted until either the patient accepts a compromise or the dentist is willing to become a psychiatrist and continue treatment on that basis. A still further consideration is the available time that a professional man has at his disposal for division among his patients. Though we must treat each individual thoroughly, care must be taken not to slight those whose problems appear less pressing.

By March, 1962, the patient was finally willing to have a new set of trial pros-

theses constructed. All the old work was removed, and full upper and lower rubber impressions were taken. Wax records were obtained of mandibular centric and excentric positions. The new casts were mounted on a Hanau kinoscope, and the entire occlusion was coordinated in wax. This time, a more conventional concept of interocclusal relationship was obtained. The castings were kept separated. The entire work was inserted on April 17, 1962.

For a short period of time some small amount of relief was obtained, but soon the old complaints returned. There was constant grinding of small high spots first on one side, then on the other. Although she insisted upon the bite being open from the right first bicuspid to the left cuspid, she also realized that the continued grinding would lower the occlusion. Her fingers were constantly in her mouth in order to show me the many areas of discomfort. In fact, sometimes there were sores on the lips where the constant pulling with her fingers would irritate the tissues. All forms of careful equilibration were used. These included thin green wax covering her lower teeth while chewing natural foods on the opposite sides. Articulating paper was also judiciously used. She was seen on an average of at least once a week.

During the entire treatment I did no additional cutting to any of the teeth that had already been operated on. The way they were prepared when the patient presented herself is the way they remained when my treatment was terminated. By so doing I added no further injury to that which had already been done.

In May, 1962, I finally decided to discontinue my services. The following letter was written on May 29, 1962.

Dear _____:

I regret to inform you that as of this date I am no longer willing to continue as your dentist. My feeling is that I have been unable to sufficiently contribute toward solving your dental problem. Although the amount of time and effort which I have spent is valued at a great deal more than that which you have thus far paid, I have decided that your financial obligation to me has been satisfied.

The second set of prosthetic work which I inserted in your mouth will save and adequately protect your teeth until you find another dentist. Moreover, all the records which you brought to me will be returned to you.

I am reluctant to take this stand, but I can no longer afford to spend the great amount of time and effort when the solution to your dental problem seems interminable.

I do hope you will find someone who is able to help you.

Sincerely,

(Signed)_____

In January, 1963, it was indirectly called to my attention that this patient was again being examined by a new dentist relative to her occlusal problem It is to be assumed that during the seven-month period in which he had not seen her she probably had received dental treatment from still another dentist, if not even a third one. Some of these patients are reluctant to have their previous dentist consulted by the present one for fear of any disclosures relating them with neurotic symptoms. This patient would have preferred for me not to consult with her former

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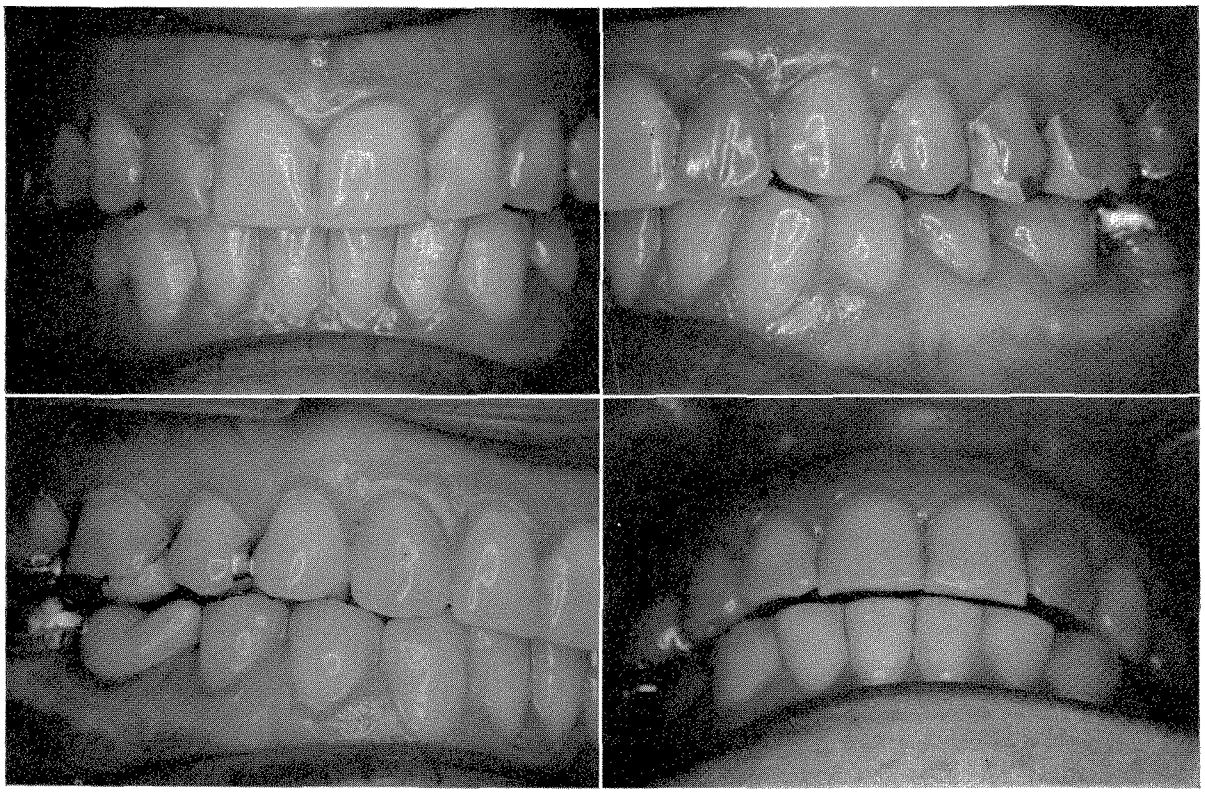


Fig. 1421. Three views of the teeth of a 51-year-old female patient. These were taken in June, 1961, at the start of treatment. (Figs. 1421 to 1435 are of the same case.)

Fig. 1422. Casts made in 1958 showing the flaring out of the upper molars. She declared that she was comfortable at this time.

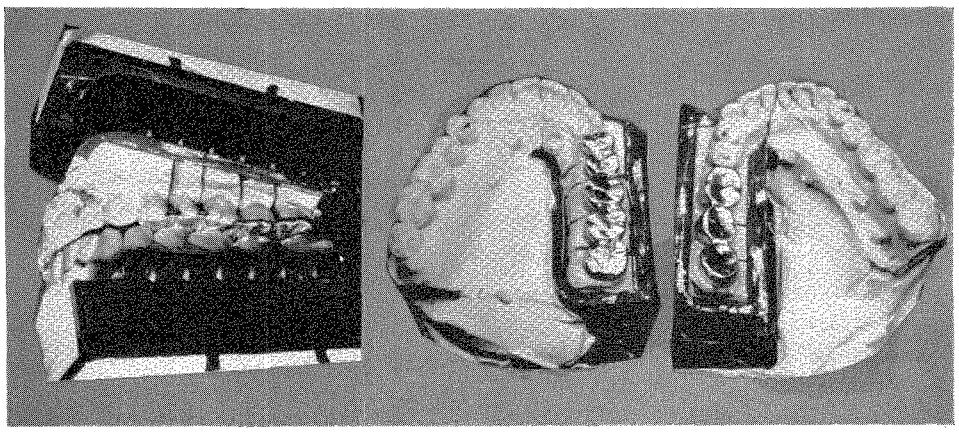


Fig. 1423. Casts were made from full rubber impressions. Upon these casts the upper and lower left splints were constructed. The 1958 occlusion was copied as far as possible. Two views of the occlusion are shown in this illustration. The inlays were made singly but were then soldered together in the form of inlay splints.

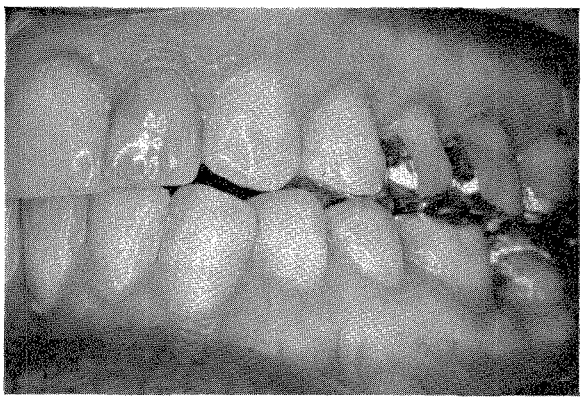


Fig. 1424. The left splints were inserted in the mouth.

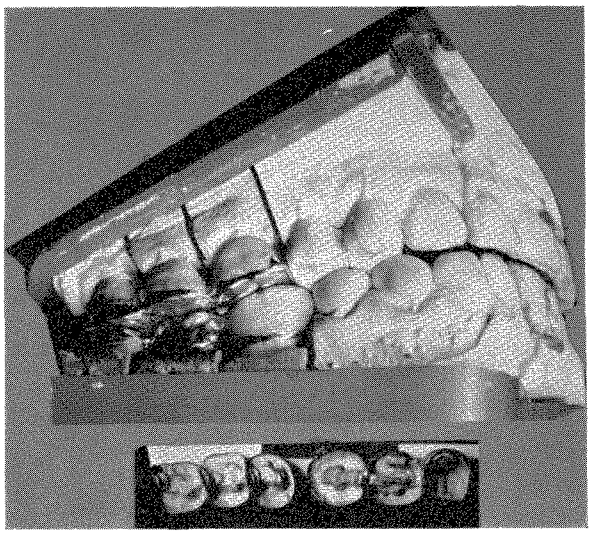


Fig. 1425. The right upper and lower splints were constructed the same way as the left ones. Full rubber impressions were taken, and individual castings were made. These were then soldered together. The 1958 casts were copied for occlusion. The upper teeth flared out. A Monson curve was present.

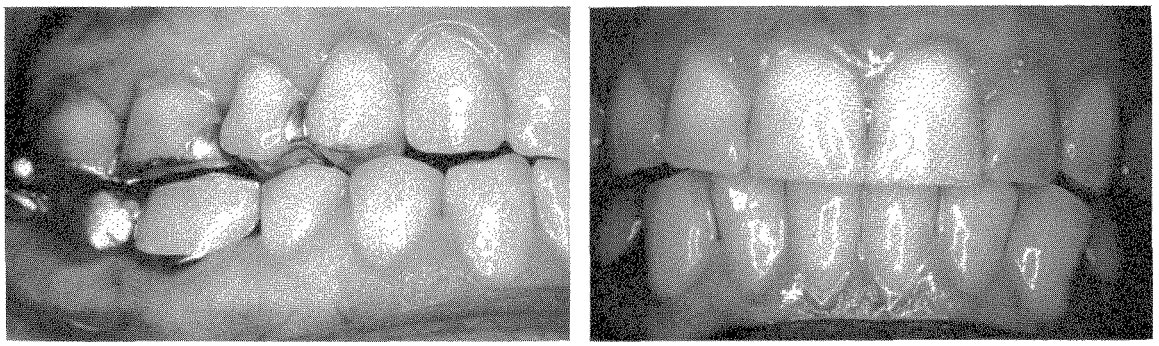


Fig. 1426. A, The completed right side is shown here. The bite is open from the right to the left upper cuspids. This phase of temporary work was completed by September, 1961. **B,** Anterior view. The vertical dimension remained the same as the original one. (See Fig. 1421.)

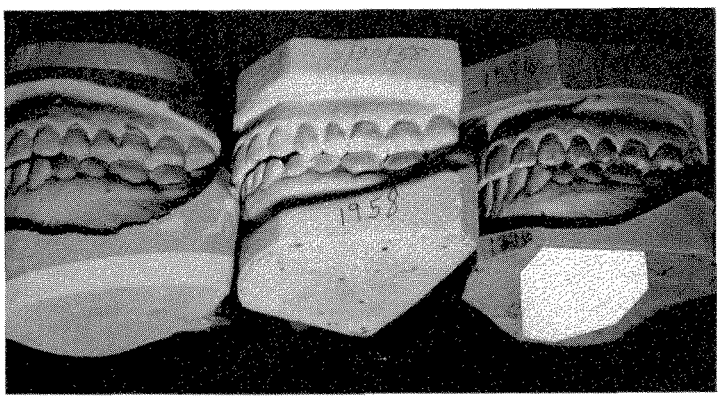


Fig. 1427. Casts taken in 1938 (right), 1958 (center), and 1961 (left) showing a similarity of the occlusal pattern. The flaring out of the molars is evident in all three sets.

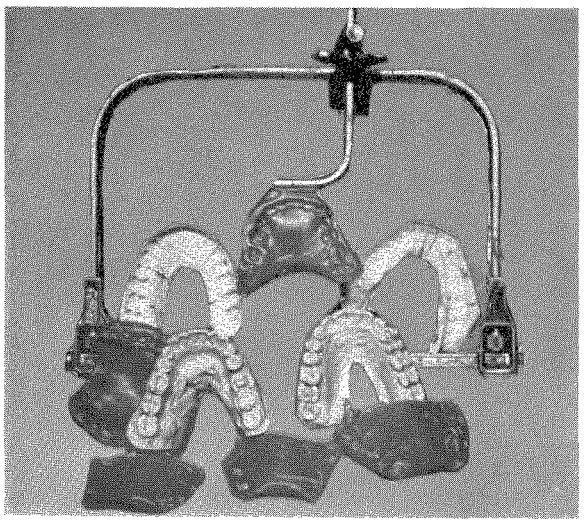


Fig. 1428. In March, 1962, complete records were taken in order to construct a new set of temporary prostheses. The new work casts were made from full rubber impressions.

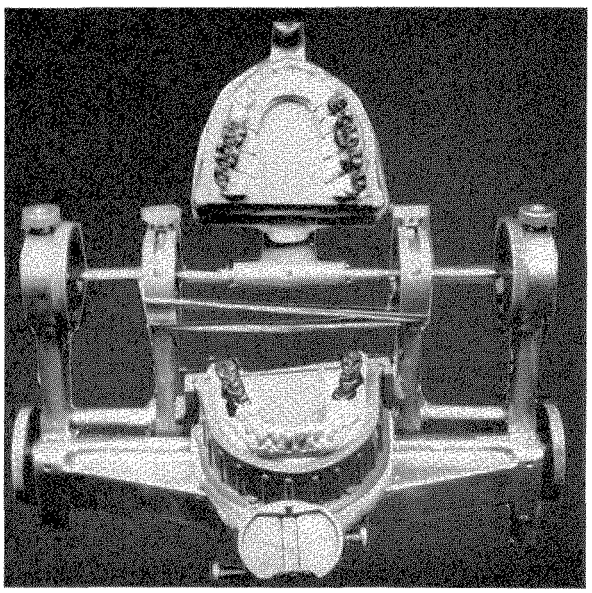


Fig. 1429. The work casts were attached to the Hanau kinoscope by means of the records. The occlusion was achieved in which balancing and working bites could be attained. The wax-up is shown in this photograph.

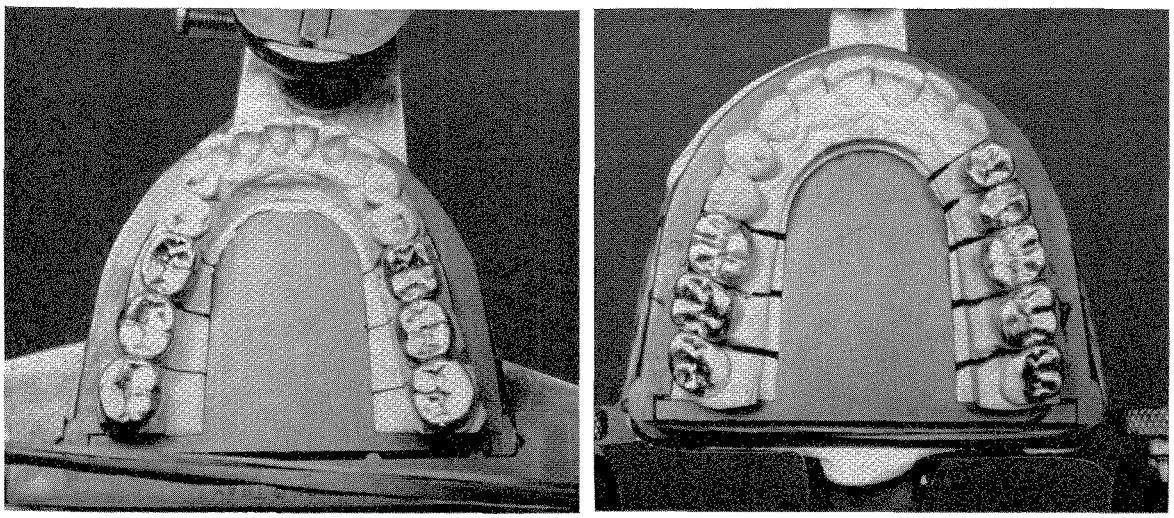


Fig. 1430. Close-up view of the completed prescription castings. These are individual and not splinted together. They will be used only as transitional prostheses.

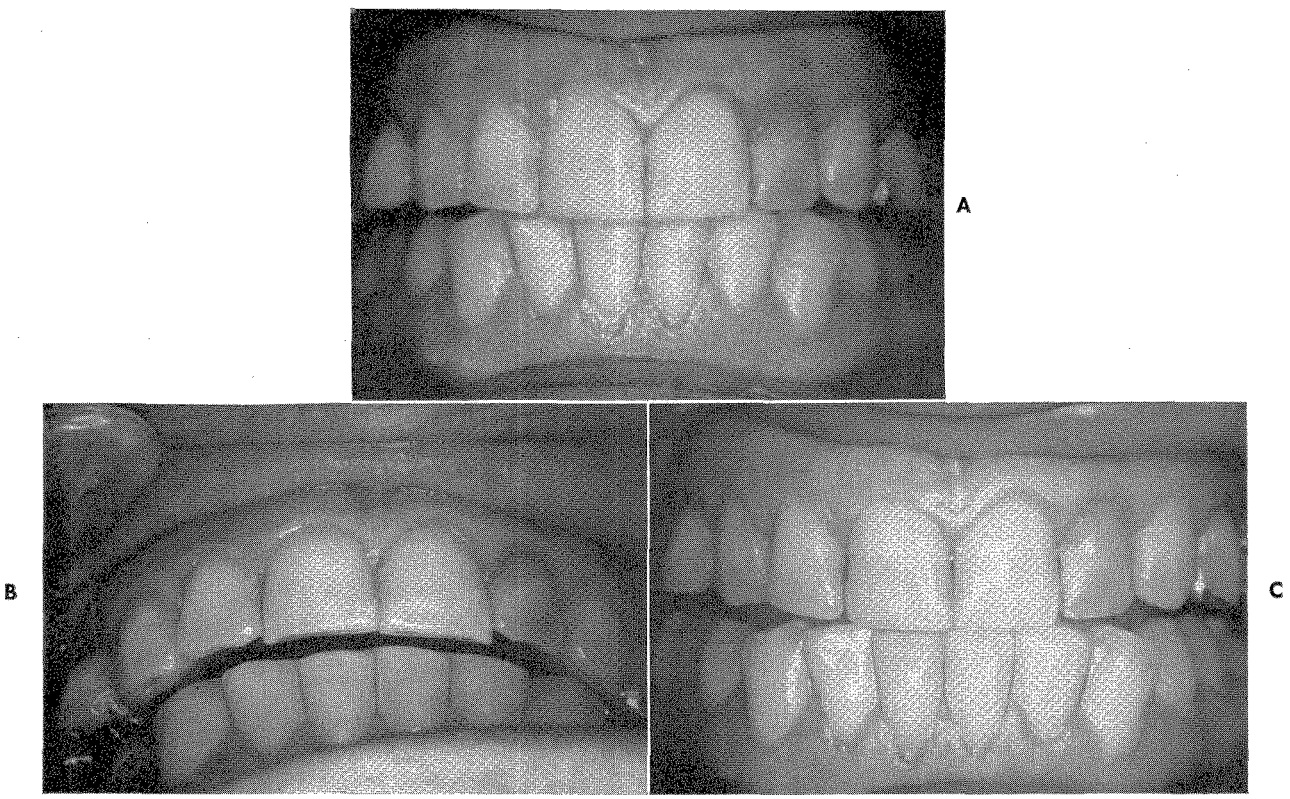


Fig. 1431. Three front views to show the slight increase of the vertical dimension in **A** and the anterior open bite in **B.** This work was inserted April 24, 1962. The protrusive bite is shown in **C.** (Compare with Figs. 1421 and 1426.)

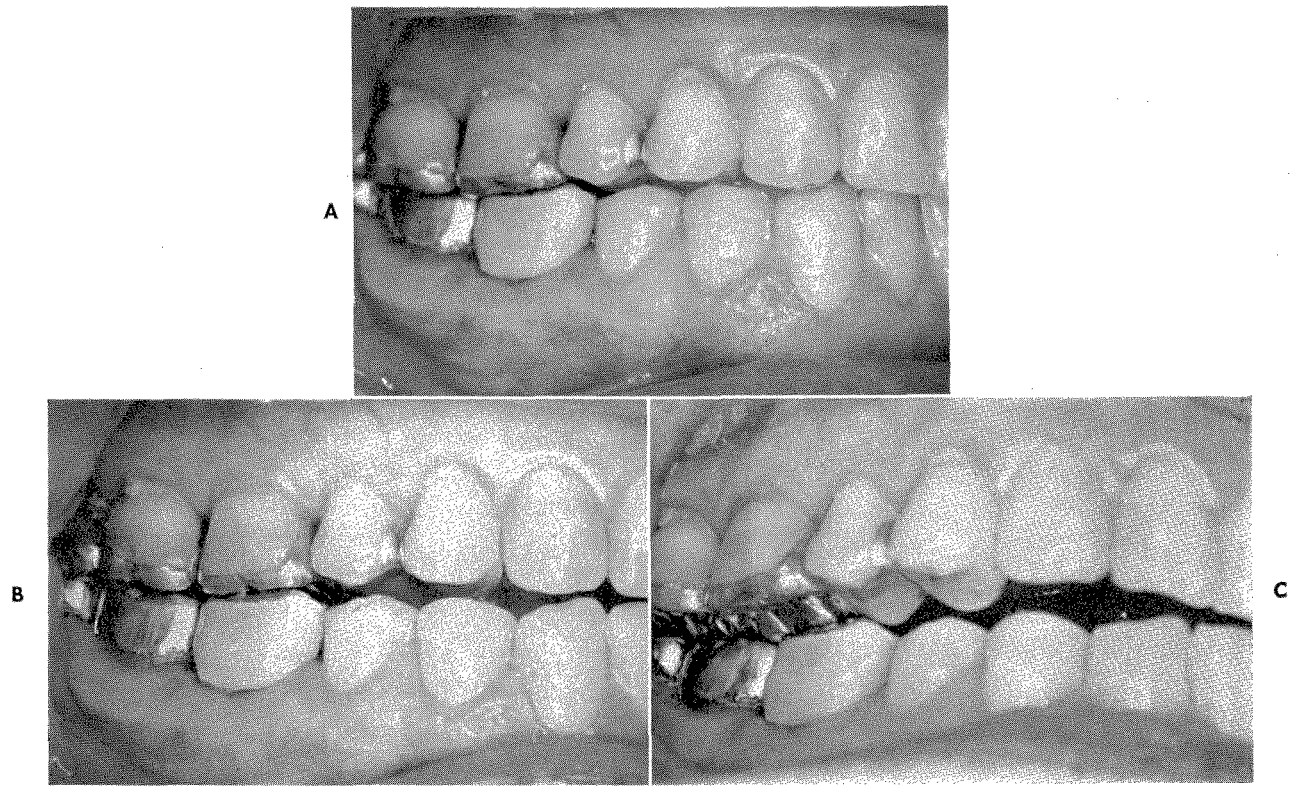


Fig. 1432. The right side. **A,** Centric occlusion. **B,** The working bite. **C,** The balancing bite.

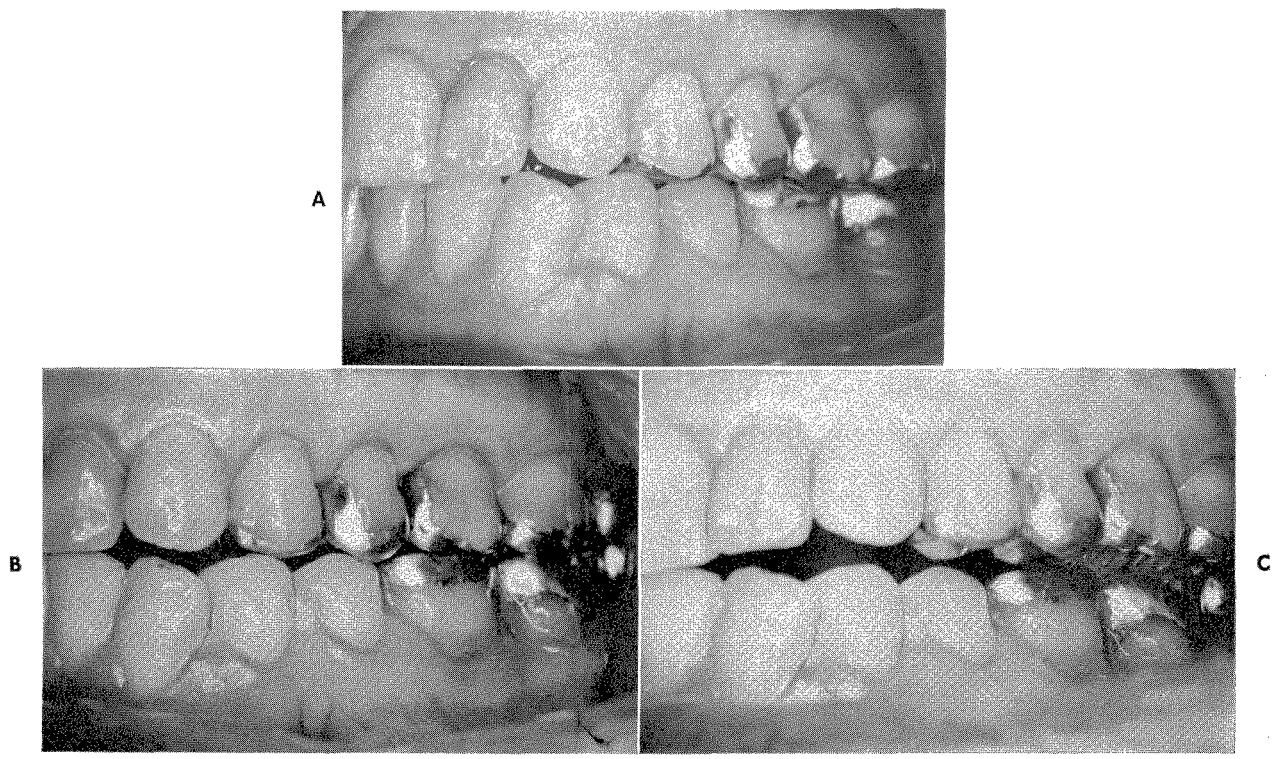


Fig. 1433. The left side. **A,** Centric occlusion. **B,** The working bite. **C,** The balancing bite.

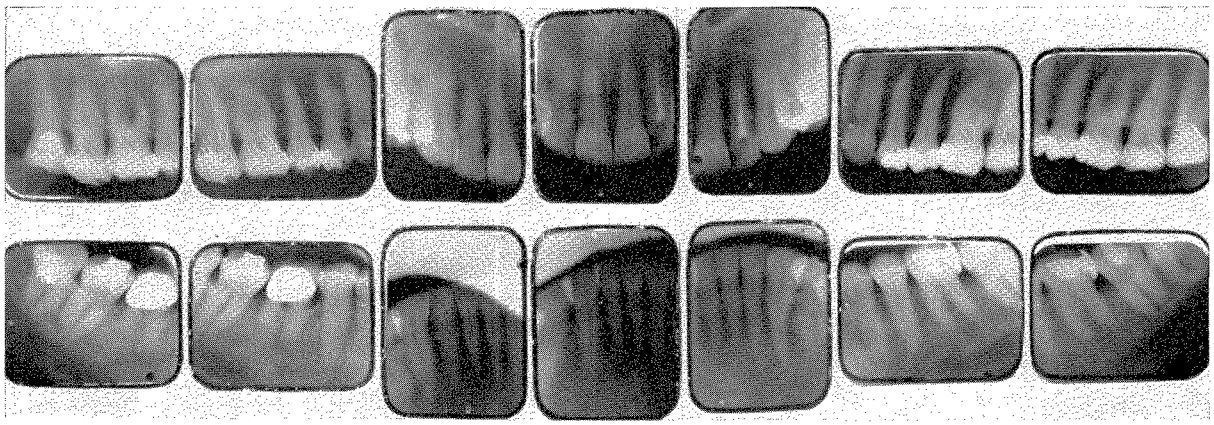


Fig. 1434. Roentgenograms taken in 1960 before work was undertaken.

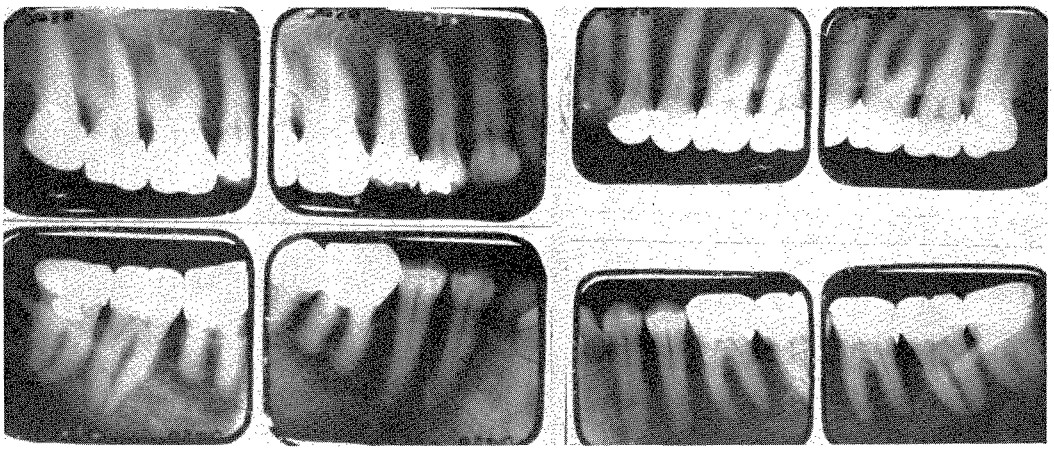


Fig. 1435. Roentgenograms of the second prescription prostheses. This is only temporary work. These were taken in May, 1962.

dentist, nor was I ever contacted by any of her new dentists regarding her case. In April, 1963, I met the patient's new dentist at a dental meeting. He referred to this patient and told me that he had not accepted the case. When the patient came to him in January, 1963, she was wearing a maxillary bite plate that some other dentist had inserted. (Figs. 1421 to 1435.)

WE MUST TRY TO DIFFERENTIATE BETWEEN PSYCHIC AND SOMATIC ILLS

Dentists must guard against considering normal patients as mental cases simply because their dental problem is difficult to solve. If we suspect that, because of our lack of knowledge, we are unable to help them, then it becomes our duty to have them obtain other advice. Sometimes a different approach is needed. Irreparable harm may come to these patients presenting unusual problems if this is not done. They can develop a dental neurosis and become convinced that they are not normal individuals.

Case 21

Past history

In June, 1958, a middle-aged woman was examined. She complained of severe pressure pains in the region of the upper right lateral incisor. According to her history, early in 1957 a dentist had placed a filling in her lower left molar. It felt uncomfortable immediately after insertion. The following day, the crown of the upper right lateral incisor fractured due to what she described as severe pressure. Her dentist attempted to equilibrate her occlusion by grinding, but her mouth has never again been comfortable.

She finally went to a specialist who further adjusted her bite and treated her for nearly one year. The upper right lateral incisor was replaced by a porcelain jacket crown. She obtained no relief. In fact, she was very seriously disturbed when, for the first time, the last dentist whom she consulted bluntly told her that she was suffering from mental illness. Upon her initial examination, she assured me that "she was not crazy."

Treatment planning

A careful examination was made of the teeth and mandibular joints by means of clinical observation, roentgenograms, and photographs. Study casts were made from alginate impressions, and the centric and excentric mandibular relational positions were registered by wax records. A face-bow record was also taken. The objects of the study were the following: (1) to relieve the right upper lateral incisor region from the feeling of constant pressure and (2) to place the mandible in a correct relational position to the maxillae and their surrounding structures. The casts were attached to a Hanau Model H articulator. In analyzing the interocclusal relationship of the teeth on the articulator it became evident that the mandible had shifted to the right.

Treatment

Removable gold posterior occlusal splints were constructed that would return the mandible to its true centric relation position and relieve the constant pressure felt in the right lateral region. These were inserted in July, 1958. The patient's teeth were not prepared in any manner.

Dramatic relief was obtained, but unhappily this was short-lived. An anterior section was then added to the splint which would make the interocclusal contact complete, but there still was no definite relief. The patient finally discontinued wearing the splints and went along with minor adjustments until October, 1958, at which time, at her request, the gold splints were again inserted.

In November, 1958, a Hawley bite plate was resorted to. This took the teeth out of occlusion and permitted contact only between her lower anterior teeth and the flat acrylic plate lingual to the upper incisors. This appliance was so adjusted that no pressure was made in the region of the upper right lateral incisor. In fact, the previous gold splints were also made without any pressure in this so-called "trigger zone." The new bite plate permitted the mandible to move freely in any direction unimpeded by any tooth contacts. This patient had never complained of mandi-

bular joint pains, and nothing unusual was observed in the temporomandibular roentgenograms. The Hawley bite plate proved no more beneficial than the other appliances.

Experiment performed

The following experiment was performed with it. The bite plate was worn continuously for forty-eight hours. When the patient returned to the office, it was removed carefully while the teeth were kept widely apart. Then, while she was seated in an erect position, she was instructed to close her teeth slowly, keeping her lower jaw retruded. It was not difficult for her to follow instructions, but it was surprising to see that the mandible closed precisely into its former interocclusal position without a second's hesitation. This closure was recorded by means of a color motion picture film.

The experiment demonstrated that even when a thin interocclusal wax record was used to relate the mandibular and maxillary casts on the Hanau Model H articulator, with the removal of the wax record the articulator did not close in the same manner as the mandible closed in the head of the subject. This may be because all articulators that have a rigid transverse axis force the plane of closure to be at right angles to this axis, whereas in the skull, the mandible is capable of deviation as it closes. Unless the casts are mounted upon a machine capable of permitting the lower cast to deviate as it closes, the movement will not be the same. The oirginal mounting on the Hanau Model H articulator indicated an incorrect relational position of the mandible. It was evident from the experiment, however, that the mounting was incorrect.

Discussion

It was reasonable to assume that if the mandible were permitted freedom of movement unimpeded by tooth cusps that might cause it to take unnatural and false positions, it would gradually assume a correct relational position, guided by a proprioceptive or reflex neuromuscular mechanism. By the same reasoning, if the mandibular teeth contacted the flat bite plate of the Hawley retainer for only forty-eight hours, when the bite plate was removed from the mouth the mandible in closure should assume its correct relational position until at least the first tooth contact had been made. When the bite plate was removed and the patient instructed to start to close but to stop when she felt the initial tooth contact, it was expected that the mandible would strike an initial contact and then be deviated by this inclined cuspal plane into some false or excentric functional position. This did not take place. Instead, there was not a single initial cusp contact but total and maximal intercuspation under reflex neuromuscular guidance, even though she had not closed her teeth for forty-eight hours. This indicated clearly that her centric relational position was correct and should not be disturbed regardless of what the articulator mounting showed.

In December, 1958, a plastic jacket crown was inserted on the upper right lateral incisor. In April, 1959, the patient was referred to an endodontist for consultation relative to the lateral incisor, but he found it to be normal. Previously, electric pulp tests had been made upon all the teeth, but nothing unusual was dis-

closed. At this time the patient was referred to another prosthodontist for an opinion. All her records were sent to him for study. He definitely advised against oral reconstruction and suggested that a neurosis would have to be considered. In June, 1960, the upper right lateral incisor was devitalized. In November, 1960, its root tip was amputated. The clinical result was favorable, but the symptoms of pressure were not relieved.

During the three years of treatment a background of some form of neurosis had been suspected. The patient was intelligent. She led a very normal life. In 1961 she was beginning her climacteric with no discernible problems. However, this stage of her life must always be considered as a possible cause of any psychic disturbance. She had the respect and admiration of her husband. I have spoken to them singly and together. She constantly stated that if her dental condition was partly mental, she was willing to put up with it. In 1960 she was referred to a medical doctor who specialized in the treatment of referred pains of the head and neck. Her experiences were unsatisfactory, and she was unwilling to submit to further treatment from this source.

It would be hazardous, indeed, to subject this patient to the dangers of total oral rehabilitation even though she would gladly submit to this procedure were it suggested. Her oral structures did not seem to warrant such drastic therapy.

After again conferring with the patient and her husband in July, 1961, they were referred to the head of the department of oral diagnosis in one of our leading dental schools. He received all of the patient's records. Once again, the consultant advised against attempting any large-scale dental operations. The following are quotations from his letter:

"Certainly, in view of my other findings, I would be very much opposed to extensive reconstruction—not that she may or may not require it from an occlusal point of view but that there is nothing to be gained by so doing insofar as her present complaint is concerned. Throughout my consultation period with her, which lasted for almost an hour and a half, I had repeatedly demonstrated for me the signs, the remarks, and the manifestations of a highly tense, nervous individual who is subject to, and reacts severely to, emotional disturbances. In addition, there is no question but that one emotional factor in the background was her unpleasant experiences with a dentist in 1958. Certainly, this may still be a contributing factor. I hesitate to look upon such incidents as being truly etiological but rather that such incidents act as 'triggering' factors in people who are emotionally predisposed.

"_____ The best forms of therapy for these patients include repeated reassurance, sympathetic understanding and careful explanation."

The dentist to whom he refers in the first paragraph is the one who informed the patient bluntly and for the first time that she was suffering from a mental illness.

Up to the time of this writing (January, 1963) no complex restorative procedures had been resorted to. The patient can relieve the symptoms of pressure in the upper right lateral incisor by tilting her head to the left or by pressing her finger over the root area. She states that at times the tooth feels loose and then, for no apparent reason, it tightens up. The application of topical anesthesia relieved the discomfort for one half hour. The application of Merthiolate also relieved the pressure for seven to ten minutes. She was unaware of the nature of this chemical when it was used.

The puzzling factor is that according to Griggs, who was quoted previously on

pp. 617 to 619 of this chapter,* a diagnosis of neurosis is not justified simply because the dentist cannot find the cause of a disease, nor is it sufficient if it is not competent to explain the entire clinical picture. In addition, this patient's past history does not include neurotic behavior prior to 1957 when her dental problem started with the insertion of a lower left posterior filling. The breaking of a crown on the right side within twenty-four hours testified to great pressure having been built up in this area. However, even if the persistence of some noxious influence introduced by the insertion of this single filling was suspected, none of the many

*Griggs, Joseph F.: Differentiation of neuroses from organic disease, Postgrad. Med. **29**:301-308, 1961; D. Digest **67**:347-350, 1961.

Text continued on p. 716.

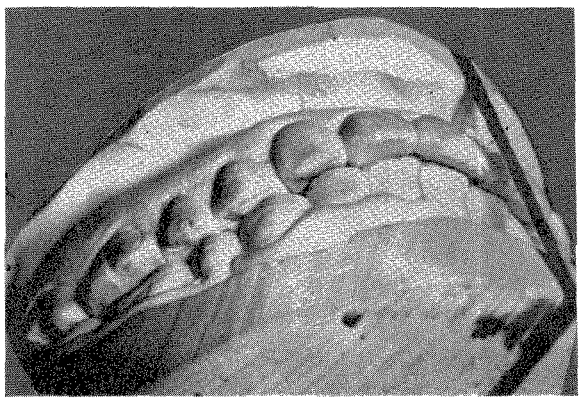


Fig. 1436. Old casts (June 19, 1957) that were taken one year before the patient was seen. There is contact in the region of the upper and lower right central and lateral incisors and cuspids. These casts were taken before the previous dentist ground the patient's teeth. (Figs. 1436 to 1444 are of the same case.)

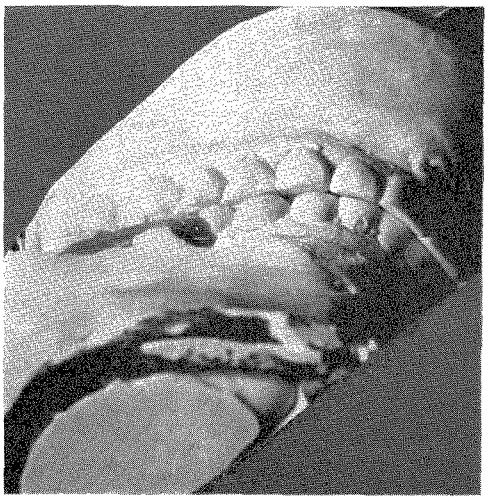


Fig. 1437. If the newly made casts (June 15, 1958) were held in the hand, there were interocclusal pressure areas of contact between the six upper and lower anterior teeth. The patient complained of pressure in the region of the upper right lateral incisor.

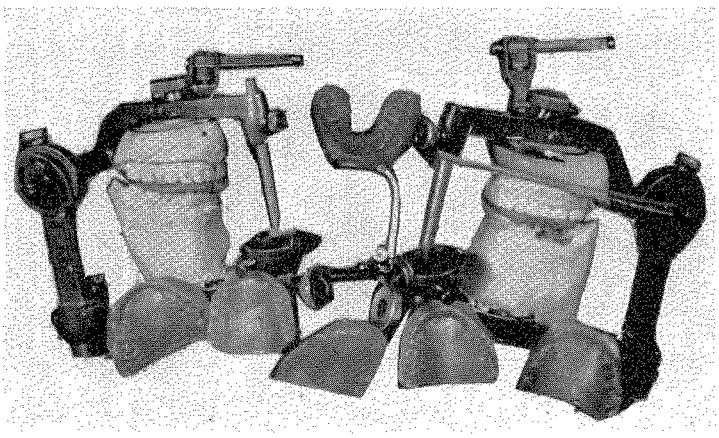


Fig. 1438. Two different operators took many wax records of mandibular positions. From them, two sets of identical casts were attached to two different Hanau Model H articulators, and the interocclusal relationship was observed and compared.

Fig. 1439. When the study casts were mounted by conventional recognized techniques, a space was always found between the upper and lower anterior teeth as shown in this illustration.

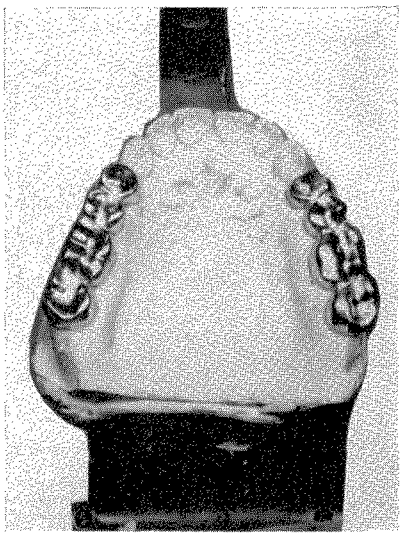


Fig. 1440. Gold upper posterior splints were constructed in an effort to permit the mandible to attain its centric relational position. This position was to the left when compared with the centric occlusion contact position. In other words, the mouth interocclusal relationship differed from the articulator interocclusal relationship. (Read text.)

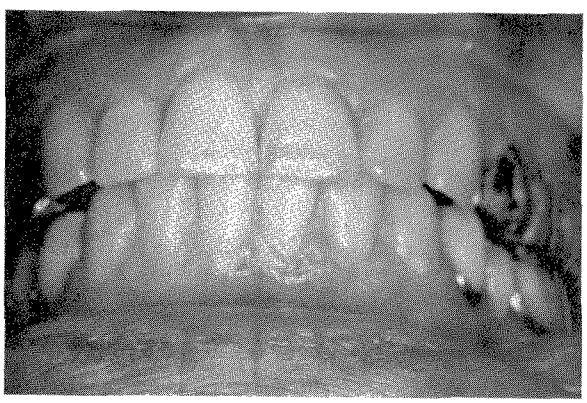


Fig. 1441. With the gold upper splints in position, all pressure was removed from the upper right lateral incisors. The splints were made as thin as possible. They were inserted on Aug. 7, 1958.

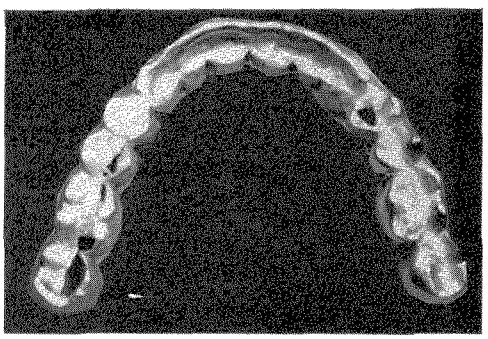


Fig. 1442. On Aug. 18, 1958, an anterior section was cast and connected to the posterior sections. This provided additional contacts to equalize the interocclusal pressures. Even with this splint, the pressure was removed from the right lateral area.

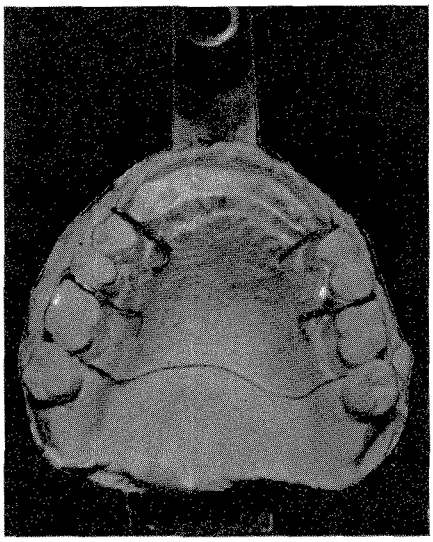
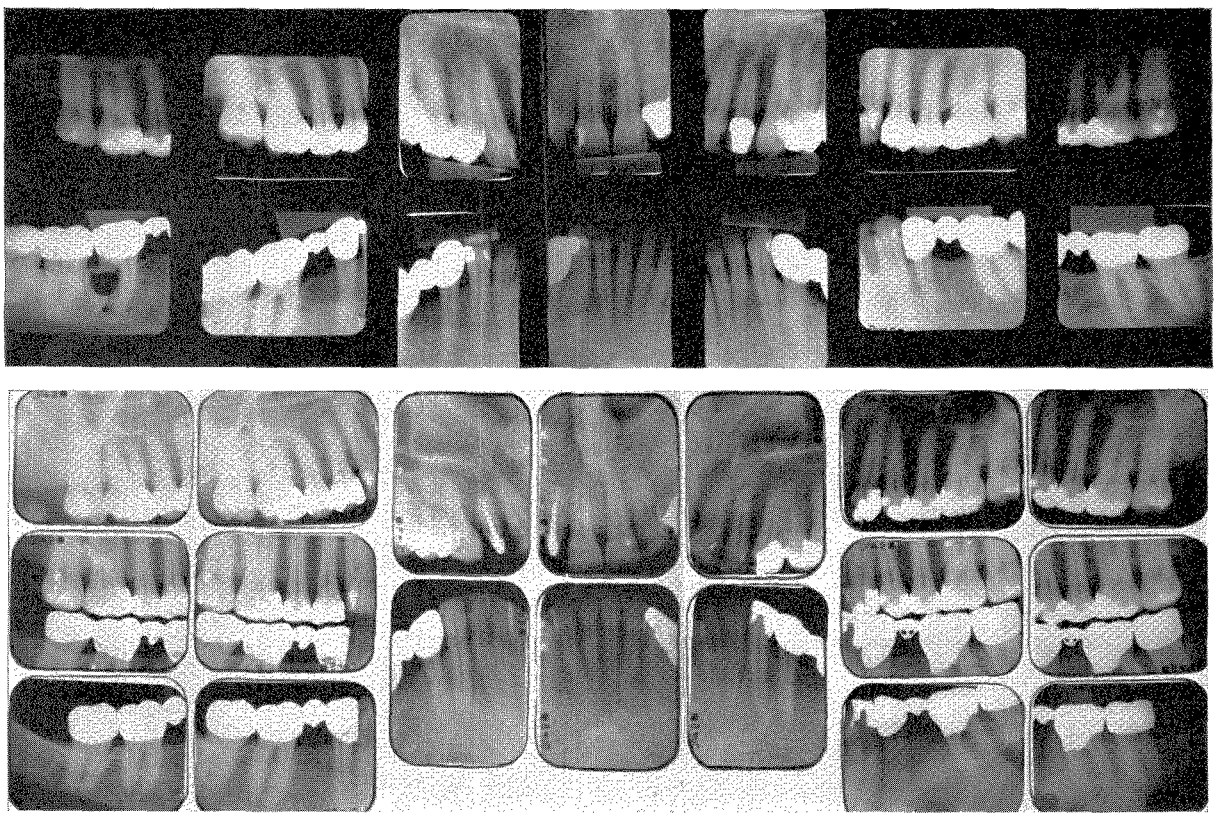


Fig. 1443. A Hawley bite plate was inserted on Nov. 7, 1958. This was done to free the mandible from any interocclusal locking. It was worn for forty-eight hours, after which a motion picture film was made of the direction and the position of the mandibular closure. (Refer to text.)



A

B

Fig. 1444. A, Roentgenograms taken in September, 1957. The patient brought these with her. **B,** Roentgenograms taken in November, 1961. The periodontal tissues were normal.

specialists to whom she has been were able to clarify the cause or successfully eliminate the undesirable results. Consequently, at least for the present, it would not be fair to submit this patient to the further trauma of total oral rehabilitation. (Figs. 1436 to 1444.)

Case 22

The final case to be presented is one which I never examined personally but had many long distance telephone conversations concerning in 1961. This patient visited dentists all over the country in an effort to obtain some relief from her dental problem.

She was 50 years old and had been through her climacteric. She stated that her trouble started when her dentist died in 1957. She had been wearing a lower removable partial denture that her new dentist attempted to change. She had a constant occlusal problem since that time. The vertical dimension had been disturbed. An open bite was present, and her hearing had been affected. She had muscle spasms, and her temporomandibular joints were painful. She also claimed that one side of her face had been enlarged as a result of incorrect treatment.

Eight lower teeth and thirteen upper teeth were present. There was a cross-bite on the right side. At least sixteen professional men in five different states had already examined her, and some had treated her. Their names and addresses are known. The majority of them are recognized for their competence and experience in treating occlusal problems. Some of the country's outstanding authorities in otolaryngology and temporomandibular joint problems had also been consulted. Competent oral surgeons and psychiatrists had been included in her safari. It would be difficult to find out how many other dentists and medical men had been consulted by her.

The patient carried her own dental kit and relined her partial denture when she felt the need. Many occlusal splints had been inserted in an effort to find a comfortable position for the mandible, but according to her, "none of these were any good." She insisted that no psyche problem was involved. Splints with flat cusps to provide free wheeling had been inserted with no better results than the various other types. She continued to make long journeys in an effort to obtain relief. The following are some of the letters from medical and dental doctors who had treated her.

Dear Dr. _____:

I hasten to reply to your note of October 10 because of the serious mental status of Mrs. _____. She came to me on April 8, 1958, describing radiating pain to left vertex coming at irregular times. She had already had her dentures replaced several times with repeated changes, intended to make the upper and lower canines meet on the left side. At that time, all the teeth were properly balanced when the partial was in place. Both mandibular joints were quite tender to pressure, and there was no masseter tremor present. She was advised to make no dental change at all and the husband was told frankly that she was a neurosis problem.

Seven months later she showed up in Dr. _____'s office, one of our best dentists here, who agreed to replace the partial denture. In the meanwhile, she had already had the partial replaced in . . . and again by Dr. _____ in . . . who advised a gold inlay. Next, she saw Dr. _____ who referred her to Dr. _____ for further study.

On Nov. 4, 1958, there was a marked masseter tremor and I started her on the simple elastic splinting while Dr. _____ proceeded with his work. We then found out that Dr. _____, one of our psychiatrists, had worked her up in 1956 and diagnosed depressive state advising her strongly to keep off of any drug medication.

That was my last visit with her and because of the presence of the masseter tremor she was advised that no amount of occlusal changes could be expected to help. In these three years she may have quieted down mentally and you really may be able to achieve something but the prognosis is extremely unfavorable.

With best personal regards, I am

Sincerely yours,

(Signed)_____

Dear Dr. _____ :

Mrs. _____ came to our office about a year ago referred by Dr. _____. I listened to her story, took impressions for study casts, located her hinge, mounted the casts in an instrument, and took excentric relations to set the instrument.

I then built in wax what I thought she should have, presented it to her and she accepted. We made appointments to do her work. She came in for the first appointment and just as I was about to insert a needle she said "Oh no, no one is going to put a precision case in my mouth." She then got up and left the office.

Both Mr. and Mrs. _____ have bothered me constantly since then trying to get me to do something temporary for her which I have refused to do. The last time Mr. _____ called me, which was last week, I told him to never ring my phone again.

I really think the woman is in trouble but something is very wrong and I'm suspicious that she wants most to visit new dentists and tell her silly story. She has been to almost every dentist I know in this country. Surely someone should have been able to do something for her by now. She paid me for the diagnosis by return mail.

Sincerely,

(Signed)_____

Oct. 24, 1961

Dear Dr. _____:

I found your letter of October 10 regarding _____. We discussed her at the meeting, and there is nothing more for me to add.

She called me several times over a period of a year or so wanting to come down. I had so much information on her through Dr. _____, Dr. _____, Dr. _____ and Dr. _____. This is all that I can recall but several others have had her as a patient and all became thoroughly frustrated with her. Finally, I let her and her husband come for a personal consultation, thinking I might be able to help her.

So far as we can determine, this patient is a paranoid and is very difficult to handle. If someone would like to take the case and study it strictly from a research standpoint, it might be very interesting to run it down to find out just how many men she has actually seen, though so far as I know, she has never paid for anything and has abused everyone she has ever seen.

If time had permitted, I would liked to have studied her case just for information as to what actually can happen in a case like this. If you ever see her, I hope that you will get a tape recording of the procedure as it will really be something.

Sincerely,

(Signed)_____

Oct. 21, 1961

Dear Dr. _____:

I am sorry that I cannot be much help to you regarding Mrs. _____. She was in my office only once and I had been forewarned about her so I did see her but did not even make out preclinical examination or case history records on her. You might ask _____ about her as he practically threw her out of his office.

Best regards,

(Signed)_____

Dear Dr. _____:

My secretary is ill today and this at 0730. Mrs. _____ was a classmate of mine in school and she talked to me or consulted me over a phone for one hour and a half about 1930 one Sunday evening as long as five years ago.

To my knowledge she has been to . . . and . . . for extensive dental care and whether she has a *dental* problem or some *mental* problem I can't say.

I hope you will forgive the informality of my answer to your nice letter and try to understand that I am not qualified to pass judgment on this case.

Most sincerely,

(Signed)_____

Nov. 25, 1961

Dear Dr. _____:

Thank you for your note of Nov. 21, 1961. I would have some comments to make regarding this case before you undertake any work for her. I would appreciate it if you would call me at your convenience in order that I may be able to discuss it with you.

Sincerely,

(Signed)_____

On pp. 674 to 677, Figs. 1389 to 1395 of this chapter, a case was presented in which definite psychiatric overtones were present. In fact, although not quite as severe, it was very similar to the one which has just been discussed. A paragraph from the letter of the dentist who is now treating this former patient was quoted. In closing this chapter, portions of my reply to this dentist will be quoted.

Sept. 6, 1961

Dear Dr. _____:

I am extremely interested in the last paragraph of your letter in which you stated that "only dentists with long experience are able to recognize the exact nature of the female and her problems." I was far from being unsuccessful with Mrs. _____. I recognized the female and her problems, but they were far from dental in her case. I could have kept my prostheses in place for a great length of time. Although it was only transitional, many dentists would readily have accepted it as final. I refused to go further, simply because it was not a dental problem and my numerous other patients with dental problems needed this precious time.

In addition, there is this to consider. She had been to about every known prosthodontist in this and nearby cities. Her husband was now desperate. I personally know many of the dentists who treated her. Of these, several of them, including myself, did evaluate her case correctly. Isn't it possible that her husband and herself feared that you may also give up her work? Therefore, they may have been cooperative in desperation. I don't say this to belittle your ability—because you know that I am aware of your capabilities; but, this case has caused a great many experienced men much grief for reasons which were not within their control.

You stated that "her present oral reconstruction units have functioned for approximately four years and will continue to do so as long as her delusionary states are recognized and confined to certain channels." Your very words reiterate what many of her former dentists have been saying, namely, that her dental problem is entirely "delusionary." But, there are those of us who are unwilling and unequipped to cope with these "delusionary states."

Then you end up with a condemnation of psychiatric methods and concepts in general, stating that they have proved "utterly useless." This is a broad condemnation. I'm sure those engaged in this work could refute it if they were given the opportunity. However, this is beside the point. I have a feeling that if the reader of this case alone stops to consider all the implications, it will be a great lesson to him and one that he will never forget. If patients come to him for treatment, he will be better equipped to evaluate their problem and save both the patient and himself from a great deal of trouble and misunderstanding.

Problems of this nature interest me greatly. If we are to handle them "through dental channels," then we must understand them better ourselves, and this can only be accomplished by exposing them.

Cordially,

(Signed)_____

These emotionally disturbed people should be taught the meaning of adaptations and brought to the position where they consider themselves as ready adjusters. They should be taught the dynamics of acceptance, and by this is meant their acceptance of inevitable difficulties, along with the acceptance of the opportunity it presents. Many of these people who are going to be more or less emotionally disturbed on and off throughout their lives, like ourselves, need to learn the philosophy of acceptance. However, the one to teach the above is a psychiatrist or a psychologist. They are better equipped than a dentist.

Ryan clearly stated the problem when he said, "The application of psychologic principles to dental practice is not a move to convert the dentist into a psychiatrist. The dentist has plenty to do without taking on such a chore. The 'treatment' of neurosis and mental disease is outside the field of dental practice. The 'recog-

nition' of unusual and disorganized behavior is a responsibility that must be assumed by everybody who treats disease of any kind—the dentist certainly included."*

*Ryan, Edward J.: Contra-angles—some things to know about your patients, D. Digest **68:**90-98, 1962.

Chapter 12

PERIODONTAL DISEASE WITH AN EMOTIONAL BACKGROUND

Case 1

Past history and present condition

The case about to be presented stands out as the most discouraging I have seen in my entire dental career. Before this patient's initial visit, he had undergone specialized periodontal treatment.

His physical condition had always been checked carefully by his personal medical doctors, and he had willingly submitted to any necessary tests. There was nothing relative to his systemic checkups that had been neglected. During the dental deterioration many such tests were continued, and new ones were added. The over-all results did not help his dental condition.

When first referred in December, 1954, he was 46 years old. His gums had already been resected twice, and the periodontal tissues were in a state of deterioration. Three upper left posterior teeth plus the lower left third molar had been removed. The lower posterior teeth had been covered by full crowns soldered together in the form of two three-unit splints. The soft tissues were never free from inflammation and chronic periodontal abscesses. These often became acute and required frequent referrals to the periodontist for incision and additional currettage.

In spite of his best efforts, the dental hygiene was poor. It was difficult for him to continue to make efforts when the results were so discouraging. There are many patients such as this one who consciously try to maintain good oral hygiene, but

their results are far from satisfactory. Because of continued food impaction, cervical and root caries were constantly occurring.

Treatment planning

Treatment was undertaken in June, 1955. All the principles of good restorative dentistry were observed. By the end of 1955, a feeling of great apprehension was present for the longevity of the proposed final work. The tissue response was far below normal. With this in mind, the decision was made that in the final work the abutment teeth and all the natural teeth that were finally to receive full coverage would be first protected by the insertion of gold copings. Fixed splints would then be constructed so that they could be inserted over these gold copings. In this manner it would be possible to remove the overlay splints so as to obtain satisfactory access to the underlying tissues for postinsertion dental care. The periodontal treatment would also be rendered more effective.

Treatment

During the treatment period, medical tests continued to be made in an effort to discover some systemic pathology, but nothing unusual was found. The occlusion was coordinated as carefully as possible. The preliminary work was constructed on the Hanau Model H articulator. The final work was completed using the kinoscope. It was not until July, 1956, that the underlay gold copings were inserted. The overlay splints were then placed in position over the gold copings, and the case was completed. A temporary cement was employed to aid retention.

Postinsertion events

By July, 1957, the continued deterioration of the hard and soft structures was evident. In January, 1959, the lower left second bicuspid and the first molars were removed. The patient became further depressed and discouraged. He completely neglected dental care and came only for emergency treatment to have an abscess incised or to obtain a sedative for a toothache. The periodontist was unable to accomplish anything, and the patient finally discontinued visiting him entirely, only to return for treatment in 1962.

As a result of continued food impaction due to poor hygiene, deep caries developed. In addition, at this time the patient suffered from severe emotional disturbances. It had been necessary for him to give up a responsible position and start as a subordinate in a new firm. There were also family quarrels and frustrations. He continued to lose teeth but came for treatment only when the pain was unbearable. During these sessions the overlay splints would be removed, and the necessary work would be executed. The overlay splints would be repaired and recemented with a temporary cement.

In February, 1961, thirteen teeth were missing. Caries were rampant, and many temporary cement fillings had been inserted. Up to this time the overlay splints had been repaired and were being used. The patient realized that his mouth would have to be re-evaluated and new prostheses constructed, but his personal affairs had not been settled, and it was difficult for him to find time for dental treatment. In 1962 he was again considering having his mouth rehabilitated. The systemic

factors were most formidable. There was the probability of the combination of physical and emotional causes. It is possible that the mechanics involved in taking this mouth apart may have initiated or augmented the subsequent quick disintegration, but the periodontal tissues had originally been subnormal. Radical treatment in the form of gum resections had already been performed, and lower posterior splints were inserted before December, 1954. Three upper left posterior teeth had also been replaced by a fixed partial denture. Even if the patient underwent further rehabilitation, there was no assurance that the destructive forces would not continue to operate until all the teeth had been removed.

Use of miracle drugs

Previously in this text, the miracle drugs, antibiotics, tranquilizers, and anticoagulants, were cited as the possible cause for rampant caries in adults. In the case just discussed it had been impossible to check the continued formation of periodontal abscesses. For the previous four years this patient had taken an antibiotic—at first every day, then every other day, and finally every fourth day. Since his medical doctors seemed to feel that this antibiotic had checked the appearance of these acute gum abscesses, he therefore continued to take the drug. However, he seemed certain that it was responsible for the softening of the tooth structure and the severe acute caries that had destroyed so many of his teeth.

The reader is referred to the continued occurrence of this acute form of caries in many other cases that have already been reported (pp. 633 to 634, 635, 636 to 638, 640 to 643, 644 to 645, 660 to 667, 827 to 829, 942 to 949, 949 to 956, 987 to 994).

Second reconstruction

In the summer of 1962, the second reconstruction of his mouth was undertaken. The patient was no longer under medication. His personal life was more stable than it had been for several years. The decision was made to maintain the present interocclusal relationship and the same vertical dimension. This would cause the least disturbance to the present equilibrium.

In the maxilla only eight natural teeth remained. These were again splinted together. The patient still refused to have a removable partial denture. Two throw-offs were added to the distal surface of both cuspids. The female boxes of the precision attachments were inserted in these throw-offs. They were parallel to each other so that if the molars had to be removed, a removable partial denture could still be inserted without removing the anterior fixed partial denture.

Just prior to the insertion of the upper prosthesis, I became convinced that the best interests of the patient were not being served, and I finally prevailed upon him to accept a removable partial denture. The precision attachment was changed from the left throw-off to the distal surface of the left cuspid veneer crown in order to create less leverage upon the nonvital cuspid. The remaining three female attachments were placed in the right throw-off and the two molars. The upper completed prostheses were inserted in November, 1962. (Figs. 1445 to 1468.)

It was not until September, 1963, that the patient was willing to have the lower work started. By that time both central incisors and the left lateral incisor were so deeply involved in periodontal pathology that it was necessary to extract

Text continued on p. 733.

Fig. 1445. Four views which were taken in January, 1955, at the start of treatment. The soft tissues had already undergone treatment. (Figs. 1445 to 1468 are of the same case.)

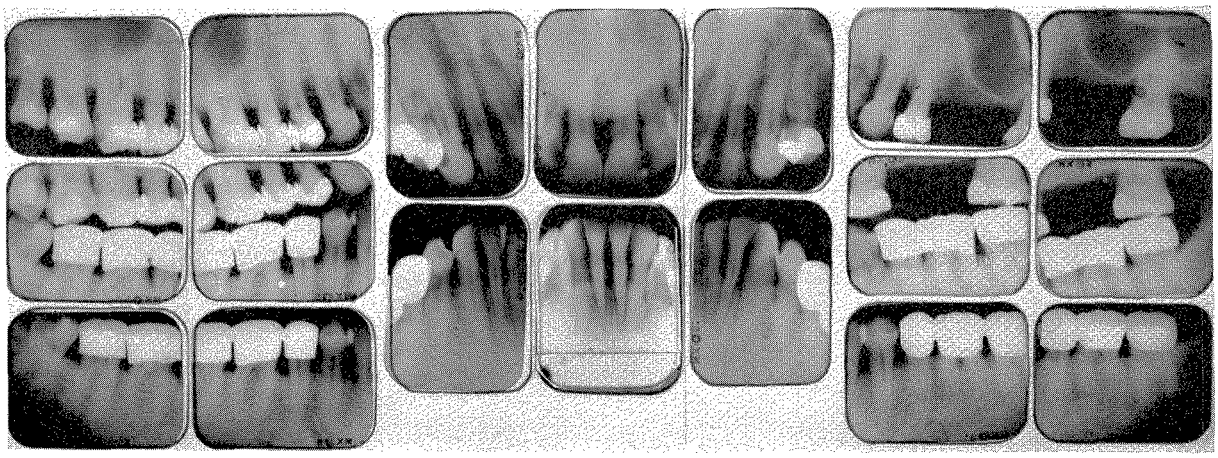


Fig. 1446. Roentgenograms taken in November, 1954, at the start of treatment.

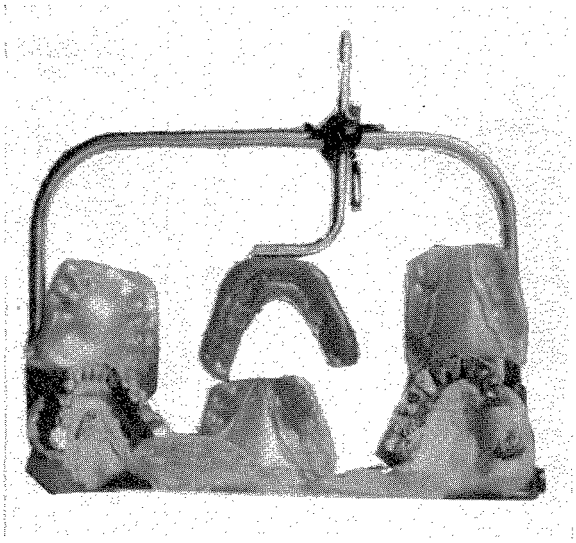


Fig. 1447. The teeth were prepared for crowns. Copper-plated dies were made, and thin gold copings were cast for each tooth in both right and left lower posterior segments and also for the upper right posterior teeth. These copings were paralleled so that the superstructure could be inserted over them. The work casts with the gold copings and the low-fusing transfers are shown in this illustration. The wax records and face-bow for mounting the casts are also shown.

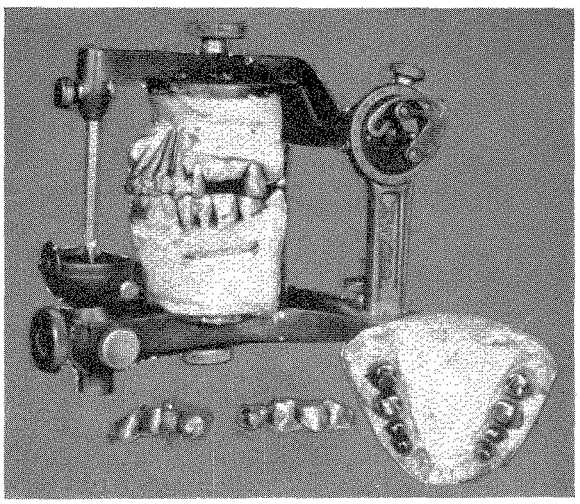


Fig. 1448. The entire articulator mounting is shown here. In the right foreground the lower cast is shown with the gold copings on the dies. The low-fusing metal transfers shown in front of the cast fit over each gold coping.

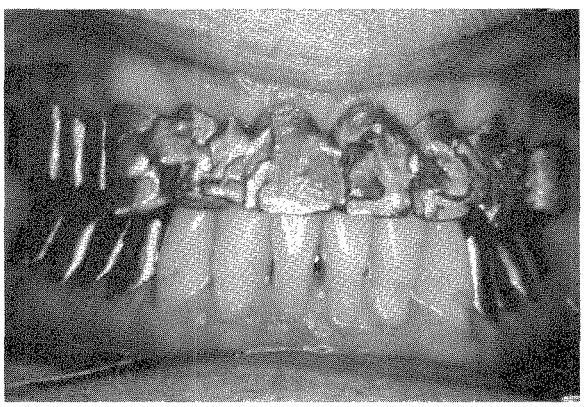


Fig. 1449. First, all the gold copings were fitted on their posterior teeth. Then the low-fusing metal transfers were placed over the upper anterior teeth. The vertical dimension and the centric relation recordings were obtained without posterior contact, as is shown in this photograph. The vertical dimension was kept at the same level as the original teeth.

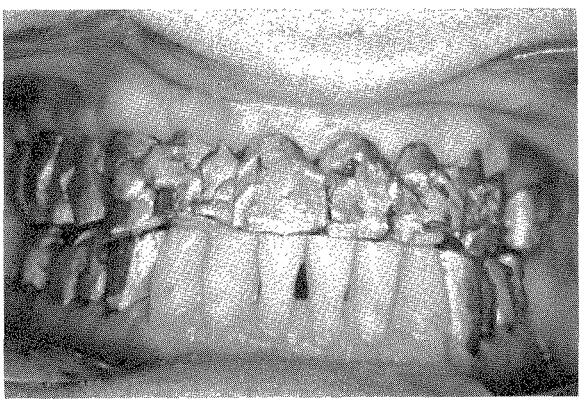


Fig. 1450. The posterior low-fusing metal transfers were inserted at the vertical height and centric relation previously established by the incisors in Fig. 1449.

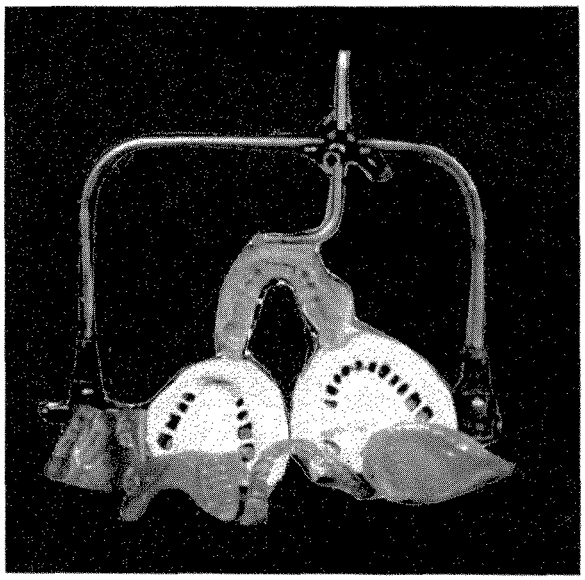


Fig. 1451. New records were taken, as shown in this photograph. From these, new work casts will be poured and a new mounting made. The final work will be proceeded with.

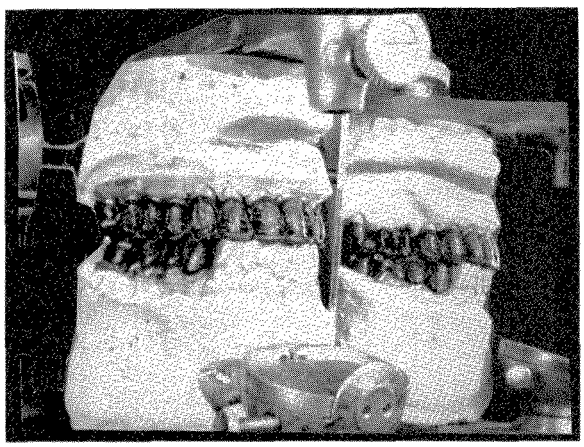


Fig. 1452. The completed wax-up for the final castings is shown in this illustration. The gold copings are beneath. The entire interocclusal relationship has been coordinated. The bridges are completed and tried in the mouth. The vertical dimension and centric relation are again checked. New records and plaster impressions are taken in order to pour new work casts and mount them on the kinoscope.

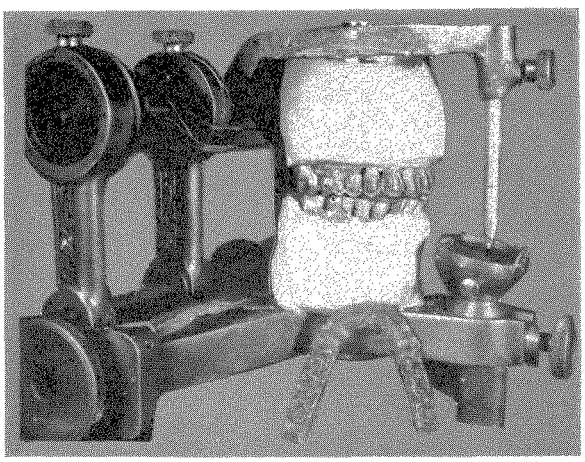


Fig. 1453. The final work is ready for completion. It has been inserted in the mouth several times at various stages of construction. This is the final stage in which a wax checkbite is in place between the casts in order to again prove and check centric relation. The second wax checkbite is seen in the foreground.

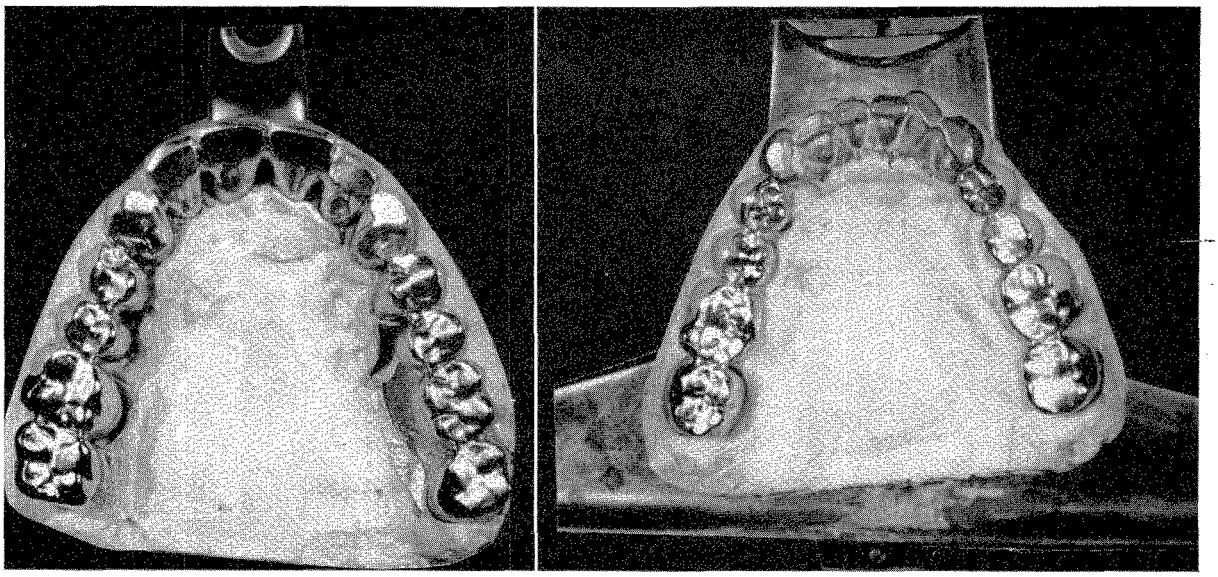


Fig. 1454. The occlusal views of the completed work are shown here.

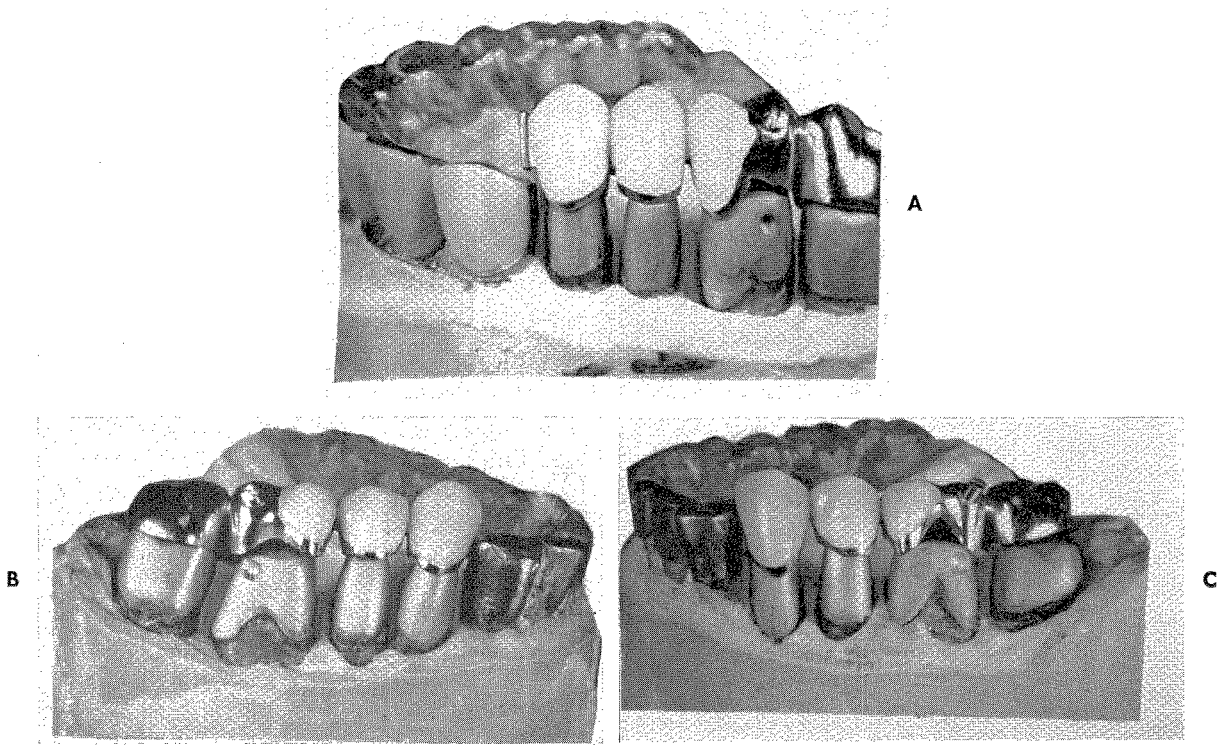


Fig. 1455. Three close-up views of the following: **A,** The upper right gold copings cover each posterior die. The four-unit splint has been raised to show the manner of the fitting of both parts together. A precision attachment joint unites the posterior and anterior splints. The first molar gold coping contains the slot for the screw which immobilizes the removable section. **B,** The lower right fixed and removable parts. The removable splint has been raised from the fixed gold copings. The first molar gold coping contains the slot for the screw which immobilizes the removable section. **C,** The lower left fixed and removable parts. The first molar on the removable section shows the screw which fits into the screw hole in the gold coping.

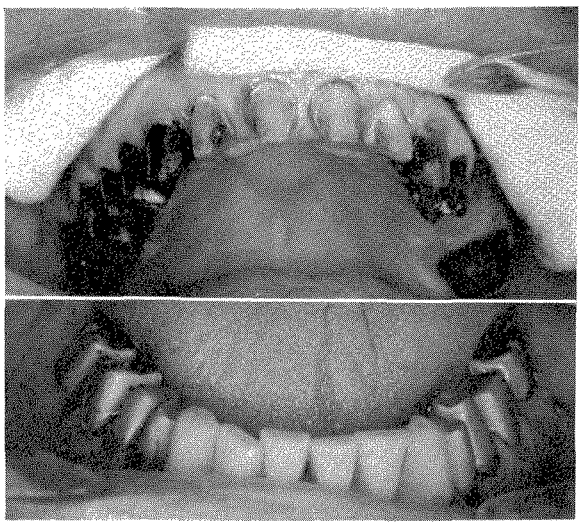


Fig. 1456. Two views taken during the final cementation. The upper posterior teeth have been treated with silver nitrate and eugenol. The lower teeth have also been treated in the same manner, and the lower gold underlay copings have been cemented into position on all the lower posterior teeth. After the upper gold copings have been inserted on the right posterior teeth, the overlay splints will be placed in position.

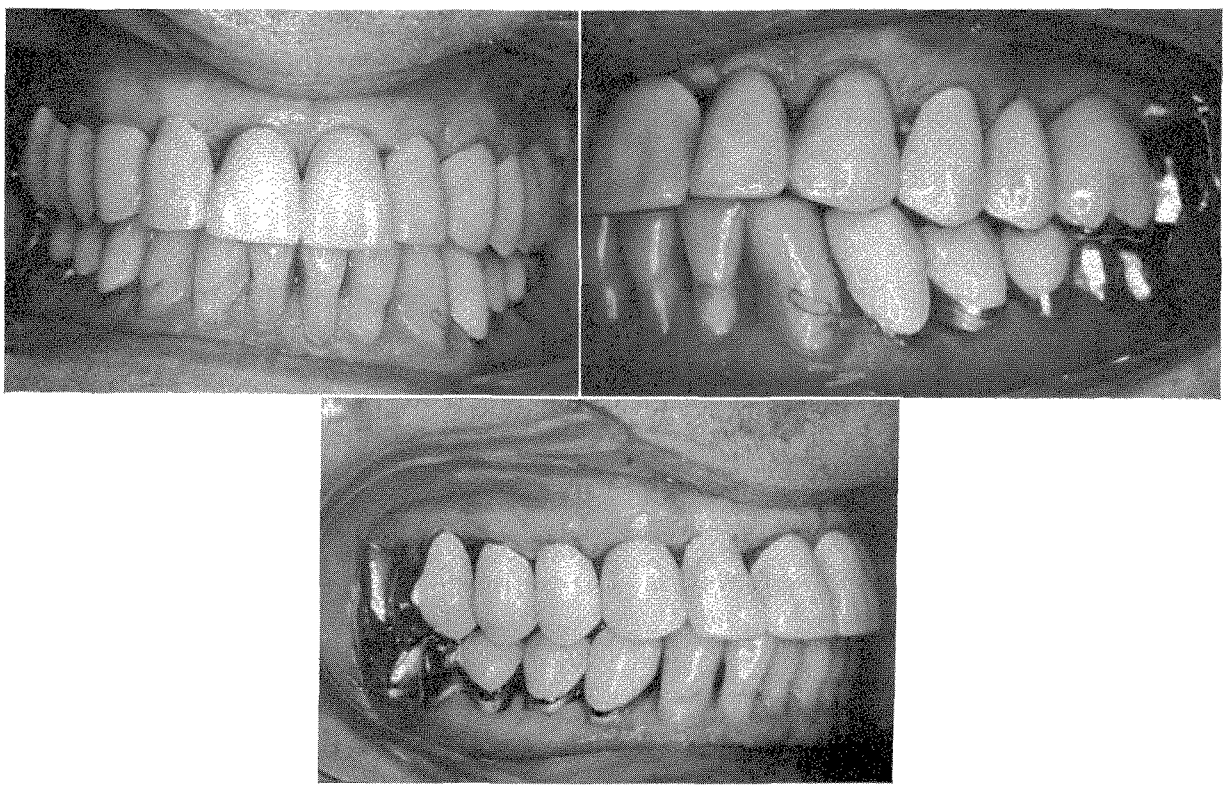


Fig. 1457. Three views of the completed work. This was inserted in July, 1956.

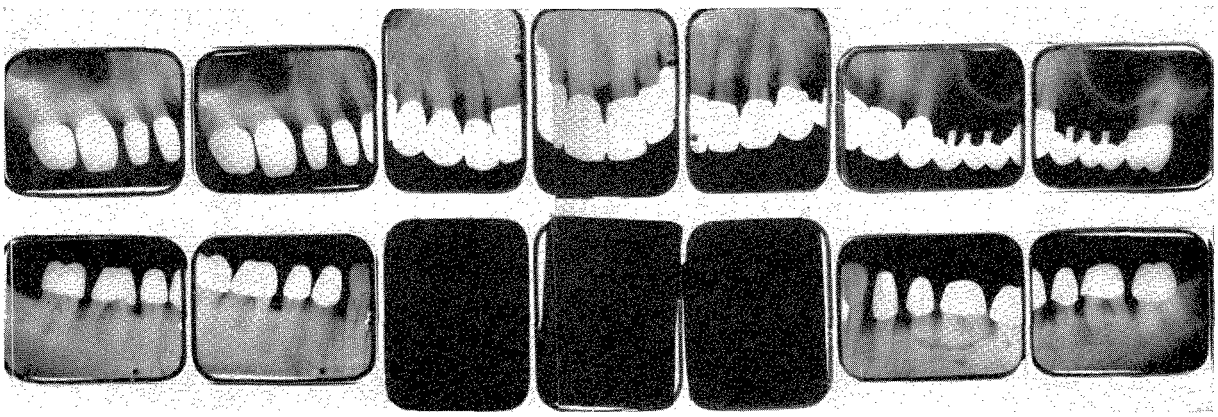


Fig. 1458. Roentgenograms taken in July, 1956. The reconstruction had been completed.

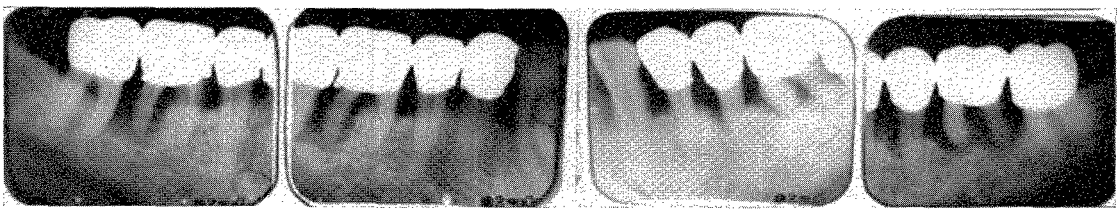


Fig. 1459. Roentgenograms taken in May, 1957.

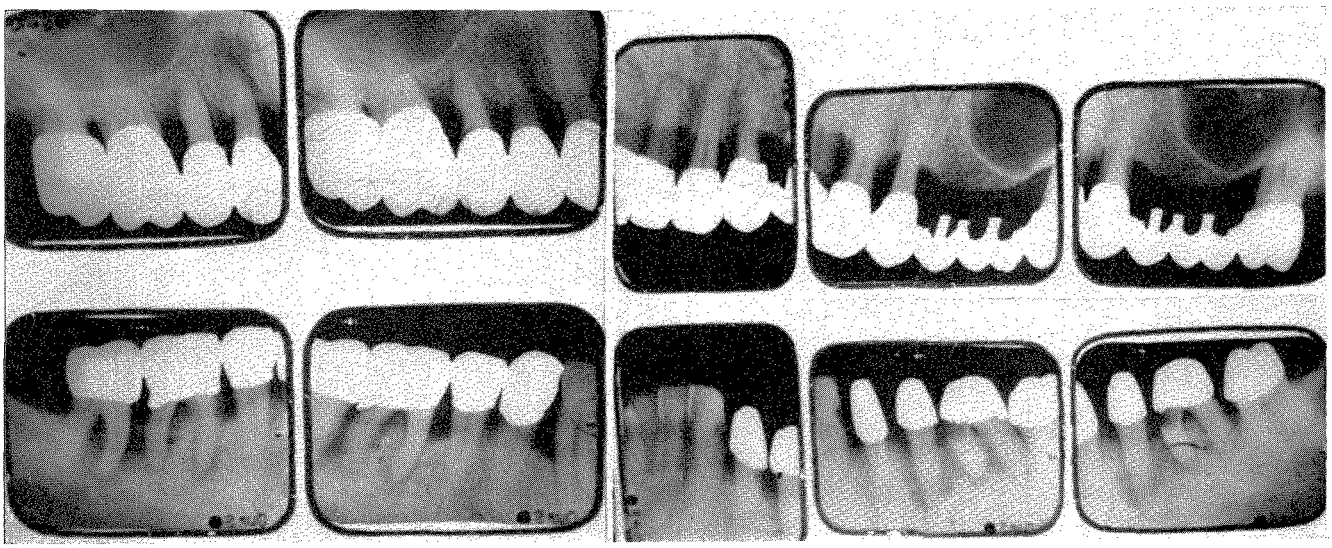


Fig. 1460. Roentgenograms taken in October, 1958. These were taken 2¼ years after completion.

Fig. 1461. Roentgenograms taken in October, 1959.

Fig. 1462. Roentgenograms taken in 1962.

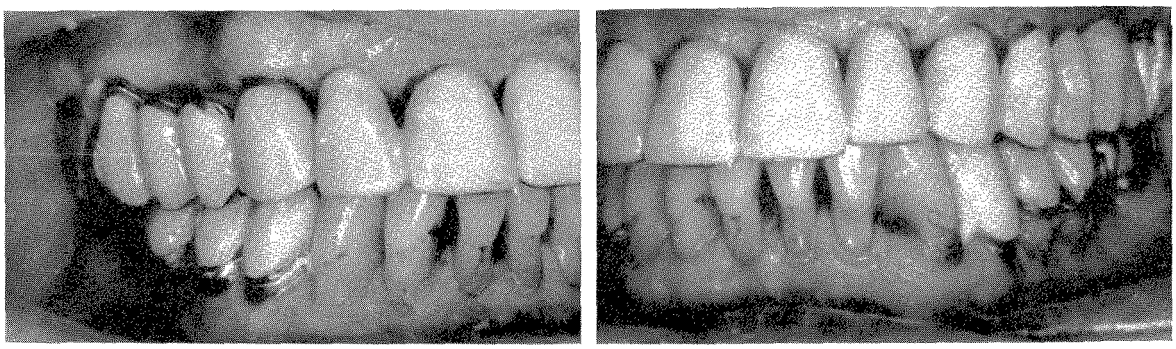


Fig. 1463. Two views of the mouth taken in 1962.

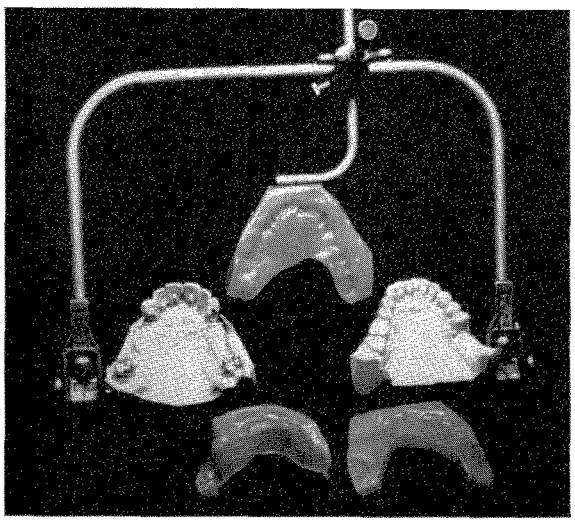


Fig. 1464. The second reconstruction was started in August, 1962. The records that were used to attach the casts to the Hanau Model H articulator are shown.

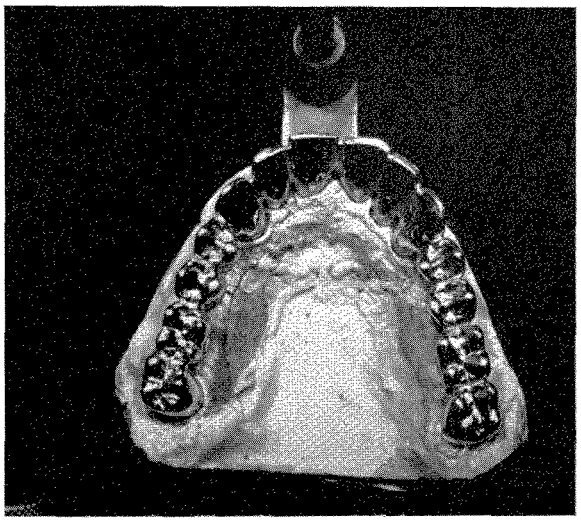
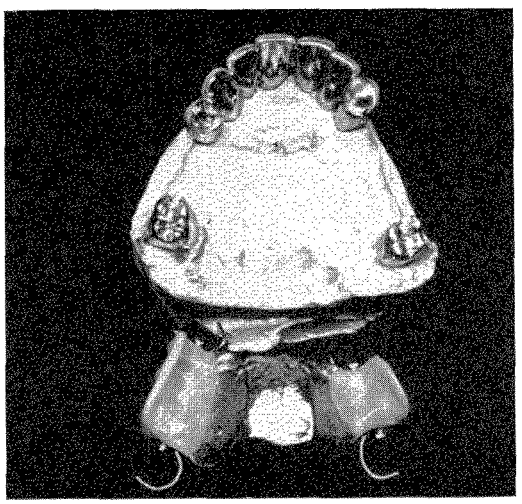


Fig. 1465. The patient was still unwilling to wear a removable upper partial denture. Therefore, a fixed partial denture was resorted to, as shown in this photograph. It was constructed in three sections, which were united by precision attachments.

A



B

Fig. 1466. A, Just before the insertion of the upper prosthesis, the patient was persuaded to accept a removable partial denture. It is shown here. (Read text.) **B,** The upper removable partial denture has been removed from the cast. The anterior seven-unit splint had one right throw-off.

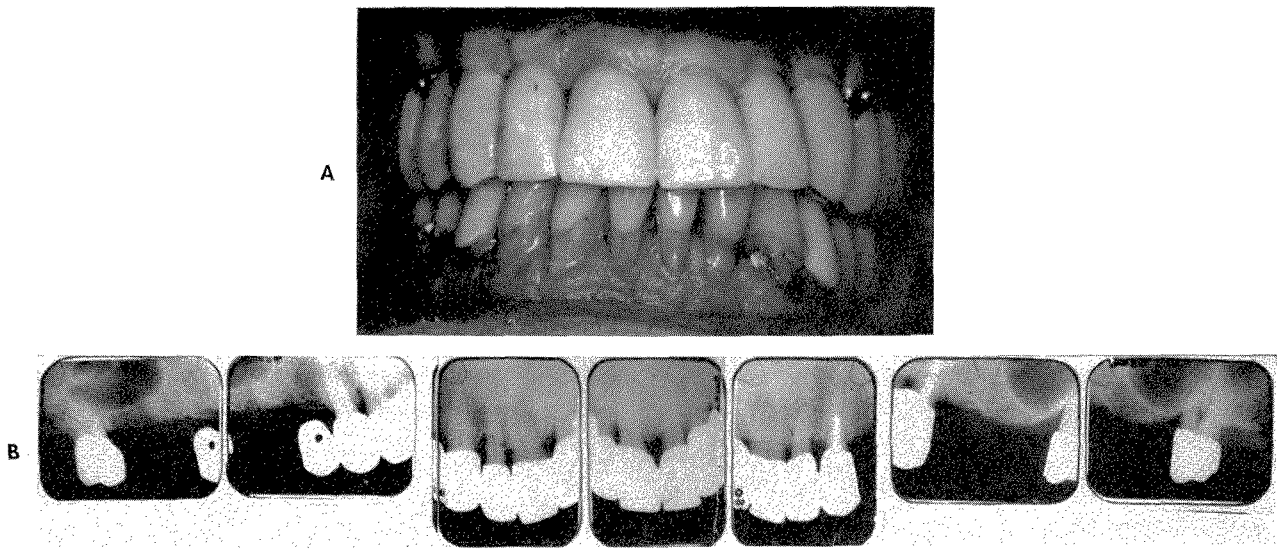


Fig. 1467. **A,** Anterior view of the completed upper work. This was inserted in October, 1962. **B,** Roentgenograms of the completed upper work taken in March, 1963.

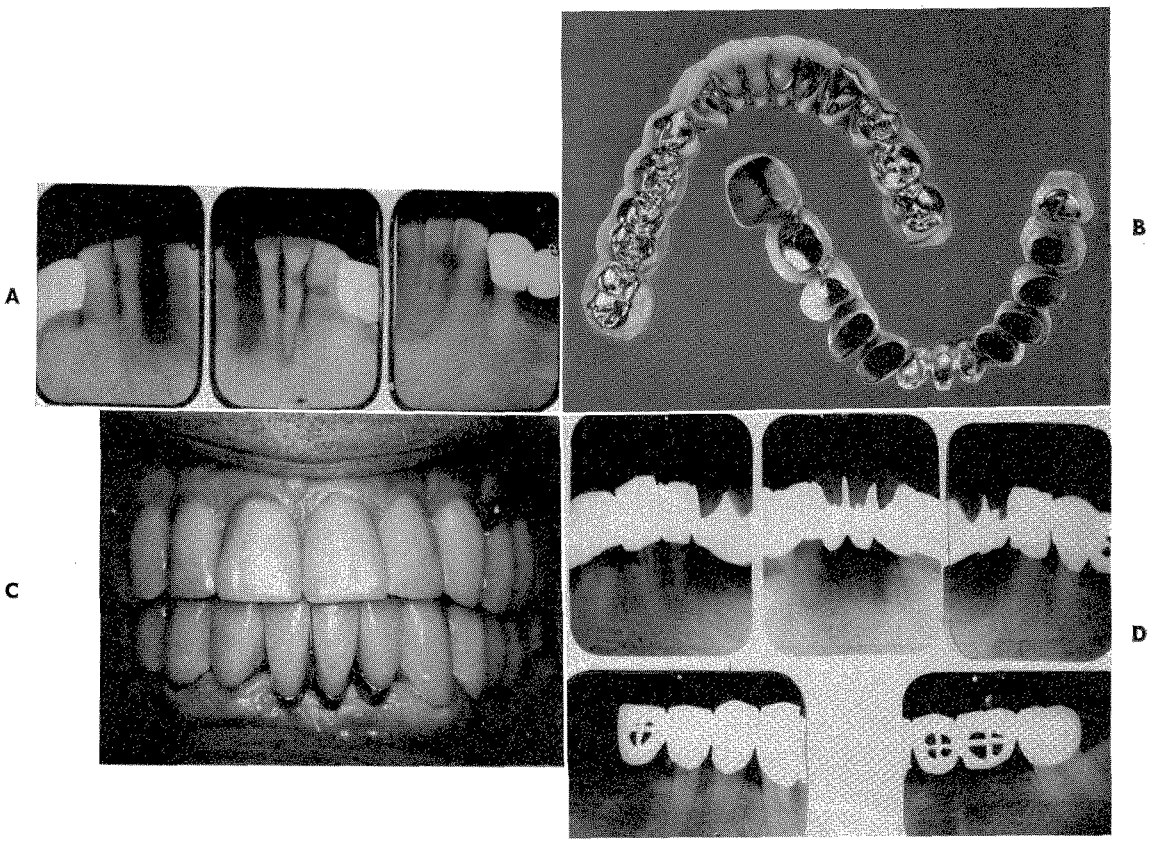


Fig. 1468. **A,** Roentgenograms taken in September, 1963. Three incisors required removal. (Read text.) **B,** Two views of the completed lower fixed partial denture. Seven abutments supported six dummies. The lower right side has one throw-off. There are two sections which are found in these views (see fifth item in the list of plans for the lower reconstruction on p. 733). **C,** Final prosthesis in the mouth. The lower fixed partial denture was only inserted in December, 1963. **D,** Roentgenograms of the final lower prosthesis.

them. In addition, the lower left lateral incisor had a postapical abscess due to distal caries as a result of neglect. The plans for the lower reconstruction were as follows:

1. To maintain the same vertical dimension and centric relation as the patient presented.
2. To insert fixed partial dentures.
3. To provide the greatest possible stabilization by means of splinting all the abutments and dummies together. This would be obtained by continuous soldered joints and/or precision attachments.
4. To throw off one bicuspid dummy on the right side.
5. To place a precision attachment on the distal surface of the lower right second bicuspid and on the distal surface of the left first bicuspid. These female attachments would be parallel to each other so that in case the lower left molar or the lower right second bicuspid was lost, a lower removable partial precision denture could be inserted without having to remove the remaining portion of the lower fixed partial prosthesis.

Fig. 1468 shows the completion of the lower prosthesis in December, 1963. A Hanau Model H articulator was used. A more detailed description cannot be given because of the time limit imposed by the publication of this book.

FAILURES CAN HARM A PRACTICE REGARDLESS OF WHERE THE FAULT LIES

The dentist cannot escape the emotional disturbances to which he is exposed when his best efforts fail. If the patient is understanding, the inadequacy and embarrassment the dentist feels are not so severe as when he is expected to solve a problem that is beyond his capacity to understand, nonetheless, treat successfully. Even when mechanical defects occur, or there are positional errors in the final prosthesis, they would still not account for the disastrous results that sometimes take place. The dentist may be convinced that the failure was beyond his control, yet if cases fail too often, his practice can be lost and with it his livelihood. Regardless of the fact that the work may be technically correct, if the case is not a success, it is not an asset to any practice or to dentistry.

IS IT INTELLIGENT TO ACCEPT A PATIENT WHEN FAILURE IS SUSPECTED IN ADVANCE?

The consequence of such thinking tells the dentist that it is unwise to accept cases that he suspects will result in failure, and although it is not always possible to determine ahead of time which cases present unavoidable difficulties, an experienced operator is able, in most instances, to rely upon his good judgment. Sometimes a greater service is afforded by not accepting this type of case. It not only cuts down the percentage of failures but also saves that precious ingredient called "energy."

Case 2

Present condition

In September, 1954, a man in his mid-forties was referred for dental consultation. He recently completed specialized periodontal treatment, including gum resections. His upper teeth had been splinted by means of wire ligatures. An examination revealed that there were ten missing teeth. Of the remaining, two were hopelessly involved in periodontal pathology and required removal, whereas several others had a questionable prognosis. The upper left first molar had a trifurcation involvement. The patient was unwilling to wear a removable appliance. In his profession he felt that his enunciation would be impaired.

Prognosis questionable

Once again a case presents itself in which the prognosis is questionable. The dentist should be apprehensive of the outcome of his treatment when a person 45 years of age, who had given good care to his teeth, has already had twelve removed and lost a large amount of bony support from those remaining. In addition, with this patient, you could not help recognize that tensions were present most of the time. During the entire treatment period tranquilizers were necessary, in addition to the normal local anesthesia. These patients should be made aware of the problematic outcome of their case. It is worthwhile to spend time educating them so that they realize the intangibles involved. The time to do this is before the reconstruction. Otherwise, should it fail, it would appear as though the dentist were merely justifying faulty work.

Treatment

Treatment was undertaken in October, 1954. The second transitional splints were inserted by Nov. 6, 1954. They were made of gold crowns veneered with acrylic. The final prostheses were undertaken in February, 1955. A transverse hinge axis recording was taken using the McCollum hinge-bow. The modified Hanau Model H articulator was the instrument upon which the occlusion was coordinated. This permitted the use of a hinge axis bow and an axis orbital plane indicator. The articulator has curved condyle paths. Gold transfers were used to seat the copper-plated dies accurately in the plaster impressions in order to make the work casts. The wax records used for mounting the work casts in the articulator were taken carefully. Extensive splinting was resorted to in the fixed partial prostheses. The marginal fit of the castings was checked by roentgenograms.

Postinsertion developments

The final work was inserted in May, 1955. By November, 1958, the plastic veneers were beginning to show the effects of abrasion. No further signs of deterioration were observed at this time. He came for periodical checkups and prophylaxis. In March, 1960, he complained of pain in the upper right posterior area. Clinical and roentgenographic examination revealed no evidence of pathology. Because of the persistence of the pain, the bicuspid crowns were removed. Deep-seated caries was then discovered which was not revealed by the radiographs, and

the pulp of the upper right second bicuspid was involved. Pulp therapy was instituted, and a new splint was made for this section of the total upper prosthesis. It was inserted on May 2, 1960. The patient had been under specialized periodontal treatment before and after the reconstruction.

Where a pulp is involved, it is often better to remove the crown and treat the tooth rather than to attempt treatment through a hole drilled in the crown. In the latter method, sometimes too much of the natural crown is removed in order to find the pulp chamber. When this is done, the crown is weakened and sometimes separates from the root, thus becoming a useless part of the splint. This takes place even though the pulp treatment and root canal filling have been successful. In cases in which it is possible to remove the gold crown, less tooth structure is apt to be sacrificed because of better vision. Although this procedure is not always feasible, it should be considered.

The April, 1961, roentgenograms indicated a deep trifurcation involvement of the upper left first molar. This tooth had a questionable prognosis at the start of treatment, and in spite of continued specialized periodontal treatment, the pathology had progressed to a point where extraction of the tooth was indicated. Because the patient was extremely reluctant to lose this tooth, a gum resection was attempted first. His 1961 radiographs also revealed that within one year's time the lower left molar had become so deeply involved with periodontal infection that its removal was necessary. In order to retain the anterior section of the old lower left bridge, the bicuspid and molar dummies were divided in half, and the second bicuspid dummy was retained as a throw-off. In order to support this throw-off more adequately, the lateral incisor was added to the left cuspid and first bicuspid by means of horizontal pin ledging.

The patient was not seen during the summer and early autumn of 1961. In November it was decided to remove the lingual root of the upper left molar and retain the two buccal roots. The molar was devitalized, and the two buccal roots were filled. On Nov. 13, 1961, under local anesthesia, the lingual root was removed. A silver amalgam filling was inserted, and a smooth lingual contour was established.

In 1962 an apical abscess developed on the lower left first bicuspid. The root canal was filled through the gold crown. A stainless steel pin was then inserted to correct the weakened root and crown in order to avoid a fracture at the gum line. The patient was advised that if the infection did not clear up in a reasonable time, the bicuspid should be removed and a lower lingual bar inserted. A root resection was rejected because of the possibility of paresthesia. The infection was still present in January, 1963. The patient was still unwilling to consider a lower removable partial denture and would not even consider cutting off the throw-off which caused additional leverage. (Figs. 1469 to 1491.)

Summary

These cases continue to embarrass us because of our lack of knowledge as to their cause and our inability to treat them effectively. We can only strive to find out more about them and to treat them with what knowledge is now available.

Most cases involving periodontal disease usually have a complex etiology. A systemic background that may include the endocrine system is often suspected. Cases in which there is a suspected emotional background do not necessarily indi-

Text continued on p. 744.

Fig. 1469. Roentgenograms of the mouth at the start of treatment in August, 1954. (Figs. 1469 to 1491 are of the same case.)

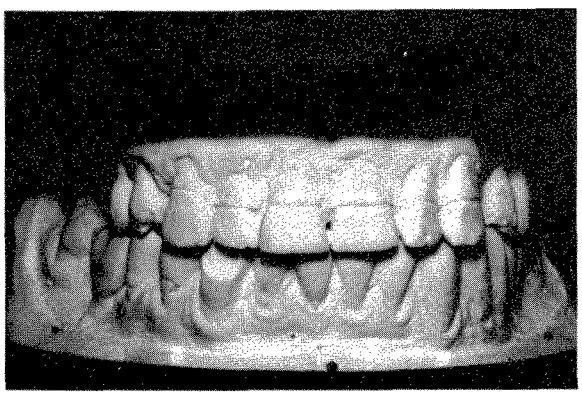


Fig. 1470. Study casts of the mouth at the start of treatment. The dental wire ligature which the periodontist had inserted was still in position.

Fig. 1471. The occlusal view of the transitional splints. They consisted of gold crowns veneered with plastic. The crowns were rigidly splinted together.

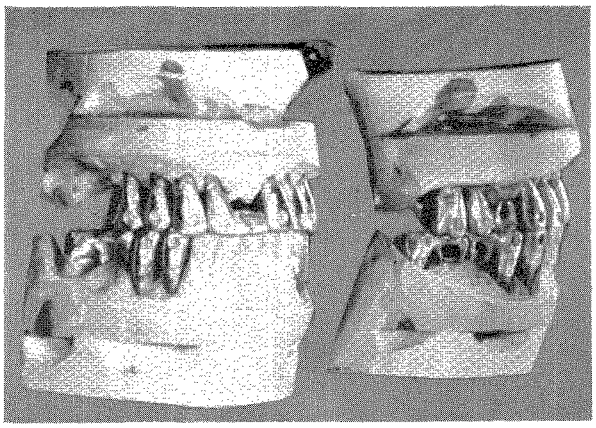


Fig. 1472. A complete set of gold transfers was made on the copper-plated dies. Several dummy teeth were added to help in registering the bite.

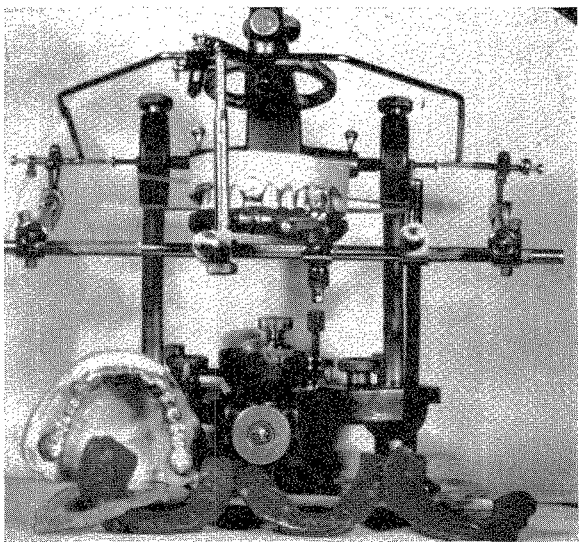


Fig. 1473. The gold transfers were inserted in the mouth, and wax records were taken of centric and excentric mandibular positions. A special clutch was used to record the transverse hinge axes. The McCollum face-bow with its provision for taking the axis orbital plane was used. The upper work cast is shown being attached to the upper frame of the modified Hanau Model H articulator. The lower cast will then be related to the upper cast by means of the centric relation wax record and attached to the lower frame of the articulator. Then the lateral wax records will be used to set the right and left sagittal condylar inclinations. The Bennett settings will be determined by formula, but they are often modified by the lateral wax records.

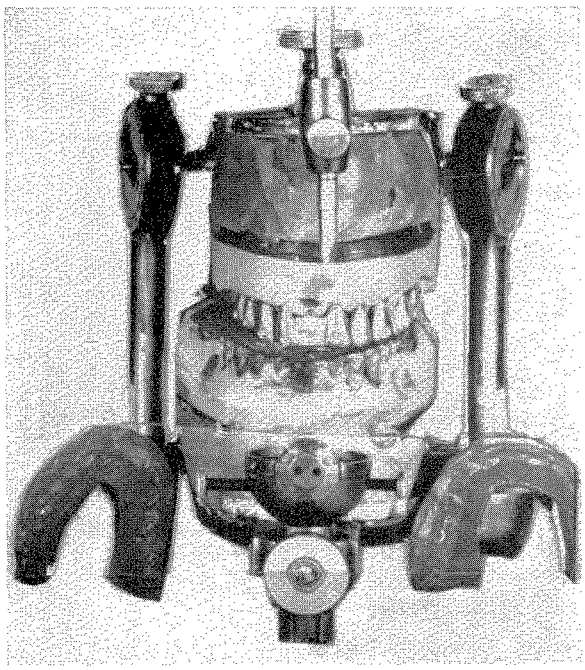


Fig. 1474. Setting the sagittal condylar inclinations by means of the lateral wax records. The left condylar inclination is being set here by means of the right lateral wax record. After the articulator mechanism has been set, the final castings are made and then tried in the mouth. Centric relation, vertical dimension, etc. are determined. Then new records are again taken.

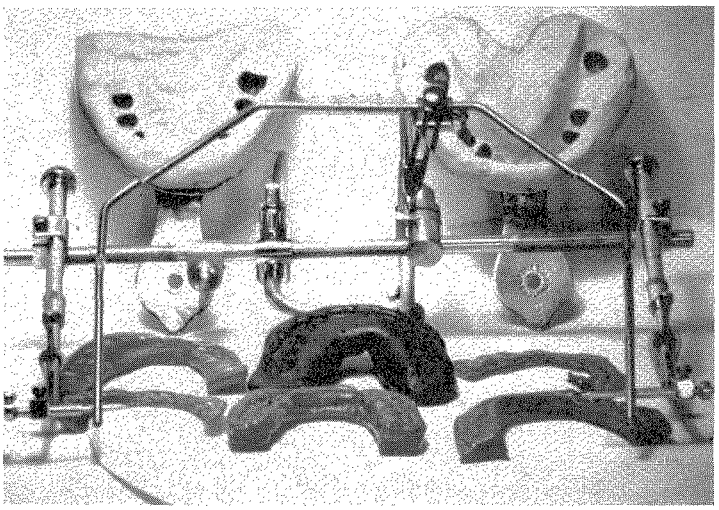


Fig. 1475. These are the new records for the new mounting. They consist of new plaster impressions, face-bow, axis orbital plane, and centric and excentric wax recordings.

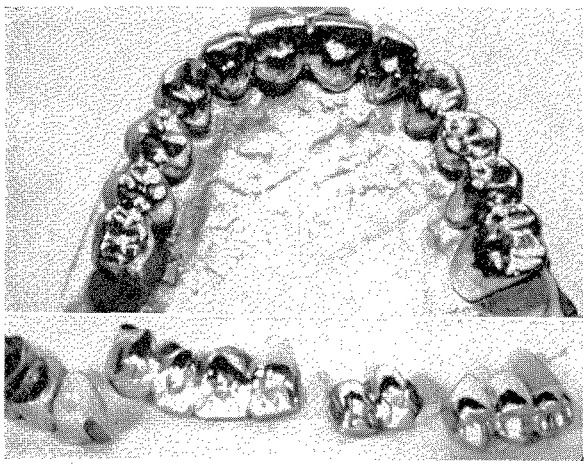


Fig. 1476. The final upper splint consisted of twelve units. Due to the lack of parallelism of the abutment, it had to be divided into four parts. These were joined by precision attachments in order to create rigidity. Three sets of precision attachments were used.

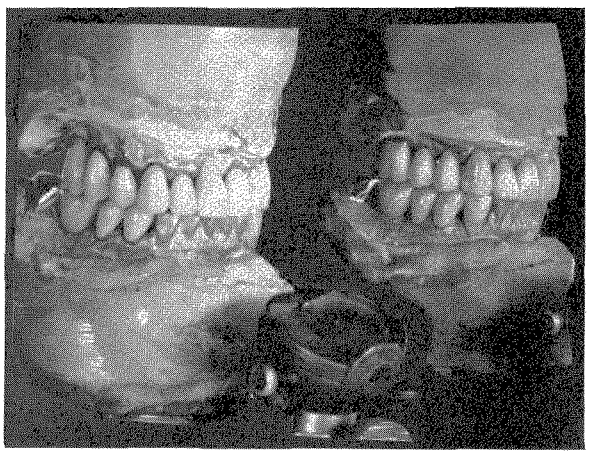


Fig. 1477. Right and left sides of the completed work. A mirrow was used to obtain the left side.

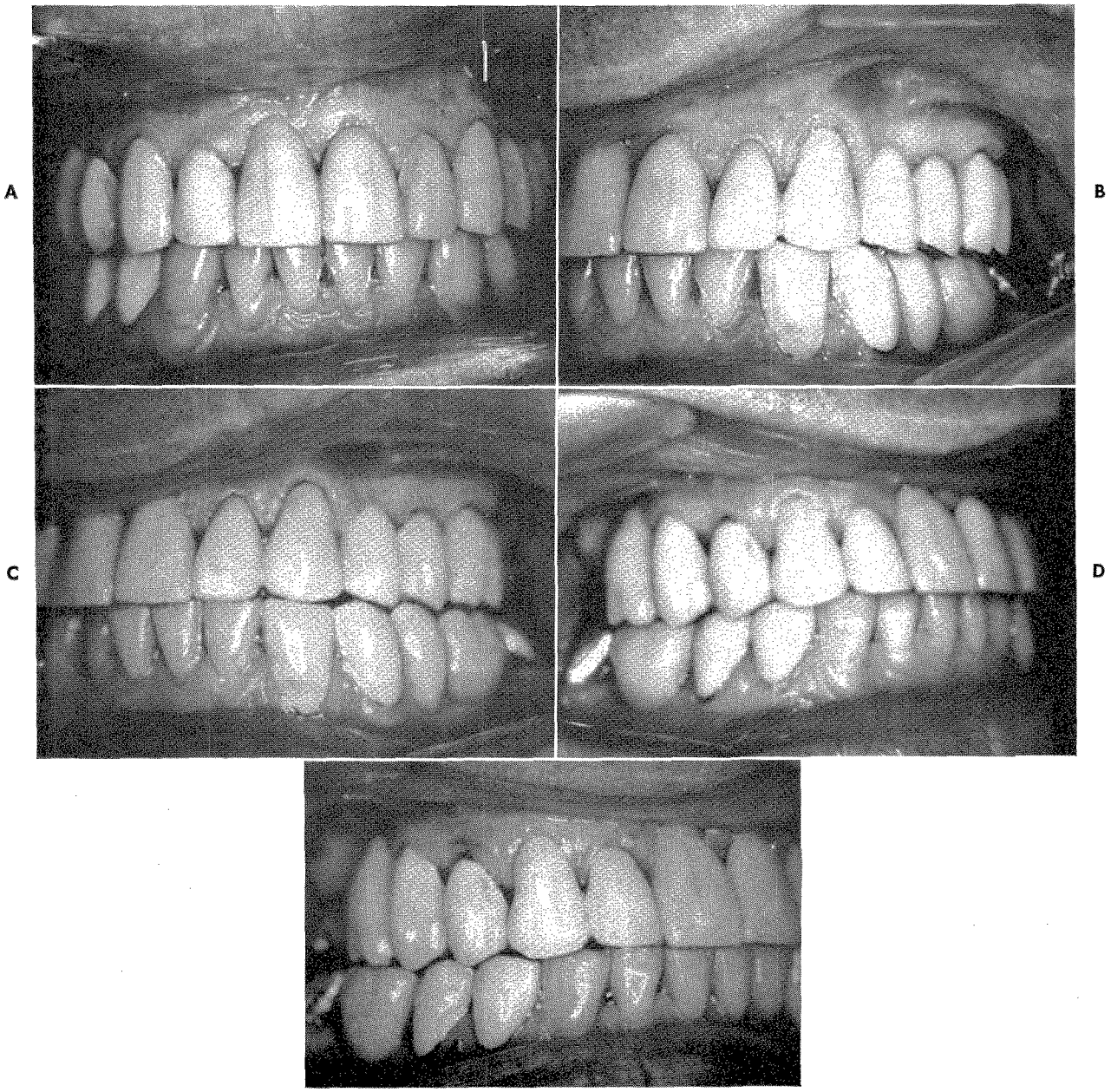


Fig. 1478. Five views of the completed work. **A,** Front view. **B,** Left side, centric occlusion. **C,** Left side, working bite. **D,** Right side, centric occlusion. **E,** Right side, working bite. This case was completed in April, 1955.

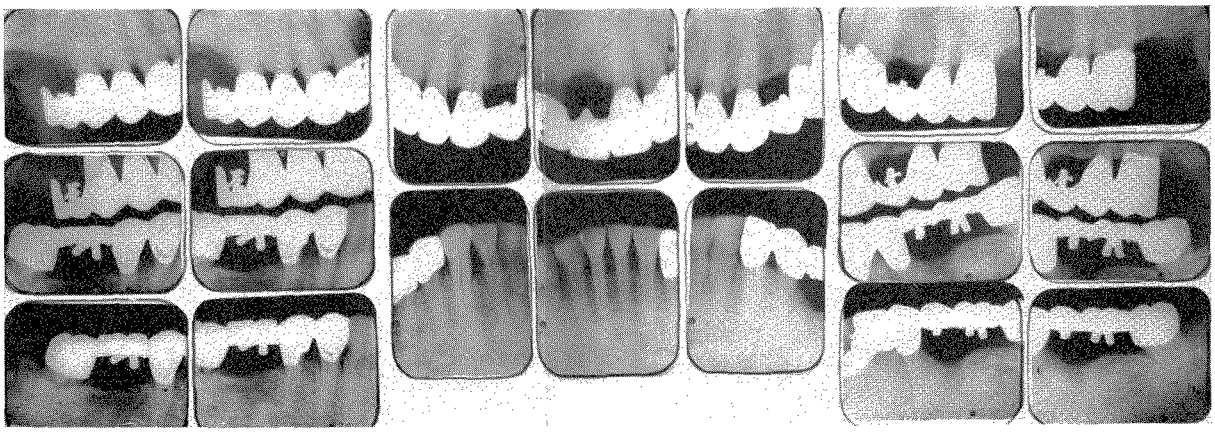


Fig. 1479. Roentgenograms taken upon completion in April, 1955.

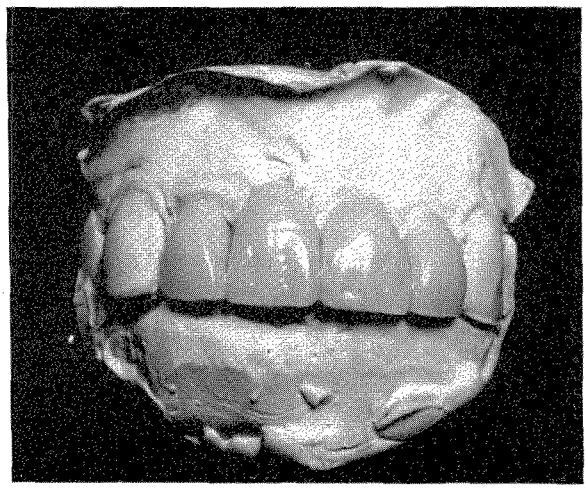
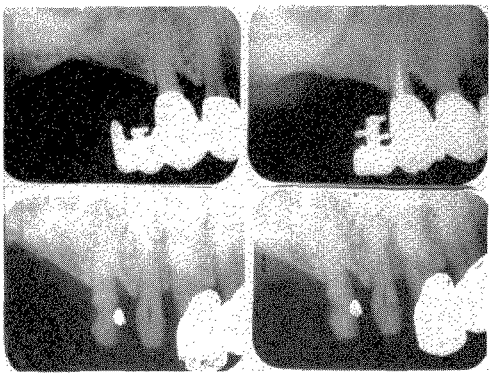
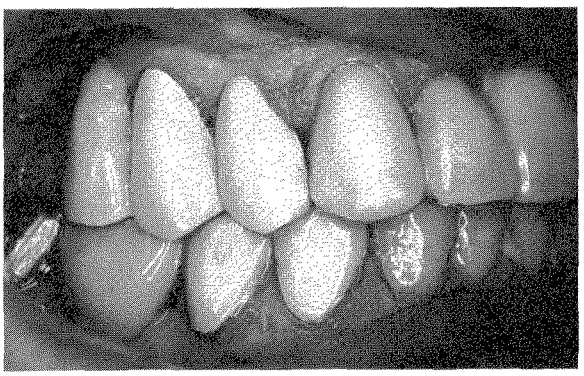


Fig. 1480. In October, 1959, the upper plastic veneers were removed in sections and replaced. The anterior four incisors are shown here being remade. These will be cemented with a plastic cement. Elsewhere in the text the technique is shown in detail. (See Figs. 585 to 589.)



A



B

Fig. 1481. In March, 1960, the upper right second bicuspid became nonvital. Although the radiograph (**A,** upper left) revealed no evidence of caries, when the crown was removed, deep caries was exposed (**A,** lower radiographs). The root canal was filled, and a new section was attached to the upper splint as shown in these photographs (**A,** upper right). **A,** The roentgenograms. **B,** The new section of the splint frame consisting of two bicuspids and a throw-off. The joint with the precision attachment made it possible to connect the new part with the old so that the entire splint is rigid.

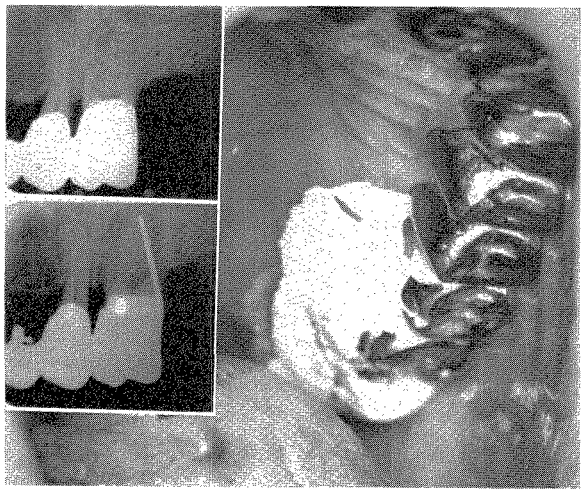


Fig. 1482. The upper left molar, which had a trifurcation periodontal involvement at the start of treatment, became more seriously involved. In May, 1961, the gum was resected. The pack is in place in this illustration. The metal probe in the upper left insert shows the depth of the pocket.

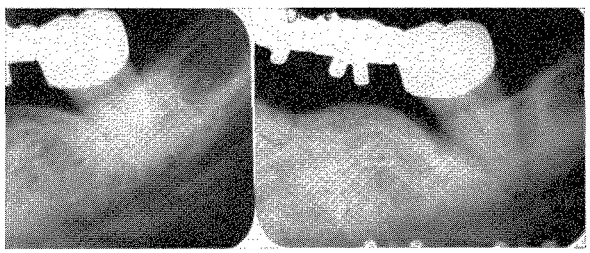


Fig. 1483. From January, 1960, to April, 1961, the lower left molar became infected and had to be removed. The radiographs show a difference of four months. The bridge was divided between the two dummies. A throw-off was retained to replace the second bicuspid, but now it became necessary to add another abutment (the left lateral incisor) to the bridge.

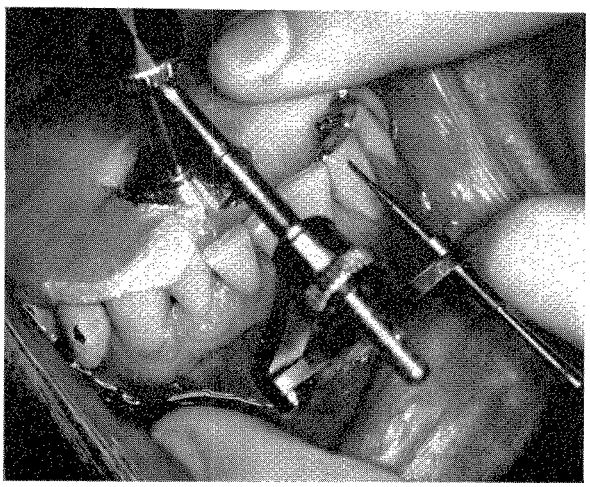


Fig. 1484. The Pontostructor technique was used to construct a horizontal pin ledge in order to attach the lateral incisor to the cuspid and thereby obtain the additional strength of another tooth to support the left posterior splint. The apparatus is shown in position. The first hole was drilled through the cuspid veneer crown. (A more detailed account of this technique is shown in Figs. 352 to 370, Chapter 4.)

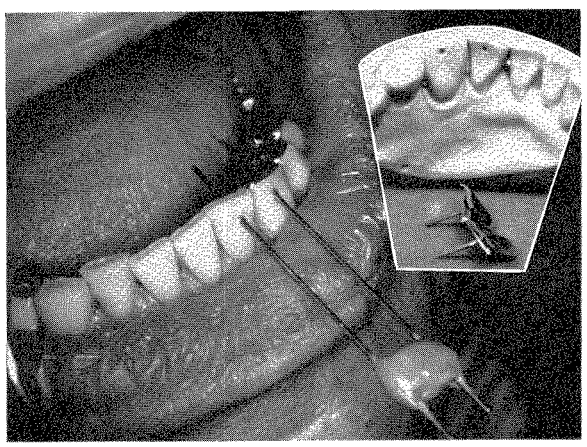


Fig. 1485. Both holes were drilled. They are parallel. A rubber impression will be taken, and the horizontal two-tooth pin ledge, shown in the upper right inset, will be constructed. This will be cemented in from the lingual surface.

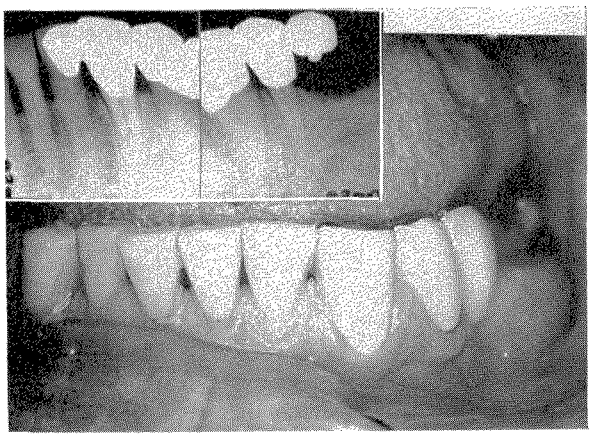


Fig. 1486. The completed lower left work is shown in this illustration. The radiograph is on the upper left side. This pin ledge was inserted in May, 1961.

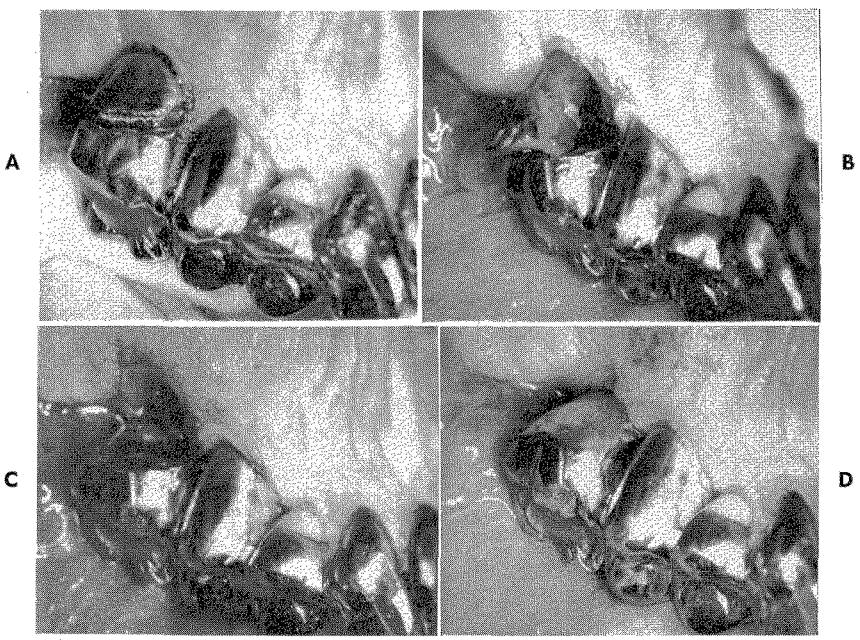


Fig. 1487. In November, 1961, the upper left first molar was devitalized, and the two buccal root canals were filled. The lingual root was then removed. The four stages of its removal are shown in this photograph. **A,** The lingual section of the gold crown was cut so that the root could be severed from the remaining portion of the tooth. **B,** The root was separated from the tooth and is shown being removed from its socket. **C,** The root has been removed. The socket is empty. **D,** An amalgam filling has been inserted. The socket is healing.

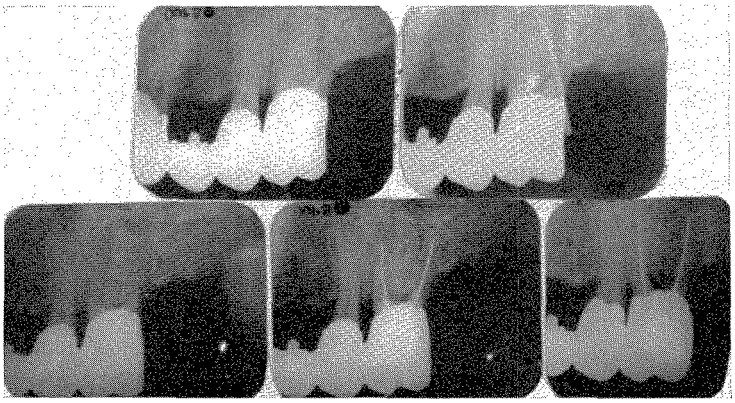


Fig. 1488. Roentgenograms before and after the removal of the upper left first molar lingual root. The upper right film shows a gutta-percha point in the lingual periodontal pocket. The lower center film shows the buccal roots filled. The lower right film shows the lingual root removed.

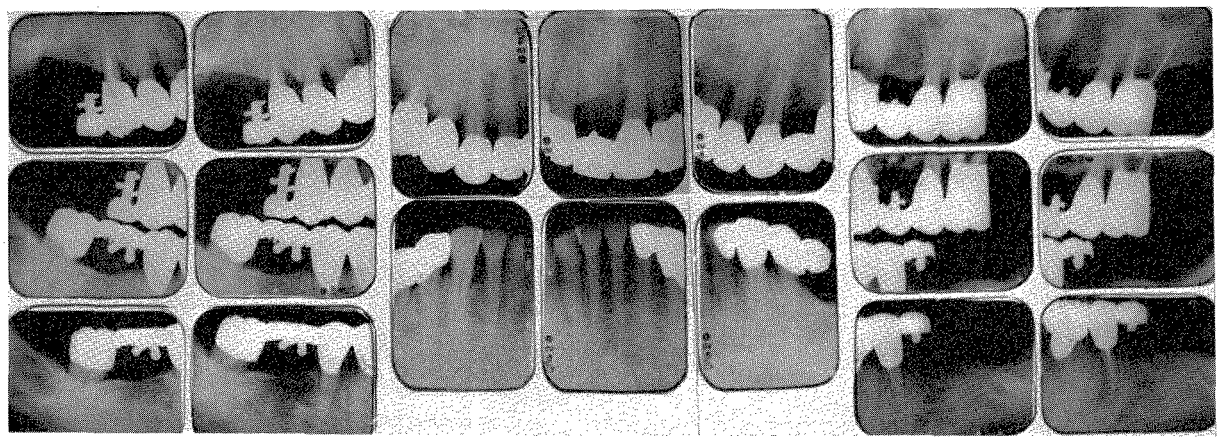


Fig. 1489. Roentgenograms taken in 1962. The lower left bicuspid became infected. Its root canal was filled in January, 1963. The roentgenogram is shown in the extreme lower right corner of the illustration.

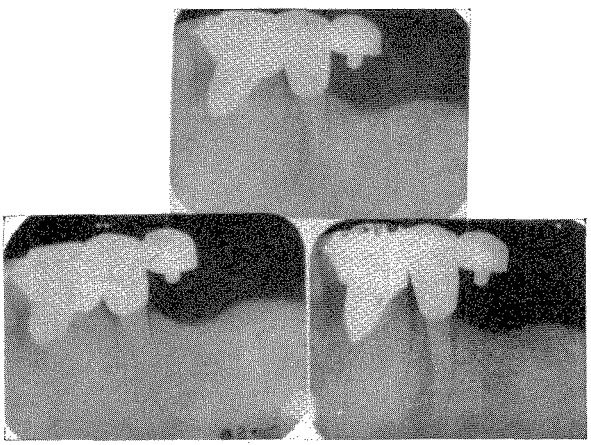


Fig. 1490. In August, 1962, the lower left first bicuspid became infected, and its root canal was filled. Whether this will clear up the infection remains to be seen. No caries was found.

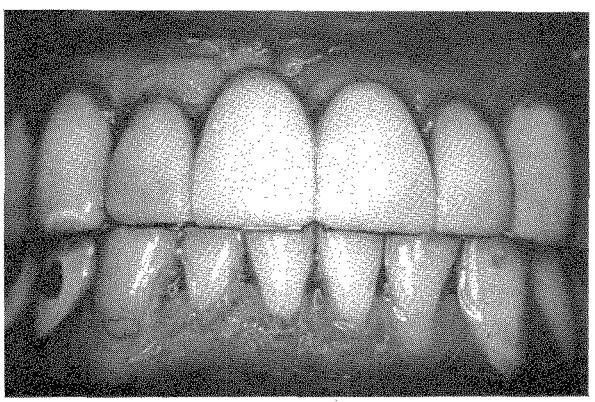


Fig. 1491. The mouth as it looked in 1962.

cate that a neurosis is present. Some patients are under tension, and their inability to combat life's problems causes them worry and apprehension. Others who are able to combat life's problems may equally worry and be apprehensive.

Case 3

I have in mind the case of a member of the clergy whose periodontal structures were weak and who was missing many teeth before reaching middle age. He did not wish to wear full dentures even though he realized that there were only a few weak teeth remaining in each arch. He was made cognizant of the questionable prognosis of these teeth and was told that the longevity of the results was unpredictable. Even with these facts strongly impressed upon him, he was not willing to sacrifice the few teeth that remained if there was any chance of their lasting even for a relatively short time. This desire is readily understandable. Some people feel that the loss of all their teeth connotes old age, and they have a repugnance toward wearing full dentures. With this patient, his vocational activities augmented the desire to retain as many natural teeth as possible. The loss of teeth can inflict a deep psychological insult to the total being. A more detailed outline of this case, with its past history, follows.

Past history

The patient first presented himself in April, 1939. The roentgenograms indicated advanced periodontal involvement in several areas. Five molars were missing, and two of those remaining were nonvital. Caries was present, and there was also a very noticeable tension and emotional background. Only a limited amount of dental work was permitted. The patient was not seen again until 1948, by which time the periodontal tissues had greatly deteriorated. An upper left fixed bridge was inserted, and the lower left fixed bridge had to be removed because of caries. The lower left molar had a bifurcation involvement. Once again, the patient permitted only a very limited amount of work to be completed.

Present condition

He was not seen again until 1956 and was wearing a lower lingual bar. His dental structures were in a state of complete disintegration. Up to this time, thirteen teeth had been removed. Three of the remaining teeth were nonvital, and the periodontal tissues were deeply involved. The patient finally realized the urgency of his dental problem and desired, if at all possible, not to wear full dentures. After a careful evaluation and many consultations, the decision was made to attempt to retain as many noninfected teeth as possible and to reintegrate the mouth.

Treatment

The work began in August, 1956. Bridges were removed, teeth were extracted, and the gums were resected. By October, healing had taken place, and the first stage of the reintegration was over. The second stage was started. In this stage the prescription for the final work would be included in the transitional work. In the maxilla, eight upper teeth were to be retained and splinted together. Two throw-

offs were to be added, making a twelve-unit rigid splint. The second and third molars were to be eliminated from either side.

In the mandible seven teeth were to be retained and used to support a thirteen-unit rigid splint. This included one throw-off. On Nov. 26, 1956, the second transitional work was inserted. This work was constructed upon a simple laboratory articulator. No face-bow was used. In this lower splint, the lower left molar, which had a bifurcation involvement, had been included, but its prognosis for use in the final work was doubtful. In January, 1957, the upper right central incisor was subjected to pulp therapy. This may have been caused by leakage of the temporary cement from around the crown in the transitional splint.

Final stage of work

In February, 1957, the third and final stage was started. The lower left molar had been removed. The final prosthesis was constructed on the Transograph. (See Figs. 533 to 556 and 1052 to 1092.) This is one of the newer articulators capable of accommodating a hinge-bow and cranial plane. It is said by its inventor to be fully adaptable and to copy accurately any off-sagittal movement the mandible is capable of making. In addition, it is said to incorporate a split axis—one for each condyle. It is also an arcon articulator and has the mandibular fossa as a part of the upper frame whereas the condyles are part of the lower frame, just as they are in the human skull.

Transverse hinge axes were taken, and their exit from the sides of the face was tattooed on the skin. The instructions of the inventor of the articulator were followed carefully. The following has already been described in the text on pp. 495 to 497, but it bears repetition because of its importance in this technique.

Several hinge wax records of various thicknesses were taken to capture the arc of closure. This is based upon the assumption that if three points at different levels in space can be found and a cord from the transverse hinge axis goes through all three, as the articulator opens and closes, then the opening and closing arc has been found for that particular patient. In this system of articulation, the face-bow of the Transograph becomes the articulator when it is taken off the head and placed on the laboratory bench.

Accurate working casts were made using both gold and low-fusing metal transfers. The lower splint was finally modified so that it contained only twelve units. The lower incisors were replaced with porcelain teeth and a gold saddle. Duplicate sets of porcelain teeth were made in case of fracture. The abutment teeth were treated with silver nitrate and eugenol. The final work was inserted in April, 1957. This took, in all, eight months.

Postinsertion events

The patient was not seen again until the fall of 1960. He had not had any treatment during this time. A periodontal abscess which was associated with his lower right second bicuspid had to be lanced. Recovery was uneventful. His work at the time of writing was about five years old. The teeth and tissues were in fair condition. He was completely satisfied and very grateful. Unfortunately he did not come often enough to receive adequate postinsertion care. This is beyond the dentist's control. The emotional factor still continues to dominate this case. (Figs.

Text continued on p. 752.

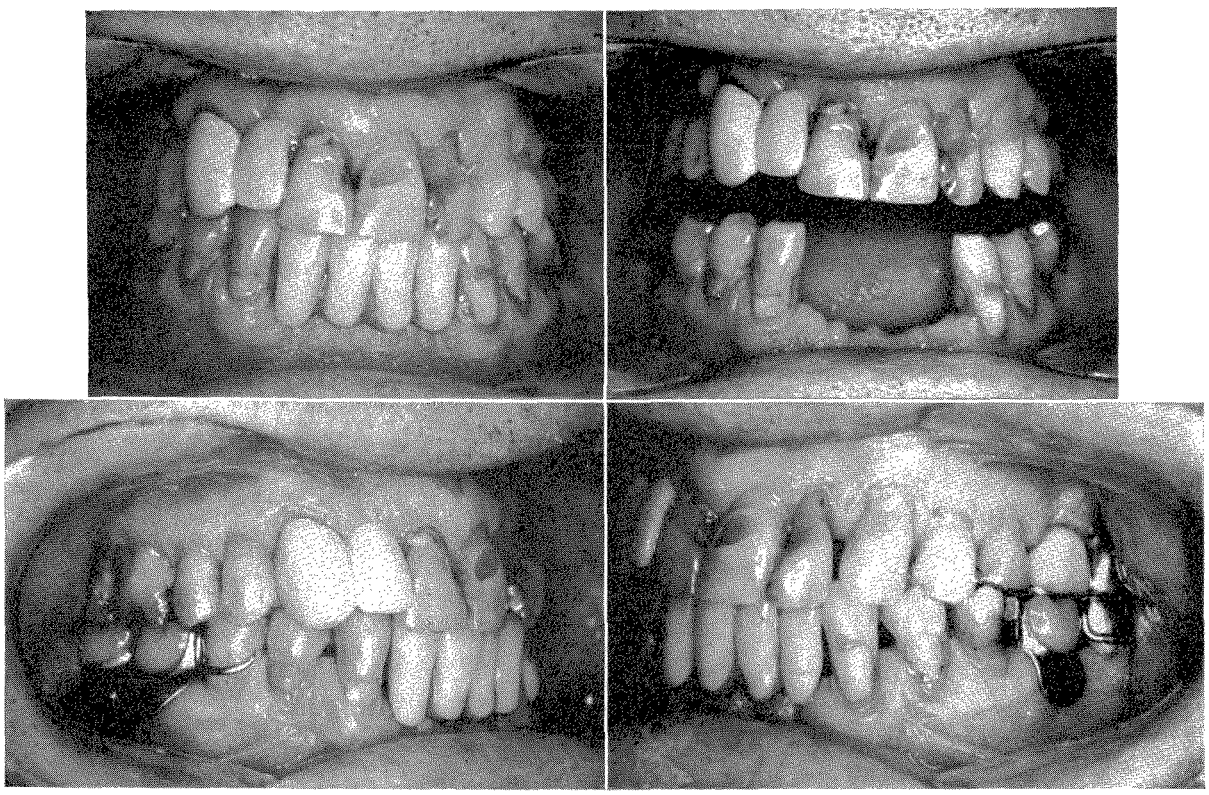


Fig. 1492. Four views of the mouth which were taken in June, 1956. (Figs. 1492 to 1508 are of the same case.)

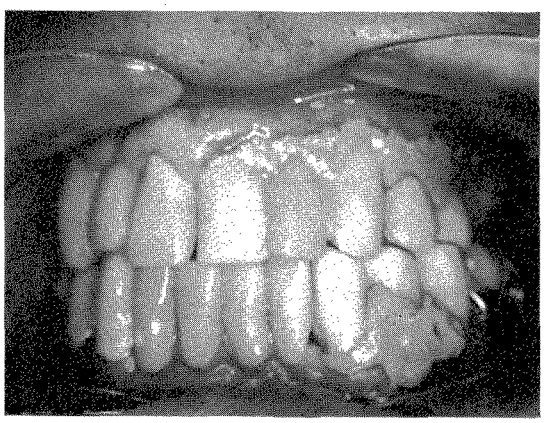


Fig. 1493. The gums were resected during the treatment stage. The protective cement packs are shown here on the upper and lower left side. The first temporary acrylic resin quick-cure crowns are in position.

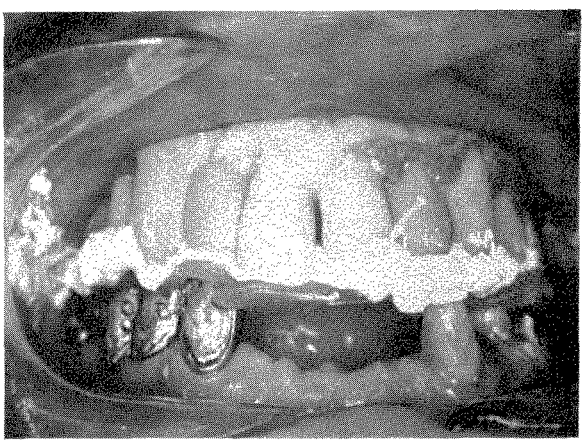


Fig. 1494. In the construction of the second transitional work, an accurate centric relation record was taken by means of a combination of wax and plaster of Paris.

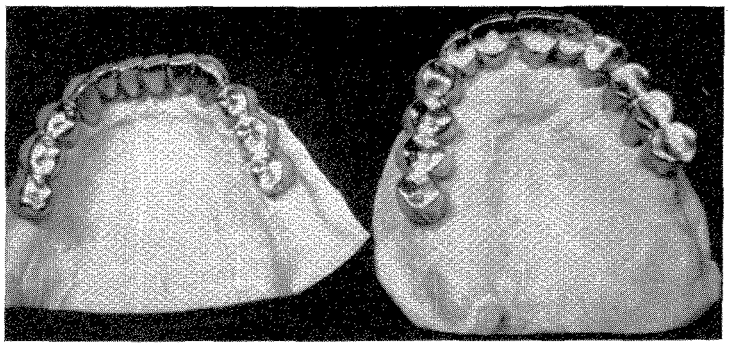


Fig. 1495. The completed second transitional work. The upper splint consists of twelve units and contains two posterior throw-offs. The lower splint also contains twelve units with two posterior throw-offs, one on each end.

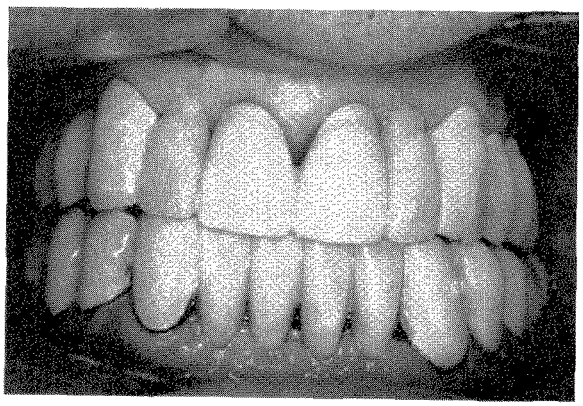


Fig. 1496. The completed second transitional work. This phase was completed in November, 1956.

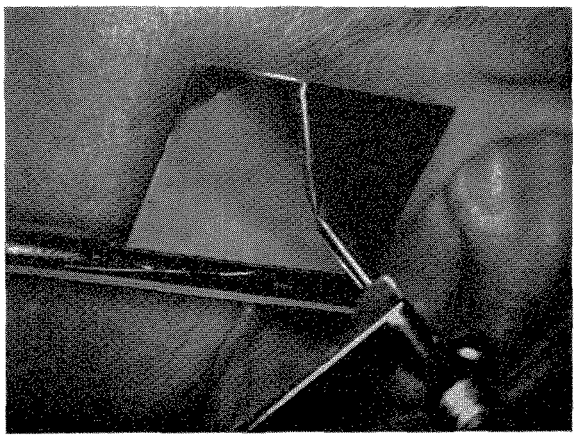


Fig. 1497. The transverse hinge axes were recorded and tattooed on the face. The pin and recording plate are shown in this photograph.

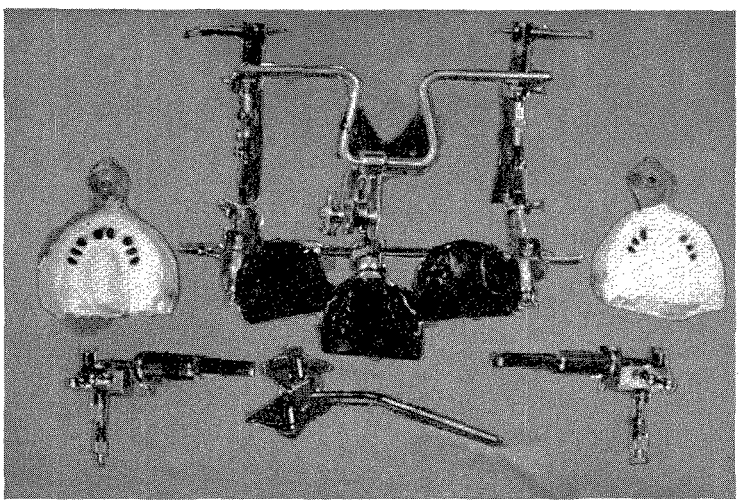


Fig. 1498. Several sets of records of the nature shown in this illustration were taken as the work progressed. A more detailed description is given in the other cases in the text that were carried out on the Transograph. Here the upper and lower plaster impressions are shown, together with the Transograph face-bow and three hinge wax records. The side arms which convert the face-bow into an articulator are also shown, together with the cam.

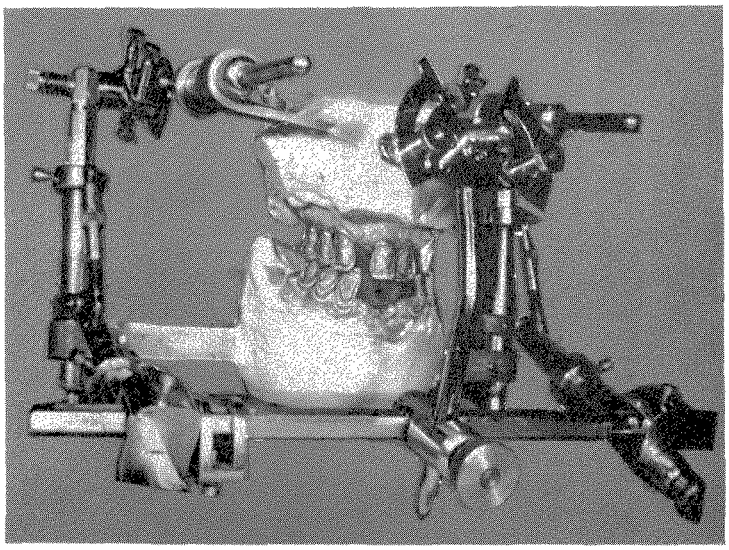


Fig. 1499. The individual final castings were constructed in accordance with the theory of Transographics. They are shown here on the Transograph.

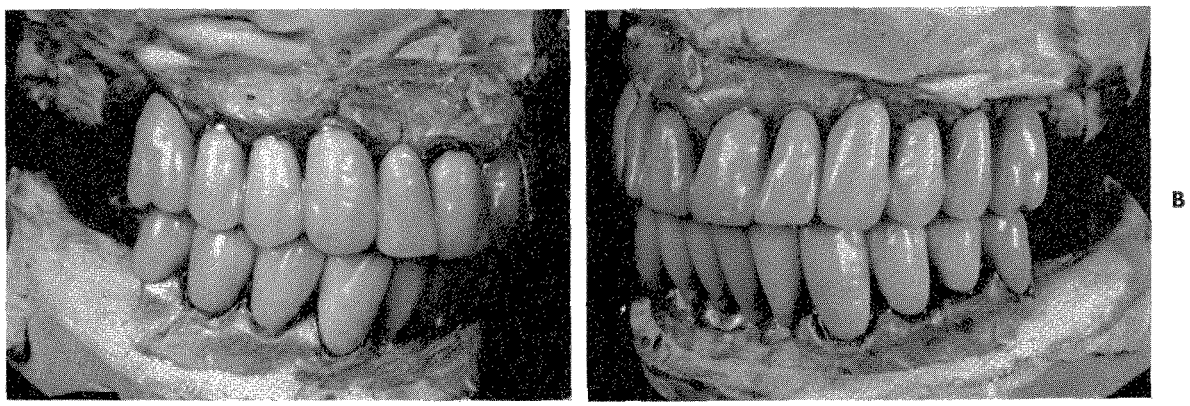


Fig. 1500. Two views of the completed work. **A,** The right side. **B,** The left side.

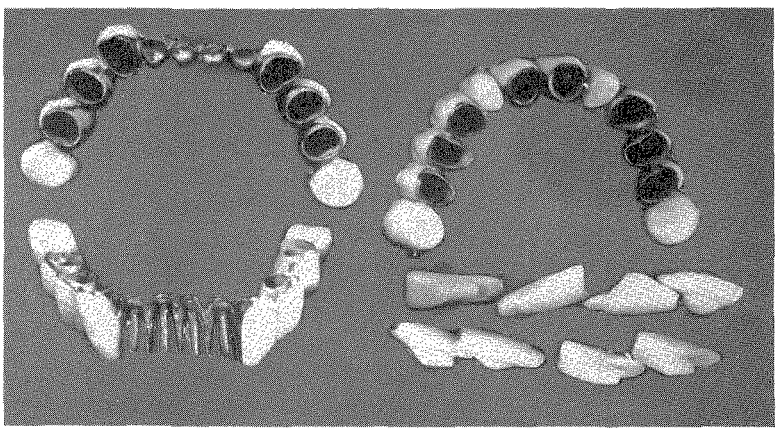


Fig. 1501. The prosthesis has been removed from the Transograph. Both upper and lower splints contain twelve units. The upper splint is supported by eight abutment teeth. The lower splint is supported by six abutment teeth. The lower anterior teeth are all porcelain crowns. Two sets of porcelain crowns were ground in in case of breakage.

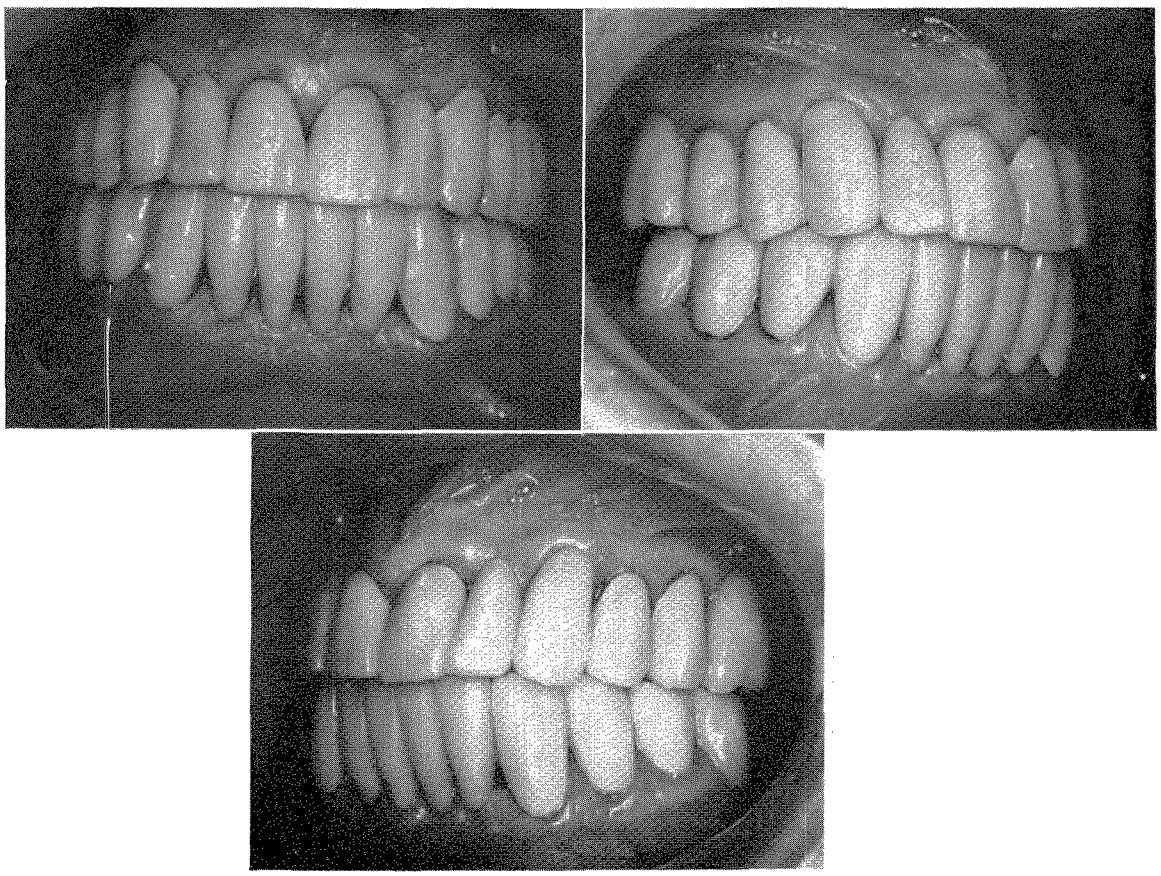


Fig. 1502. Three views of the completed work in the mouth. The final work was inserted in April, 1957.

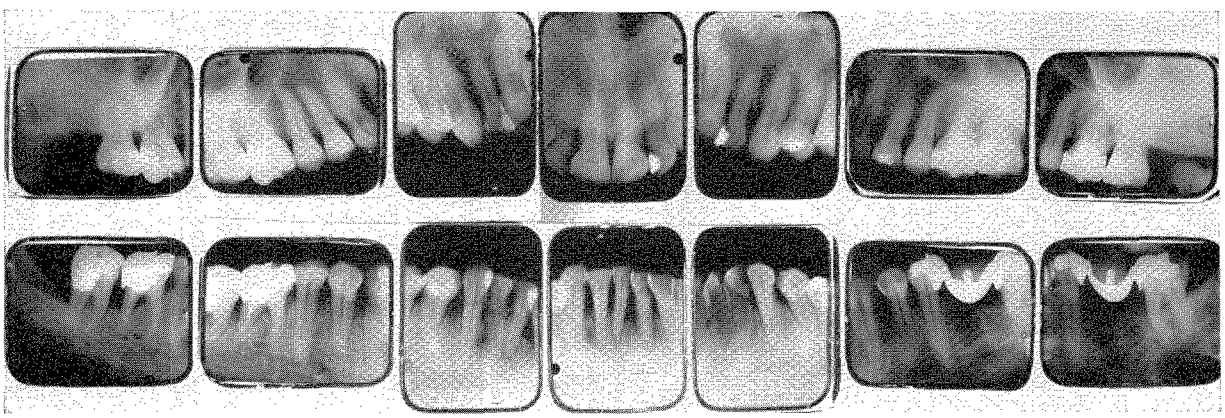


Fig. 1503. Roentgenograms taken in April, 1939.

Fig. 1504. Roentgenograms taken in September, 1948.

Fig. 1505. Roentgenograms taken in June, 1956.

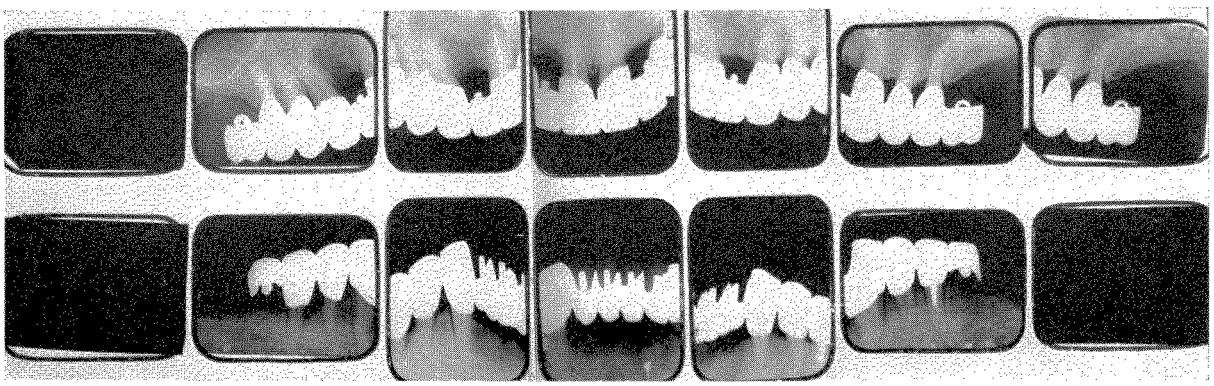
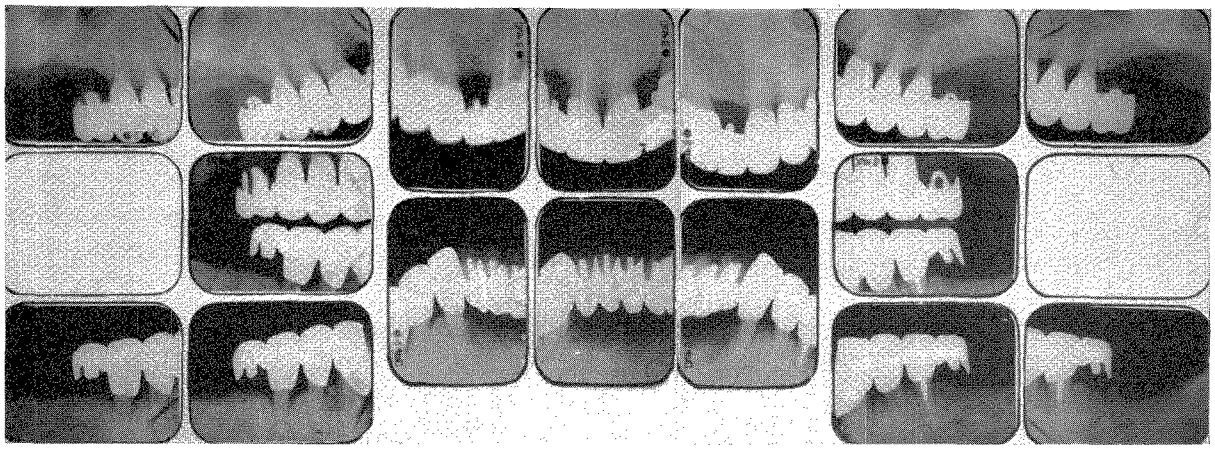
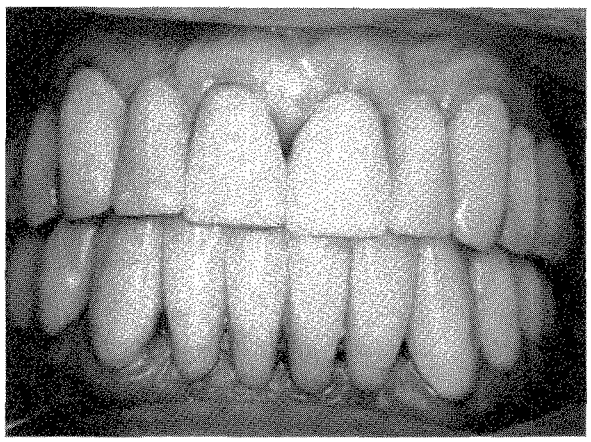


Fig. 1506. Roentgenograms taken in June, 1957.

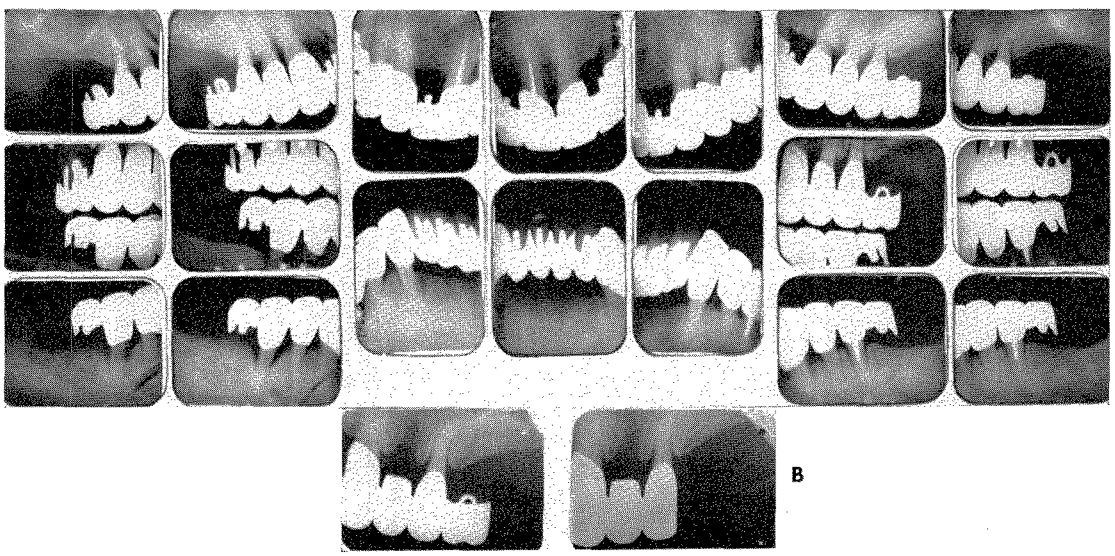


A



B

Fig. 1507. **A,** Roentgenograms taken in December, 1960. **B,** The mouth in December, 1960.



A

B

Fig. 1508. **A,** Roentgenograms taken in September, 1963. **B,** The upper left first bicuspid was deeply carious. Its root was removed. The cantilever dummy molar had to be removed from the splint to prevent the extra leverage which was resisted only by the remaining splint. (Read text.)

1492 to 1508.) Before this book went to press, this patient came in for examination. He had not been seen for nearly three years. His September, 1963, roentgenograms are shown in Fig. 1508. The upper left first bicuspid was deeply carious. Its root had to be removed from the upper splint. Because of the additional pressure which the molar free-end cantilever would now exert, removal of the tooth was advisable; hence it was cut off from the fixed partial denture (Fig. 1508, **B**). Otherwise the mouth is still in the same relative condition it was at the completion of the work in 1956. Once again I must repeat—these postinsertion happenings are beyond the dentist's control.

Chapter 13

MISCELLANEOUS CAUSES THAT CREATE DENTAL PROBLEMS

POOR JUDGMENT ON PART OF DENTIST

Although there are numerous causes for the failures encountered in our extensive reconstruction procedures, one of the most important must be attributed to poor judgment exercised by the dentist in evaluating the case and in executing the work. This may be due to lack of experience and faulty mechanics.

It is only natural that specialists in oral reintegration should receive more than their average share of consultations with patients who are having a difficult time as a result of their oral reconstructions. However, to balance these numerically, there are patients who never seek outside consultation even though they consider their work a total failure. Therefore, were all patients considered, the balance would be heavily tipped by those with unhappy results.

There are two categories of patients: (1) those whose cases have already been undertaken and completed and (2) those whose cases were never completed because during the procedure the patient became wary and sufficiently apprehensive to seek consultation elsewhere.

Case 1

Past history

Occasionally it is possible to examine the mouths of patients in whom poor judgment and faulty mechanics were present in equal proportions. One of the worst combinations of these two factors came to my attention in January, 1961. A woman in her early fifties had her mouth reintegrated twelve years previously. She had gone to her dentist for periodic checkups ever since. Her mouth had been examined

in June, 1960, which was only six months prior to her consultation. She was a business woman, intelligent, and neat about her person.

Present condition

Her occlusion had been built up entirely in plastic. The crowns were now severely abraded. Many teeth were involved with deep caries, and infections were present. Crowns were worn through and broken. She probably had an original Class II, Division 1 malocclusion. Her periodontal structures had been severely abused and had suffered the consequences, though the only missing teeth were her third molars. When she was told that her mouth was in very poor condition she was amazed, as she had been told that everything was satisfactory. She was so bewildered that she went to a colleague for verification of the findings. This was revealed sometime later.

Even though finance was a problem, she still desired good dentistry. It took a great deal of time to evaluate this case. She was unmarried, and her first thought was the esthetics. She had an aversion to wearing anything removable. She was willing to risk the retention of some of her problematic teeth, if at all feasible.

These last remarks can be applied to many patients who find themselves in similar predicaments and are faced with losing many teeth. They may not be making the wisest decision from the standpoint of longevity of their natural teeth, but they prefer to take their chances with their own teeth and to wear removable appliances or full dentures only as a last resort.

Treatment planning

The final prescription was to retain as many teeth as possible, remove teeth with obvious untreatable infections, restore good esthetics, and provide adequate function with reasonable longevity. This woman's mouth had obviously been mistreated, and the profession owed her every consideration.

The treatment plan was explained carefully to her, and the contract letter again reconfirmed the problems. Whenever new problems would be encountered during the treatment, they were to be re-evaluated and changes made where necessary. A letter that contained all the above information was sent for her signature to avoid future misunderstanding.

Treatment

At the start of treatment all the old work was removed. The previous tooth preparations were equally as poor as the rest of the reconstruction. A great deal of effort was expended in repreparing and building up what remained of the natural teeth. The coordination of the bite was a simple procedure as compared to the groundwork necessary to rebuild the broken-down, infected teeth and restore the traumatized periodontal tissues to normal.

First stage of reintegration

The reconstruction was accomplished in three stages. In the first stage, quick-cure plastic crowns and bridges were used. The hopeless teeth were removed, and

those that remained were rebuilt one by one. The gums were treated, and surgical resections were resorted to where necessary. The lower left molar roots were separated in order to eliminate a bifurcation involvement. Then this molar was regarded as two separate teeth each having only one root. The upper left molar was treated by extracting the distobuccal root and by retaining the mesiobuccal and lingual roots. This tooth then served as a two-rooted instead of a three-rooted abutment. Several teeth were fortified by metal posts and pins. Entire crowns were restored in gold or silver. These were finally covered by gold veneer crowns. The gum resections and the rebuilding of the remaining teeth took six months to complete, allowing time for healing of the soft tissues.

Second stage of reintegration

The vertical dimension presented no problem. It was restored very slightly in the second stage which was undertaken in June, 1961. The articulator upon which this phase was constructed was the Hanau Model H. In this stage the entire occlusion was coordinated at one time. Three slow-curve acrylic splints, one anterior and two posterior, were used in each arch. The work was inserted on June 27, 1961. Wax records were again taken, and the casts were remounted and any discrepancies corrected. The second stage was completed on June 29, 1961. The prescription had now been written for the final work.

The lower incisor plastic crowns had originally been inclined forward at considerable angulation in order to occlude with the upper incisors owing to this original Class II, Division 1 malocclusion. This had always been objectionable to the patient. However, if the lower incisor crowns were to be uprighted in the finished work, there would either have to be a space between the upper and lower anterior teeth in the interocclusal contact position or a large lingual platform would have to be built out from the upper incisors to provide contact. In this second stage the lower incisors had been inclined forward.

Another problem was color. She had selected a very light shade for the second stage, even though it was lighter than normal for her age and gave an artificial appearance. Her reasoning, however, was understandable. Most women, she said, had artificial fingernails, hair, eyebrows, lipstick, facial rouges and creams, and varied-colored dyes for their hair. With this in mind, why not have very light teeth if it enhances the esthetic effect? This light color was duplicated in the final work.

Third stage of reintegration

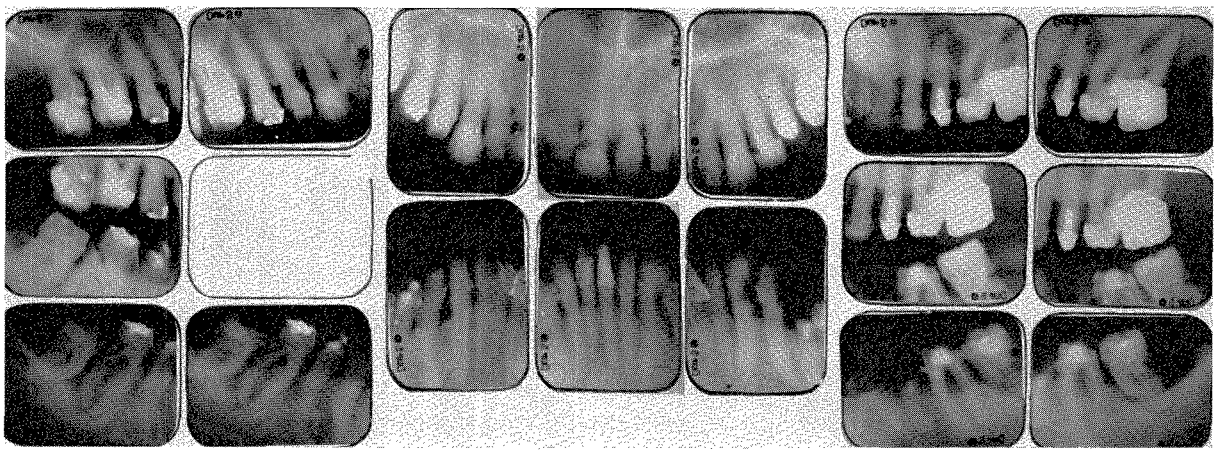
By mid-July, 1961, the third phase was undertaken. This was accomplished using the second transitional work as the pattern. The vertical height, in addition to the centric and excentric bites, had already been recorded, and all that remained to complete was one side at a time for the final work. The same Hanau Model H articulator was used. The registrations remained the same for the condylar inclinations and the angulation of the vertical posts (Bennett). Only a new face-bow and centric wax record were taken. The left upper and lower posterior work was constructed first using the stone casts of the right transitional work as a guide. This final work for the left side was inserted before the right posterior upper and lower work was undertaken. For the right side the left final work and the anterior

transitional work were used as a guide. When all the posterior work had been completed and inserted, the anterior segment was the last to be restored. This took place in November, 1961. The upper right second molar had a very questionable prognosis (refer to the original roentgenograms). For that reason it was not included in the upper right splint. In 1963 vertical food impaction caused a periodontal flare-up between this tooth and the adjoining first molar. Inasmuch as the second molar had served normally up to this time, I decided to fortify it by including it in the upper right splint. This would give it the rigidity it needed and would prevent vertical food impaction. The principle of vertical pins was resorted to effectively because of the nonvitality of the first molar. The crown was removed from the second molar, and a gold inlay which contained two vertical pins was soldered to it. Then this unit was cemented in place. Up to this date (September, 1963), the second molar was nonsymptomatic. (Figs. 1509 to 1536.)

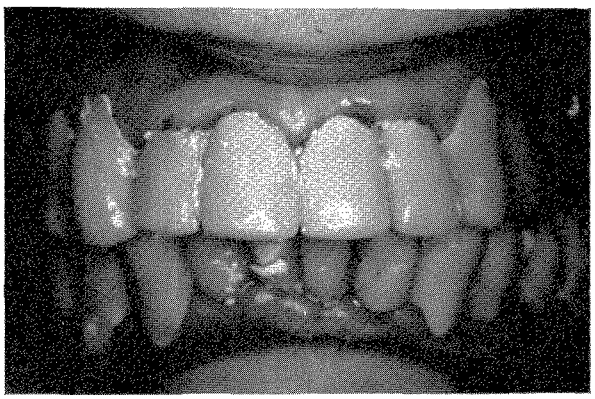
These cases require all of our knowledge and skill. Even then there are vacuums that we are unable to fill. It bears repetition that complete reintegration is a serious and difficult undertaking. When a case that we are inadequately trained to complete presents itself, it is no shame to refer it to a colleague who is better equipped to render a more adequate service. Not only is the greatest contribution made to the well-being of the patient, but the profession is also elevated. Otherwise, severe problems may result that can cause great physical, mental, and financial hardships for all concerned.

Text continued on p. 768.

Fig. 1509. Four views of the mouth at the start of treatment in January, 1961. (Figs. 1509 to 1536 are of the same case.)



A



B

Fig. 1510. A, Roentgenograms at the start of treatment. This was one of the worst cases of oral disintegration after rehabilitation that I have ever seen. (Read text.) **B,** In March, 1961, the first stage was completed, as shown in this photograph. All the old prostheses had been removed and new quick-cured acylic resin crowns and bridges had been inserted. The same vertical dimension and centric relation which the patient had presented were retained.

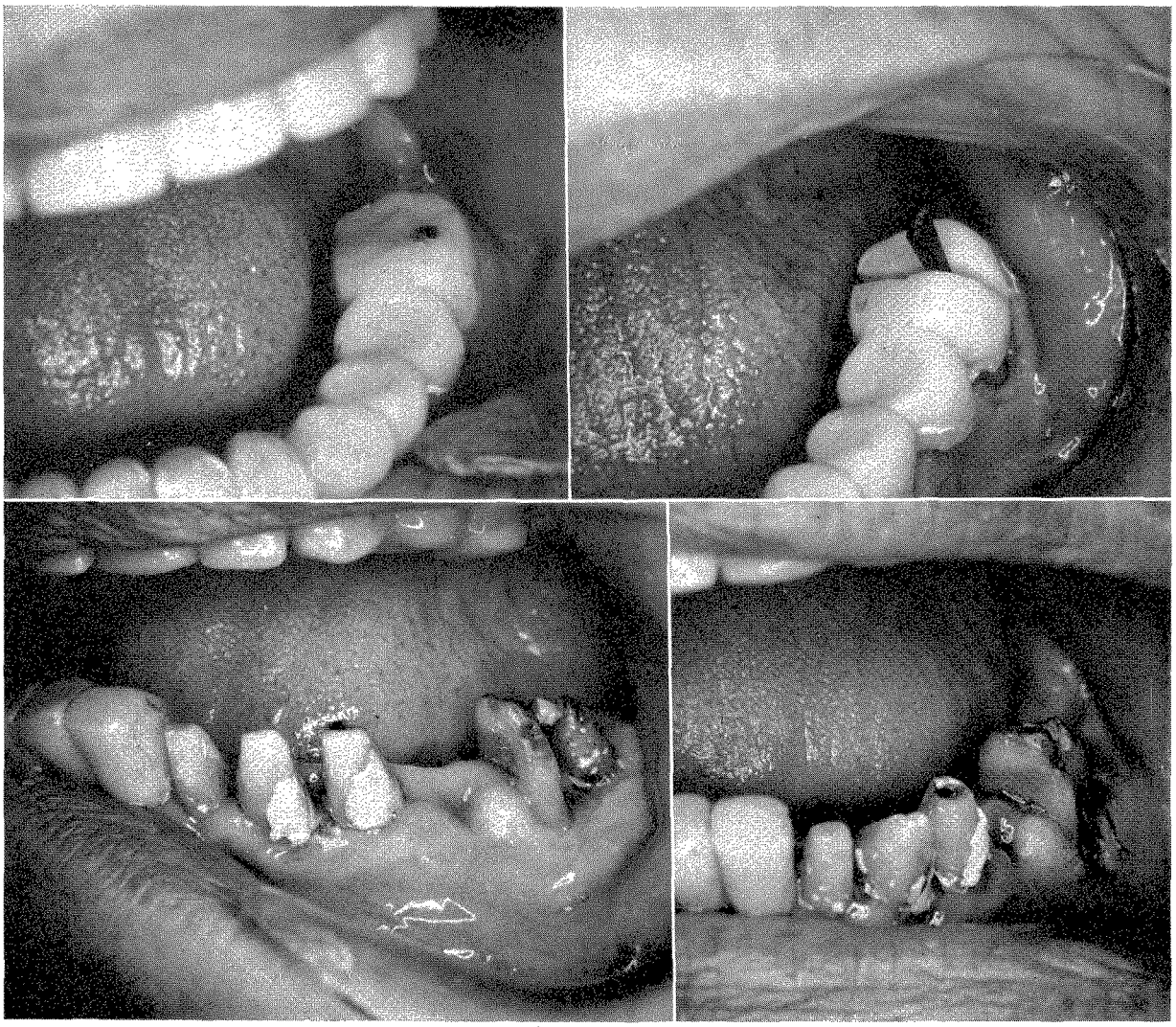


Fig. 1511. Below right, The gum was resected around the lower left molar. Then the mesial and distal roots were separated. **Upper right,** The quick-cure acrylic temporary crown was cut in two, and a plastic wedge was inserted to wedge the two roots apart gradually. **Upper left,** Quick-cure acrylic resin was inserted into the space caused by the plastic wedge. The excess of the wedge was ground down to the occlusal level. This was again opened in a week's time, and the roots were wedged further apart each time until, **below left,** the effect was to create two separate teeth. In this manner the bifurcation involvement was overcome.

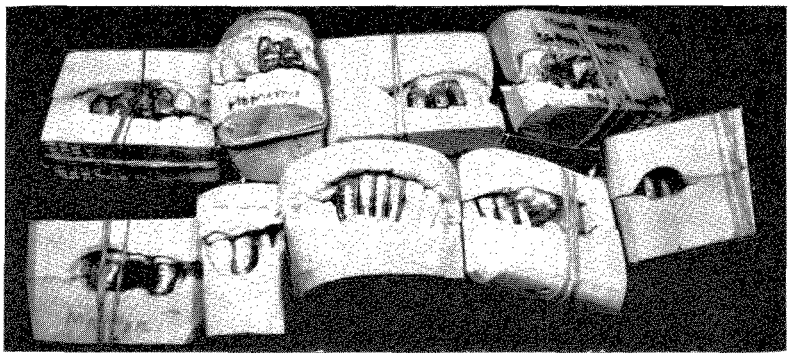


Fig. 1512. Low-fusing metal transfers were made for all the prepared teeth. A squash bite was taken, and the transfers were built up to this bite level. These transfers were made in small sections as the teeth were prepared. Later on they were used to cover the preparations when the impressions for the working casts were taken.

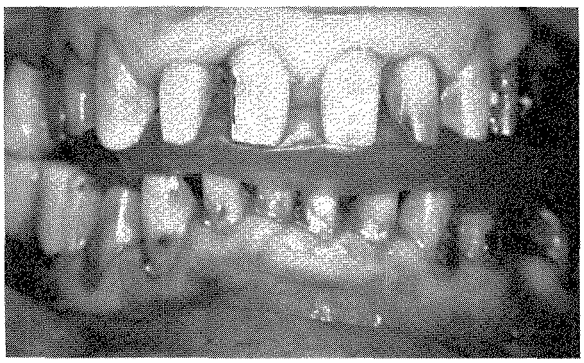


Fig. 1513. In order to retain the same centric relation and vertical dimension as the first temporary work, all the plastic temporary crowns were removed except the right upper and lower posterior plastic splints. Then a wax record was made of three quarters of the arch, using the right acrylic splints as a guide.

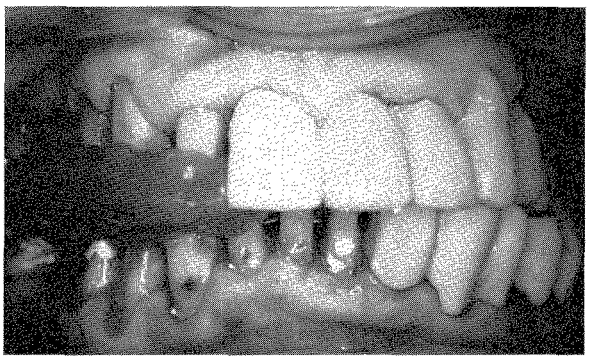


Fig. 1514. The right acrylic splints were now removed, and a wax record was taken with the anterior and left acrylic splints in position to act as a guide.

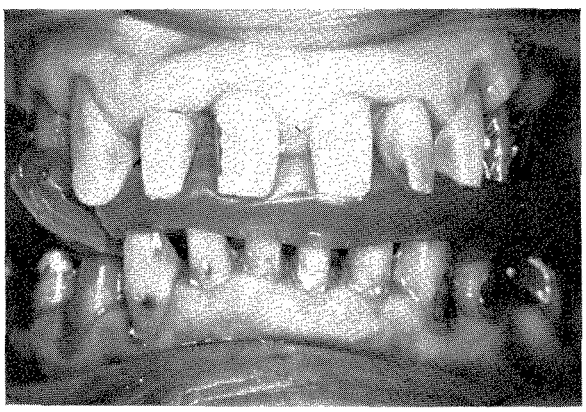


Fig. 1515. Finally, all the acrylic splints were removed, and both right and left wax records were inserted and melted together in the mouth. This wax record now registered the original centric relation bite and the vertical dimension that the patient presented and the records that the operator wished to maintain.

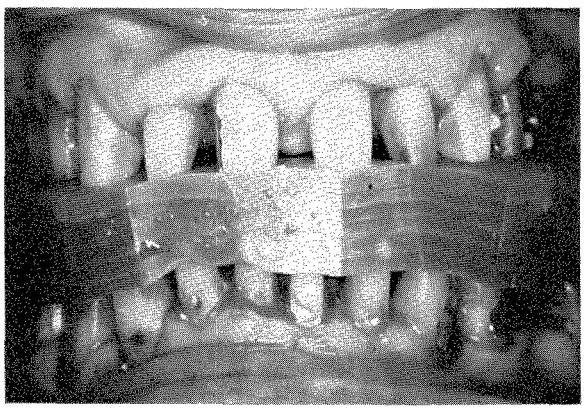


Fig. 1516. The protrusive wax record. This will also be used to adjust the articulator mechanism.

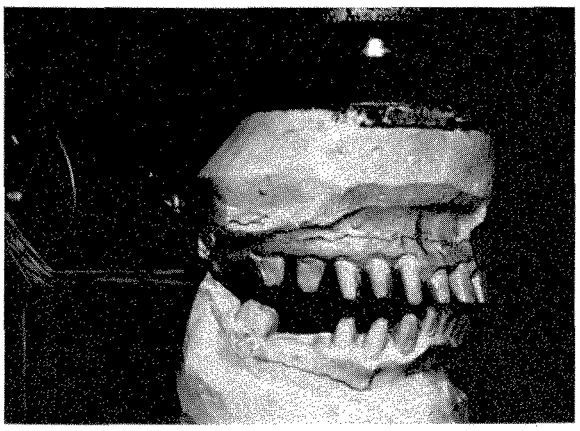


Fig. 1517. The articulator has been set by means of the registrations that were taken. The second transitional work is about to be waxed up. The occlusion will be coordinated and the work completed with plastic splints. There will be two posterior and one anterior plastic splint constructed for each arch. These splints are slow cured.

Fig. 1518. An occlusal view of the completed acrylic splints. These will provide the prescription for the final work. Once these splints are inserted and the interocclusal relationship corrected, the final work can be done in individual sections rather than the entire work at one time.

Fig. 1519. The vertical and horizontal overbites were extreme.

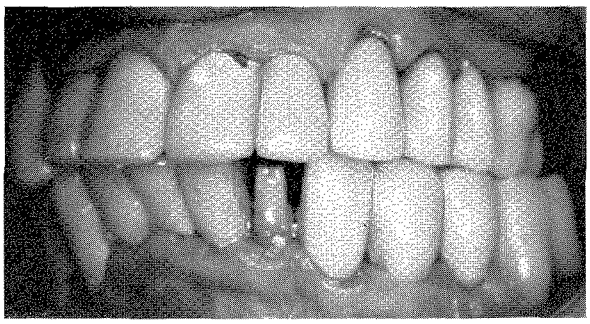
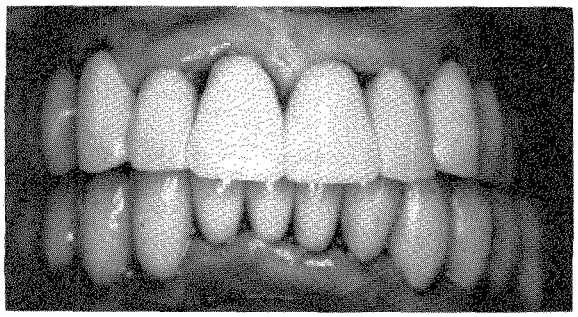
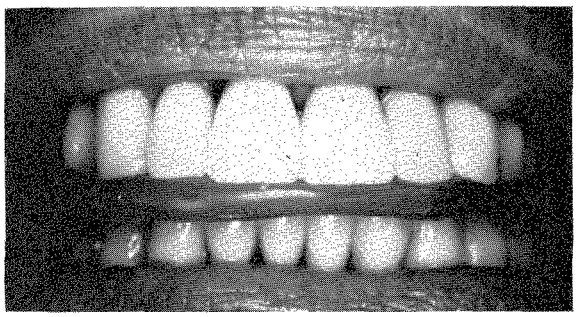


Fig. 1520. The upper and lower first temporary acrylic splints were removed from the left side of the mouth, and the second transitional splints were inserted. This technique was employed in order to see how closely the centric relation and vertical dimension corresponded to the original one. After this the upper and lower right first temporary splints were removed, and the second transitional ones were inserted and checked. Finally, the old anterior splints were taken out and the new ones inserted. In this photograph, only the upper and lower left side have the new splints in place. They do check with the old centric relation and vertical dimension.

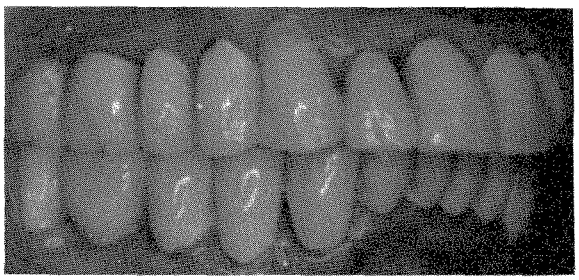
A





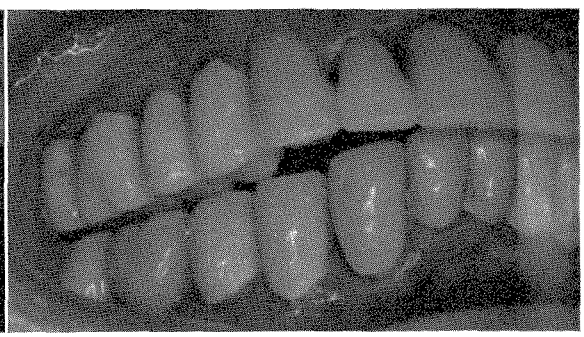
B

Fig. 1521. **A,** The second transitional acrylic splints are in place. They were inserted on June 27, 1961. **B,** A wax checkbite is being taken in order to remount and correct the centric relation if it is necessary.



A

B



C

Fig. 1522. **A,** The right second transitional splints are in place. This is centric relation. **B,** The right second transitional splints are in place. This is the working bite. **C,** The right second transitional splints are in place. This is the balancing bite.

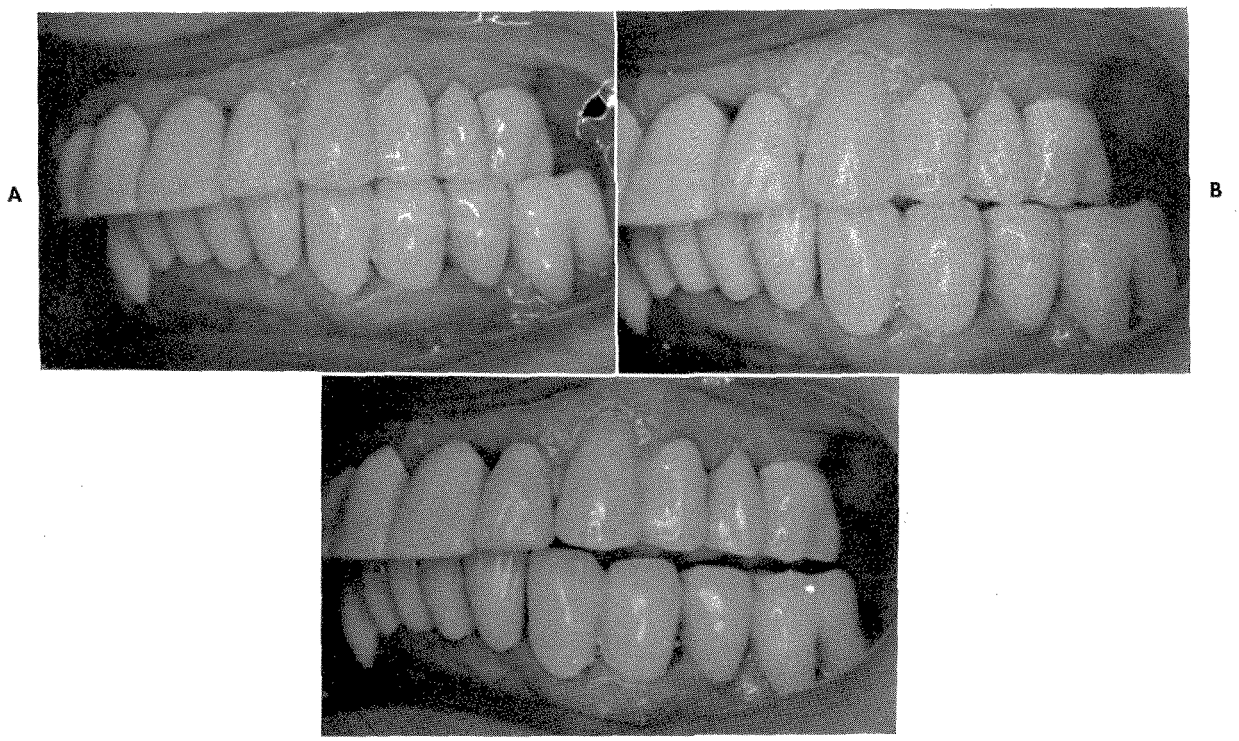


Fig. 1523. **A,** The left second transitional splints are in place. This is the centric relation bite. **B,** The left second transitional splints are in place. This is the left working bite. **C,** The left second transitional splints are in place. This is the left balancing bite.

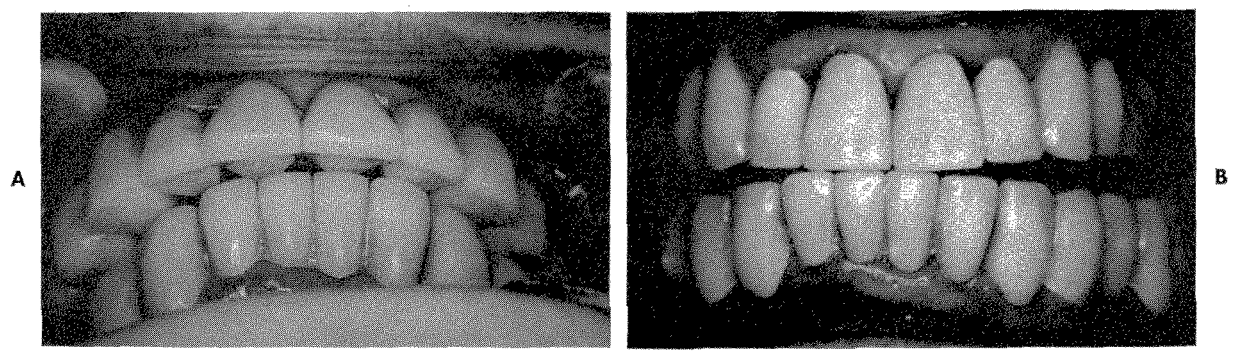


Fig. 1524. **A,** The second transitional splints are in place. This is the anterior contact in centric occlusion. **B,** The second transitional splints are in place. This is the protrusive contact. Because of the atypical anteroposterior and mesiodistal occlusal curves, incisal contact in protrusion is at a minimum.

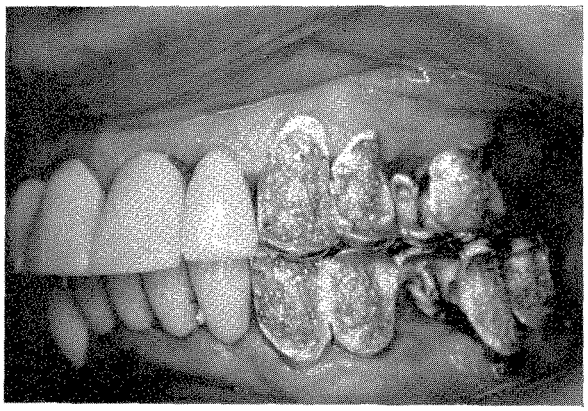


Fig. 1525. With the second transitional splints in position providing the prescription, it was now a relatively simple procedure to complete the posterior left upper and lower final work first. This was carried out on the Hanau Model H articulator. The left final work is being tried in the mouth. The next step is to complete it and insert it. The entire remaining portion of the second transitional work is being used as a control.

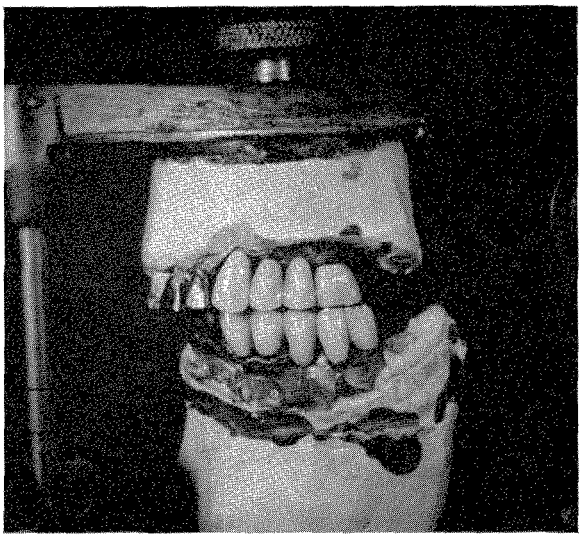


Fig. 1526. The completed upper and lower left prosthesis is shown here on the articulator.

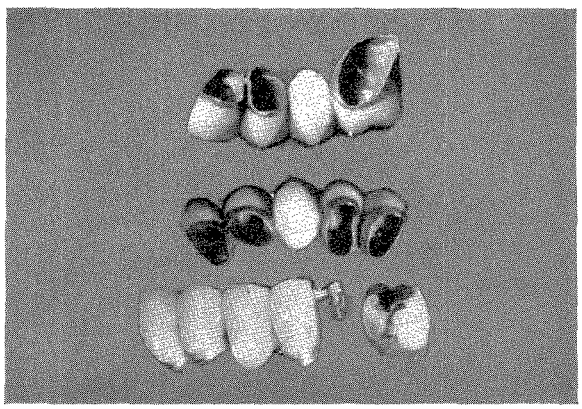


Fig. 1527. **A,** The upper left final four-unit fixed partial denture. The molar has only two roots. The distobuccal root was removed. **B,** The lower left final five-unit fixed partial denture. The two molar roots were split apart and separated. Each root is covered by a separate crown. In this photograph the bridge is assembled as though it were one rigid bridge. This is not so, as the lower photograph shows. **C,** This is the same lower left final fixed partial denture which is shown directly above it, only in this photograph the crowns covering the separated mesial and distal portions of the molar show how these parts have been united. A deep metal pin may be seen projecting from the distal surface. First the crown covering the distal part of the molar is cemented in. Then the remaining four units of the bridge are cemented at the same time the vertical pin is cemented. This was necessary because of the lack of parallelism between the mesial and distal parts of the molar crown.

Fig. 1528. The completed upper and lower left final prosthesis is shown here. This is the centric bite. Both the original and the three successive stages were completed with the cross-bite arrangement shown here.

Fig. 1529. The upper and lower right second transitional work has now been removed, and the final work will now be proceeded with in the same manner as the left side.

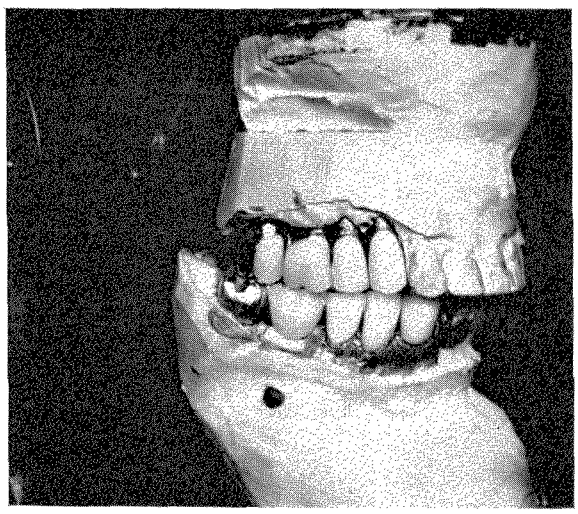


Fig. 1530. The final work has been completed for the right side. It will now be inserted.

Fig. 1531. The final work has been inserted on the right side. The anterior work is still transitional.

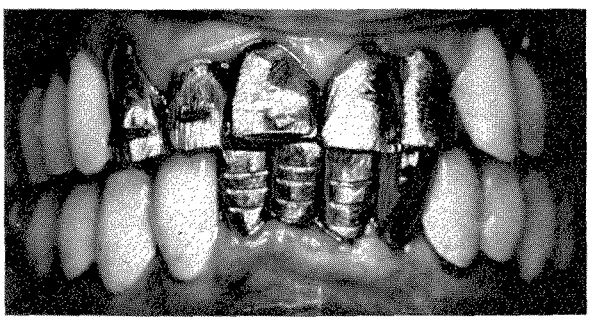


Fig. 1532. Low-fusing transfers are being used to position the transfers accurately in order to complete the anterior final crowns. The upper incisors will be covered with porcelain jacket crowns. The right cuspid will be covered with a gold acrylic veneer crown. At first porcelain bonded-to-platinum crowns were constructed for the lower four incisors, but it was impossible to obtain sufficient mesiodistal room for their insertion. Finally it was necessary to resort to lower acrylic resin jackets.

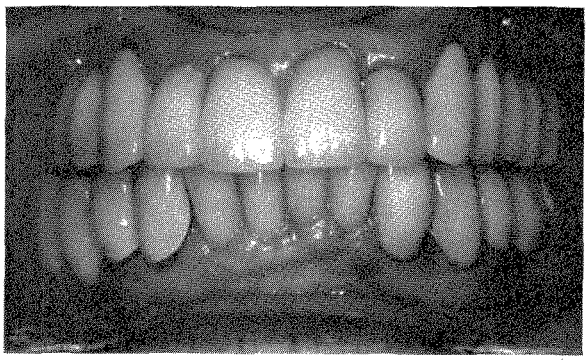


Fig. 1533. Front view of the completed case. The work was inserted in November, 1961, which was eleven months after the work was started. This is centric occlusion. Because of the gold occlusal surfaces, it was difficult to show the working and balancing bites. The reader is referred to Figs. 1522 to 1524 to observe what was attained in the prescription. The same results were obtained in the final work.

Fig. 1534. Front view of the completed work. The teeth have been parted to show the extent of the vertical overbite. There is also a horizontal overjet, but it cannot be seen in this projection.

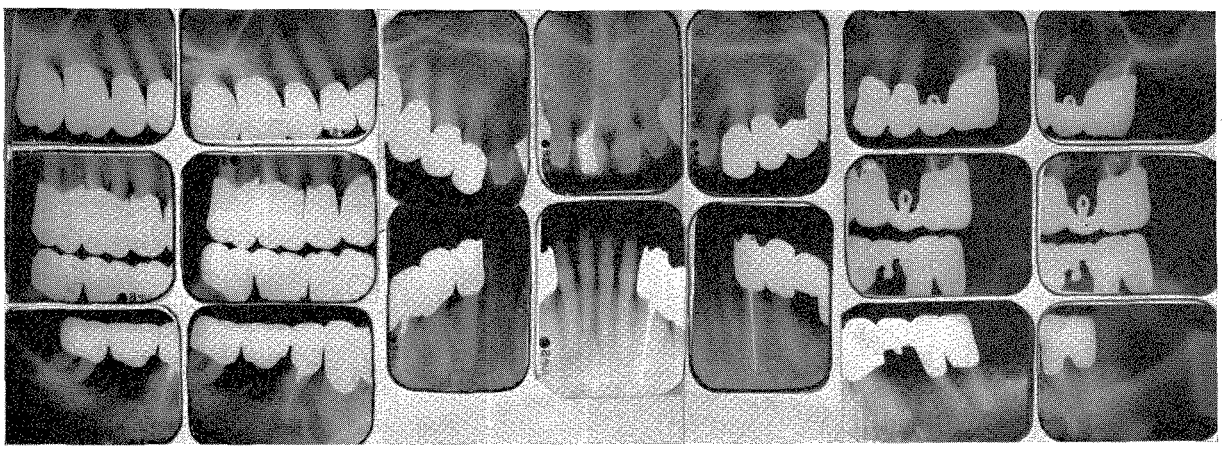


Fig. 1535. Roentgenograms of the completed work taken in 1962.

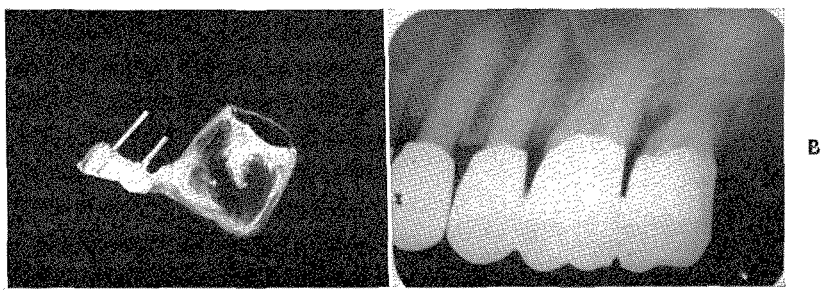


Fig. 1536. In June, 1963, vertical food impaction caused a periodontal flare-up between the upper right first and second molars. At the start and all during treatment, the upper right second molar had guarded prognosis (see the original roentgenograms). Instead of removing the tooth when the flare-up took place, the gold crown was removed, and a gold inlay with two deep vertical pins was soldered to it. When this casting was inserted, the second molar was splinted to the second bicuspid and first molar. At this writing (September, 1963), the inflammation has completely subsided. The casting is shown in **A**, and the postinsertion roentgenogram is shown in **B**. (This is actually the right side, not the left.)

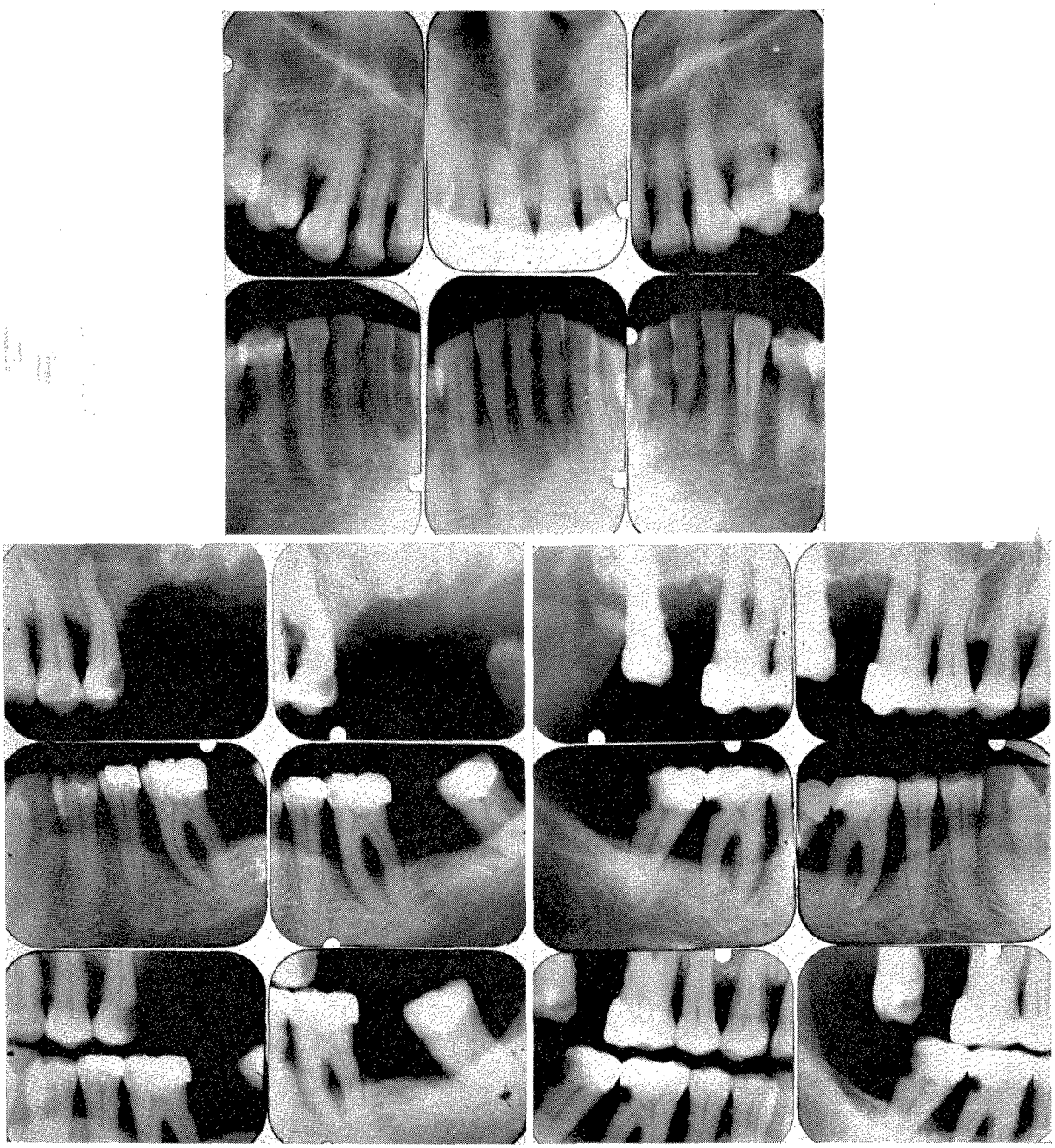


Fig. 1537. Roentgenograms taken in April, 1947, before treatment was instituted. (Figs. 1537 and 1538 are of the same case.)

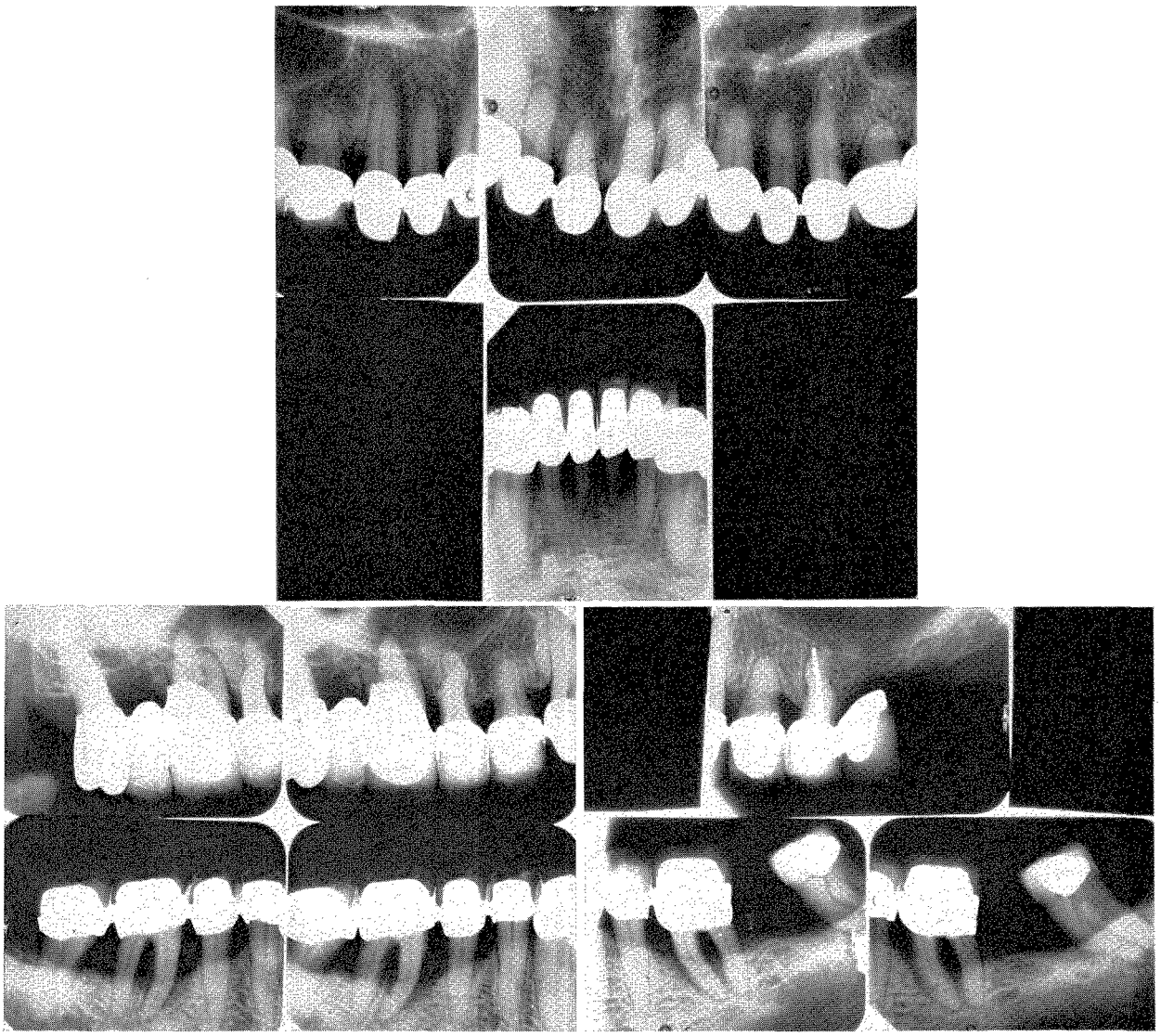


Fig. 1538. Roentgenograms taken in June, 1947, after the completion of treatment. Refer to Case 2 in the text.

Case 2

A middle-aged woman was sent to me for dental consultation in April, 1947. There were many infected teeth present that required removal. After evaluating the case, I referred her to a periodontist for additional consultation. The decision was then made to remove the hopeless teeth and only then to consider reconstruction. The following paragraphs are taken from the periodontist's report on July 18, 1947:

"The clinical examination of the periodontal condition of Mrs. _____'s mouth discloses an advanced case of periodontitis complex.

"The lower right and left molars have deep bifurcation involvement, with pockets measuring 7 to 9 mm., and each tooth has mobility of three. These should be extracted.

"The lower right third molar and the lower left second molar, although single-rooted teeth, could not support any partial denture because of pockets measuring up to 8 mm. and mobility of three. These two should also be extracted.

"The upper left first molar has the bone in the trifurcation destroyed deeply and with pockets measuring 11 mm. The tooth has also extreme mobility of three. Extraction is definitely indicated.

"Mrs. _____ also has hypertrophic gingivitis, and for this reason it is highly imperative that periodontal treatment be instituted prior to the placement of any restoration."

Additional recommendations were also made, but only the above have been reported. Over the week end this patient met a friend who insisted that she go to his dentist before having any teeth extracted. This she did. The results of his treatment are shown in the photographs. No teeth were removed or periodontal treatment instituted. We need not be proud of the manner in which this case was treated. It does not help elevate dentistry to the true status of a healing profession. (Figs. 1537 and 1538.)

ADVISABILITY OF COMPLETING PERIODONTAL TREATMENT BEFORE RESTORATIVE PROCEDURES

In the previous case, in the letter from the periodontist he stated that it was highly imperative that periodontal treatment be instituted prior to the placement of any restoration. This is correct in cases with periodontal involvement in which the mouth needs total rehabilitation or extensive restorative procedures. In any prosthetic restoration in which the abutment teeth present periodontal pathology, it should be the rule to complete the periodontal treatment first before engaging in the final prosthetic replacements. Exposed root surfaces can be covered and thus protected by the prosthesis in cases in which the periodontal tissues are treated first and permitted to heal. If the prosthesis is inserted first and then the periodontal treatment is instituted, the healing of the soft tissues will expose the margins of the crowns or inlays and the root surfaces. The esthetics will be very poor. There are some cases of mobile teeth for which the periodontist prefers that they first be partially prepared and then splinted for better protection before he institutes his periodontal treatment. This would be the exception to the rule. When the periodontal treatment is completed, the preparation of these teeth must be completed.

Sufficient time should be allowed for complete healing. This is possible because

of the use of temporary or transitional bridges during the procedure. The manner of healing may produce different levels and contours of cervical gum margins. These unidentical margins may then be covered by the various types of prosthesis being used. Should the prosthesis be inserted before the periodontal treatment, the metal margins may act as irritants and prevent or delay complete healing. In the case just presented, no periodontal treatment was given either before or after the insertion of the prosthesis.

CASES IN WHICH INVOLVED ORAL STRUCTURES ARE WEAK

By means of case reports an attempt has been made to demonstrate moderate normal aging of the stomatological system. Abnormal deterioration due to some form of pathological disturbances has also been discussed. It is not difficult for the experienced prosthodontist to determine, in most instances, when he is undertaking a case whose outcome is questionable. The past history, the present condition, conversing with the patient, contacting his medical advisor, and obtaining records for evaluation, such as photographs, study casts, and roentgenograms, will give a deep insight into the case under consideration. Some of these signs are subjective whereas others are objective.

Patients who have undergone some form of previous treatment and whose cases have been considered difficult and at times perplexing are usually referred to a specialist. Some come with too little too late, whereas others expect too much without being willing to share the responsibility. One is often influenced into promising that which cannot be fulfilled. When dealing with a problem case for which extensive prosthesis is indicated, the best approach is an honest one. The patient must be made aware of his problem and must be advised that the reconstruction may be short-lived. Actually, there is no other course to be taken if strict professional ethics are to be followed. Should good judgment dictate that the patient be best served by the removal of all remaining teeth, it is then necessary to tell him and to permit him to decide which course he wishes to pursue. He may elect to retain his remaining teeth even for a short period rather than wear full dentures. It may be only a matter of psychology, but to the patient it is extremely important. His involvement is both physical and monetary, whereas the dentist gives both of his time and energy. Both parties concerned must understand just what the other is trying to accomplish.

The dentist's professional reputation should be considered. If the natural teeth being retained are hopelessly involved with deep-seated infections, he should refuse to insert fixed or removable partial prosthesis using such teeth as abutments. Whether the patient agrees to accept the responsibility is irrelevant. Patients somehow have a way of forgetting their promises and, in addition, their health may be seriously involved. In cases such as these, it is much wiser to insist upon the removal of the infected teeth.

SHARE THE RESPONSIBILITY WITH ANOTHER COLLEAGUE

As a further precaution against being censured should a case be undertaken in which the condition of the remaining teeth is such that their longevity is question-

able, it is intelligent to share the responsibility with other colleagues. These patients can be referred to their medical advisors, to periodontists, orthodontists, oral surgeons, and other prosthodontists. If the retained teeth are weak because of periodontal involvement and if the patient is unwilling to have them removed after an honest appraisal, the dentist may proceed with the knowledge that he has fulfilled his professional obligations if he agrees to retain these teeth.

Case 3

Present condition and treatment planning

In 1956 a middle-aged woman was referred by her medical doctor for treatment. She had been under severe nervous tension which was further complicated by her dental problem. An examination revealed the absence of eight upper teeth with deep-seated periodontal pathology involving many of those teeth remaining. Clenching and bruxing habits were present that were augmented by the important governmental work to which she was assigned. The patient was referred to a periodontist for further treatment. The upper left molar had to be sacrificed. The upper right molar and four upper bicuspids had deep periodontal pockets, but after due consultation a decision was reached to retain them regardless of their questionable prognosis. Although the lower teeth required some attention, the patient and her medical doctor requested that this be postponed until some time after her total physical and mental recovery. Her history revealed the missing teeth had been lost because of periodontal disease.

The problem was to replace the upper missing teeth. With the loss of the anterior teeth, the alveolar bone resorption had created an abnormal space which posed the additional problem of restoring pleasing esthetics while at the same time avoiding oversized teeth.

With a fixed partial denture, the teeth would have to be oversized. This would prevent good esthetics. On the other hand, a removable partial denture would have to cover the palate, and its constant removal and insertion might further weaken the few remaining teeth. The final decision was a fixed partial prosthesis because of its greater splinting effect and its passivity.

Treatment

In the reconstruction, the original vertical dimension was retained. All the upper teeth were rigidly connected together in one thirteen-unit splint. The lower teeth served as the pattern for the wax-up. The work was completed on the Hanau Model H articulator. A single bicuspid throw-off was used on the upper left side. The left molars were not replaced. The anterior teeth were shortened by the use of a three-sectioned removable plastic mask which the patient inserted and removed at will. This solved the esthetic problem and also relieved the unpleasant tendency for the upper lip to get caught in the concavity produced by the abnormally long incisors. Because of her vocation this patient was frequently called upon to speak in public, at which time this annoying habit would take place. The use and technique of constructing these plastic masks were described on pp. 257 to 262, Figs. 568 to 578.

The longevity of this work cannot be predicted. It is to be placed in the category

of conformative dentistry inasmuch as it was constructed to conform to the lower arch form and to the presented vertical dimension. The work was completed in June, 1956.

Postinsertion problems

The patient continued to clench and grind her teeth. The bite had to be adjusted several times. From the point of view of the dentist, the case proved unsatisfactory. The patient was very temperamental, and long periods of time usually

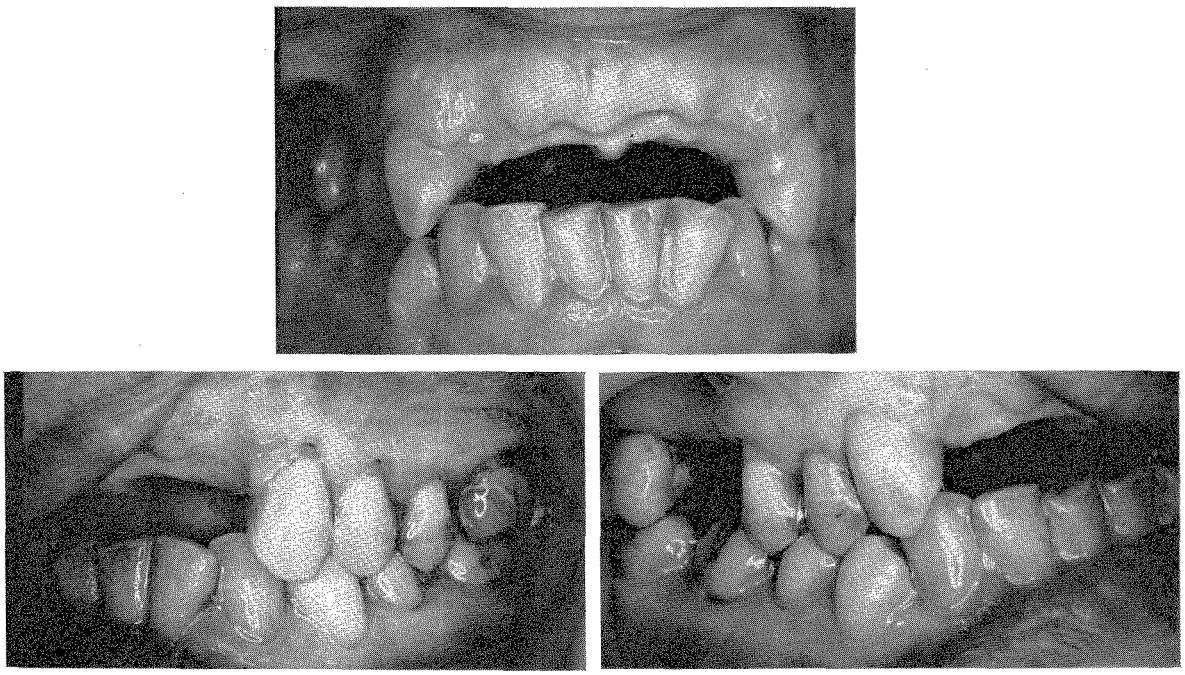


Fig. 1539. Three views of the mouth at the start of treatment in May, 1956. (Figs. 1539 to 1548 are of the same case.)

Fig. 1540. Roentgenograms taken at the start of treatment in May, 1956.

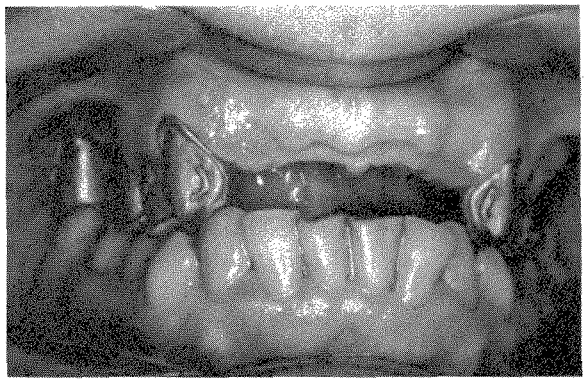


Fig. 1541. The remaining seven upper teeth were used as abutments to support a thirteen-unit upper fixed partial denture. The individual gold crowns are shown here in the position of centric occlusion.

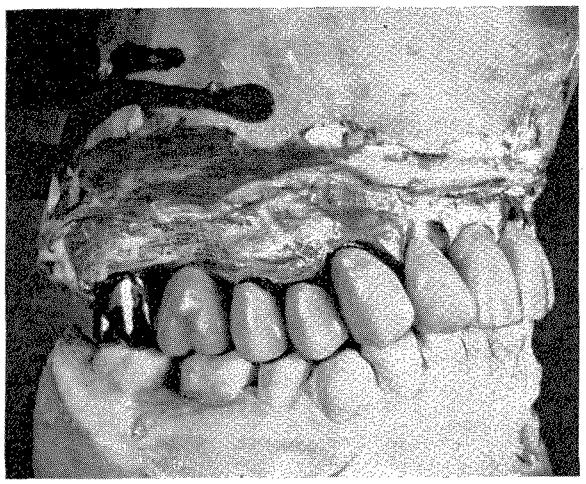


Fig. 1542. The upper splint was completed on a Hanau Model H articulator.

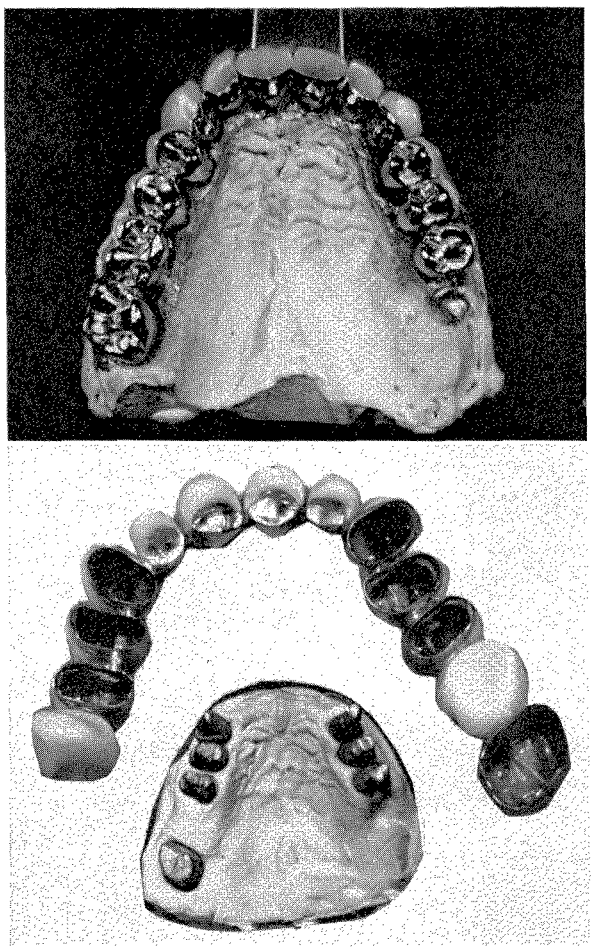


Fig. 1543. Two views of the completed upper fixed partial denture on and off the cast. The lower half also shows the copper-plated dies upon which the individual crowns were made.

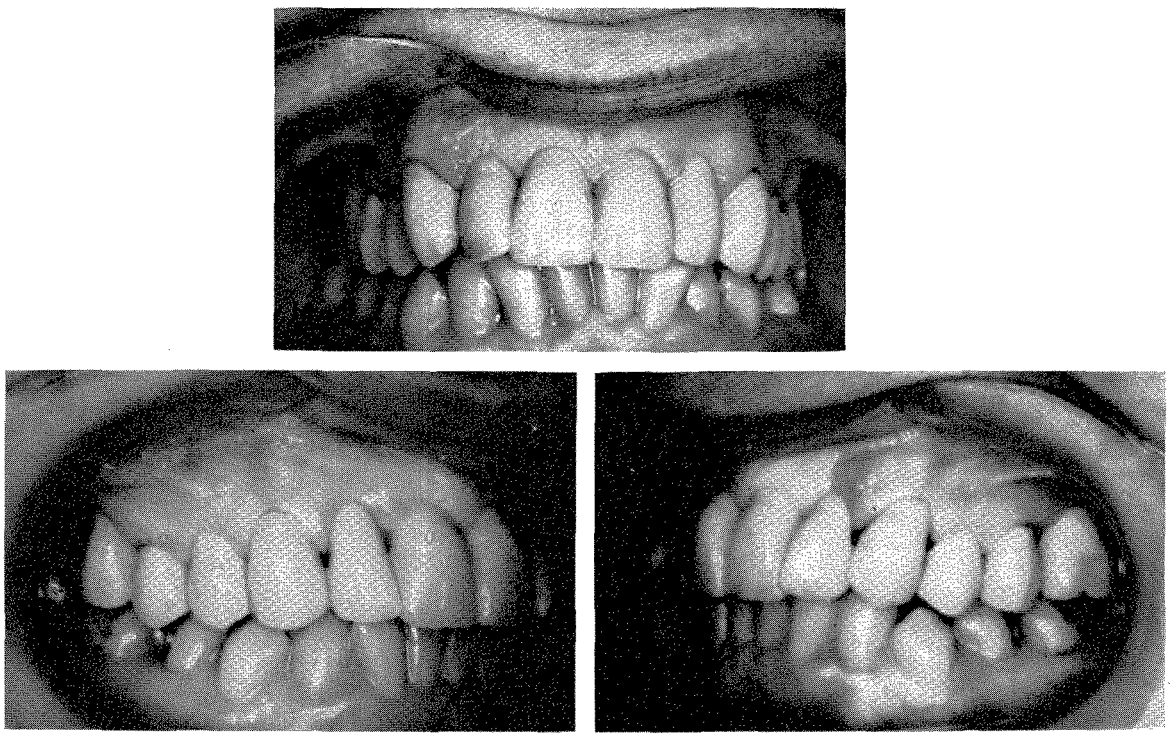


Fig. 1544. Three views of the completed work in the mouth.

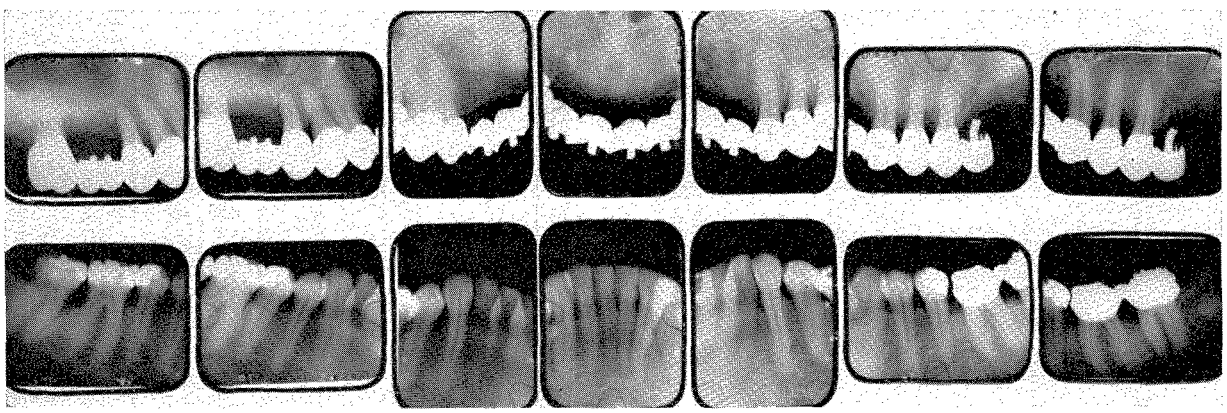


Fig. 1545. Roentgenograms of the completed work taken in May, 1957. These were taken one year after insertion.

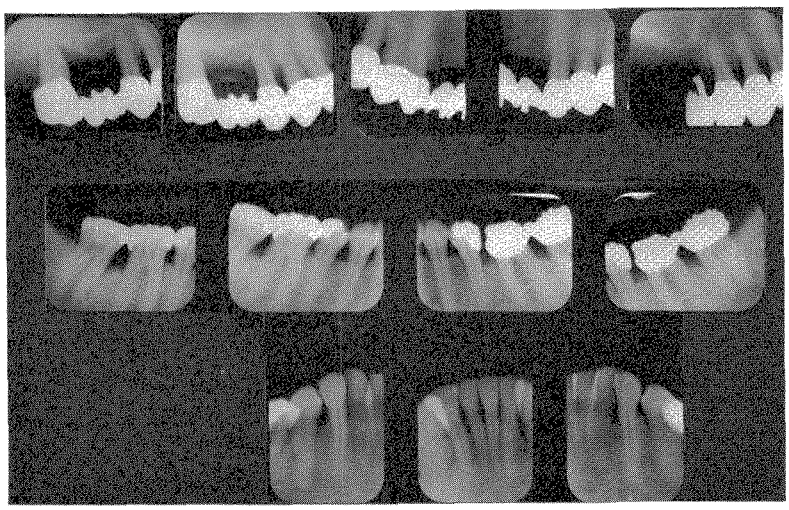


Fig. 1546. Roentgenograms taken in January, 1962. The upper right molar developed a periodontal abscess that was incised. In 1963 this molar had to be removed. One half of the dummy was retained in the form of a cantilever.

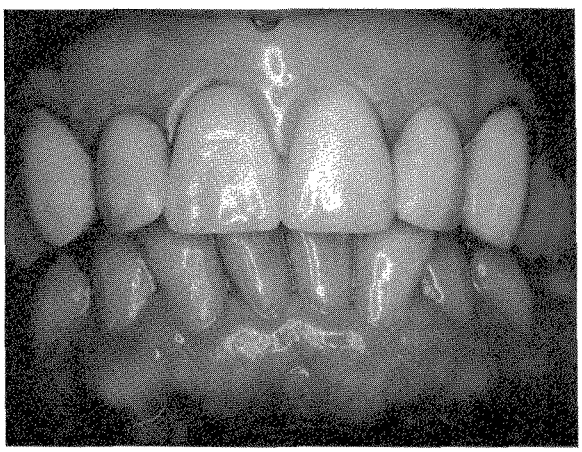


Fig. 1547. A plastic gum mask covers the cervical surface of the upper four incisors. This was inserted in May, 1960, and served both to shorten the teeth and to prevent the upper lip from catching into the concavity produced by the elongated dummies. Compare this illustration with Fig. 1544, **top,** to see the effects of the mask.

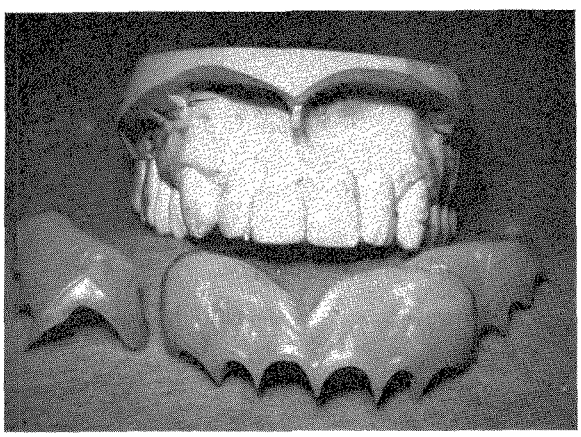


Fig. 1548. In August, 1960, a new plastic mask was made in three sections. These served to cover the receded areas as far back as the first molars. The technique for constructing these masks is described in detail on pp. 257 to 262.

elapsed before she returned for examination. She frequently visited dentists at distant places who consulted with me. At the time of writing the work was six years old. The periodontal pockets were still present, as the roentgenograms disclose. This case was problematic at the start of treatment and remained in that category. (Figs. 1539 to 1548.)

PROBLEMS ENCOUNTERED BY THE ORTHODONTIST

The orthodontist is often of assistance in helping to solve prosthetic problems, especially ones involving his specialty. However, he is not permitted the same degree of latitude in treating an adult as in treating a child, and if the orthodontic treatment is not executed carefully, the results will be unsatisfactory. Failure in this early stage of the reconstruction can jeopardize the entire future health of the oral structures.

Case 4

In 1951 the case of a female individual in her late twenties with a mandibular deviation was reported.* The result of the deviation was facial asymmetry. It was decided to attempt correction by means of orthodontic treatment. An open bite was present, together with a malocclusion, but the structures were in excellent health. The treatment was undertaken in 1938 and completed three years later.

Discussion

The correction of the facial asymmetry, which was one of the important purposes of the treatment, was not achieved. The entire movement took place within the dental arches and was a tooth movement, not a change in the relational position of the mandible. It was true that a functional occlusion was obtained, but only at a great sacrifice to the supporting structures. Where strength and good health had been present, there was now weakness. Contacts had been disturbed, and noxious influences had been injected.

In the course of time, greater stabilization took place. However, the patient was uncooperative, and as a result of the orthodontic treatment and lack of adequate regular care, deterioration set in. In 1954 the lower right molar had to be removed and a fixed bridge inserted. The only remaining lower left molar had been traumatized severely by the treatment and was still in a precarious condition. Many other teeth had lost much of their bony support. The date of the last record was 1956. The patient was then in her early fifties. Her continued general negligence on top of her weakened structures should now cause an even more rapid deterioration since her resistance was declining.

Conclusions

This and similar cases teach that orthodontic treatment should be instituted only in adult cases with due consideration for the age of the patient and the condition of the oral structures. The objectives should be defined carefully.

*Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., pp. 230-232.

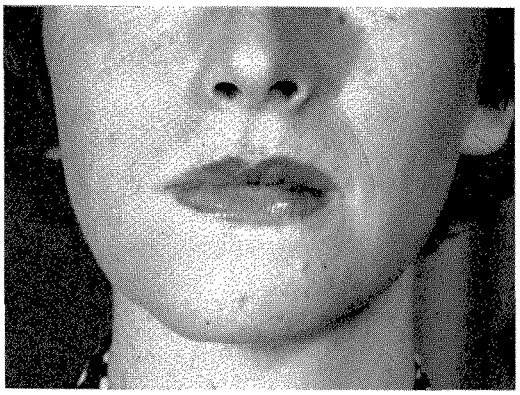


Fig. 1549. Observe the deviation of the mandible toward the right side in this patient, a woman in her twenties. (Figs. 1549 to 1555 are of the same case.)

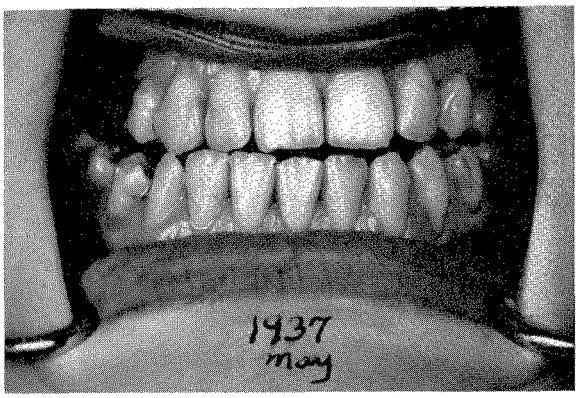


Fig. 1550. The anterior view of the teeth in occlusion. The median line is one complete lower incisor to the right. This patient was treated by orthodontics in an effort to correct the occlusion and change the position of the mandible.

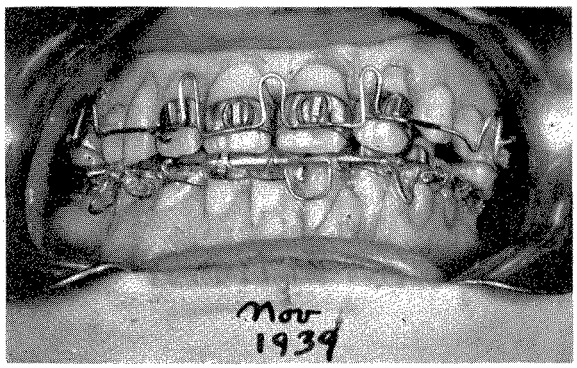


Fig. 1551. The orthodontic appliances are shown in position. The orthodontic treatment took three years.

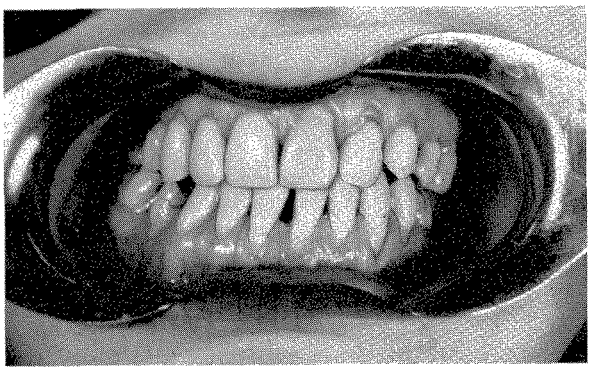


Fig. 1552. An anterior view of the completed case ten years later. The occlusion was improved, but the movement had been only a tooth movement. The position of the mandible was correct to begin with, and it was not changed, as Fig. 1553 indicates.

Fig. 1553. Compare this illustration, taken eleven years after, with Fig. 1549. Observe that the mandibular asymmetry and deviation are still present and have not changed. The orthodontic treatment changed the position of the teeth but not the mandible. The supporting tissues were considerably weakened as a result of this treatment.

Fig. 1554. Roentgenograms that were taken in 1939. These were taken one year after the start of the orthodontic treatment.

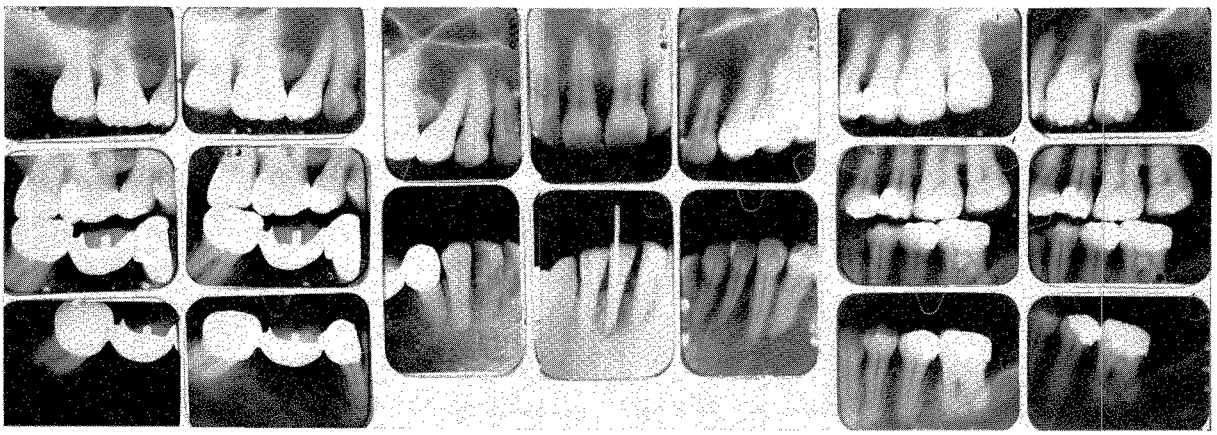


Fig. 1555. Roentgenograms that were taken in 1956. The patient was not seen since this time. The lower right central incisor had a periodontal pocket that extended to its apex. The lower right first molar was lost. The lower left first molar had its bifurcation involved. The upper right central incisor lost a considerable amount of supporting bone.

In some cases it is better judgment not to interfere as long as function is adequate and structures normal. This patient consented to go through the lengthy orthodontic treatment in the hope of correcting her facial asymmetry. This did not occur. Instead, she ended up with weakened oral structures. (Figs. 1549 to 1555.)

Case 5

A male patient, 42 years old, presented himself for treatment in March, 1962.

Past history

In 1948, at the age of 28 years, his dentist referred him for orthodontic consultation with the idea of possibly correcting what appeared to be an Angle Class III malocclusion. According to the patient, one or more members of his family also had this type of bite.

After careful evaluation by the orthodontist, his letter contained the following remarks and recommendations:

Jan. 6, 1949

The x-ray findings presented basal bone and alveolar process of the mandible and maxilla which is well mineralized but contains areas of sclerotic bone and stress lines indicative of the abnormal stresses being placed upon the teeth due to the malocclusion present. The lower left and right second premolars are anomalous in character but useful in nature. First degree root absorption is present on the upper right first and second premolars. First to second degree alveolar crest atrophy is present, surrounding practically all the teeth.

The abnormalities of the teeth and supporting structures appear to be progressive in nature. The existing malocclusion appears to be the exciting factor for these abnormalities.

In the maxilla, supporting bone is slightly deficient. Condylar x-rays as well as intraoral examination shows that the patient's occlusion is that of a false or pseudo-Class III maintained by occlusal interferences. . . .

Intraoral examination and photographic records demonstrate a gingival recession evidently furthered by both abnormal toothbrushing and mechanical stress of the malocclusion. The present relation of the teeth and the jaws appears to make the rehabilitation of the mouth a precarious one unless orthodontic intervention produces the necessary normal occluding teeth and jaws. The excursion of the mandible is being limited by the locking of the right and left molars and premolars as well as anterior interferences. The mandible assumes a shift to the left upon closure of the teeth due to these interferences.

Etiologically we appear to be dealing with a problem based upon early constitutional abnormalities, local and crossed inherited factors. These causes, however, have balanced themselves in a manner which may have proved amenable to preventive therapy. At present, these causes are in the main continued by the local factors, accented by the patient's strong musculature, which must be severely contended with if successful treatment is to be accomplished.

From the above facts, which could herein only be summarized, we conclude that for the preservation of the teeth and supporting structures presented, removal of the interferences outlined and proper positioning of the mandible and maxilla are of the utmost importance. This is true if the life of the patient's dentition is to be maintained, or even if proper support is to be obtained for restorative work in the future.

Very truly yours,

(Signed)_____

The lateral roentgenograms revealed upper left first and second bicuspids with extensive root resorption on Nov. 30, 1948. The lower right and left second bicuspids were rotated and their roots shorter than those of the first bicuspids, but the supporting bone was normal. Only one tooth was missing, namely, the upper left third molar. The 1948 study casts revealed what appeared to be an Angle Class III malocclusion. The upper and lower anterior teeth had normally formed roots with evidence of a small amount of alveolar resorption.

The patient stated that he did not recall having any difficulty with his occlusion or with his function. He was sent to the orthodontist because his dentist felt that the future longevity and health of his teeth perhaps could be protected better by this consultation and the recommended therapy.

Orthodontic treatment was instituted early in 1949 and was continued until 1953. Upon the completion of the treatment, the patient stated that he wore retainers at night for six to eight months. These were used for the upper as well as the lower teeth.

From the history report, the patient stated that when the orthodontist completed the work in 1953, he recommended that the teeth be stabilized in their new positions by means of restorative procedures which included splinting. He remembered that the teeth were loose when the orthodontic appliances were finally removed. His general dentist was not in accord with the recommendations relative to the supporting prosthesis, and therefore it was not done.

Although his teeth were loose for several years and he was advised by his dentist to consult with a prosthodontist relative to another evaluation of his problem, the patient was unwilling to follow this advice until recently (1962). He came at this time only for consultation because he realized that some of his teeth were about to fall out.

Present condition

The oral examination in March, 1962, revealed that many teeth had undergone extensive resorption of their root tips. The upper six anterior teeth as well as the upper bicuspids were loose and unhealthy. The lower anterior teeth had lost a large amount of their supporting bone. The mouth was generally in a state of complete deterioration.

Three third molars were missing. Many teeth were carious. The periodontal condition was abnormal inasmuch as, in spite of great mobility, there was very little suppuration and the pockets were very shallow. Another interesting feature was the fact that the roentgenograms taken before the start of the orthodontic treatment demonstrated that there was resorption of the bicuspids so that it must be assumed that this patient was subject to resorption. If this were so, then five years of orthodontic treatment would certainly subject these susceptible teeth to severe trauma. This is actually what took place.

Recommended treatment

Extract the upper right and left central and lateral incisors and the right cuspid and first bicuspid.

Splint the upper right second bicuspid and first and second molars and the upper left cuspid, first and second bicuspids, and first and second molars.

Then insert an upper removable partial denture. Temporary splinting would be resorted to for two to three months in order to observe the condition of the problematic teeth, namely, the upper right second bicuspid and the upper left cuspid and first and second bicuspids. If these teeth show signs of recovery, then insert more final work.

Resurface all the lower posterior teeth. Splint the lower bicuspids together. Use horizontal pin ledges on the six lower anterior teeth and join the bicuspids to the lower anterior teeth.

The present vertical dimension was to be maintained and the occlusion coordinated.

Actual treatment—transitional work

The patient was extremely reluctant to have all but the very necessary teeth removed. He was willing to gamble even if the odds were small on the retention

of some of the problematic teeth. With this in mind, the following treatment was instituted.

The upper four incisors were removed. All the posterior upper teeth were splinted together by means of first quick-cured and then slow-cured acrylic splints. A transitional removable partial denture, retained by clasps, was inserted.

The vertical dimension was maintained. The lower bicuspids were splinted together first by means of quick-cured and then by slow-cured splints. The lower right second and third molars were inlaid in gold. The lower right first molar was crowned and splinted to the bicuspids.

The bone loss in the anterior region was extensive. Because of this the saddle of a removable partial denture is necessary to fill in this space and establish acceptable esthetics. If fixed partial dentures were resorted to, this space could be restored by means of a removable acrylic plastic mask which is demonstrated elsewhere in the text (pp. 257 to 262). The prognosis of the problematic teeth is questionable because their roots are so short that any further trauma would carry this infection beyond their apexes.

Final stage of treatment

The final stage of the work was started in November, 1962. Low-fusing transfers were constructed for all the prepared teeth. The vertical dimension of the transitional work was maintained. The articulator used in the final reconstruction was the Transograph. (See Case 3, pp. 490 to 510, Figs. 1052 to 1092.) Hinge axis, cranial plane, hinge bites, etc. were obtained as records.

Another consultation was held with the patient, who wished to have the pros and cons of the fixed vs. the removable prosthesis again explained to him. He had been wearing a transitional removable partial denture for several months and had had a good opportunity to judge its effect upon him both psychologically and functionally. A luncheon date was reserved for this discussion because of its intimacy and freedom from pressure. After hearing what I had to say, he elected complete fixation for the remaining upper teeth in spite of my advice to choose an upper removable partial denture as the desirable prosthesis.

The following letter gives a more detailed account of the evaluation. This was sent to the patient and was signed and returned by him.

Nov. 26, 1962

Dear Mr. _____:

This letter is a confirmation of what you and I discussed during our luncheon on Wednesday, Nov. 21, 1962. I am in the process of rehabilitating your mouth and am now at the stage where it is necessary to decide what type of replacement will be used to restore your upper missing teeth.

Owing to the extreme weakness of what remains, it will be much more practical to use a combination of fixed splinting and a removable partial denture. Should some of your weak teeth require removal, it will be much simpler to add them to the removable denture without the need of a large-scale replacement. This means less energy, time, and expense on your part. Then, again, good esthetics is much simpler to attain because a labial saddle which replaces the lost structure can be added to the removable partial denture. This cannot be done with the fixed partial denture. In the case of the latter, a removable plastic mask will have to be made to fill in for the lost tissue. This can be removed and replaced at will.

I explained to you that Dr. _____ is also of the opinion that removable prosthesis is the appliance of choice. Your upper bicuspids and cuspids have lost a considerable amount of root and bone structure and are mobile. They have extremely guarded prognosis. If removable prosthesis is inserted, their removal does not pose the difficult problem which fixed prosthesis entails.

For these important reasons I have urged you to consider wearing a removable partial upper to replace your missing upper teeth. After serious consideration and considerable time to think it over, you have decided upon the fixed upper prosthesis and are willing to gamble upon its future longevity, even if it is only for a year or two. I again urge you to reconsider. However, if your mind is made up, I will do all in my power to protect these teeth and to construct the fixed work so that the maximum longevity is obtained.

This will involve fixed rigid splinting and a removable plastic mask in the anterior part of your upper teeth. If nonstrategic teeth are lost, the splint can still function without its having to be removed.

While this is not my prescription, I still am willing to do what I can to furnish you with the prescription of your choice. This will undoubtedly solve your psychological needs for the present if not for the future. When the future must be faced, I trust you will do so with the same fortitude you are using in your present choice.

I would appreciate your signing and returning the copy for my files, while keeping the original for yours.

I enjoyed lunching with you.

Sincerely,

(Signed)_____

Further discussion

The temporomandibular joint roentgenograms reveal what I would consider this case to be, namely, a true Class III malocclusion, not a false one. There is a relatively small degree of protrusion, and the lower arch is wide. In addition, there is evidence of other Class III malocclusion cases in the patient's family.

A case of this nature impresses upon us the possibility of a similar failure if other cases of the same nature are attempted. It becomes hazardous and extremely embarrassing when a failure of this type occurs. Orthodontic treatment for adult patients is still a complex procedure. If the original oral structures are weak and show signs of definite deterioration, the need for interference becomes more apparent. The oral structures in this case were more normal than otherwise. If treatment were to be instituted on the basis of esthetics, then the possibility of failure should be carefully presented to the patient, and the greatest portion of the responsibility should be assumed by him.

When a patient insists upon having a procedure performed for his mouth that may cause a deterioration of his structures, he should be required to sign a letter assuming the responsibility. These human experiments will serve the purpose of teaching us what and what not to do. Although they are not to be encouraged, still they serve a useful purpose, because experiments of this nature on human beings are otherwise not possible.

On pp. 340 to 345, Figs. 741 to 749, a case was reported in which a dentist had raised a bite and advanced a mandible excessively. The result was questionable. In answer to the question of why he resorted to these extreme measures when he was uncertain of the consequences, he stated, "It is not always the easiest way

Text continued on p. 790.

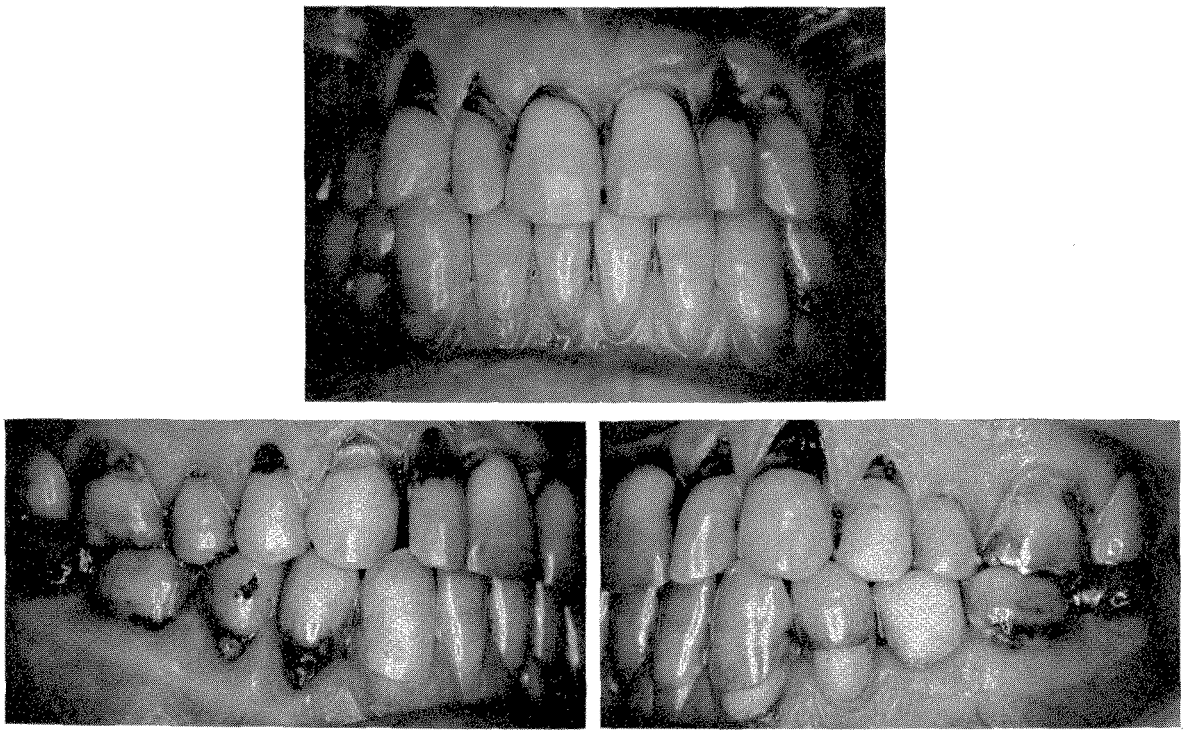


Fig. 1556. Three views of the mouth of a 42-year-old man. These were taken in March, 1962. Five years of orthodontic treatment had been completed in 1953. (Figs. 1556 to 1575 are of the same case.)

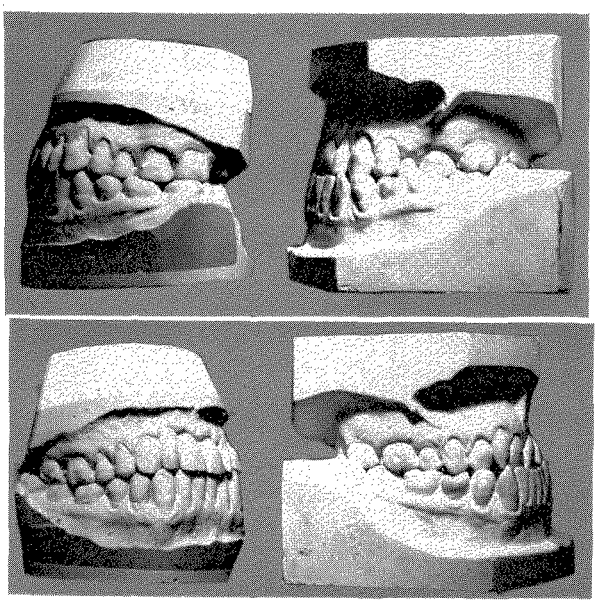


Fig. 1557. Two views of the models taken in 1948 before orthodontic treatment was instituted (right) and again in 1962 (left).

Fig. 1558. Lateral roentgenograms taken in November, 1948, before orthodontic treatment was started. Observe the resorption of at least three upper bicuspid roots and the small size of the lower second bicuspid roots. The inserts show the resorption of the upper right and left bicuspid roots more clearly.

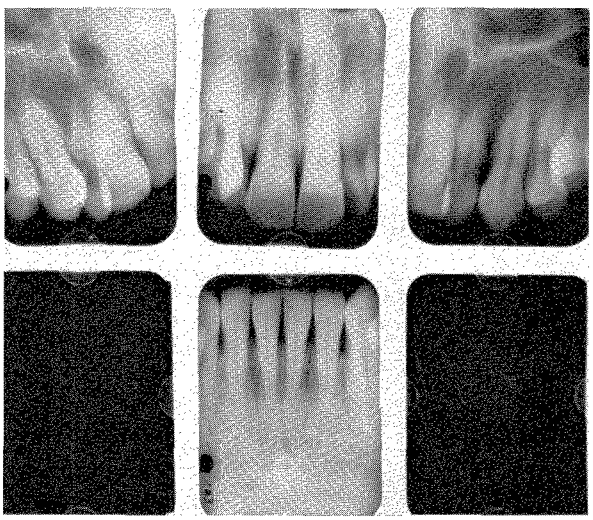


Fig. 1559. Roentgenograms of the anterior teeth taken in 1948 showing normal supporting bone before treatment.

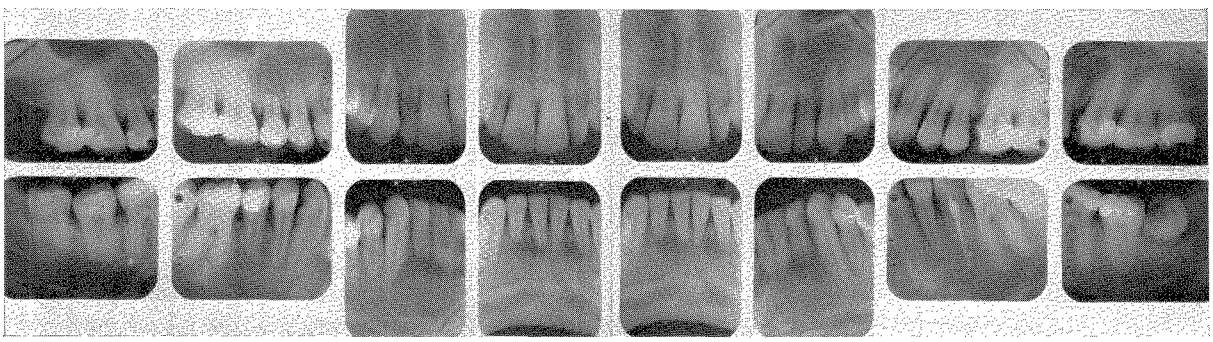


Fig. 1560. Roentgenograms taken in 1954 when orthodontic treatment was completed.

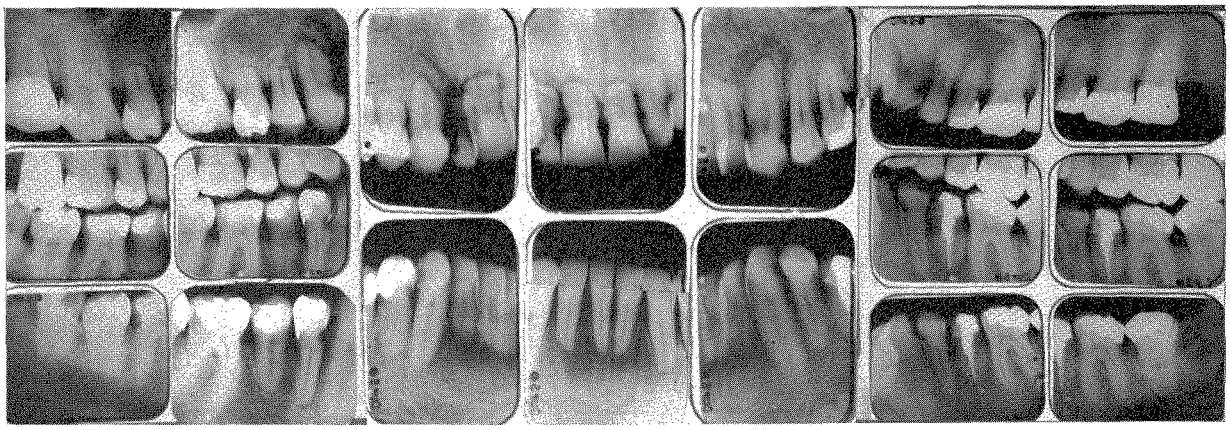


Fig. 1561. Roentgenograms taken in March, 1962, revealing the extensive alveolar absorption and the resorption of many of the root tips.

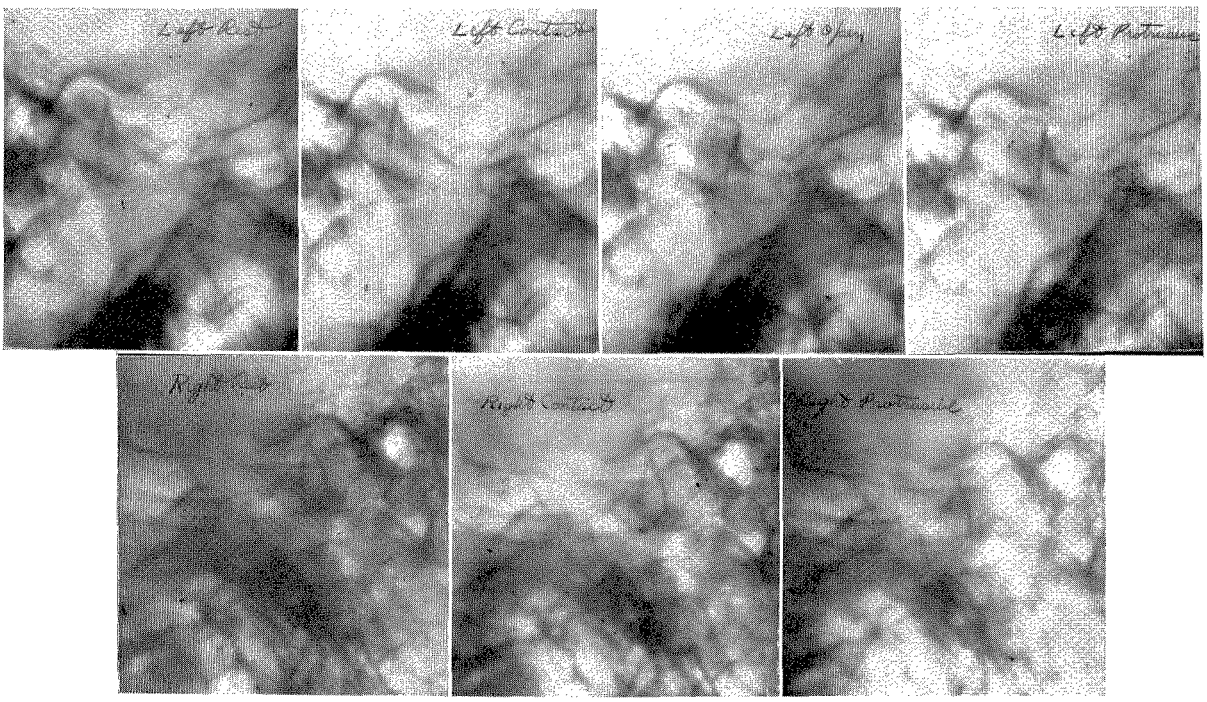


Fig. 1562. Temporomandibular joint films taken in May, 1962, revealing what I consider to be further proof that this is a true Angle Class III malocclusion. The upper row represents the left temporomandibular joint. The lower row represents the right temporomandibular joint. In both joints the articular eminence is flat, and the protrusive range of movement is limited. This is natural for Angle Class III malocclusions.

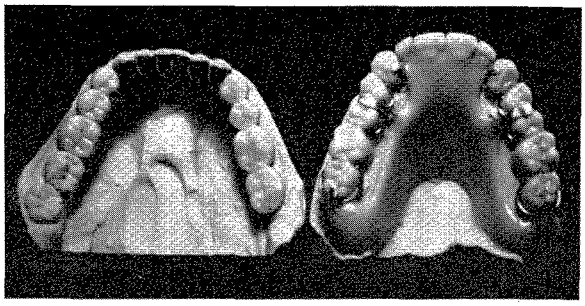


Fig. 1563. In the first stage of the treatment the upper four incisors were removed, and an immediate removable partial denture was inserted. Later on slow-cured acrylic splints were constructed with a better-adapted removable partial denture. The upper slow-cured splints contained five units each—the lower right, three units, the lower left, four units. The second-stage prosthesis is shown in this illustration.

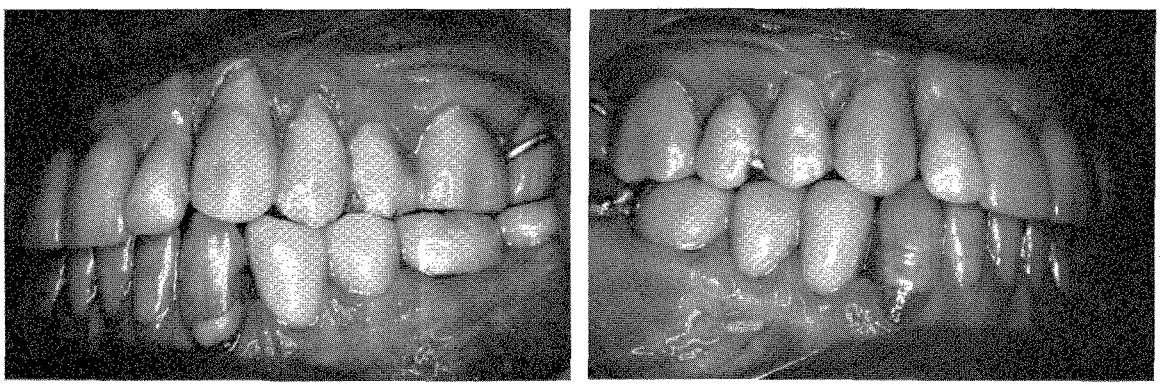


Fig. 1564. The second transitional work is shown in position in the mouth.

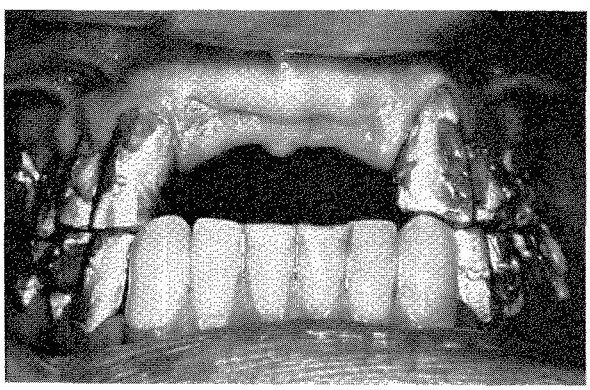


Fig. 1565. Low-fusing metal transfers were constructed to fit the copper dies of the final preparations. These were inserted in the mouth. The transitional splints were used as a reference to vertical dimension and centric occlusion of the final work. The original vertical dimension that the patient presented was retained in the final work. One quarter of the arch was covered at a time until all of the posterior transfers were in position, as shown in this illustration.

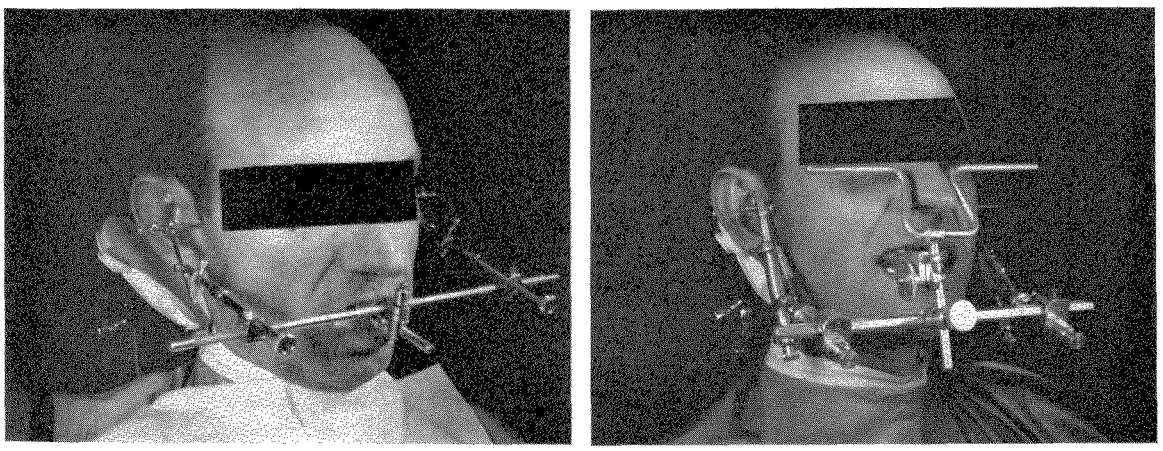


Fig. 1566. A, The transverse hinge axes were determined using the McCollum face-bow. **B,** The Transograph was then used as the face-bow. The cranial plane is shown attached.

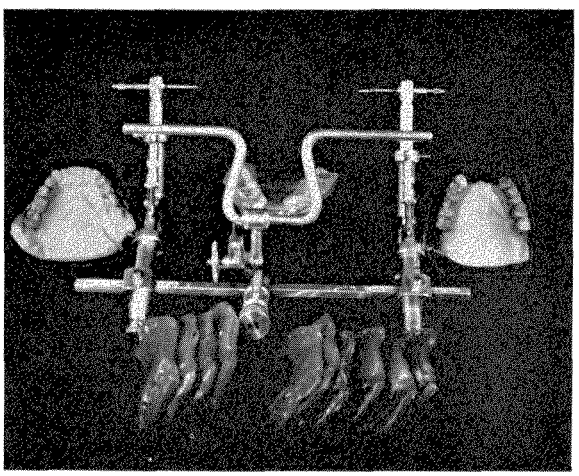


Fig. 1567. The face-bow was removed. At least nine wax hinge bites were taken. Three represent hinge opening at different levels, and three represent different degrees of right and left lateral movement (three right and three left). The side arms of the Transograph will be added and the casts attached as previously shown in Figs. 1052 to 1092. The upper and lower work casts with the low-fusing metal transfers are shown on the right and left of the face-bow.

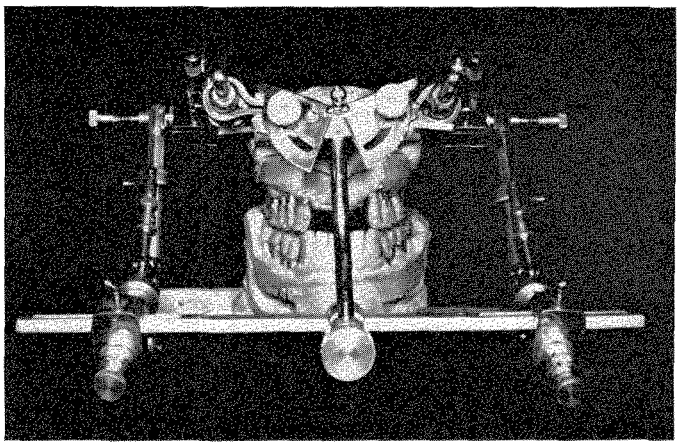


Fig. 1568. The cast crowns were then constructed and are shown in this photograph. They will be tried in the mouth and new records taken. The cams have been lowered from 55° off the horizontal plane because steep cusps were not desirable owing to the extreme weakness of the natural teeth.

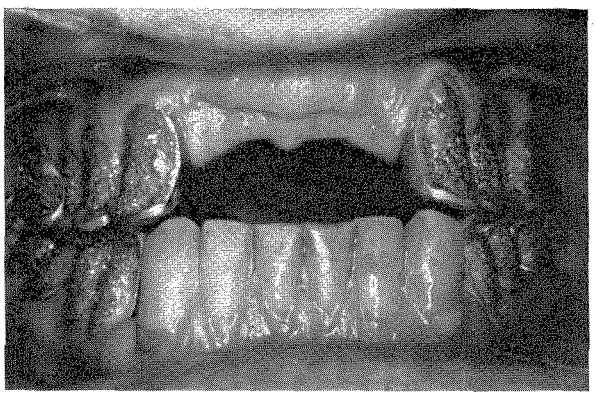


Fig. 1569. The first try-in of all the cast crowns is shown here. New wax records will be taken. Plaster impressions will also be taken. The crowns will be soldered together, and the final stages of the prosthetic restorations will be proceeded with.

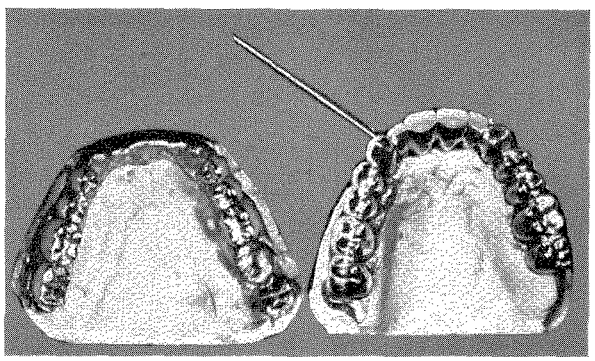


Fig. 1570. A checkbite was taken and a remount made. Then the work was completed, as shown in this photograph. The stainless steel wire, which projects from the upper right cuspid, was later used to stabilize the precision attachment which served to join two sections of the fixed restorations. It prevented movement because of future wear of the metal of the male and female parts. This additional rigidity is often necessary even though two sections of a splint are united by a precision attachment. (See Fig. 1049.)

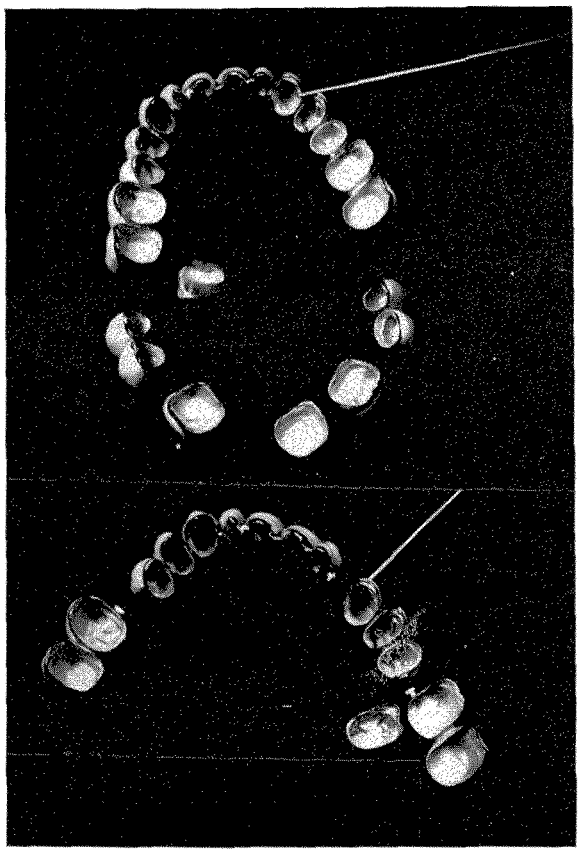


Fig. 1571. The upper splint contained fourteen units, as shown in the top and the bottom portions of this photograph. It was made of four sections joined together by means of precision attachments. The upper right second molar was first covered by the coping shown below and to its right in the upper photograph and to its left in the lower photograph. The coping served to make it parallel to the remaining upper abutments. The lower bicuspid cast crowns were splinted together. The lower molar crowns were not splinted. These are shown in the middle section. The various parts of the upper prosthesis are shown in the lower part of the photograph.

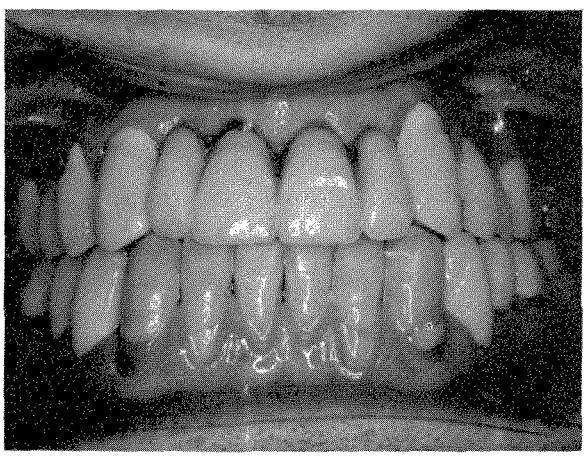


Fig. 1572. The completed work in the mouth. The upper lateral and central incisors are high-fusing porcelain teeth with a gold saddle, as shown in Fig. 1571. A plastic mask will finally cover these teeth and produce a pleasing esthetic effect.

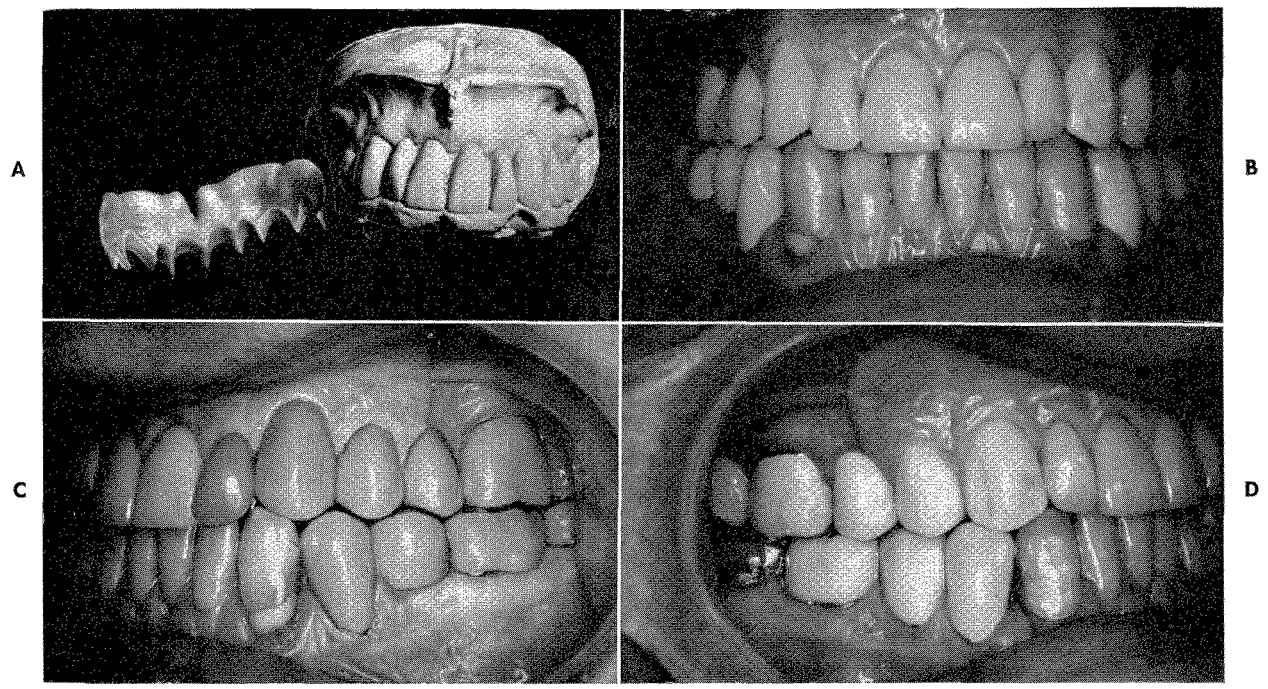


Fig. 1573. A, A plastic mask was constructed to cover the cervical quarter of the upper anterior teeth and reduce their size to that of normal teeth. Their oversize was due to the severe loss of bone due to alveolar resorption. The mask extended around both first bicuspids. **B,** The plastic mask is in position. The esthetics is pleasing. The mask is removable. (See pp. 258 to 262, Figs. 568 to 578.) **C** and **D,** Left and right sides of the completed prosthesis.

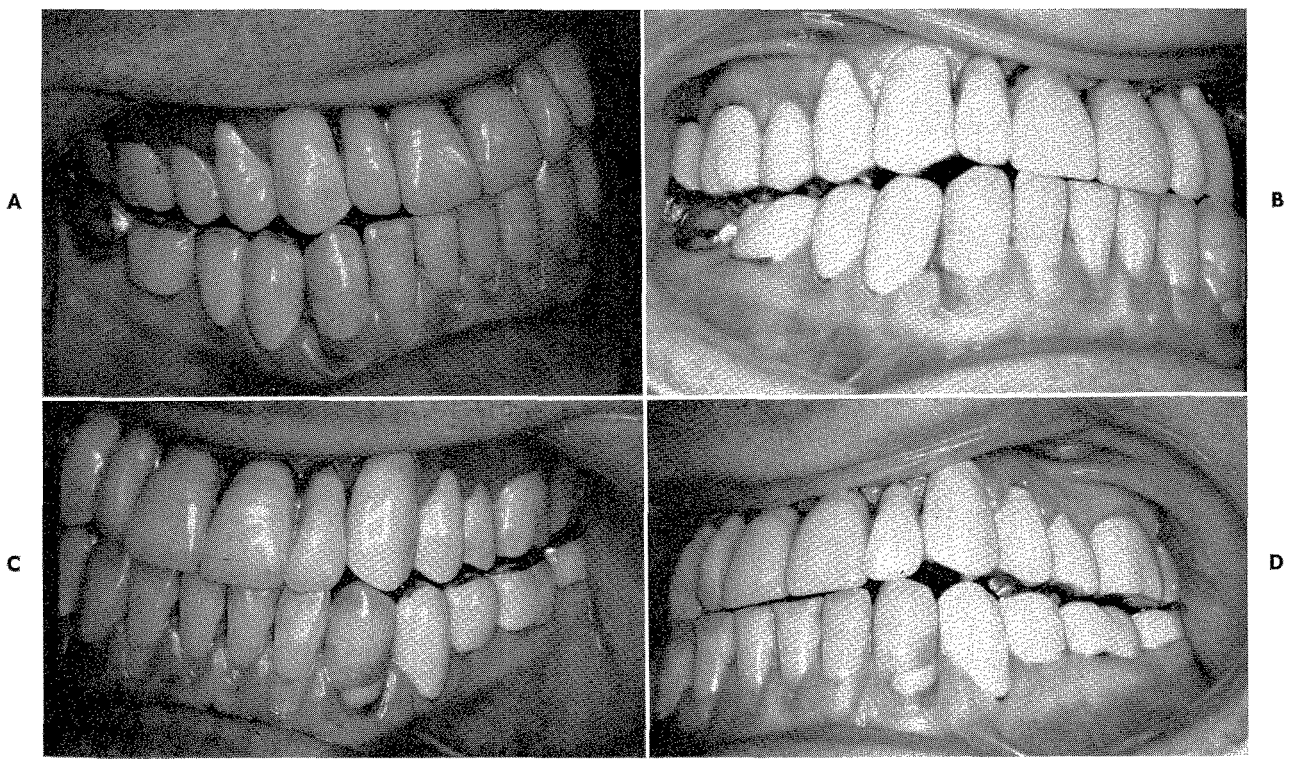


Fig. 1574. A, The right side showing the working bite. **B,** The right side showing the balancing bite. **C,** The left side showing the working bite. **D,** The left side showing the balancing bite.

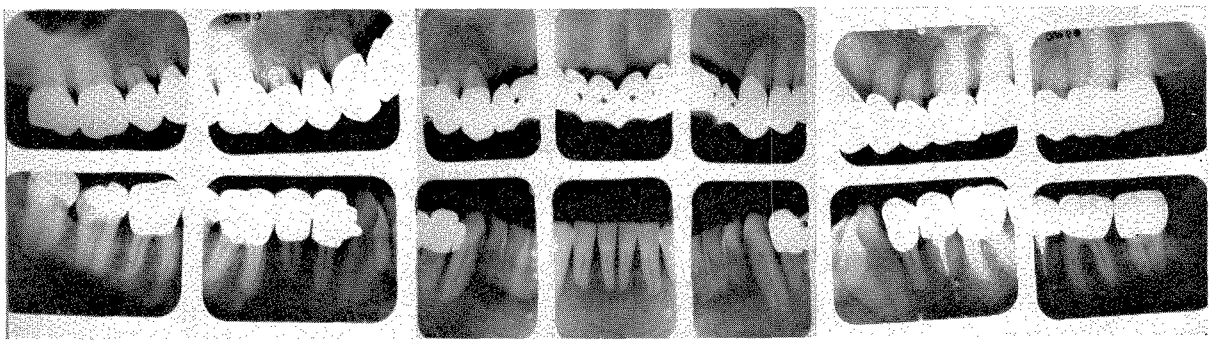


Fig. 1575. Roentgenogram of the final work. These were taken in December, 1962.

which is the best, and the recognized professional laws must direct us, but not be a limit of our resources." (Figs. 1556 to 1575.)

Disturbing oral equilibrium

Disturbing the oral equilibrium can be dangerous, especially in adults. It is less complicated to disturb the oral equilibrium in children, in whom the soft and hard structures are undergoing continued change, than to disturb this same equilibrium in adults, in whom these tissues have attained a greater degree of stability. Not that continued change does not take place throughout life, but the patterns have been set when adulthood is reached, and whatever changes do occur in response to functional stimulation are slight and gradual. When a competent orthodontist and prosthodontist work together, an otherwise difficult case may have a very happy ending. This reflects itself to the great advantage of the patient.

Case 6

A case needing this combined effort was undertaken in June, 1959, when a young woman in her early twenties presented a dental problem that required a combination of orthodontics and prosthodontics. Her upper and lower anterior teeth presented a crowded, irregular appearance that created an extremely poor background for an otherwise attractive face. The result was that she would suppress her smile and create an unnatural expression. A deep vertical overlap further complicated the case. A great deal of time was spent in evaluating her problem. The final decision was to remove both upper lateral incisors and the lower left central incisor. The lower anterior teeth would then be moved together and the upper cuspids moved forward to occupy the position of the former lateral incisors, while the rotated central incisor would be straightened. After the movement, the upper anterior teeth would be covered with four porcelain jacket crowns.

Treatment

The extractions were performed on July 8, 1959, and the orthodontic appliances were inserted immediately. The actual movement took ten months. On April 19, 1960, the appliances were removed, and a lower wire retainer was inserted. The upper cuspids and central incisors were then prepared for porcelain jacket crowns,

and an acrylic splint was inserted to further stabilize them during the operative work. On May 6, 1960, the porcelain jacket crowns were inserted. On May 10, 1960, the lower wire retainer was removed, and on May 13, 1960, a retaining device was made to be worn at night for at least three months in order to prevent a relapse. (Figs. 1576 to 1584.) The orthodontic treatment was performed by Dr. Alexander Sved, New York, N. Y.

When orthodontics and prosthodontics are performed in this manner, everyone concerned benefits by the combination of efforts. Unfortunately, this is not always so. Sometimes both members of the team fail in their duty, whereas at other times, one of them is at fault.

Fig. 1576. Mouth at the start of treatment in June, 1959. This patient is in her early twenties. (Figs. 1576 to 1584 are of the same case.)

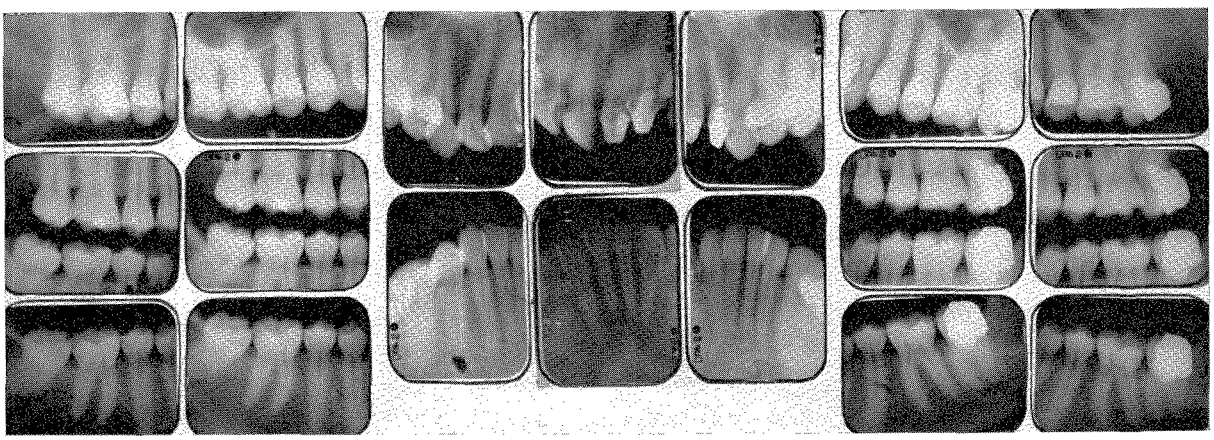


Fig. 1577. Roentgenograms at the start of treatment in June, 1959.

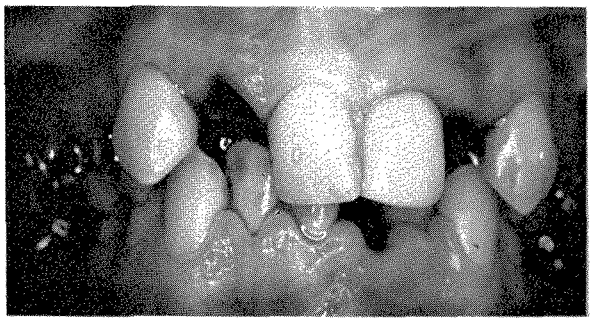


Fig. 1578. The upper lateral incisors and the left lower central incisor were removed in July, 1959.

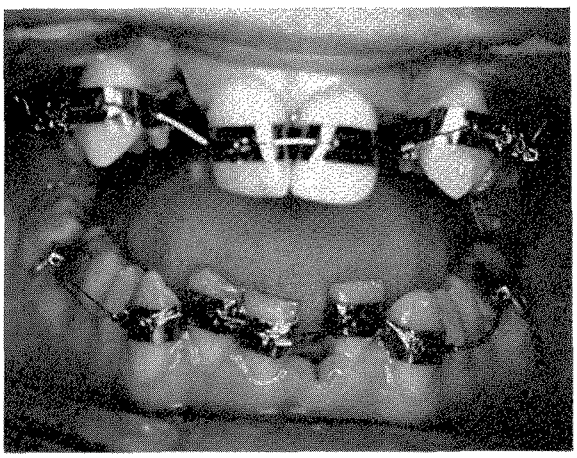


Fig. 1579. The orthodontic braces were inserted immediately after the removal of the teeth.

Fig. 1580. Within six months the teeth were brought into their predetermined positions. This photograph was taken on Jan. 7, 1960.

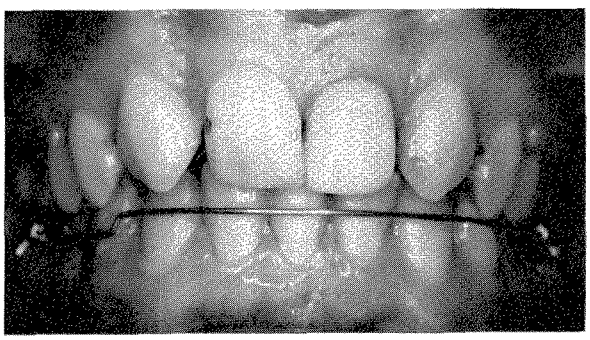


Fig. 1581. Retention was used until April, 1960.

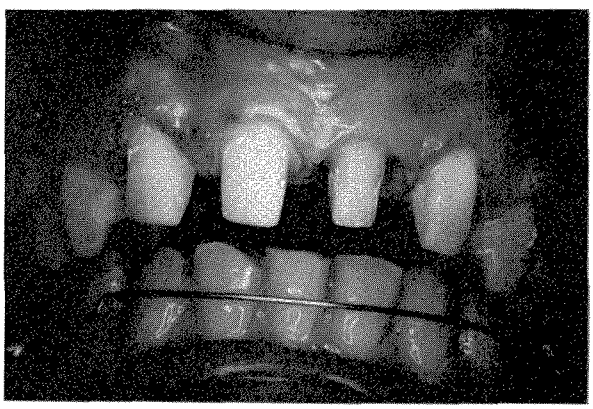


Fig. 1582. The upper canines and central incisors were then prepared for porcelain jacket crowns. The cuspids were finally made to resemble lateral incisors (see Fig. 1583).

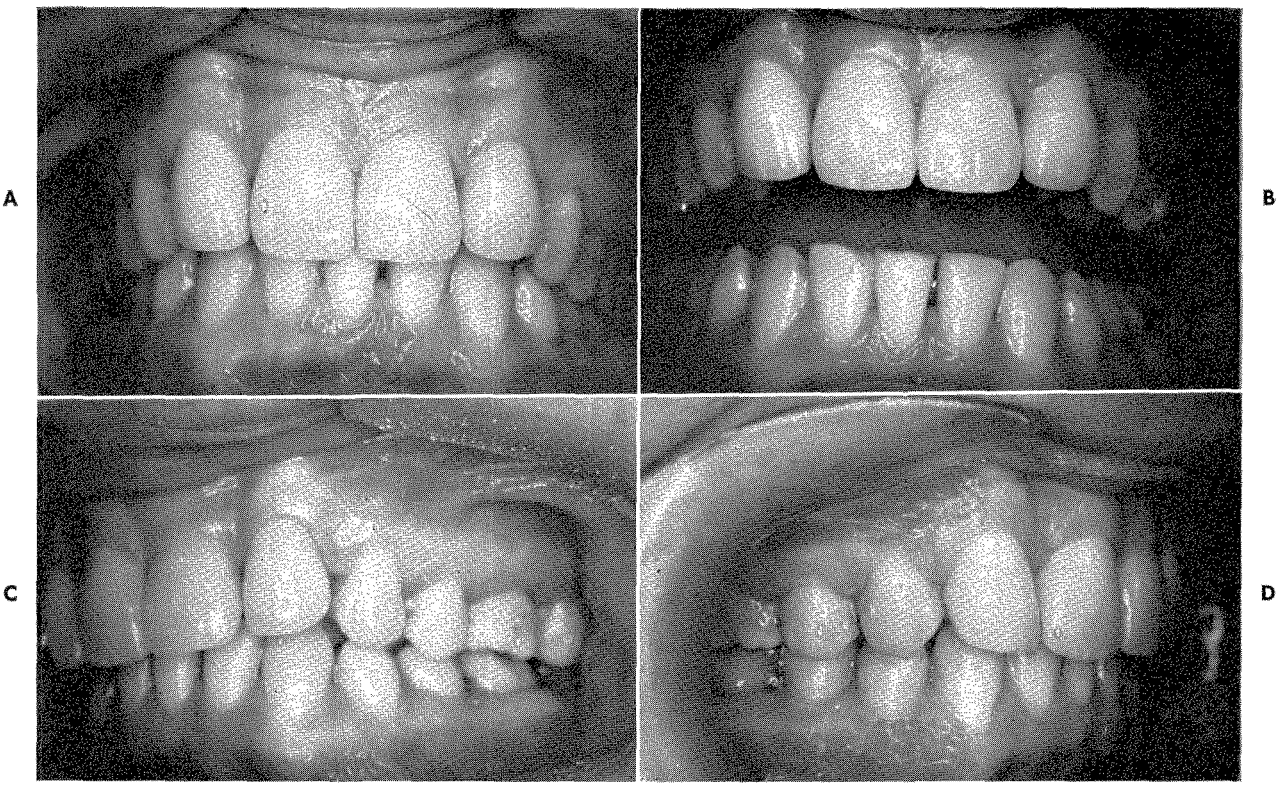


Fig. 1583. Four views of the completed work. **A,** Front view. **B,** The teeth apart. **C,** The left side. **D,** The right side.

Fig. 1584. Roentgenograms at the completion of work (May, 1960).

Case 7

In October, 1955, a man in his mid-forties with an Angle Class III malocclusion was examined. Only consultation advice was given. Orthodontic treatment was instituted, and a good result was obtained considering the difficulty of the case. The anterior occlusion was brought into a tip-to-tip relationship, partly by tooth movement and partly by shortening the teeth. Following the conclusion of the orthodontic treatment, the prosthetic treatment was finalized.

The patient was again examined in October, 1956. The dental work had been poorly executed. Although it was of recent insertion, it was already in a state of deterioration. The removable partial denture was not well planned. The crowns had faulty margins. The periodontal tissues were inflamed. In addition, the patient stated that he had not been informed as to his responsibility in maintaining good oral hygiene.

Although the dentist cannot be excused from his share of the responsibility for this failure, neither can the patient be exempted from his. Poor hygiene, unwillingness to give adequate compensation for professional services, and general apathy all take their toll. The patient was examined for the last time in October, 1960. His mouth was in a further state of deterioration. The gingival and palatal tissues were inflamed and swollen, and their hygiene had been neglected. The roentgenograms of the upper teeth indicated infection and caries. Here was a case of poor dentistry, aggravated by neglect on the part of the patient. The orthodontist had performed excellent service. (Figs. 1585 to 1589.)

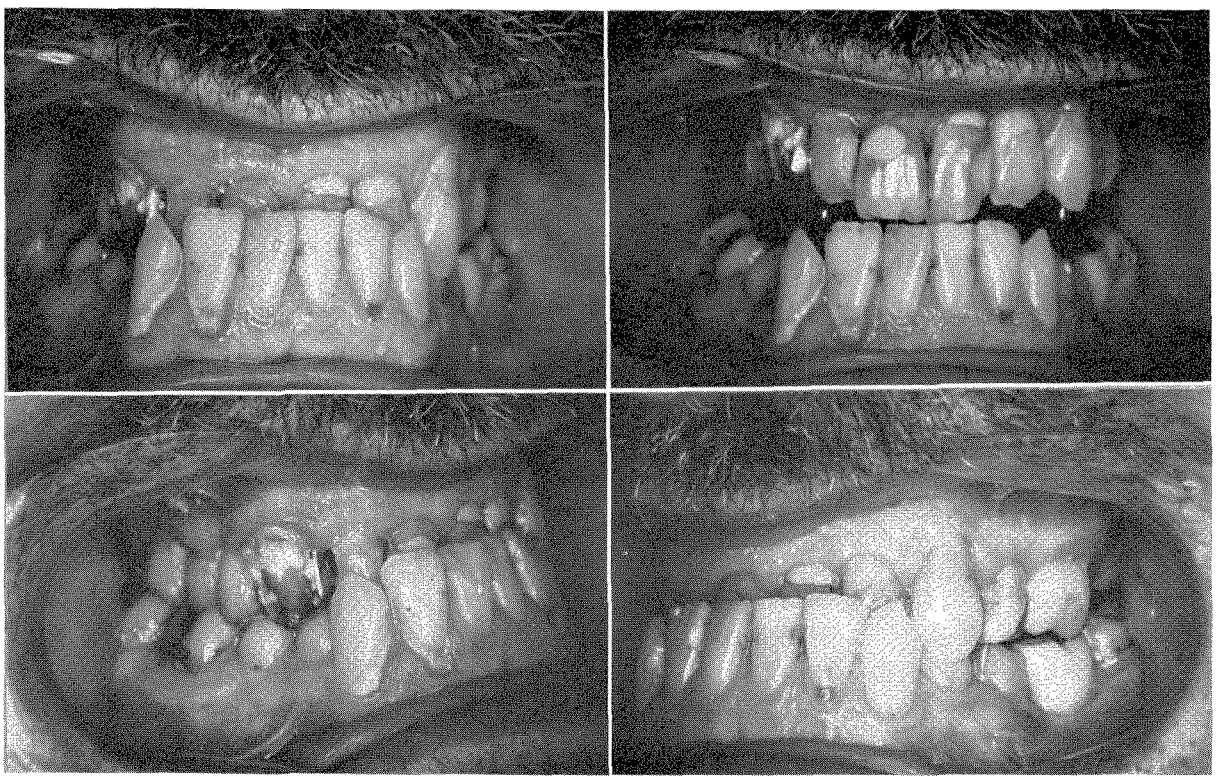


Fig. 1585. Four views of the mouth taken before treatment was instituted. These were taken in October, 1955. (Figs. 1585 to 1589 are of the same case.)

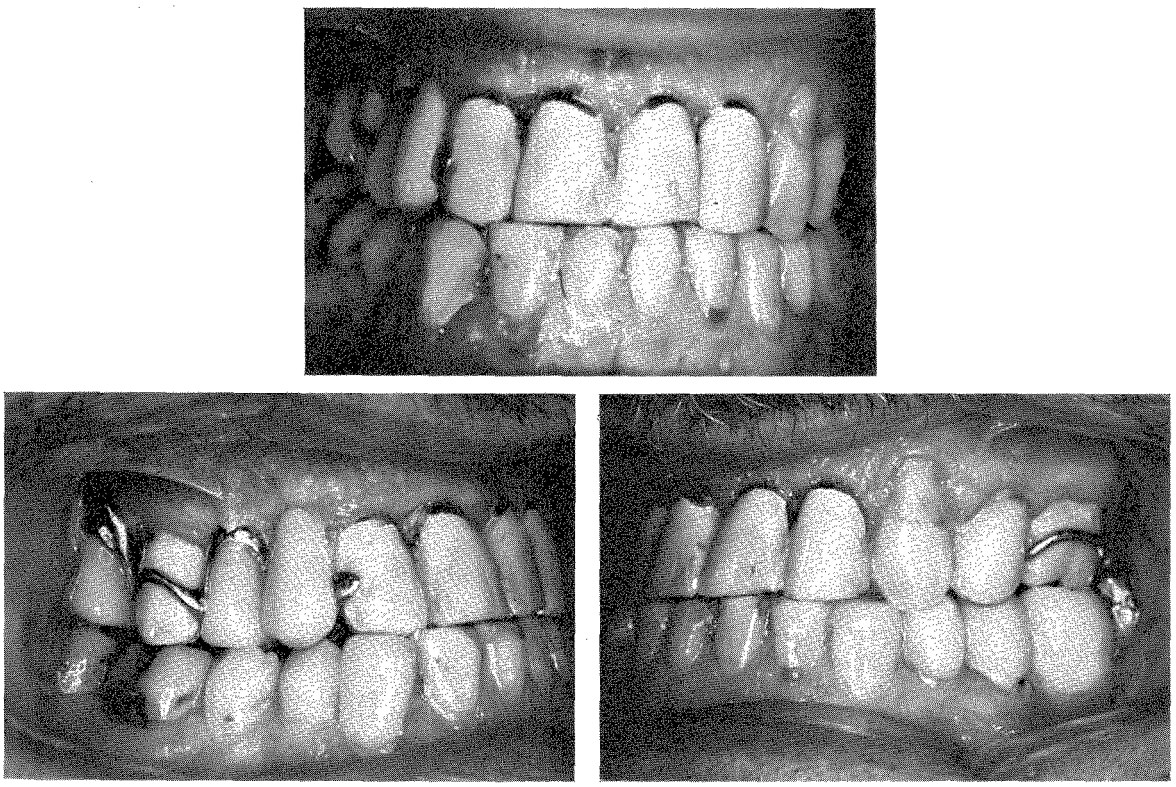


Fig. 1586. Three views of the mouth taken after the orthodontics and prosthodontics were completed. These were taken in October, 1956. I did not do the prosthetic work.

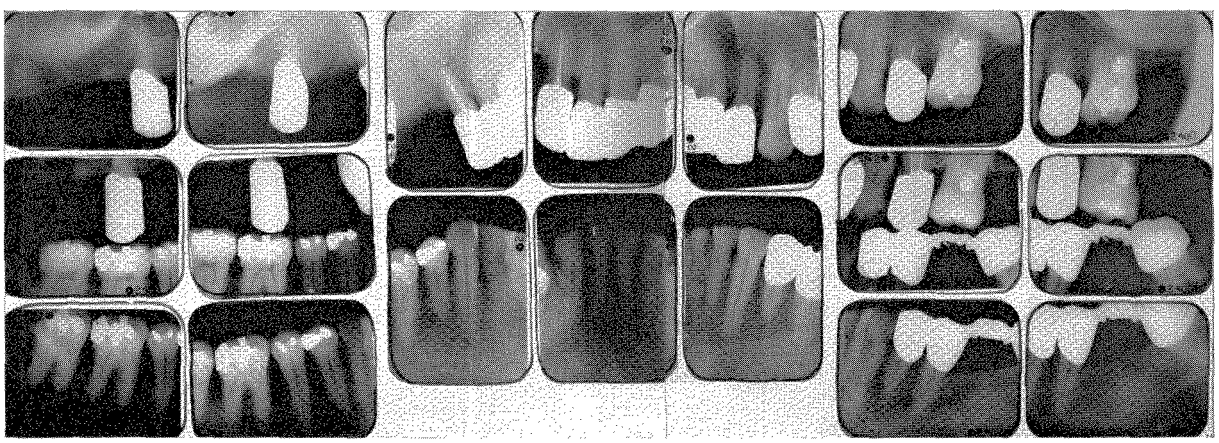


Fig. 1587. Roentgenograms taken in October, 1956.

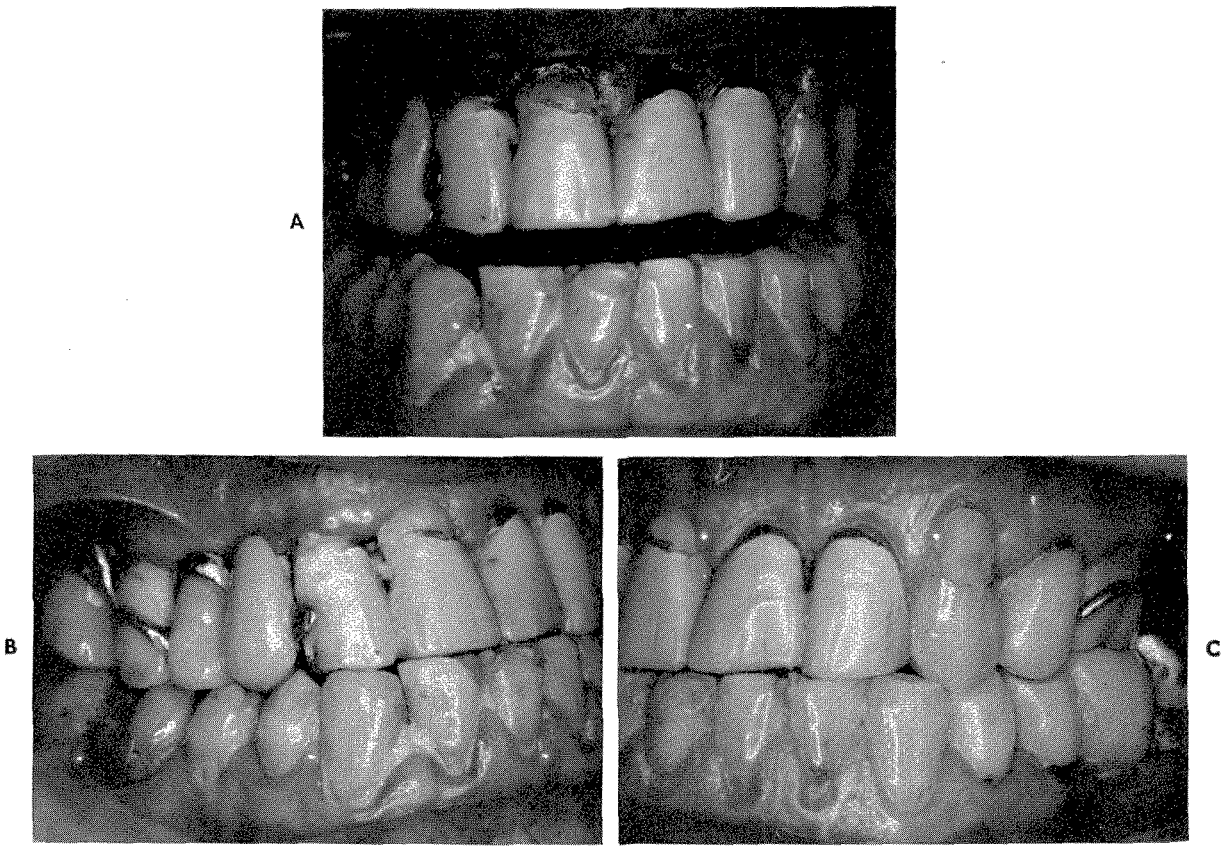


Fig. 1588. Three views of the mouth that were taken in October, 1960. **A,** Front view. **B,** Right side. **C,** Left side.

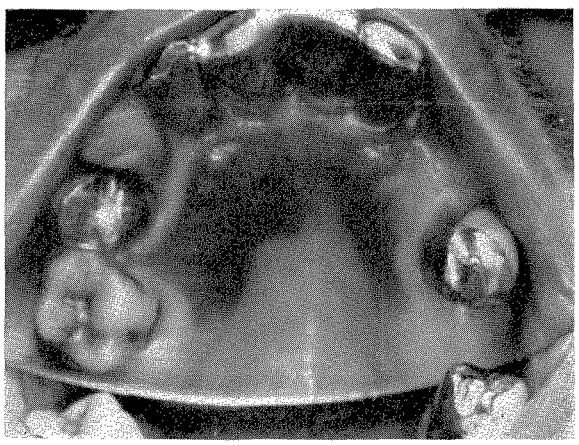


Fig. 1589. Palatal view showing inflammation of the vault due to pressures and poor hygiene caused by a removable partial denture.

RESULTS OF DISTURBING THE ORAL EQUILIBRIUM

The insertion of single inlays or crowns that have seriously disturbed entire occlusal patterns was discussed previously. There are many patients whose delicately balanced interocclusal relationship has been thrown eskew by the insertion of improperly constructed prostheses. It bears constant repetition that the teeth, the musculature, and the temporomandibular joint are in harmony in most individuals. Even if a small three-unit bridge does not conform with the surrounding structures, Nature usually effects an accommodation in most individuals so that, without too much difficulty, an equilibrium is again established. The assumption is that the discrepancy is not too great. However, it must be emphasized that there are many cases on record in which improperly constructed and assembled fixed and removable partial dentures have served to upset the equilibrium of the entire stomatological system. In these cases the results have been far-reaching and have seriously affected the well-being of the patients who happen to be the unhappy and unfortunate victims.

Case 8

Past history

In March, 1945, a 40-year-old man was referred for dental consultation. Lower right and left first molars had been removed several years previously. These teeth had been replaced by two fixed bridges that were attached to the second bicuspids and second molars. He had pain and discomfort ever since their insertion. The right temporomandibular joint was painful upon his initial examination. He stated that his mandible had deviated to the left. In the photographs of the teeth the mandible was one entire lower incisor to the left.

According to the history, he distinctly remembered that upon the insertion of the lower fixed bridges, he noticed an immediate compression of the right ear. His hearing was affected, and he had to shift the mandible in a certain manner in order to open up the ear passage. As time went on, this progressively became more severe, and he often found difficulty in hearing. During treatment he was sometimes observed shifting his mandible from the left to the right in an effort to improve this sense.

This case was reported in 1951* with a history covering ten typewritten pages. Only very brief accounts are being presented here. He revealed that the fixed bridges had been changed no fewer than three times and that the vertical dimension had also been increased. He had been to many dentists and had also consulted otolaryngologists, but nothing seemed to help.

Treatment

His mandible was repositioned by means of three gold occlusal splints in order to bring it to the right almost the width of a lower lateral incisor. The lower and

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*Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., pp. 242-247.

upper median lines were now directly in line with each other. The patient stated that he was made more comfortable with these splints in place. The splints had shallow cusps in order to unlock the occlusion, and they served to increase the vertical dimension 2 mm.

His mastication improved, but his right mandibular joint continued to be sore. With index fingers in the ears, there was a definite feeling of the left condyle coming out of the fossa in the opening movement, whereas the right condyle remained in the fossa. A wooden peg was also inserted in the right molar region in an effort to pivot the right condyle downward and forward, but this failed. There was distinct crepitus in the right ear as if the condyle was rubbing against bone.

He wore the splints for three months, and once again his interocclusal relations were registered by means of wax records in such positions in which he maintained he obtained most relief. Additional metal was then added to the splints in order to enable the patient to reach his most comfortable position. The new splints were inserted on June 4, 1945. They seemed to relieve the tinnitus and stuffiness in the right ear.

After the splints had been worn for a month, he reported a definite improvement. However, if he removed the splints, his old symptoms immediately reappeared. The cusps of the splints were still shallow so as not to lock the occlusion completely. The patient was encouraged, although not entirely cured. For the first time in several years some relief had been obtained.

Text continued on p. 801.

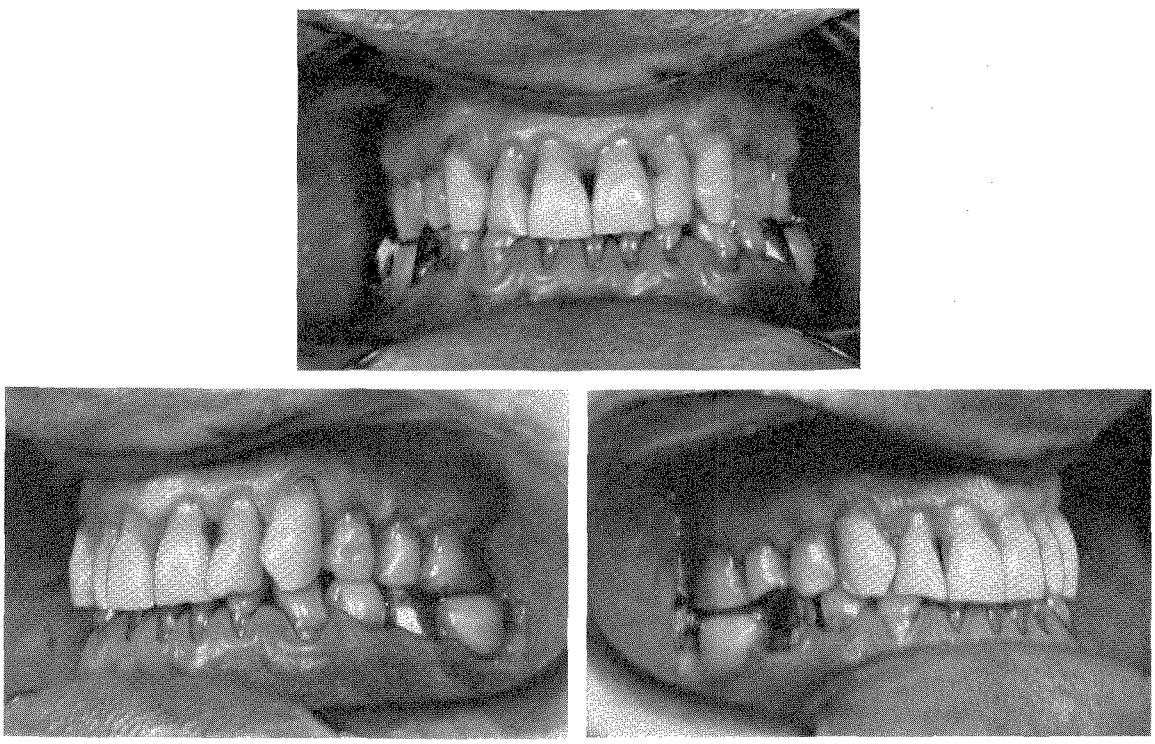

Fig. 1590. Anterior, left, and right views of the mouth of a 40-year-old man who suffered greatly from pain and stiffness in the jaws and temporomandibular joints. He claimed that the trouble started with the replacement of two lower posterior fixed bridges (right and left). (Figs. 1590 to 1595 are of the same case.)

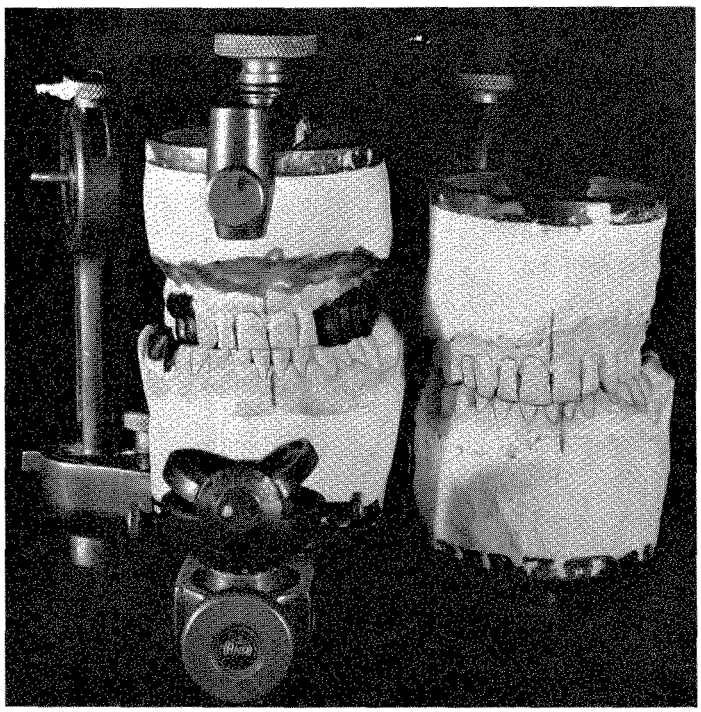

Fig. 1591. The casts of the teeth were carefully related upon the articulator by means of many wax interocclusal records, and an attempt was made to reposition the mandible laterally and vertically. On the right side the original position may be observed.

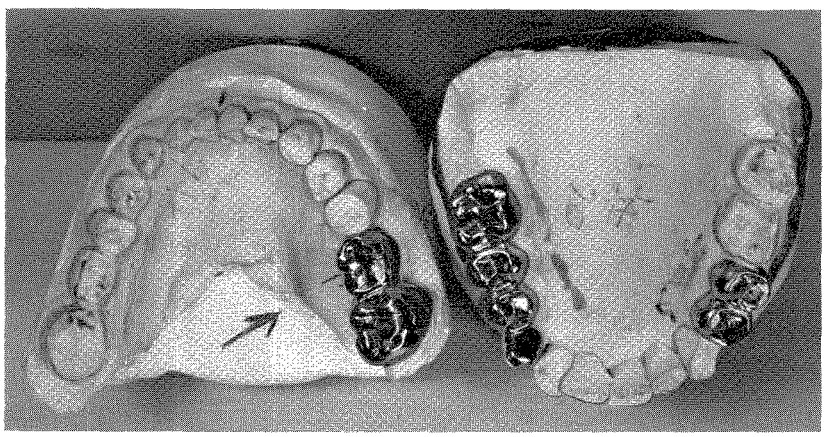

Fig. 1592. Splints in the form of gold crowns were cast for the upper and lower teeth, as shown here, to reposition the mandible. (See Fig. 1591.)

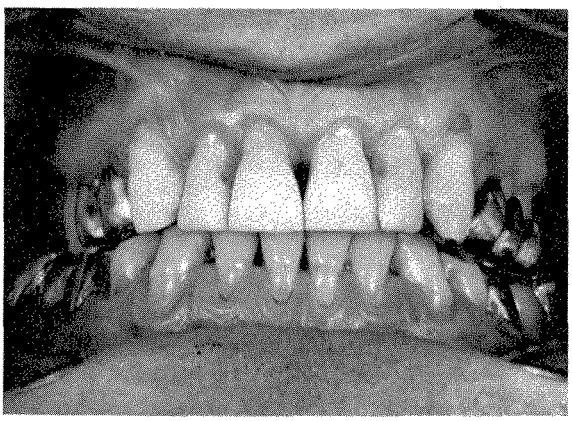

Fig. 1593. The splints were placed in the mouth and worn for two months. They gave a lot of relief, especially in the right temporomandibular joint and the right ear when the hearing (according to the patient) was affected by his condition. (Compare with Fig. 1590, **top.**)

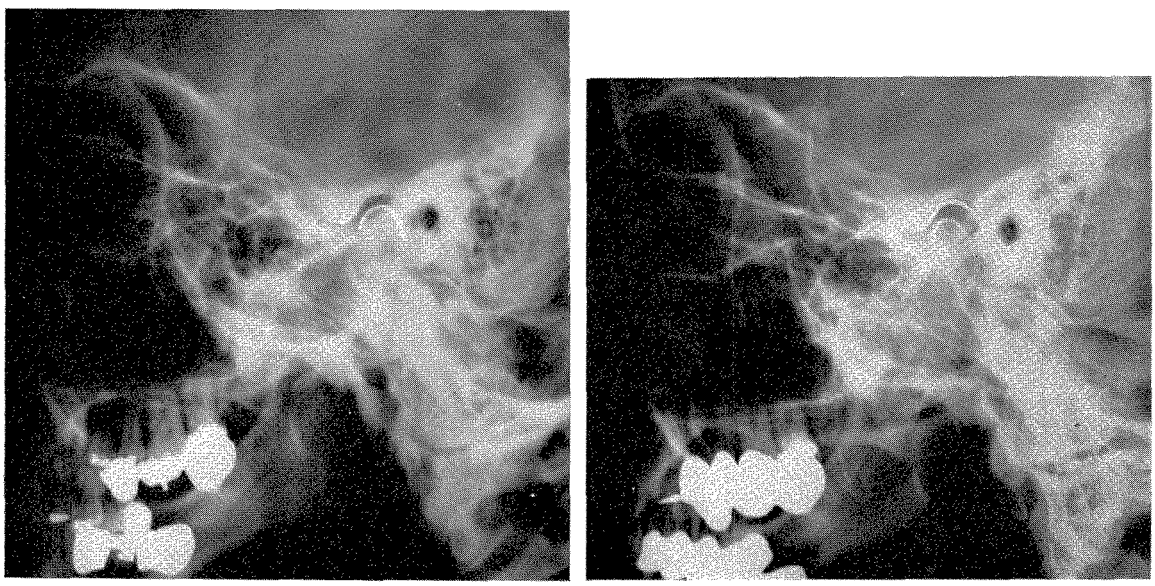

Fig. 1594. Lateral radiographs of the temporomandibular joint revealed that on the right side the condyle was positioned slightly downward and forward with the splints in position. **Left,** without splints, **right,** with splints.

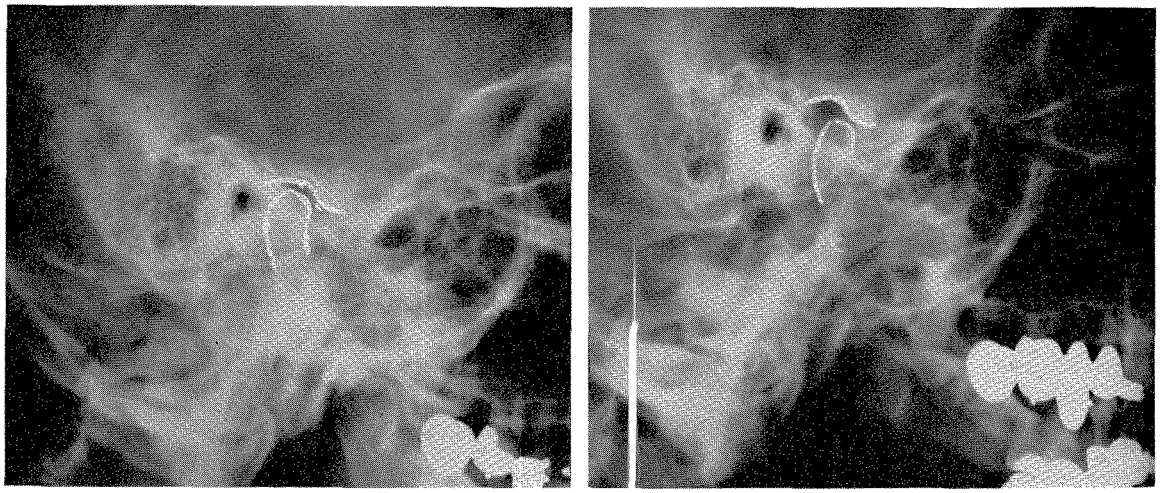

Fig. 1595. On the left side, however, the splin brought the condyle down out of the fossa, and its position was incorrect and could not be maintained without damage. Temporomandibular joint radiographs are a great help in cases of this nature. These splints were lowered so that the condyle maintained a more favorable position in the glenoid fossa. **Left,** without splints, **right,** with splints.

In December, 1945, he complained of a running right ear and tinnitus. He was referred to a colleague who specialized in temporomandibular joint disorders. The report concerned itself with an appraisal of lateral rotation and suggested that the vertical opening was too great on the left side. In January, 1946, an upper acrylic occlusal splint was inserted at a decreased vertical opening, and the mandible was positioned more anteriorly. The patient left the city and has not been heard from since. (Figs. 1590 to 1595.)

Discussion

Although no claim has been made to have all the answers for the cure of these problematic cases, it is the hope that with these cases reported and exposed for serious consideration, more care will be exercised in the construction of dental prosthetic restorations. No dentist enjoys the guilt of causing such great mental and physical anguish to patients.

In the construction of a dental prosthesis, faulty mechanics may be based upon poor judgment. The dentist may be capable, but he is sometimes pressed by time and by the patient's demands. The monetary consideration may also influence the type of restoration being considered.

SOME MECHANICAL CONSIDERATIONS—MATERIALS

The plastic materials are often at fault. There are innumerable occasions in which they are indicated, but the biting surfaces of the posterior natural teeth are not included among them. These surfaces require a material that is hard enough to resist abrasion and prevent torque. Although the porcelains are too hard when placed against gold or natural teeth and cause too rapid abrasion, acrylic, on the

other hand, does not have enough resistance to ordinary wear and as a general rule should not be used on occlusal surfaces.

Another safe rule to follow is to avoid the splinting of abutments when they are too far apart, such as a right third molar and a right lateral incisor. The span is too great, and there is too much torque, even if the right central incisor is added to the splint. The arc from molar to lateral incisor is too curved, and the stresses are out of proportion to the strength of the abutments. In similar situations, either more abutment teeth should be employed or a removable partial denture should be resorted to; otherwise failure is invited.

Case 9

Chief complaint and past history

In October, 1946, the mouth of a young woman was examined. The previous year a dentist inserted two extensive fixed partial dentures replacing nine upper missing teeth. The right third molar, central and lateral incisors, left lateral incisor, cuspid, and second and third molars remained. The patient complained of poor esthetics due to the discoloration of the anterior teeth. Her gums were swollen and inflamed.

Present condition

The roentgenograms revealed good osseous structures. The bridges had plastic occlusal and incisal surfaces and an internal framework of twisted wire. The castings were well fitted. The patient was also wearing a plastic bridge in her lower left quadrant similar in construction to that in the upper quadrant. Although her complaint concerned the poor esthetics that was presumably caused by seepage, it could also have been due to faulty mechanics. To attach a fixed prosthesis to a third molar and central and lateral incisors on the upper right side is to invite failure. The third molar had a conical root as did the central and lateral incisors. This lowered their ability to support large spans adequately. In addition, the dummies took the direction of a curve which increased the interocclusal stresses.

Discussion

The upper left fixed partial denture ran from a cantilevered left central incisor to the left lateral incisor and cuspid abutment teeth. Three teeth were then replaced, ending with a left second molar as the posterior abutment tooth. The soldered joint between the left lateral incisor and cuspid was very weak and susceptible to early breakage. The upper left third molar should have been included, and it is inconceivable that it should have been omitted. The remaining seven upper teeth were reasonably healthy. The prescription of choice would have been to splint the four anterior teeth in one fixed unit, splint the upper left second and third molars, crown the upper right molar, and insert a precision upper partial removable denture. This would have provided a better chance for longevity and would have permitted good esthetics and a reasonable chance for future repair. It also would have provided tissue support.

If a fixed partial denture had been prescribed, then all the upper teeth should

Fig. 1596. Front view of the teeth. This photograph was taken in 1946. (Figs. 1596 and 1597 are of the same case.)

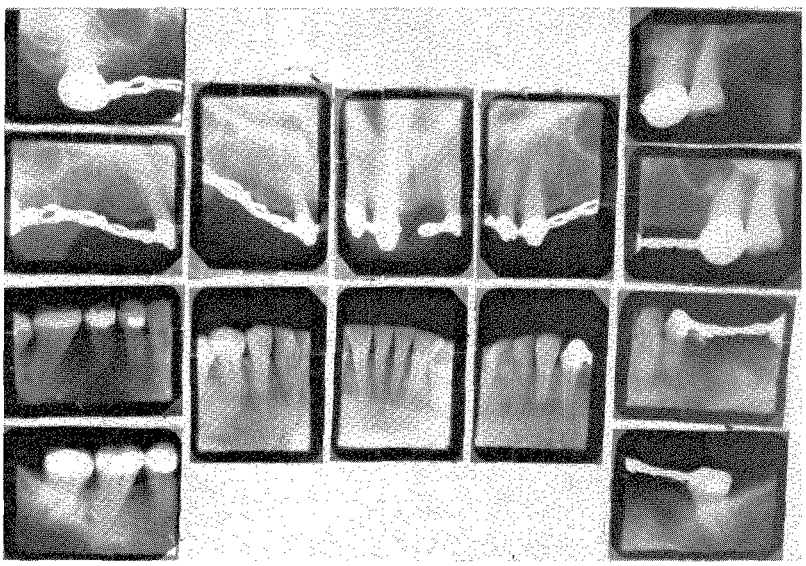

Fig. 1597. Roentgenograms of the teeth taken in October, 1946. (Read text.)

have been connected and should have shared the load. Provision could have even been provided for the loss of abutment teeth in the form of precision attachments such as have been shown previously. (Refer to Figs. 601 to 609, pp. 272 and 273.) With precautions of this nature, the longevity is guarded. It is also necessary to safeguard the plastic veneers and occlusal surfaces from abrasion. Gold occlusal surfaces would have served better. The same can be said relative to the lower left fixed partial denture. (Figs. 1596 and 1597.)

DISCUSSION OF MATERIALS USED ON OCCLUSAL SURFACES

Case 10

A good illustration of the subject of occlusal wear of acrylic surfaces was a young woman examined in December, 1949, whose mouth had been reconstructed

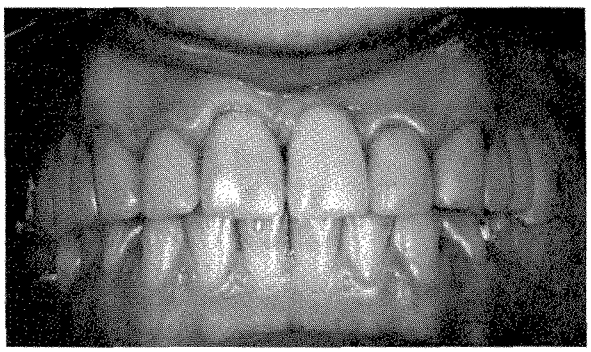

Fig. 1598. Front view of the mouth of a young woman. The upper fixed partial dentures are all acrylic. The bridgework was six years old. (Figs. 1598 to 1602 are of the same case.)

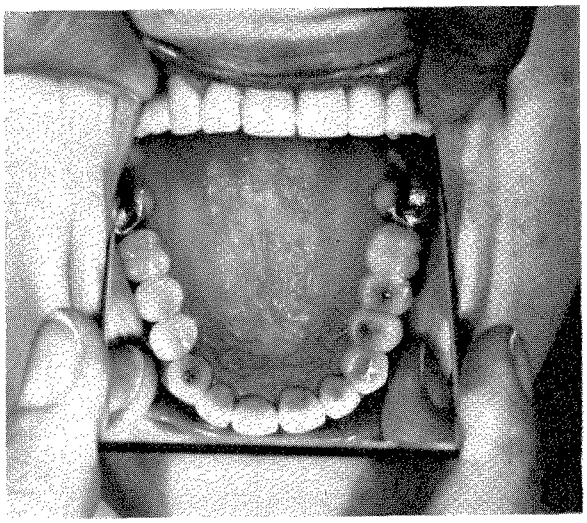

Fig. 1599. Occlusal view of the acrylic bridgework. Observe the abrasion and attrition. The gold copings are exposed in several areas.

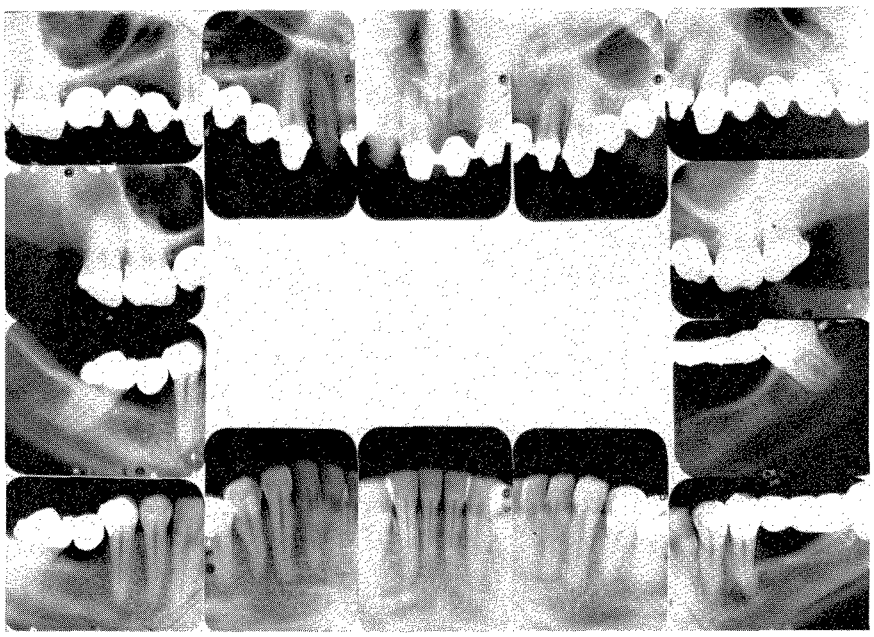

Fig. 1600. Roentgenograms of the teeth showing the all-acrylic upper fixed partial dentures. The acrylic had been processed over gold copings.

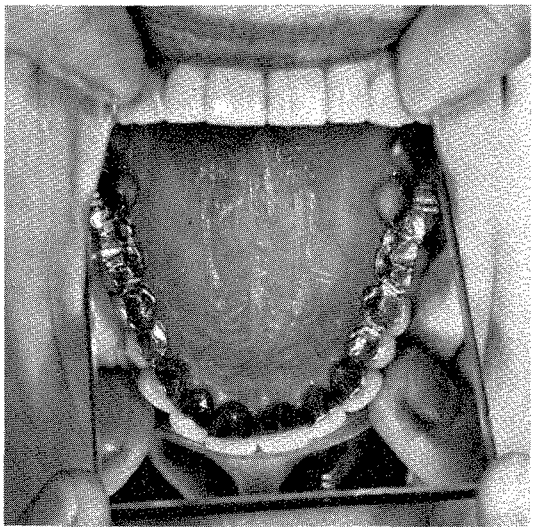

Fig. 1601. Palatal view of the same mouth shown in Figs. 1598 to 1600. The upper acrylic bridgework had been replaced by bridges with gold occlusal and lingual surfaces. This is a year after insertion.

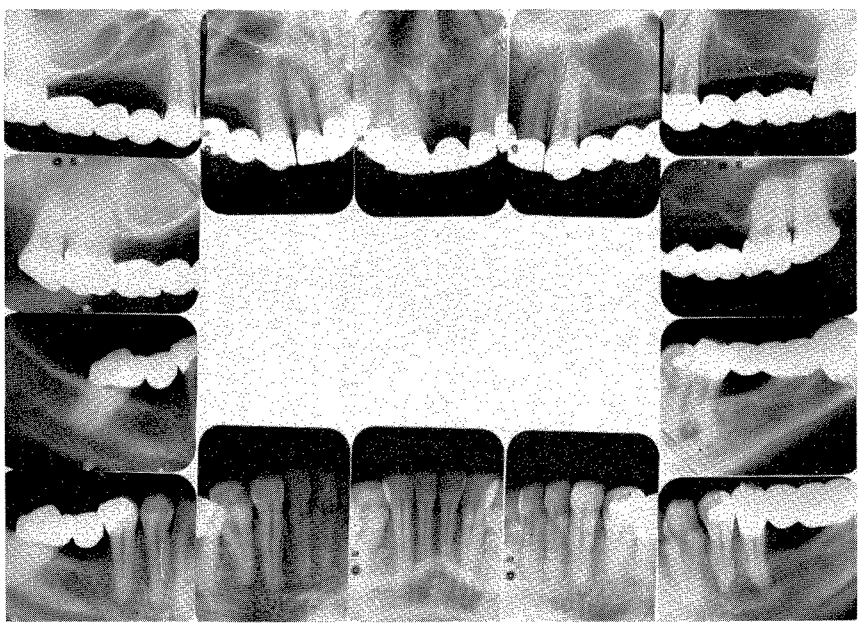

Fig. 1602. Roentgenograms of the new bridgework.

in 1945. There were nine remaining upper teeth. The case was similar to the previous one except that there was one more right upper molar and a right cuspid present. Although the mechanics in this case will not be discussed, the wear on the plastic occlusal surfaces is very evident in the photographs. In 1951 the upper teeth were reconstructed. This time the occlusal surfaces were constructed of gold while incisal tips of acrylic were maintained. These tips did not seem to be subjected to severe abrasion, perhaps because incision takes place for very short intervals of time in functional chewing. Because of the long upper spans, it would most likely have

been stronger mechanically to have included two upper right and left molars in order to divide the occlusal load better. (Figs. 1598 to 1602.)

GOLD VS. PORCELAIN OCCLUSAL SURFACES

Gold occlusal surfaces permit a certain amount of wear to take place that is undoubtedly beneficial. The hard surfaces of artificial teeth that are made of high-fusing porcelain, when opposed by natural teeth, cause the natural teeth to become abraded at a much faster rate than the porcelain teeth. Because of this, if porcelain teeth are used for partial or full dentures, it is safer if the antagonistic teeth are made of this same material. Gold occlusal surfaces should oppose natural teeth or surfaces of the same material. Actually, unless a patient's vocation demands it, all-porcelain posterior teeth with porcelain occlusal surfaces should be avoided in any mouth. The porcelain is too hard and too rigid. Breakage is frequent, and the natural abrasion that should take place is absent. In addition, it very often becomes necessary to remove too much of the natural tooth crown to allow for the thickness of the porcelain surfaces.

Case 11

In 1950 a 32-year-old woman came with an occlusal problem. She complained of her inability to masticate properly and of discomfort in her interocclusal relationship. Her upper teeth had been covered completely by porcelain jacket crowns. There were fourteen units in all that included two four-unit porcelain coping bridges. The lower posterior teeth had also been covered by porcelain jacket crowns except for the lower six anterior teeth. The work had been completed only two years previously, yet several jackets had already fractured. Infections were present, and the interocclusal contact position was incorrect. The soft tissues were swollen and inflamed. A careful analysis disclosed occlusal disharmony. (Figs. 1603 and 1604.)

ALL-PORCELAIN POSTERIOR OCCLUSAL SURFACES

Where porcelain jacket crowns cover all the posterior and some of the anterior teeth, the mandibular relational positions are usually incorrect. This is because the porcelain technicians are very specialized and usually construct small or large individual bridges. They are not generally called upon to coordinate an entire occlusion in porcelain. This is a very difficult mechanical procedure. Besides the mechanical problems, there are others that include abrasion, breakage, repair, and cost, which make all-porcelain occlusal surfaces undesirable. (Refer to Figs. 582 to 584.) Even in the case of removable partial dentures, many dentists prefer gold occlusal surfaces to be opposed by surfaces of the same material because the rate of wear is closer to that of the natural teeth.

PORCELAIN BONDED TO METAL

While on the subject of porcelain jacket crowns, porcelain bonded to metal must be mentioned. Ever since porcelain was discovered and used in dentistry,

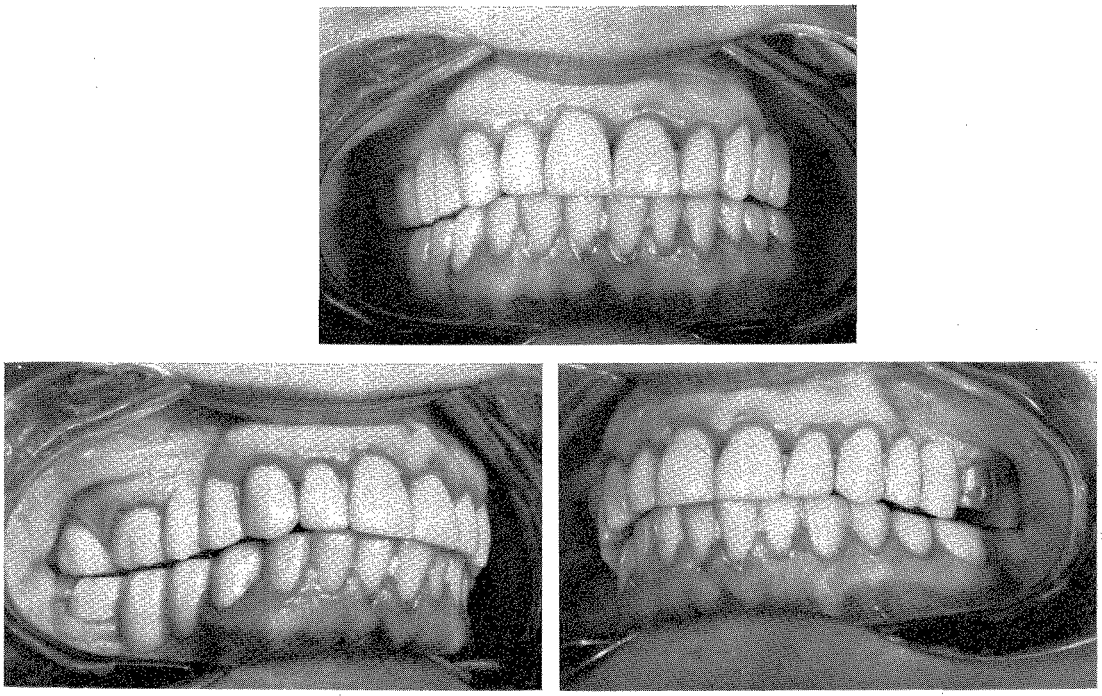

Fig. 1603. Three views of the mouth of a 32-year-old woman. Almost all of the teeth were covered with porcelain jacket crowns. (Figs. 1603 and 1604 are of the same case.)

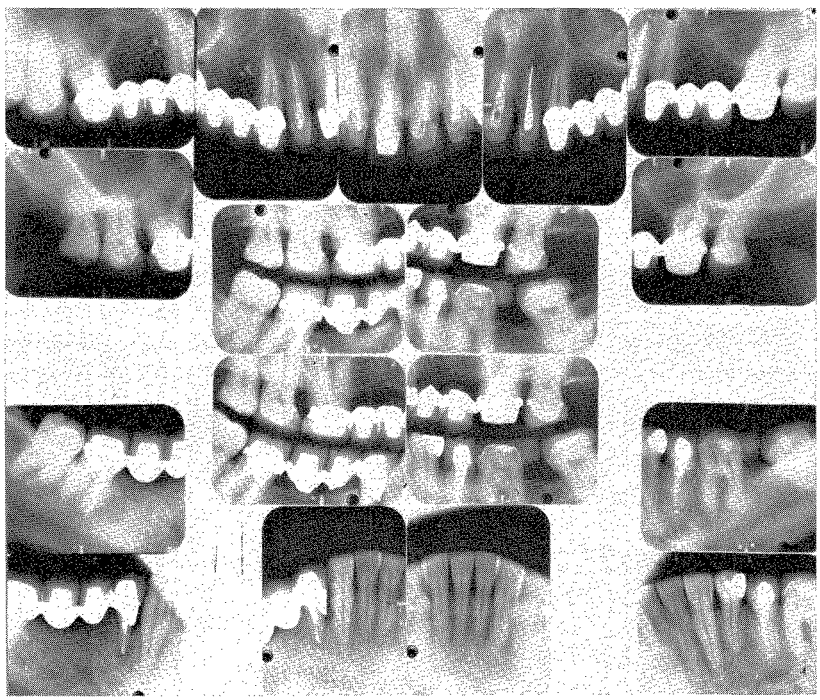

Fig. 1604. Roentgenograms of the teeth of the patient whose mouth is shown in Fig. 1603. (Read text.)

it has been acknowledged to be a superior material and has been adapted to all types of restorative dentistry. Its limitations have been due to the difficulty in handling the material and its tendency to fracture when subjected to occlusal stresses. Experiments, attempting to bond it with metal, have continually been performed and within the past decade have attained recognizable status by several manufacturers. The material is being extensively advertised by some laboratories, but even these advise caution when it is used with fixed restorations involving long spans. For short spans, the risks are not as great.

The failure lies in the possibility of the material fracturing and in the inability to repair it if this should take place in an extensive fixed partial denture. Its abrasive action on all materials with which it comes in contact has been mentioned previously. In addition, the abutment teeth must be bulky enough to permit their reduction to the degree that will allow for an adequate thickness of the metal coping plus the porcelain. Because of the background of metal, color presents another problem, but good progress is being made in this area. As an increasing number of bridges of porcelain bonded to metal are being inserted, the clinical evidence of success and failure will be compared and evaluated better.

Case 12

The following thirteen-unit upper fixed partial denture was inserted in 1957. There were six abutment teeth, including the right second molar, cuspid, central and lateral incisors, left cuspid, and second molar. A lug extended from the right cuspid and set in a lug rest in the right lateral incisor. Bridgework such as this requires great optimism to undertake. It cannot be recommended as a practical routine procedure because it is very likely to fail. When this takes place, the dentist is placed in an embarrassing and unremunerative position. The more practical procedure would have been to splint all the anterior abutments as a six-unit splint while using the two molars as posterior abutments for an upper removable partial denture. Precision attachments would have been the retainers of choice. (Figs. 1605 to 1607.)

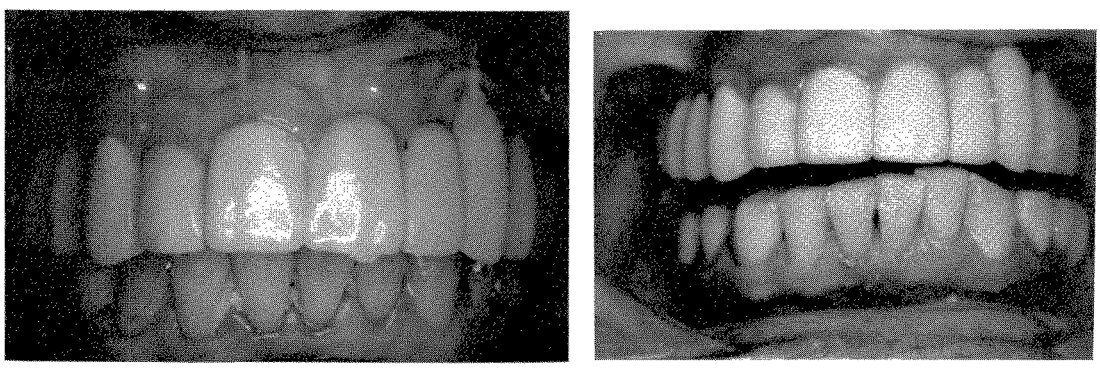

Fig. 1605. Two views of the mouth of a middle-aged woman who had a thirteen-unit upper fixed partial denture made of porcelain bonded to metal. Actually it is constructed in two parts joined by a lug and a lug rest. (Figs. 1605 to 1607 are of the same case.)

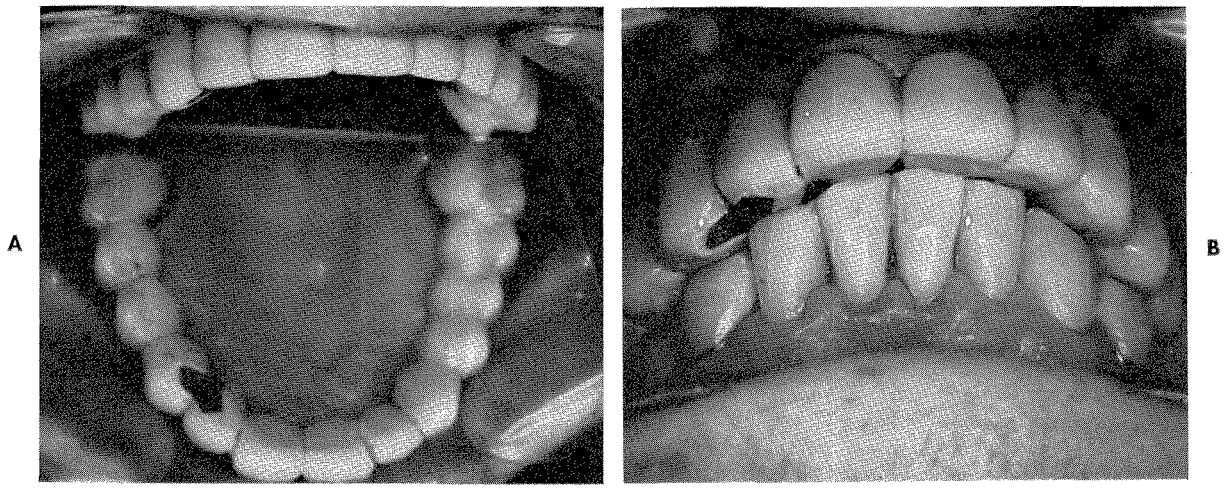

Fig. 1606. A, Palatal view of the upper porcelain bonded-to-metal bridgework. A lug rest connects the upper right posterior and anterior segments. **B,** Large vertical and horizontal overbite is shown here.

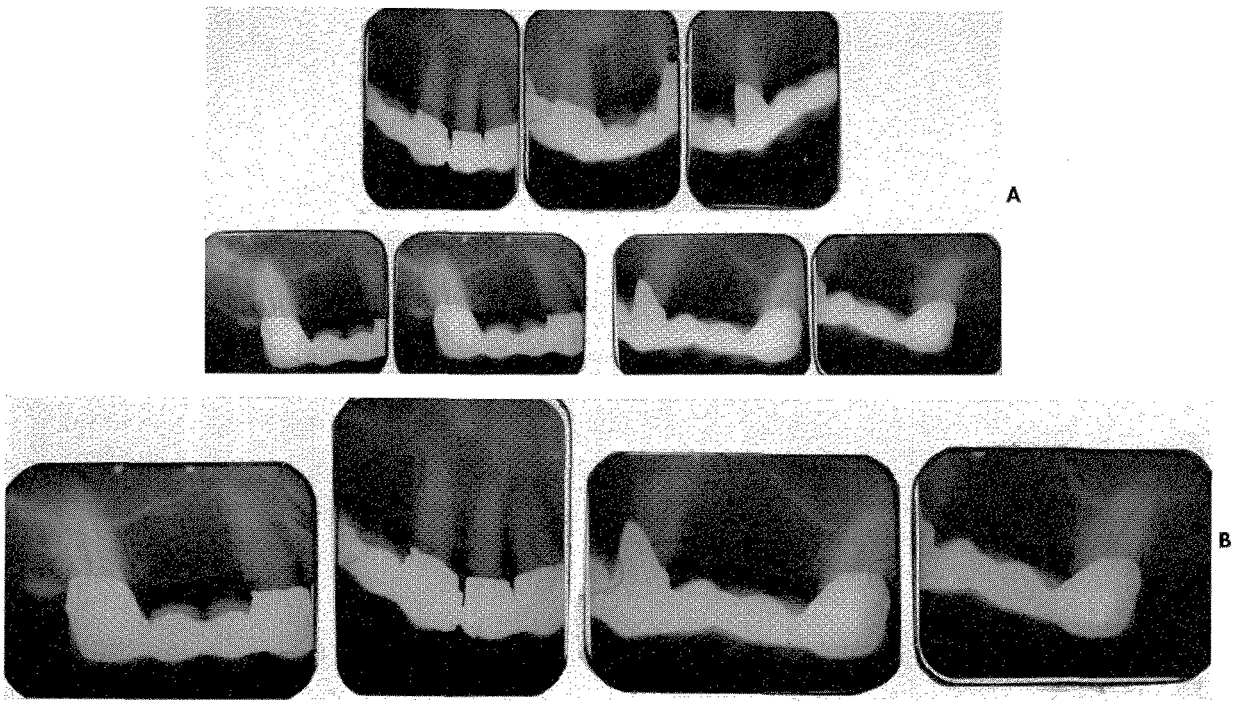

Fig. 1607. A, Roentgenograms taken in October, 1963. The prosthesis is now six years old. Observe the caries in several teeth and the apical infection (see **B**). **B,** Close-up to more closely reveal the caries in the right cuspid, right lateral incisor, left cuspid, and left molar. Although this may be due to shrinkage of the metal collar when the procelain is being bonded to it as described in the text, it can also be due to the patient's habit of sucking lozenges day and night.

PORCELAIN BONDED TO METAL—DIFFICULTIES OF CONSTRUCTING THE METAL COLLAR

Another factor that must be considered in working with porcelain bonded to metal is the contraction of the metal in casting and in bonding the porcelain to it. This permits leakage around the shoulders of full crowns because of the loss of some of the collar. To counteract this, it becomes necessary to overextend the collar of metal so that when the porcelain is bonded to it, the remaining collar is sufficiently wide to enable it to encompass the root surface immediately below the free margin of the gum. This also applies to gold veneer crowns, but not to the same extent. The gold collars are usually adequate when the initial try-in is made. Later on, when the plastic is cured and the crown finished, some of this metal collar may be lost. The dentist is not always at fault for this occurrence. If there is a definite collar to begin with that is slightly longer than the intended final collar, the anticipated shrinkage in processing is allowed for, and the final result will at least be adequate. Should the final crown have a collar that is too long, it can always be reduced.

STANDARDS OF PERFORMANCE

The physician who performs in the hospital under constant scrutiny of his peers is compelled to be alert to change. His records are open to review. If the results from his methods of treatment are below standard, he is aware that he will be subject to some form of discipline. He must perform in good conscience. He has the added compulsion to meet standards set by the hospital staff.*

Once the dentist receives his degree and begins practice, he becomes the sole judge of what he does within the confines of his own office. No one is able to examine the type of dental service that he renders to his patients. In this respect group practice is better because it provides criticism. Although the great majority of patients receive good dental services, still the temptation to perform tasks that would be subject to criticism were they to be examined by others is ever present.

The entrance of the younger patients into high schools and colleges and from there into the military service exposes a great deal of below-standard dental service. For this reason many unsuspecting patients have been alerted, and by the same token it has been rewarding for the conscientious dentists whose patients were often informed of the good quality of their dentistry. The dentist sets his own standards. His records are rarely exposed. He should examine his conscience at frequent intervals to be certain that he is doing his utmost and not coasting along on his personality or reputation. He should be cognizant of the latest developments in his field.

Case 13

Past history

Early in 1956 a 60-year-old woman came for dental treatment. Her regular dentist, who had treated her for many years, had retired. She had been given to

*Ryan, Edward J.: Contra-angles, D. Digest **68**:40, 45, 1962.

understand that her teeth were beyond saving and that full dentures would soon have to be worn. She was unwilling to accept this prescription and continued to have what remained of her natural teeth constantly repaired.

This is a familiar story with many patients. It must not be assumed that these patients are unwilling to make the necessary sacrifices to retain their natural teeth. It is their privilege to make their own decision after a plan is presented with a detailed explanation of what the oral reintegration will require. Very often a patient will rebel against wearing full dentures and will be quite willing to retain his natural teeth providing he has confidence in the ability and integrity of his dentist. The greater the patient's confidence, the larger the dentist's responsibility.

There are various explanations as to why people decide to retain their natural teeth, regardless of how few. With older patients, it may be that they wish to retain them for psychological reasons. Others of a different age group are convinced they are able to chew more comfortably and efficiently with their natural teeth, whereas a third group retain them for esthetic reasons.

Present condition

When the patient under discussion was first examined, there were only eighteen teeth remaining, nine in each arch. Of these, four lower teeth and one upper tooth required removal. All the eight remaining upper teeth and two lower teeth were nonvital. Necessary explanations were given, and the patient understood the questionable prognosis of the proposed treatment clearly. She stated that she was fully prepared to accept dentures when the time arrived but would gamble for the slimmest chance of saving her natural teeth. Treatment was initiated in September, 1956.

Treatment

During the first stage of the rehabilitation specialized periodontal treatment was given, and endodontic treatment was instituted. Healing took several months. The articulators used in the reconstruction were the Hanau Model H and the kinoscope. A combination of fixed and removable partial dentures was finally inserted to restore the many missing teeth. Precision attachments were used as the retaining devices. No stressbreakers were resorted to.

Stressbreakers are resorted to infrequently in the construction of removable partial dentures. The limited movement that is afforded by precision attachments that are used as retainers is preferred. Stressbreakers that permit excessive movement of the saddles cause tissue resorption resulting in lack of functional contact in these areas. This is especially so in the case of free-end saddles. If stressbreakers are used, the amount of movement should be controlled. To obtain a precise fit of the saddle, it is important that a detailed mucostatic impression and an additional relational impression to join the fixed and removable parts be taken.

Conclusions

At the time of writing it was five years since the insertion of the final work. The patient was well satisfied and happy that she elected to retain her teeth. The

Text continued on p. 817.

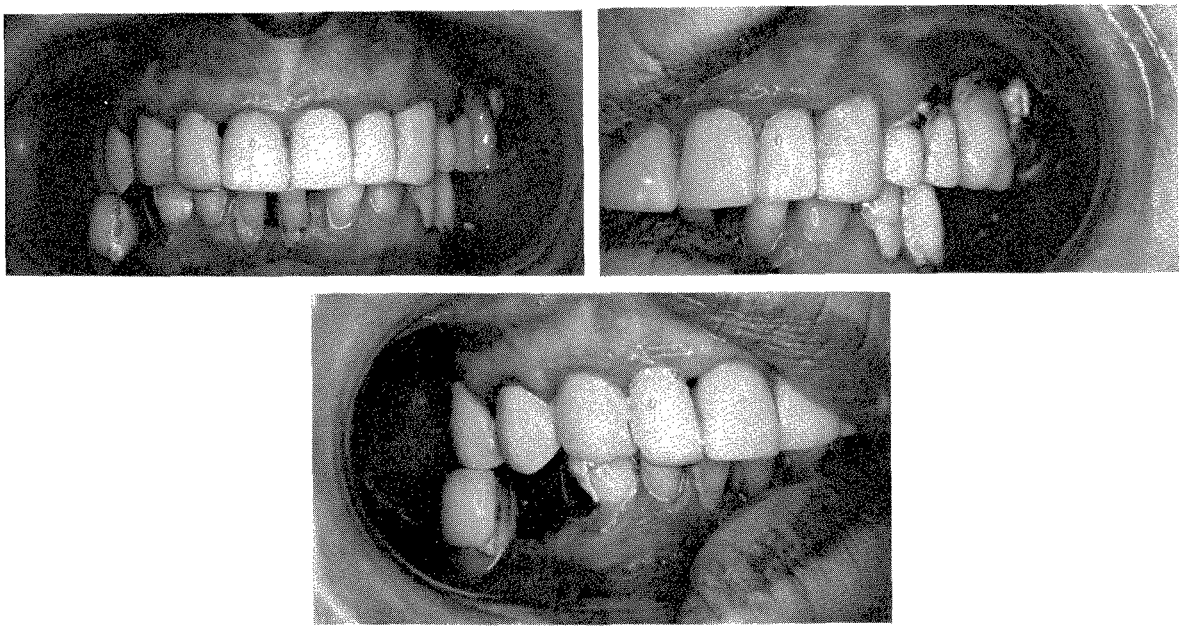

Fig. 1608. Three views of the mouth at the start of treatment. These were taken in May, 1956. (Figs. 1608 to 1622 are of the same case.)

Fig. 1609. The lower temporary work consisted of an anterior eight-unit splint supported by five natural teeth and a lingual bar to supply the posterior missing teeth. The upper teeth have been prepared for full crowns and are also shown here.

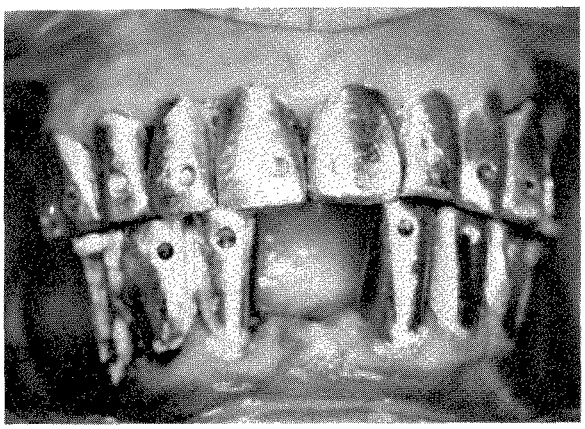

Fig. 1610. Both low-fusing metal transfers and silver cast crowns were used to register the centric relation and vertical dimension. In this illustration the silver crowns are being used. The holes in the crowns enable the operator to check the fit.

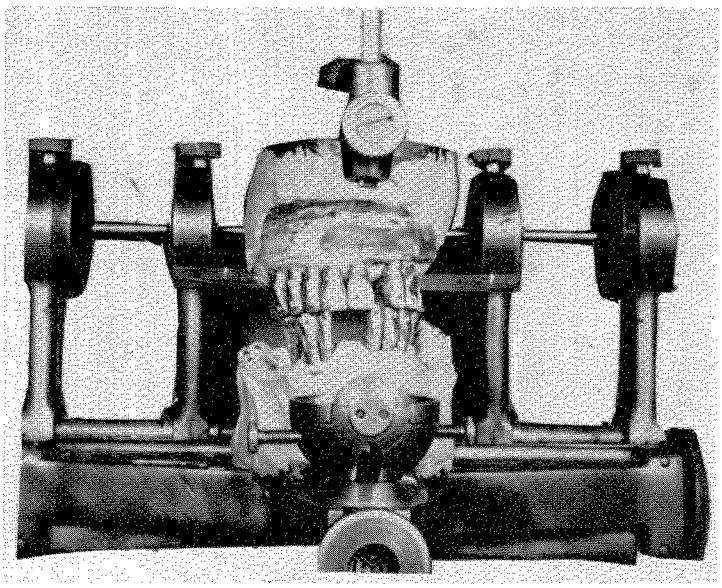

Fig. 1611. The Hanau kinoscope and the Model H articulator were used in the reconstruction. The silver crowns which were used as transfers may be seen in this illustration. They are removed and the final castings waxed up in order to coordinate the interocclusal relationship at one and the same time.

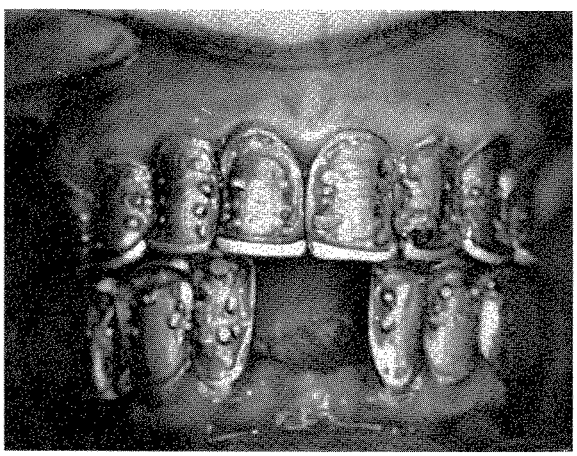

Fig. 1612. The final individual crowns are first constructed and tried in. Vertical dimension and centric relation are determined. Then a new set of wax records, face-bow, etc. are taken.

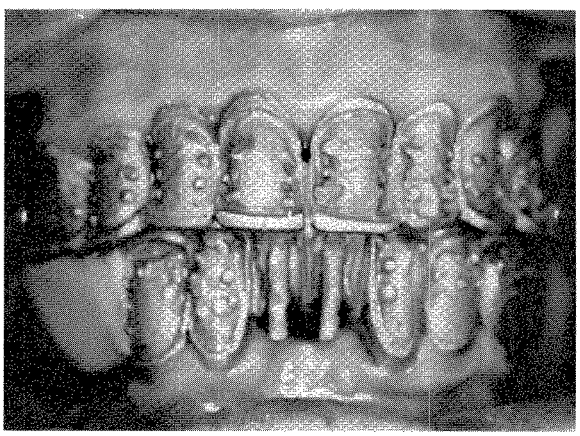

Fig. 1613. The cast crowns are soldered together and the final work proceeded with. Then this work is tried in the mouth, and once again vertical dimension and centric relation are checked, and new records are taken.

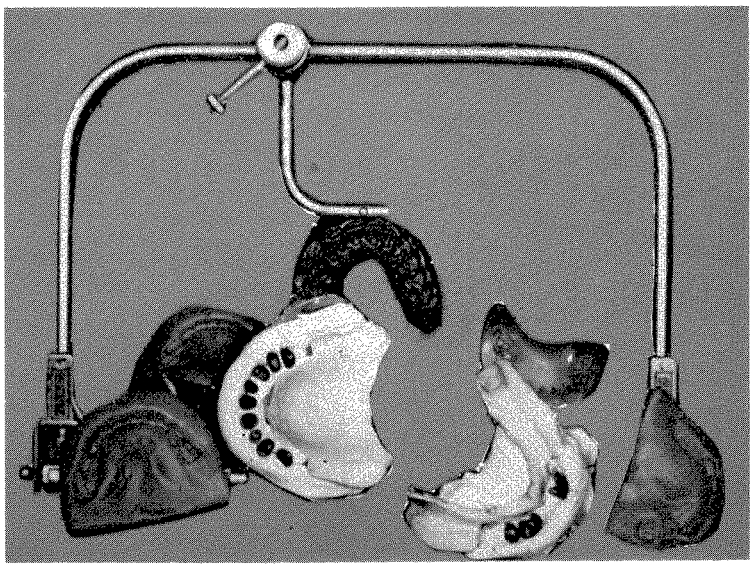

Fig. 1614. This is what the records usually consist of: a face-bow, upper and lower plaster impressions, and several wax records. They will determine the new work casts and the mounting.

Fig. 1615. The final try-in of the completed work. The veneers are only in white wax. Once again centric relation is checked. If all the essentials are considered to be correct, the work is completed.

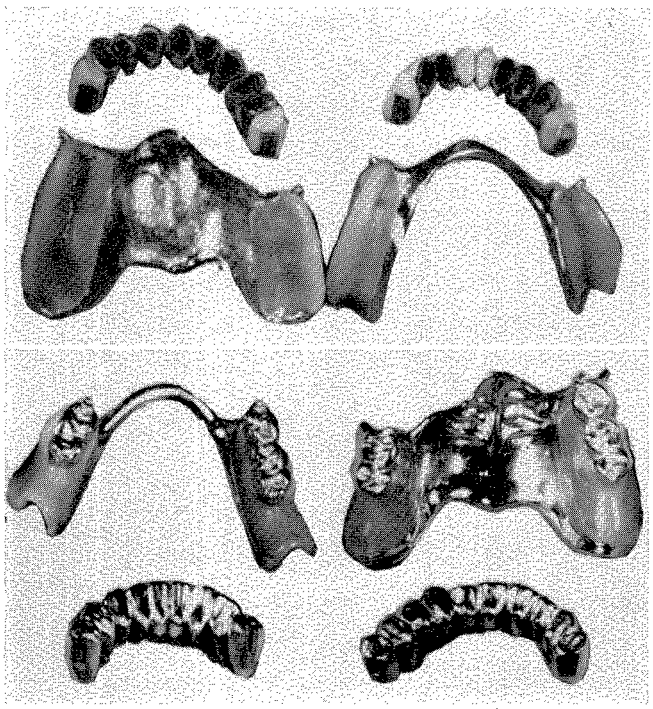

Fig. 1616. Two views of the completed prostheses. Both the upper and lower fixed splints contained one throw-off at each end. The female boxes of the precision attachments were placed in these throw-offs.

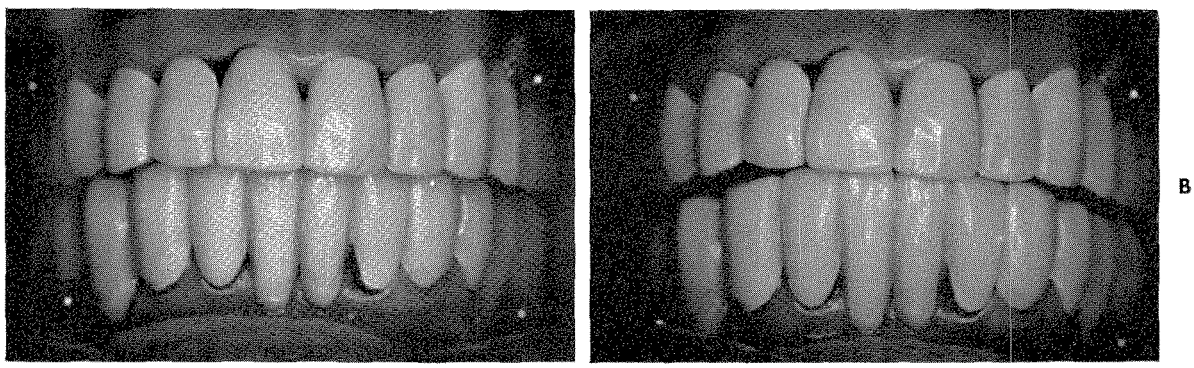

Fig. 1617. A, Completed work, front view, centric occlusion. **B,** Completed work, front view, protrusive bite. These were taken in April, 1957. The entire work took ten months to complete. This included the periodontal resections and one summer vacation.

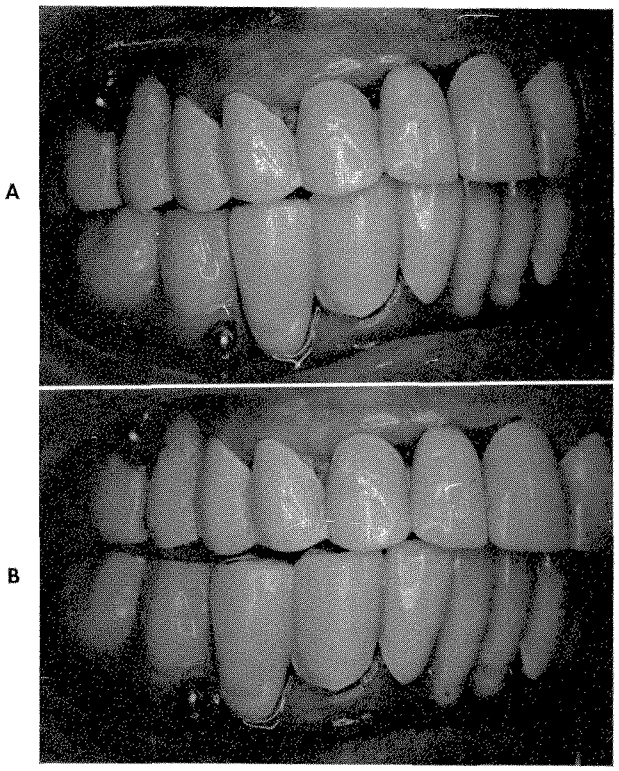

Fig. 1618. A, Completed work, right side, centric occlusion. **B,** Completed work, right side, working bite.

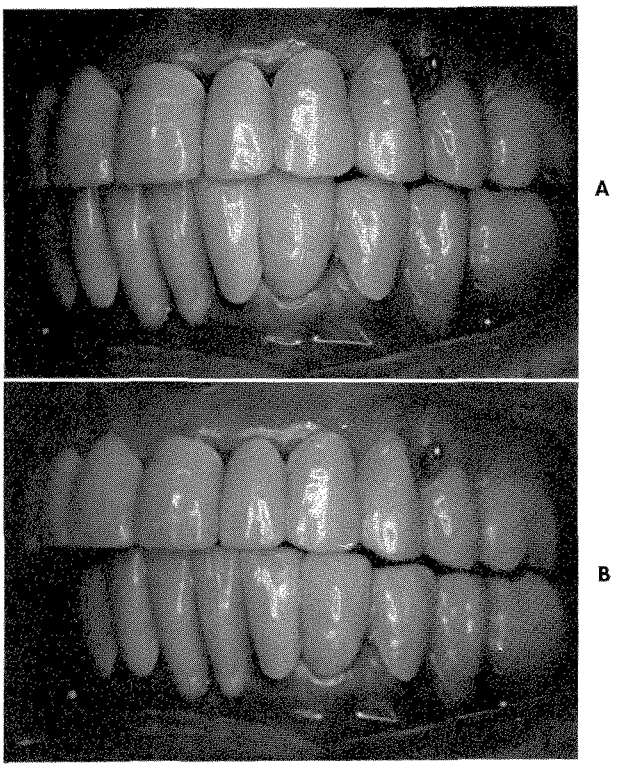

Fig. 1619. A, Completed work, left side, centric occlusion. **B,** Completed work, left side, working bite.

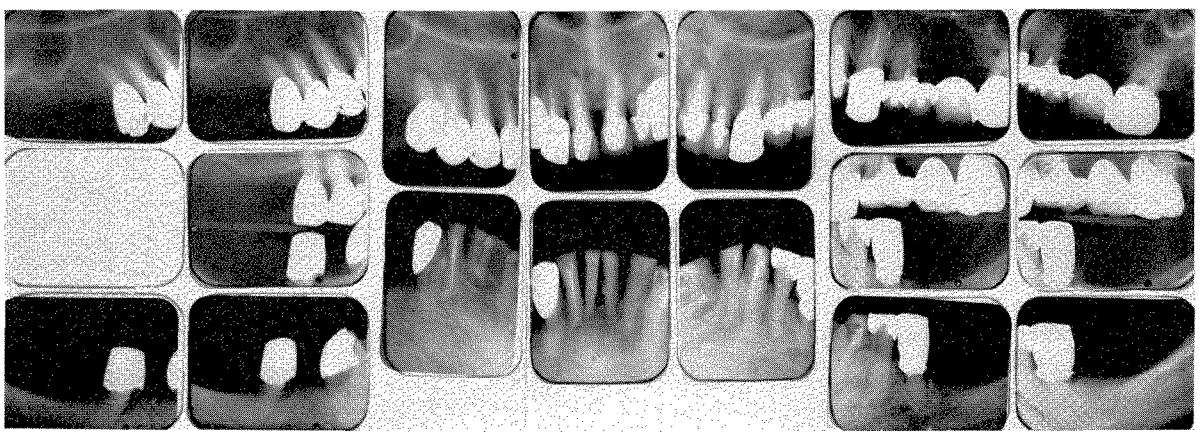

Fig. 1620. Roentgenograms at the start of treatment. These were taken on April 9, 1956.

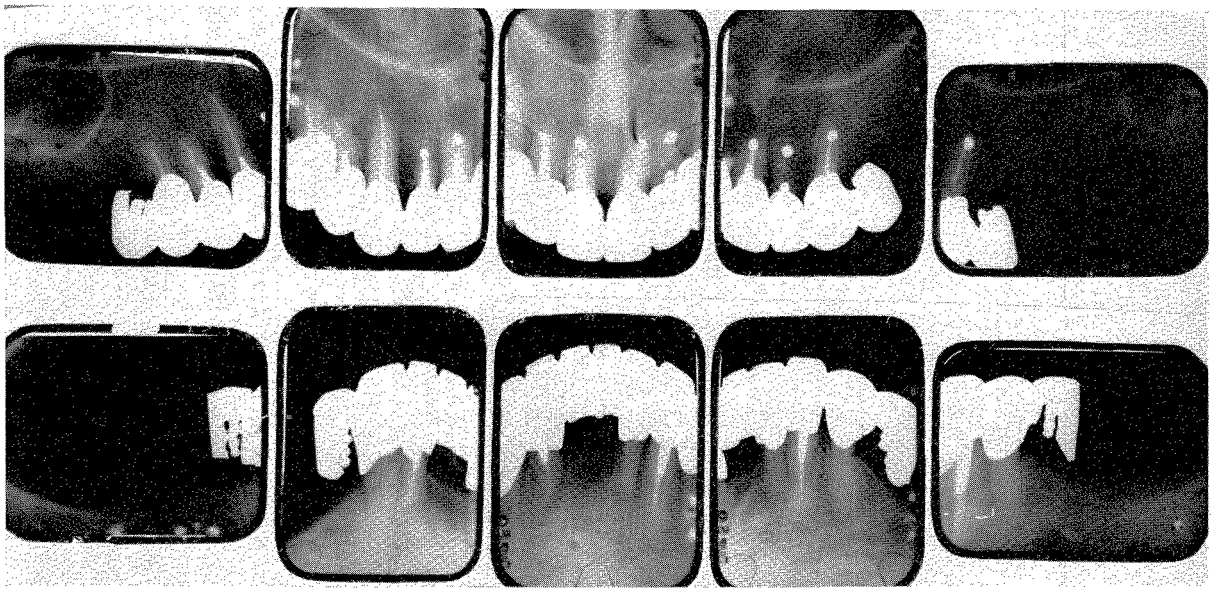

Fig. 1621. Roentgenograms taken in March, 1962. This was over four years after treatment was completed.

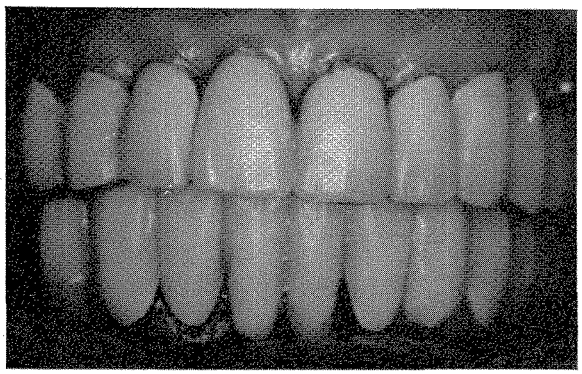

Fig. 1622. Anterior view of the mouth taken in 1962. This was four years after completion.

original cause of the deterioration in this case was most likely caries rather than periodontal pathology.

The retention of so many devitalized teeth may be questioned. However, would upper and lower full dentures have been more satisfactory? Had the lower remaining teeth been removed, it would have been necessary to remove the upper natural teeth because they would have been too traumatic for the lower ridges. It would have been possible to retain the lower teeth and remove the upper teeth. In retrospect, with no pathology about the remaining teeth, the patient's gratitude fully justified the chosen method of treatment. There seems to be no reason why the retained teeth should not continue to give efficient service for several years to come. (Figs. 1608 to 1622.)

SYSTEMIC DISEASE

The effects of many diseases of the body manifest themselves to a greater or lesser degree in the oral cavity. In the disease known as acromegaly, there is a progressive enlargement of the head and face. Any attempt to do large-scale restorative work would be futile. Dental problems associated with various systemic diseases are reported as follows.

DIABETES

Diabetes is sometimes encountered. This condition is marked by sugar in the urine, excessive thirst and hunger, and progressive emaciation. In "sugar diabetes" the body is unable to utilize the carbohydrates in the diet properly due to a failure in the secretion of insulin by the pancreas.* Patients who are afflicted with this malady usually present a complicated dental picture. The teeth and periodontal structures both suffer.

Case 14

In 1956 the dental treatment of a 25-year-old woman who suffered from diabetes for many years was undertaken. She was under insulin therapy and also required psychiatric treatment. This young woman was extremely moody, and the doctor-patient relationship was difficult. Her mouth was small, and access was limited. Because of her illness and neurosis, the teeth had been neglected seriously. A chronic Vincent's infection aggravated the condition. This patient was referred to a periodontist for the treatment of the soft tissues. Anterior gingival resections were performed.

Whether from continued neglect on the patient's part or from a poor reaction to the periodontal surgery that was superimposed upon a background of diabetes, in April, 1958, the upper four incisors had to be removed. Although the initial treatment began in late 1956, the periodontal treatment took place in the latter part of 1957 and extended until April, 1958. It is also possible that her oral tissues were adversely affected by the medication necessary to combat her disease. The posterior teeth were restored by means of gold inlays and full coverage where necessary.

In July, 1958, an upper anterior fixed partial denture was inserted. This was attached to the cuspids and first bicuspids and contained eight units. No further report can be given because the patient left New York. (Figs. 1623 to 1631.)

Discussion

Several serious factors enter into a case of this nature. These patients should be treated as conservatively as possible because of the systemic background. In this case only good conformative dentistry was performed with no disturbance of the original vertical dimension.

*Webster's new collegiate dictionary, ed. 2, Springfield, Mass., 1956, G. & C. Merriam Co., Publishers.

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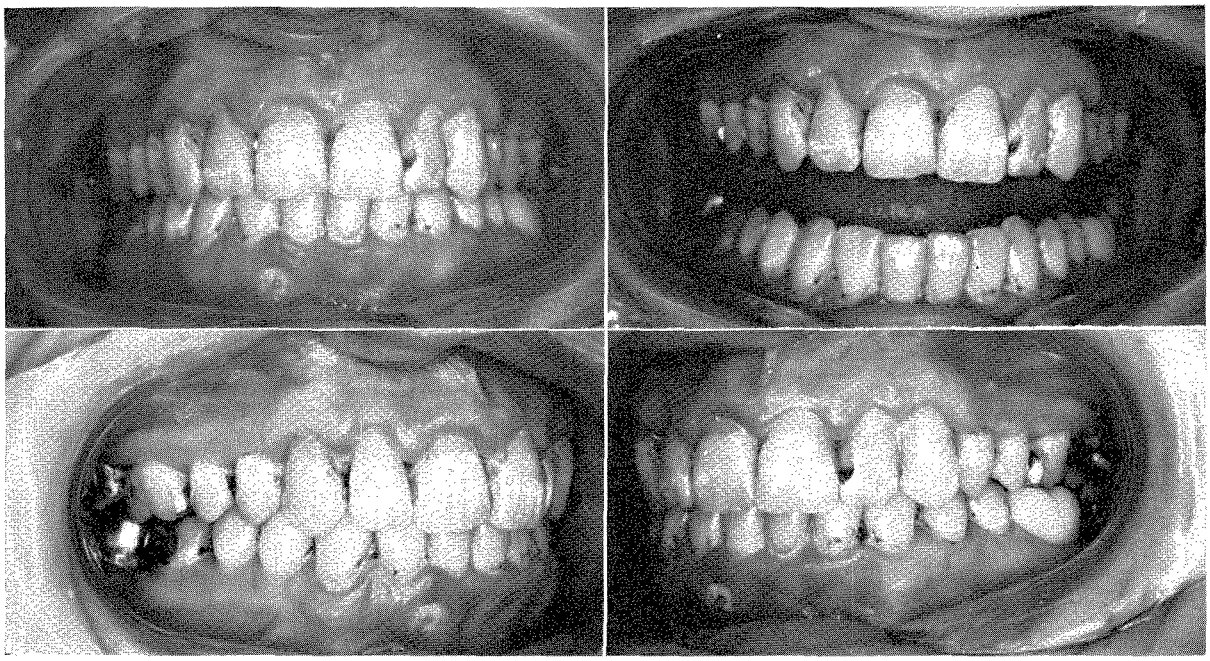

Fig. 1623. Four views of the mouth of a 22-year-old woman suffering from diabetes. These were taken in May, 1956. (Figs. 1623 to 1631 are of the same case.)

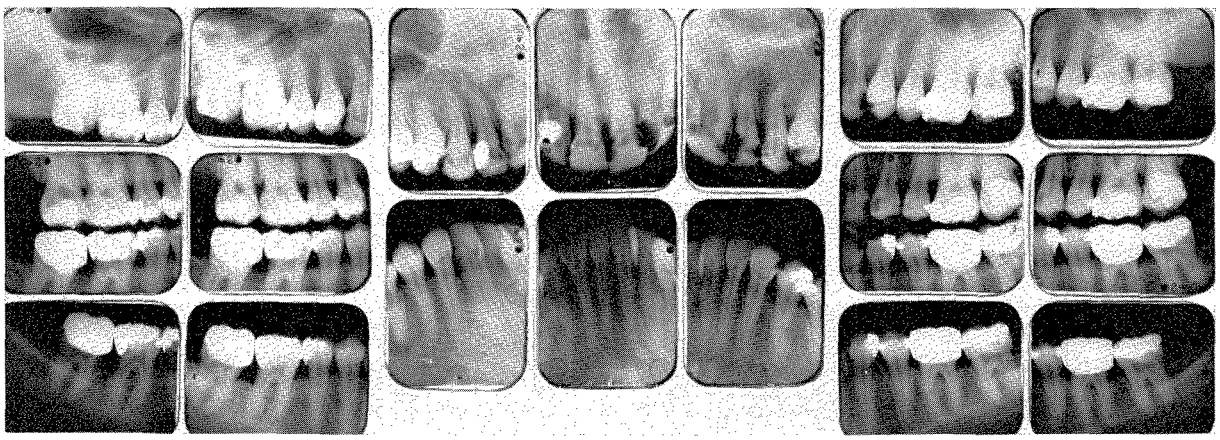

Fig. 1624. Roentgenograms taken in August, 1956.

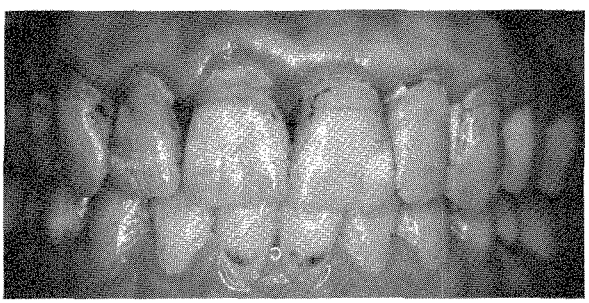

Fig. 1625. Front view of the case shown in Fig. 1623. This was taken a year later, after periodontal treatment.

Fig. 1626. Roentgenograms of the upper anterior teeth taken in April, 1958. The lateral incisors were devitalized. The central incisors lost a great deal of alveolar bone. This was after periodontal gum resections had been performed.

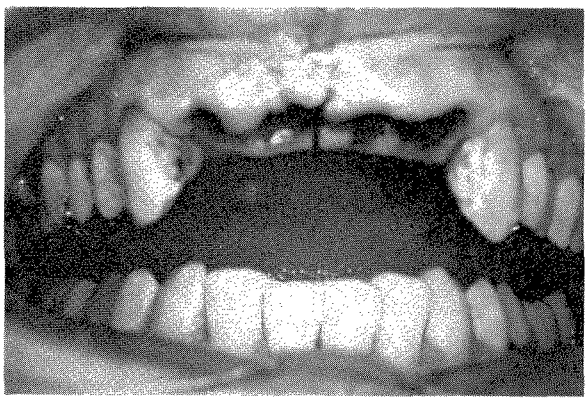

Fig. 1627. In April, 1958, the upper central and lateral incisors were removed, and a temporary remo able partial denture was inserted.

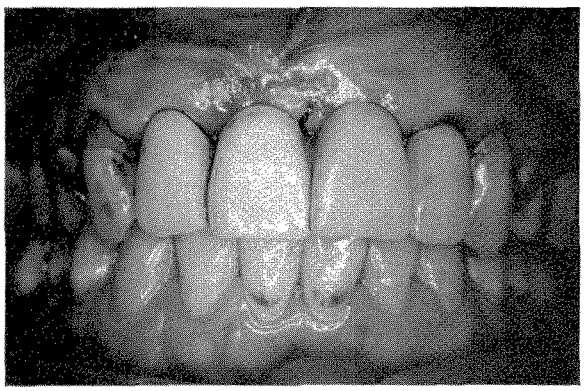

Fig. 1628. The removable partial denture is in position. This was an immediate insertion.

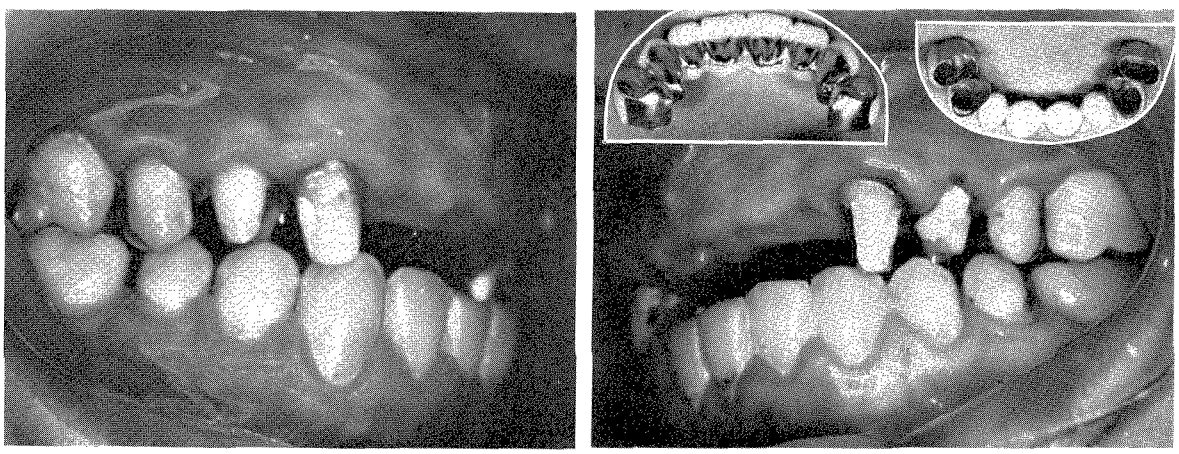

Fig. 1629. The left cuspid had to be devitalized. The four abutments, namely, the first bicuspids and the cuspids, were deeply involved in caries, and there was very little left of the clinical crowns. The bite was close and unfavorable. The final bridge is about to be inserted. These photographs were taken in July, 1958. In the right photograph, two views of the final fixed partial denture are shown in the upper inserts.

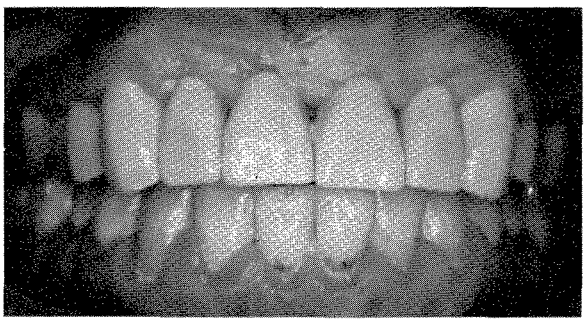

Fig. 1630. The completed case is shown here. This was finished in August, 1958.

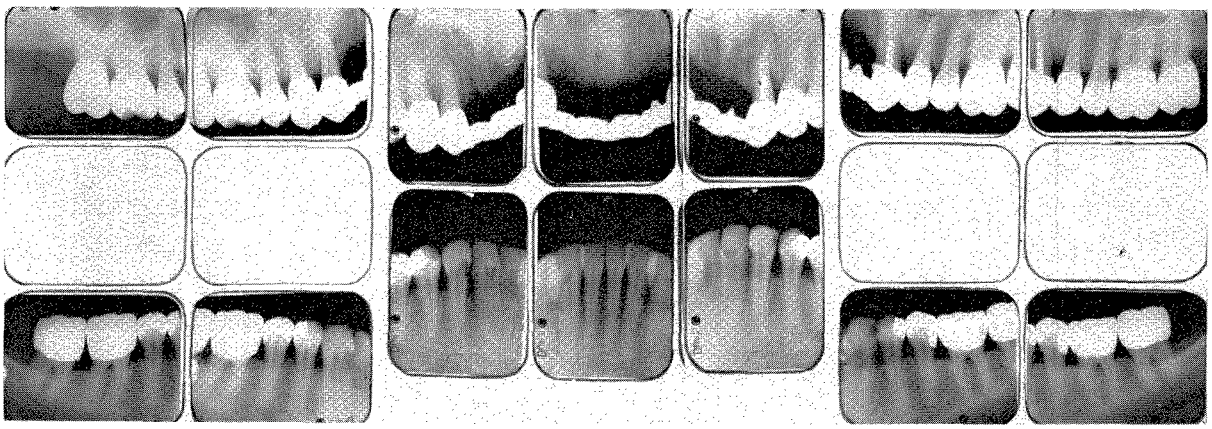

Fig. 1631. Roentgenograms taken in August, 1958. The work was completed at that time.

In the treatment of the periodontal tissues, unfavorable reactions can be expected and, if great care is not exercised, teeth may have to be sacrificed. With this in mind, radical periodontal techniques should generally be avoided. If surgery is undertaken, the medical doctor should be consulted first and his advice heeded.

In diseases such as diabetes, the health of the oral tissues is below normal. Dental restorations are placed in subnormal physiological environment, and their maintenance requires frequent checkups and constant attention. When the disease occurs early, the parents should be made familiar with the problem. Sympathetic understanding must be given to these patients, even though their cooperation may fall far short of what we expect.

CORONARY DISEASE

Case 15

In 1947 the case of a 50-year-old man was reported. His lower right teeth had been splinted in an effort to retain a lower right first bicuspid. Part of the treatment consisted in eliminating the severe wedging action of an upper first bicuspid.*

*Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., p. 984.

Text continued on p. 824.

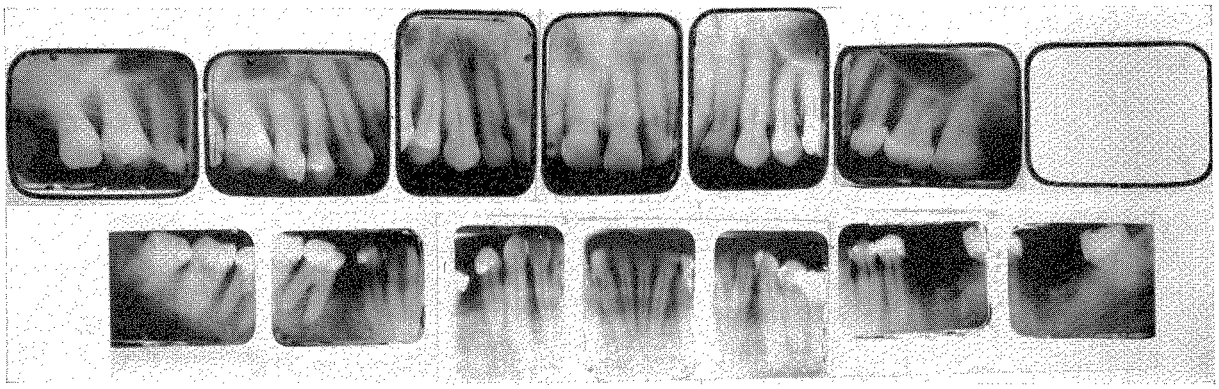

Fig. 1632. Roentgenograms taken in 1932. The patient was then 35 years old. (Figs. 1632 to 1637 are of the same case.)

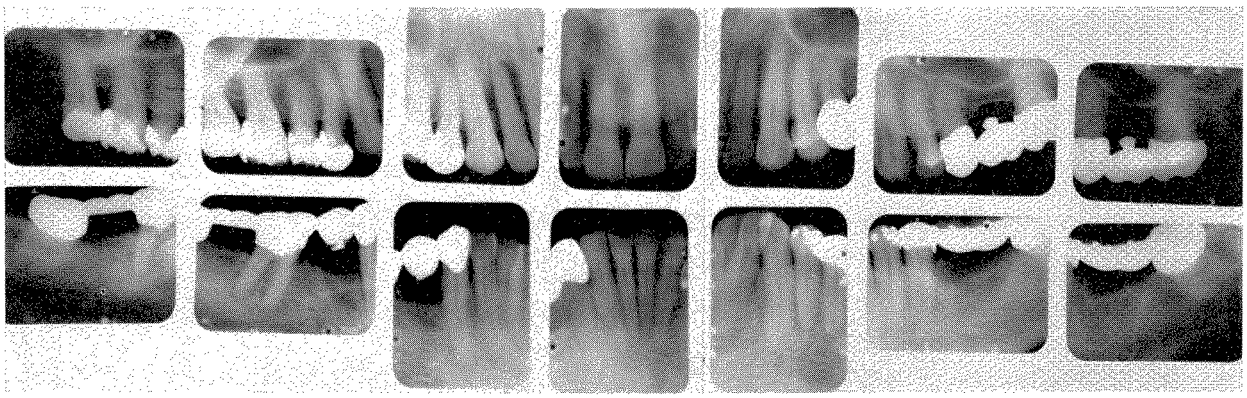

Fig. 1633. Roentgenograms taken in 1950. The patient was then 53 years old. Observe periodontal pathology associated with the upper right lateral incisor. (Read text.)

Fig. 1634. Photograph of the mouth taken in 1950 showing the unhealthy condition of the soft tissues. The upper right lateral incisor was removed in 1950, and a fixed bridge was inserted which may be seen in this photograph.

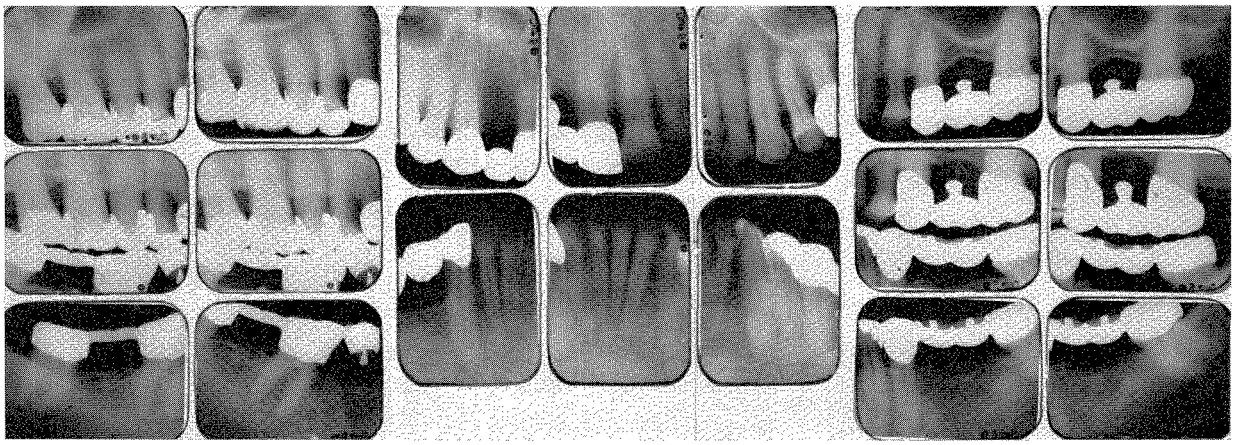

Fig. 1635. Roentgenograms taken in 1962. The patient was 65 years old.

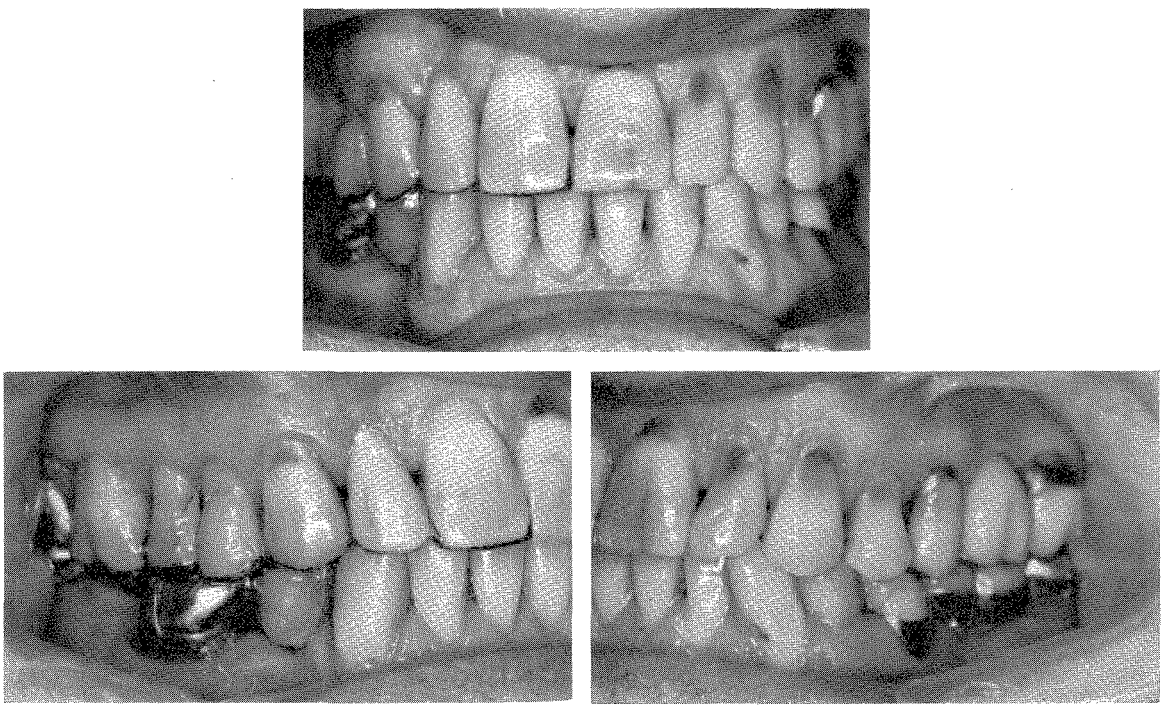

Fig. 1636. Three views of the mouth of the patient shown in Figs. 1632 to 1635. These were taken in 1962. Compare the normal healthy gum tissue on the right side with Fig. 1634, which was taken in 1950, just after a coronary attack and a dietary change.

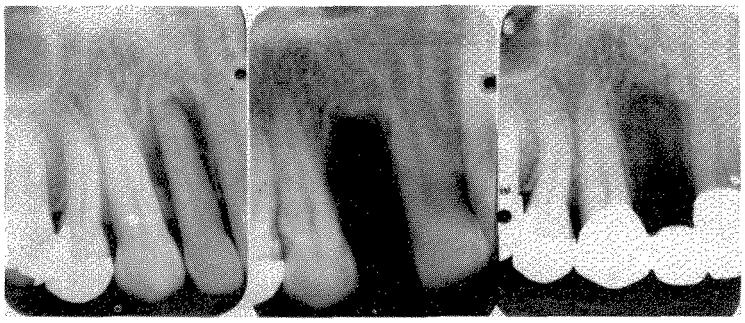

Fig. 1637. Roentgenograms taken in 1950 just before the extraction of the right lateral incisor and after the insertion of the bridge replacing it. The right radiograph was taken a year after the left one. The 1962 radiograph shown in Fig. 1635 reveals good osseous structures.

It became necessary to remove the lower right first bicuspid, but the splint still remained in position. This patient's oral condition was still more interesting because of the following history.

He was first treated in 1932 at the age of 35. His structures were good. Five teeth were missing at that time, but they were replaced by fixed partial dentures, and during the next fifteen years nothing unusual was required. In 1946 a periodontal pocket was observed associated with the upper right lateral incisor.

This patient was afflicted with gout. In 1948 he had a severe coronary attack and was hospitalized for several months. During and after this illness, he was placed on a strict salt-free diet. Before his illness, the oral tissues were in good condition. After his illness and the dietary changes, these same tissues deteriorated rapidly. The periodontal tissues became acutely involved, and two teeth required removal. As time elapsed the rigid diet was modified, and he was permitted many of his former foods. The unhealthy periodontal tissues returned to normal without any special treatment other than regular prophylaxis. Today the teeth are firm, and the oral tissues are healthy.

It is probable that the change in diet that was required after the coronary attack caused the periodontal disease. This took place in a relatively short time and was reversed in an equally short time with the patient's return to his former diet and a more normal life. (Figs. 1632 to 1637.)

Systemic disease has a debilitating effect upon the entire system and can readily manifest itself locally in such an area as the oral cavity. Diseases such as osteoporosis in which there is increased porosity and softness of the bone can exert noxious influences upon the bone structures of the oral cavity. Tuberculosis also has its effects upon the vascular system, and the periodontal tissues may be adversely affected as a result of this disease.

TUBERCULOSIS

Case 16

In 1929 a young woman with normal dental structures received regular treatment. There may have been a slight tendency toward periodontal disease, but it was insignificant. Her 1936 roentgenograms revealed advanced periodontal disease

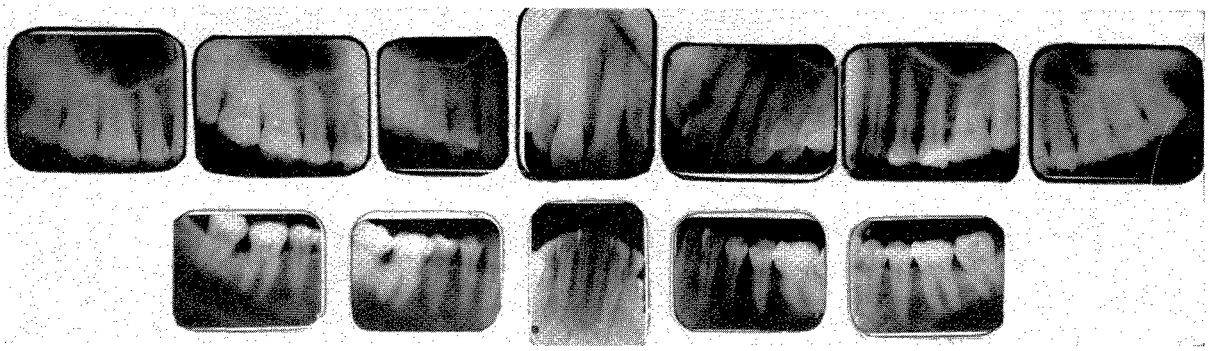

Fig. 1638. Roentgenograms of a young woman. These were taken in 1929 at the age of 29. (Figs. 1638 to 1641 are of the same case.)

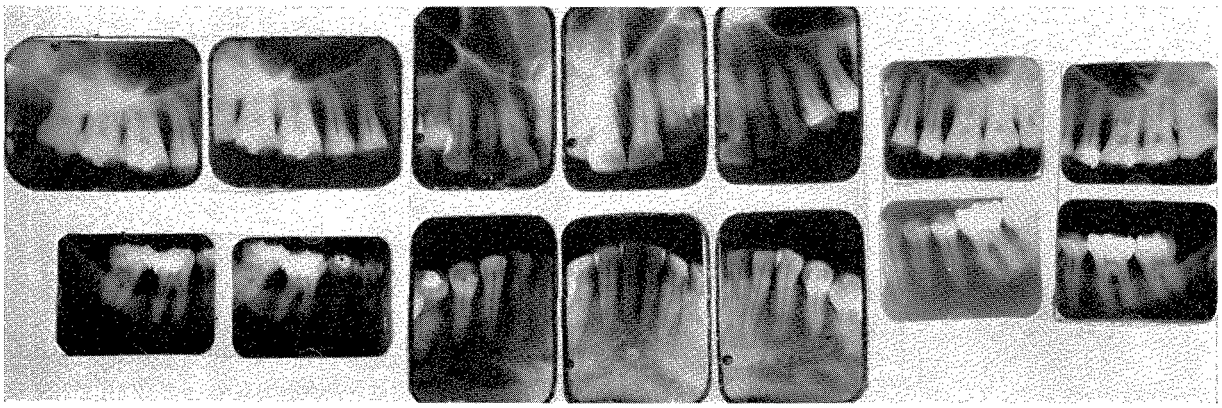

Fig. 1639. Roentgenograms taken in 1936 reveal deep periodontal pathology. (Read text.) The patient was then 36 years old.

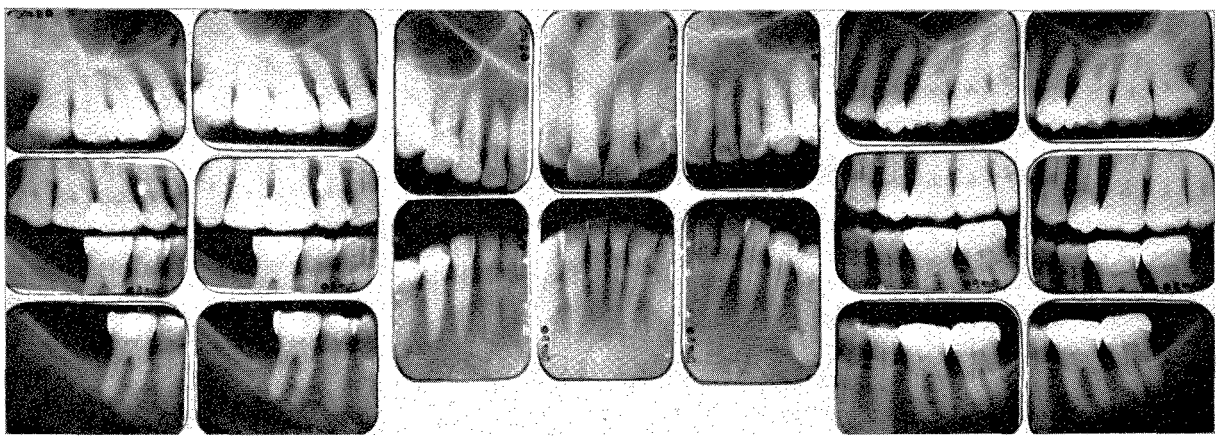

Fig. 1640. Roentgenograms taken in 1962. The periodontal tissues have recovered and are in better condition than in 1936. No special treatment has been given. The patient was then 62 years old.

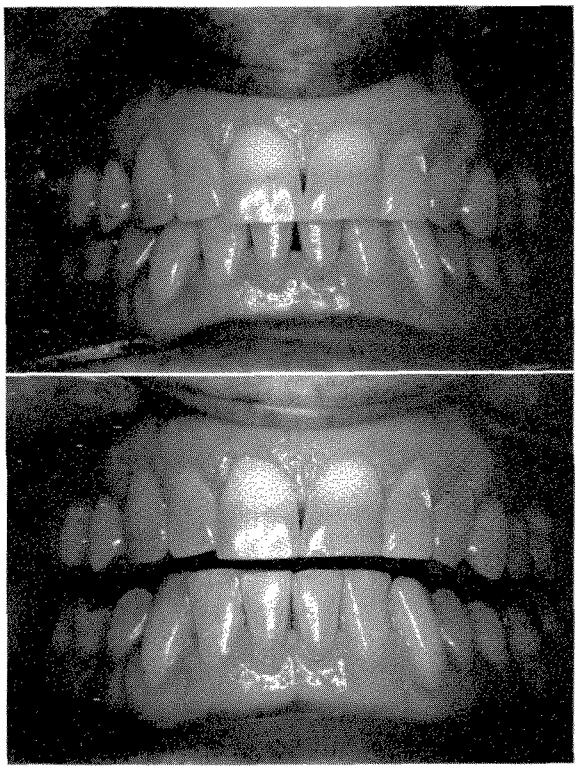

Fig. 1641. Two views of the mouth as it looked in 1962.

and a considerable amount of bone loss. During this period of her life she had contracted tuberculosis and was under careful medical attention in order to eradicate the disease. She was finally declared cured. The 1961 roentgenograms indicate that the severe bone loss had been checked, and other than the loss of the lower right third molar, the periodontal tissues were even better today (1963) than they were in 1936. No specialized gum treatment was ever given. The lower left postapical area in the region of the bicuspid had been diagnosed as a cementoma. The condition was first noticed in 1936. This tooth is still vital. It may have been an effect of the disease. (Figs. 1638 to 1641.)

When systemic disease is recognized and treated successfully, there is the possibility that our dental treatment, whatever its nature be, will survive and continue to be effective. On the other hand, when systemic disease is present, in whatever form it may take, and is unrecognized or not combated successfully, no matter how well dental treatment has been executed, it is under a severe handicap, and its effectiveness is jeopardized.

CEREBRAL THROMBOSIS, PARKINSON'S SYNDROME

The rapid dental deterioration of a patient who suffered from a combination of diseases, among them cerebral thrombosis, Parkinson's syndrome, and idiopathic postural hypertension, was witnessed in 1956 through 1957. As a result of his illness, this middle-aged man lacked control of his oral musculature. This made proper mouth hygiene impossible to execute. Rampant caries combined with in-

flammation of the soft tissues rapidly destroyed otherwise resistant structures. This patient died in 1958.

There are also many unknown systemic factors that manifest themselves locally. Investigations have been made recently on the effects of endocrine dysfunction as a possible etiological factor in cases of progressive marginal periodontitis.*

It has been mentioned previously that the newer drugs, among which are the numerous miracle drugs for the treatment of neuroses, the tranquilizers, anticoagulants, the antibiotics, and cortisone and its related drugs, may prove responsible for some types of periodontal disease and the rampant caries that is sometimes found in the mouths of adults. (Refer to pp. 643 and 644.)

EMBOLISM

Case 17

A man of middle age came for treatment in January, 1959. He had been treated for an embolus in his leg and had been placed on anticoagulant therapy. Tranquilizers were also administered regularly. He maintained that prior to his illness his mouth had always been in excellent condition. Following his illness, his oral tissues deteriorated rapidly, and many teeth had to be removed due to periodontal disease.

Of the twenty-one teeth remaining at his initial examination, three had to be removed because of disease of the soft tissues. Specialized periodontal treatment was instituted, and the occlusion was reintegrated by the insertion of fixed and removable partial dentures. Not long after the prosthesis was inserted the patient succumbed to a coronary attack. More cases of this type should be reported in order to determine whether there is a connection between oral disintegration and the ingestion of the newer drugs that are flooding the market. (Figs. 1642 to 1648.)

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*Kluczna, J., Rozeik, F., and Herrmann, M.: Effects of endocrine disturbances on the periodontal tissues, D. Abst. **6**:599, 1961; Parodontal **15**:32-41, 1961.

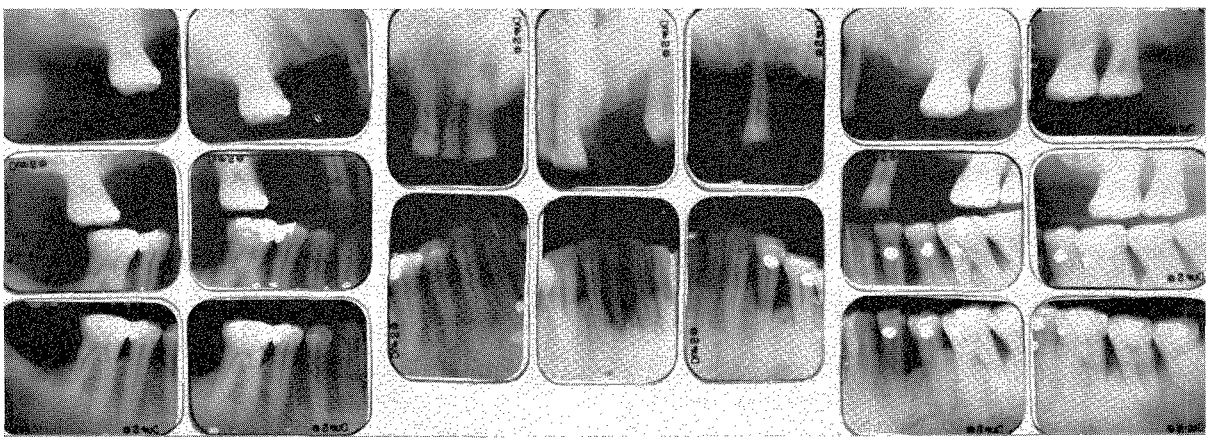


Fig. 1642. Roentgenograms at the start of work. These were taken in January, 1959. (Figs. 1642 to 1648 are of the same case.)

Fig. 1643. The lower teeth were prepared for a porcelain bonded-to-metal fixed partial denture.

Fig. 1644. The frame of platinum is shown here. The completed bridge is shown in Fig. 1645.

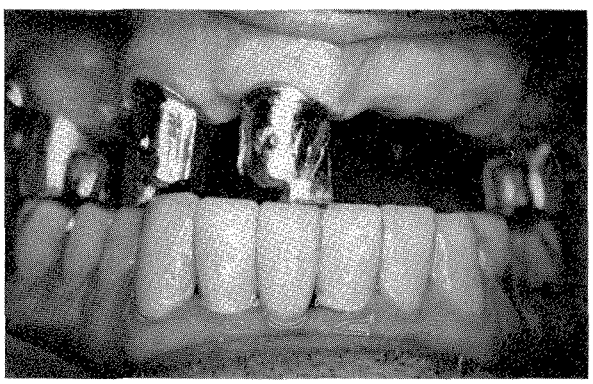


Fig. 1645. The completed five-unit bridge of porcelain bonded to metal is shown here. The upper crowns of platinum are in place. The centric bite is being registered. A combination of fixed and removable upper partial dentures will be constructed for the maxillary teeth.

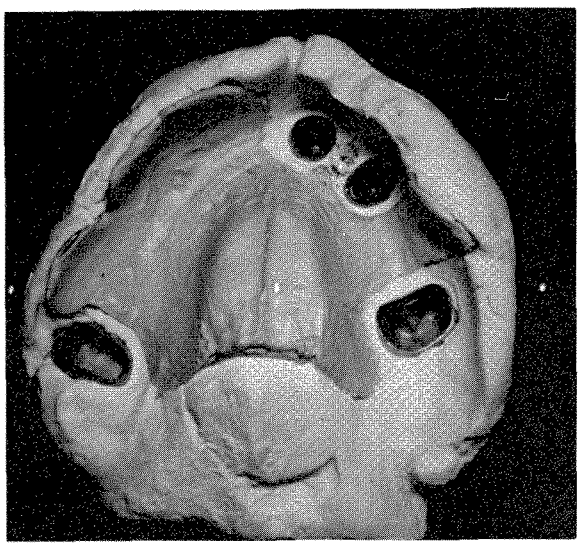
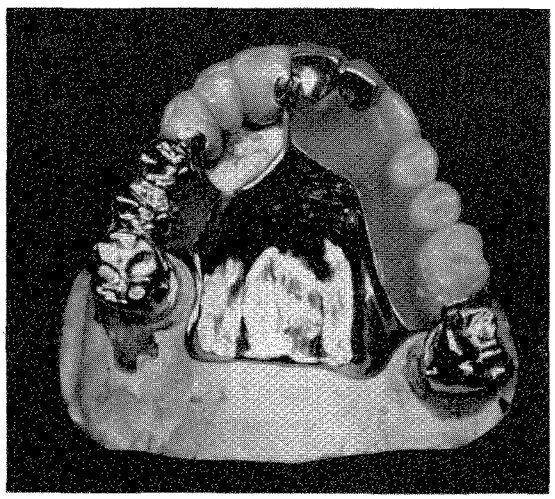


Fig. 1646. A double impression was taken with a special metal tray. The upper removable partial denture was constructed on the cast poured from this impression.

A



B

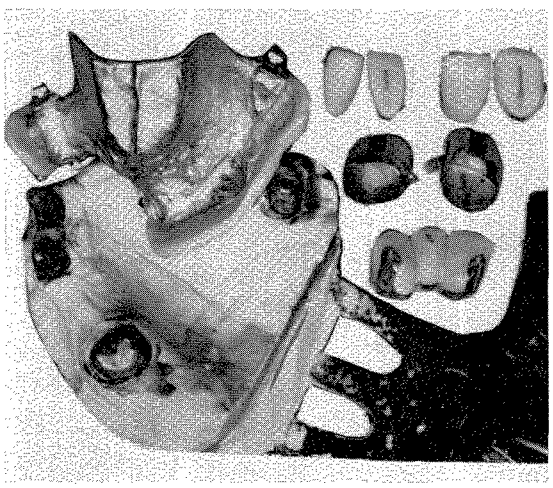


Fig. 1647. A, The prostheses are still in place upon the cast. The fixed portion from the right central incisor to the right cuspid consists of porcelain bonded to platinum. The left central and lateral incisors are Steele's facings. **B,** The Steele's facings have been duplicated in case of fracture. The tissue side of the removable denture has not been highly polished. The retainers are precision attachments. The casting is rigid.

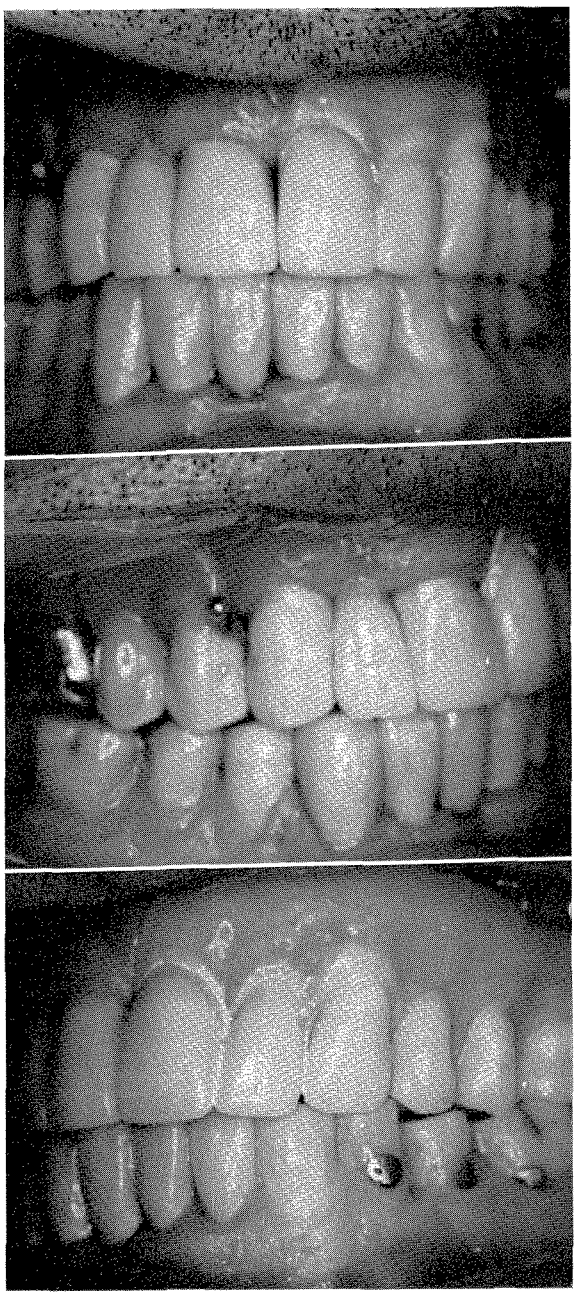


Fig. 1648. Three views of the finished work in the mouth. The gold knob protruding from the right side is for the convenience of the patient in removing the partial denture.

OSLER-RENDU-WEBER SYNDROME

In the disease known as hereditary telangiectasia (hemorrhagic) or by the eponymic designation of Osler-Rendu-Weber syndrome, patients are subject to mucous membrane injuries upon the slightest trauma. This causes hemorrhages in the region of the dilated vessels. Taking impressions for these patients can result in slight tissue irritations that may be sufficient to injure these vessels. As an indirect result, the underlying bone can be involved. These tissues take a long time to heal.

Case 18

In one patient whom I examined, the impression material caused the bone to be exposed in the region of the mylohyoid ridge. The healing process was slow and painful. A condition such as this makes extensive prosthetic restorations difficult to undertake.

The patient also had an abnormally attached frenum. This made the insertion of a lingual bar difficult. Her medical doctor was reluctant to give his permission to have this frenum removed in order to facilitate the insertion of the lower lingual bar. For all these reasons no replacements were made for the lower right missing molars. A fixed partial denture was inserted to replace the missing lower left first molar. (Figs. 1649 to 1651.)

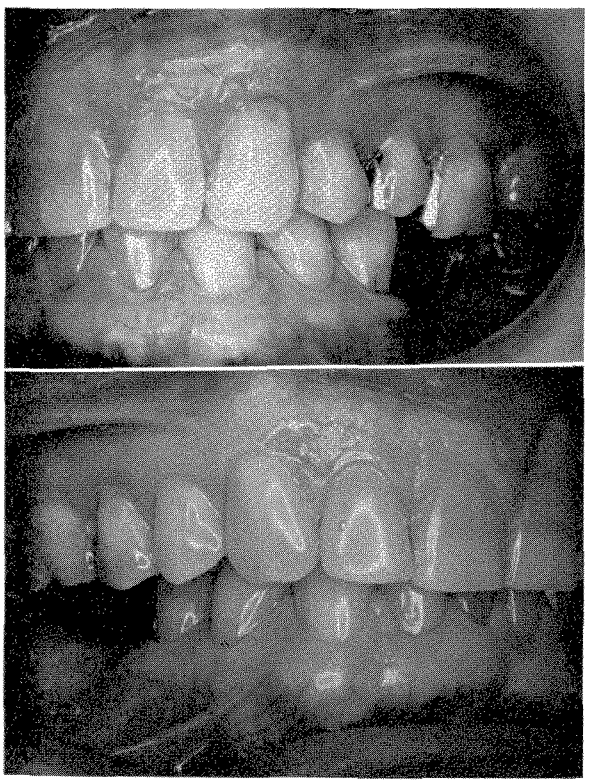


Fig. 1649. Two views of the mouth of the patient. The right lower molars and the left lower first molar were missing. (Figs. 1649 to 1651 are of the same case.)

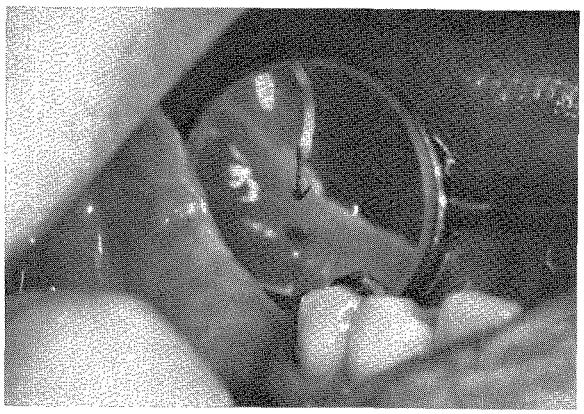


Fig. 1650. The dentist the patient had seen previously took a lower impression over three weeks before. The bone in the mylohyoid area was still not healed. The soft tissue had sloughed, and the bone had been exposed. The arrow points to the dark spot where the lesion is still healing.

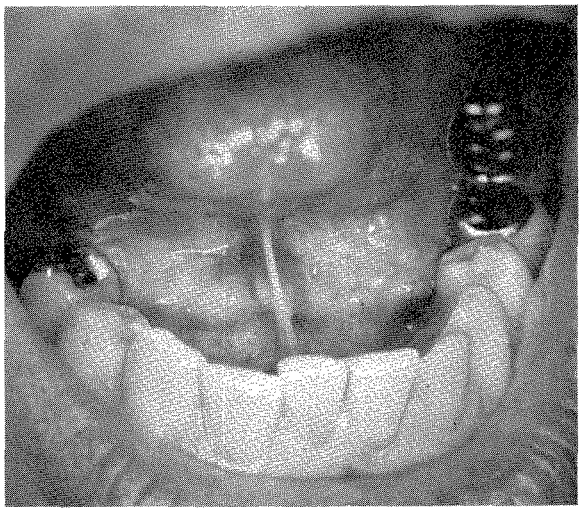


Fig. 1651. The lingal frenum was abnormal. Its anterior attachment was close to the cervical margin of the lower anterior teeth and would make the insertion of a lingual bar difficult. The lower left fixed partial denture had already been inserted. (Read text.)

FAULTY HABITS

Pernicious habits may cause serious dental problems. The deterimental habits of bruxing and clenching have been discussed previously. Pipe smoking is another habit that may cause excessive strains and stresses to be exerted upon the natural teeth. Such a habit may exist for many years before its discovery and usually results in a loss of teeth. The continuation of such a habit after the mouth has been reconstructed simply serves to perpetuate an existing evil, and the completed work is subject to failure. The pipe stem held between the teeth continuously clenched upon creates unfavorable leverages. Although intermittent pressures sustained for short periods are received favorably by the periodontal membrane, still the direction must be in line with the long axes of the involved teeth. With many pipe smokers, the pressures are sustained for a considerable period of time and are unfavorable as they are of the same nature as those created by inclined plane action. Several examples can be given of the damage caused by pipe smoking.

Case 19

Smoking a pipe

In one patient, the lower right first molar was already lost in 1929 while he was in his twenties. By 1946 the lower right second molar became nonvital, and the periodontal pocket that was associated with the second bicuspid became very deep. A larger bridge was constructed including two bicuspids. It was not until 1952 that his pipe smoking habit was discovered. The pipe stem was held by the right posterior teeth. Although there is no definite proof of the relation between

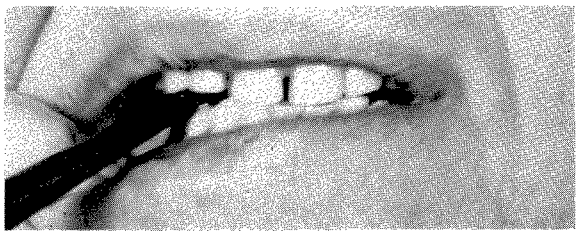


Fig. 1652. This photograph was taken in 1952. Although the loss of the lower right first molar and the periodontal involvement of the lower right bicuspids cannot be attributed definitely to the pernicious habit of biting for long periods on the stem of a pipe, still this habit is very possibly a cause. (Figs. 1652 to 1654 are of the same case.)

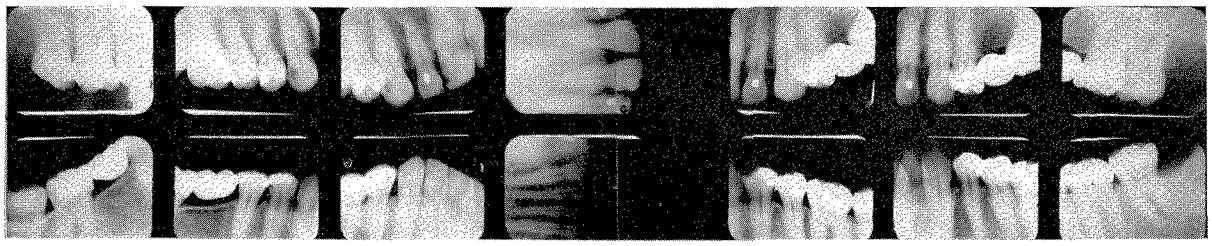


Fig. 1653. Roentgenograms taken in 1929 showing the loss of the lower right first molar. The patient was 25 years old when these were taken.

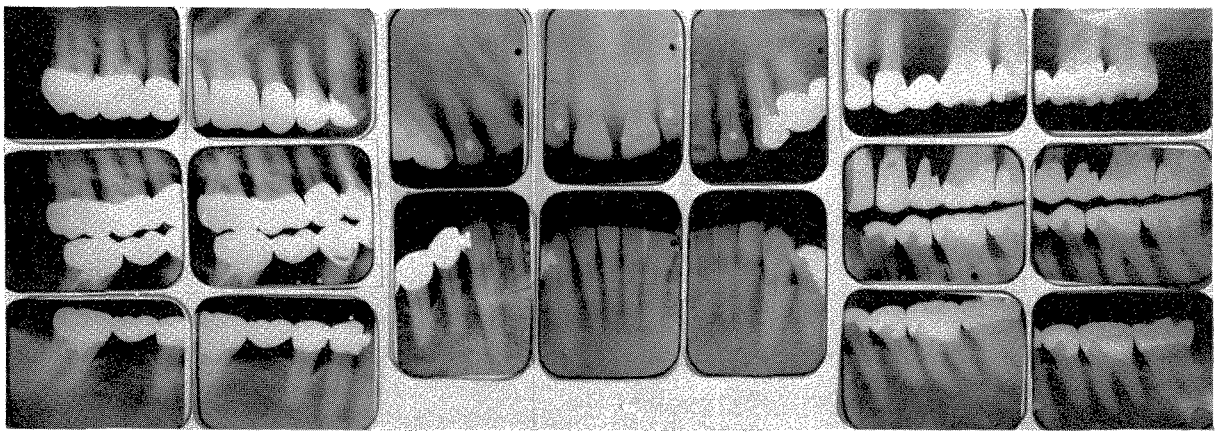


Fig. 1654. Roentgenograms taken in 1957. The patient was 53 years old. (Read text.)

holding the pipe stem between the teeth and the loss and deterioration of the teeth in this area, still suspicion points strongly to this conclusion. (Figs. 1652 to 1654.)

Case 20

A second patient carried his pipe in the region of the right cuspids. The upper cuspid became so loose that it finally had to be removed. Even then, the cause remained unsuspected until a much later period. This patient died in December, 1962, at the age of 78 years. His mouth had undergone two reconstructions. His

Text continued on p. 838.

Fig. 1655. Roentgenograms taken in 1929. The patient was 45 years old at that time. The upper right cuspid was severely traumatized even then. (Figs. 1655 to 1669 are of the same case.)

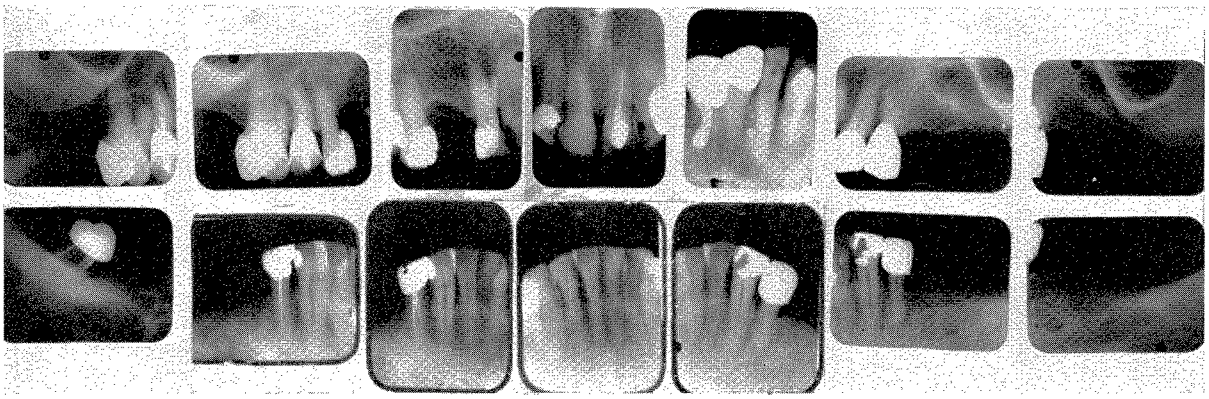
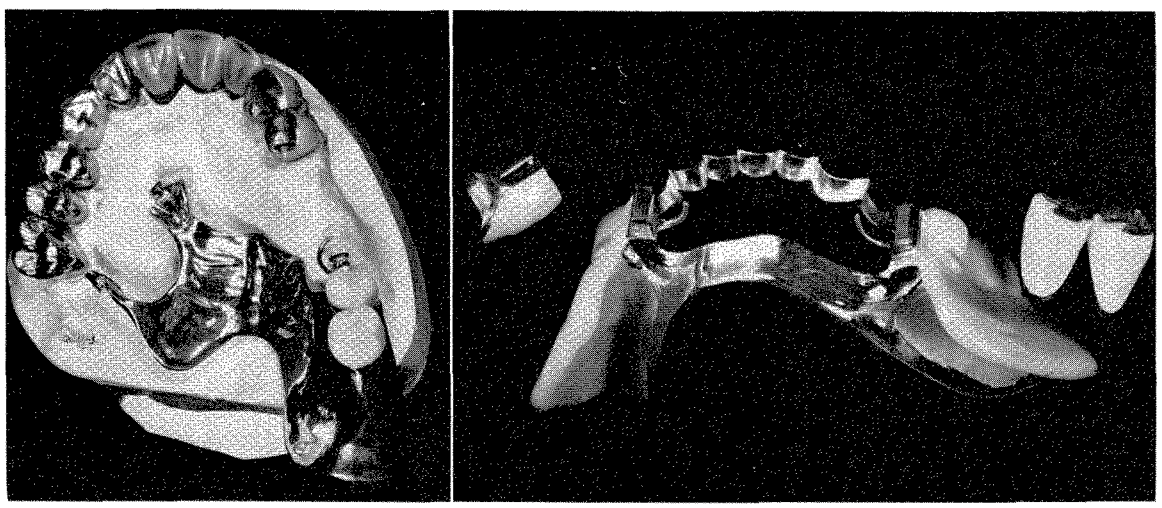


Fig. 1656. Roentgenograms taken in 1940. The patient was then 56 years old. The upper right cuspid was removed in 1938.

A



B

Fig. 1657. A, The completed upper work. The mouth was rehabilitated in 1948. Fixed and removable partial dentures have been combined. **B,** The completed lower work. The lower lingual bar was split in order to break the stress. This did not prove effective as time went on and finally had to be made rigid.

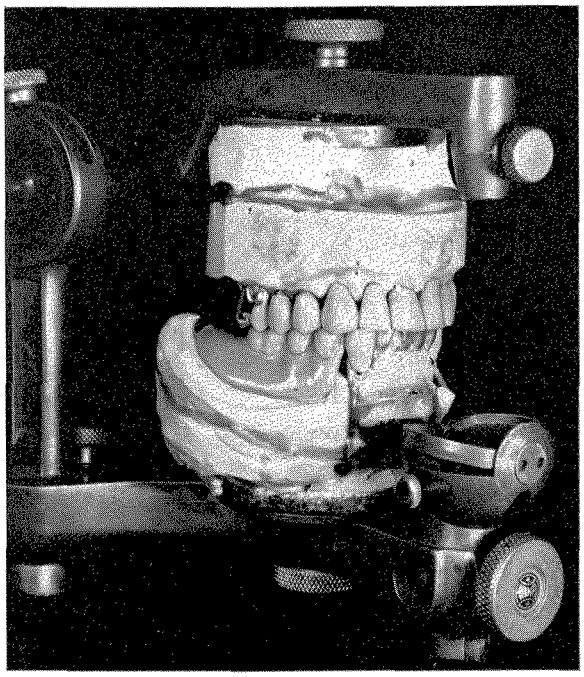


Fig. 1658. The completed prostheses on the articulator.

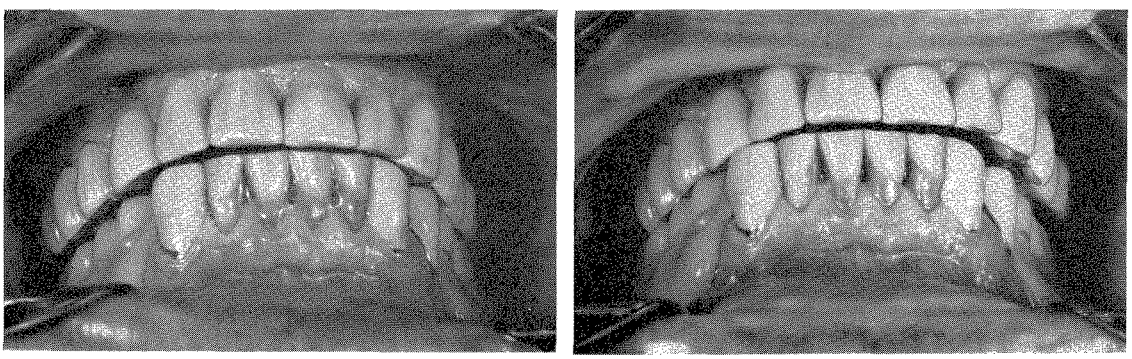


Fig. 1659. The completed prostheses in the mouth. **A,** The front view, centric occlusion. **B,** The left working and balancing bites. **C,** The right working and balancing bites.

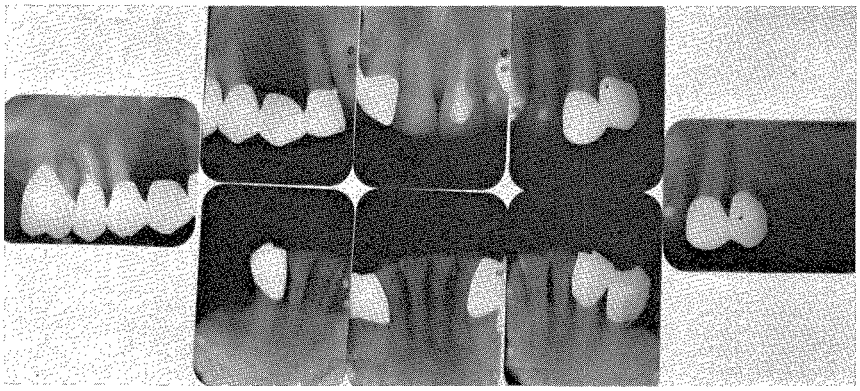


Fig. 1660. These roentgenograms were taken at the completion of the work in 1948, when the patient was 64 years of age.

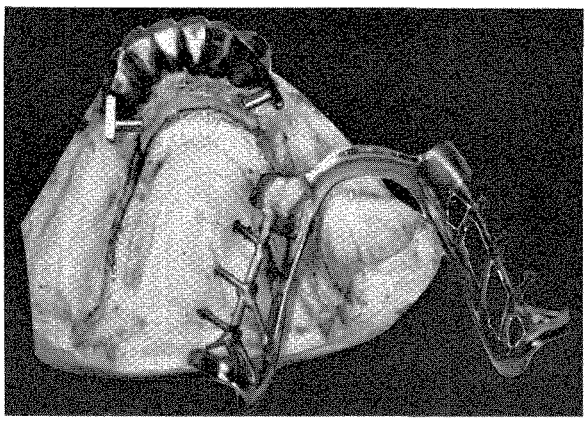


Fig. 1661. In 1955 the lower prosthesis was redone. The anterior teeth were crowned and splinted together. A more effective stressbreaker, shown in this illustration, was inserted. It provided for limited controlled movement.

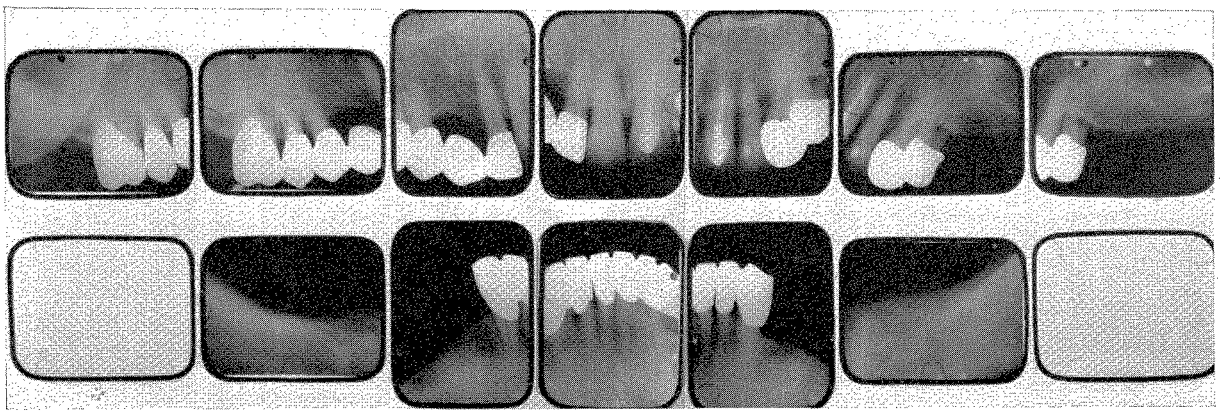


Fig. 1662. These roentgenograms were taken at the completion of treatment in 1955.

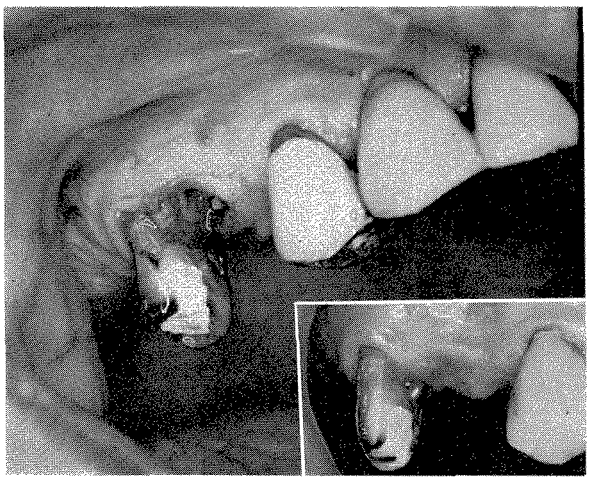


Fig. 1663. In 1959 the upper work was redone. The only remaining right molar had its mesiobuccal root removed in April, 1959. By June (inset) the tissues had healed. This tooth was again used as an abutment.

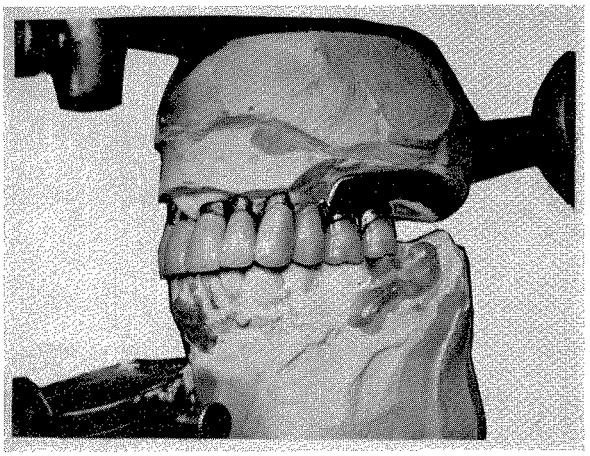
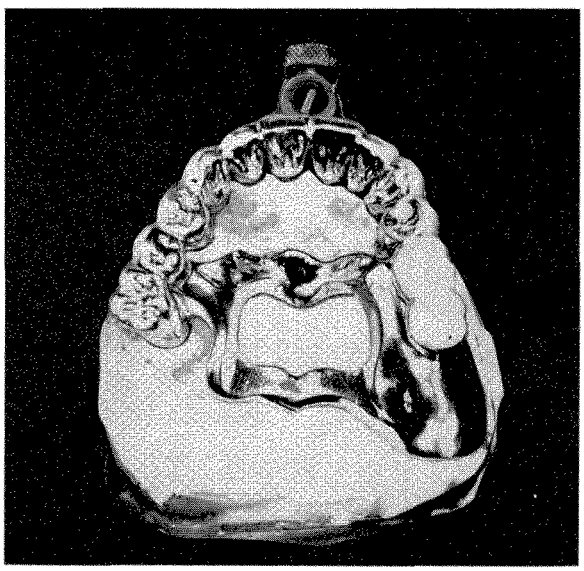


Fig. 1664. Fixed and removable partial dentures were again resorted to. The anterior teeth were constructed of porcelain bonded to platinum. Precision attachments were used as the retainers.



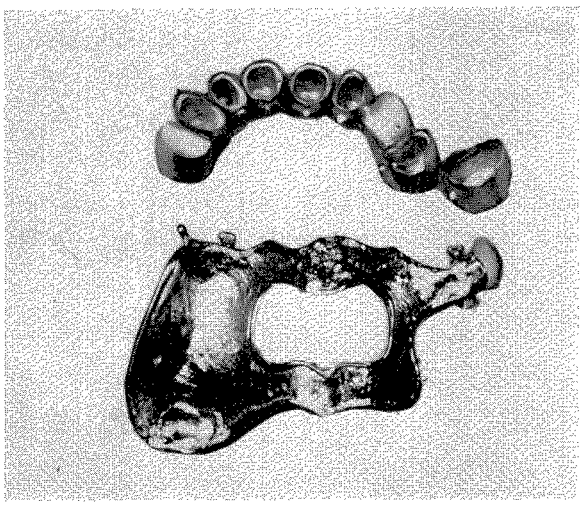


Fig. 1665. Two views of the completed upper work which was inserted in 1959. The anterior fixed partial splint was made of porcelain bonded to metal. Precision attachments were used as retainers.

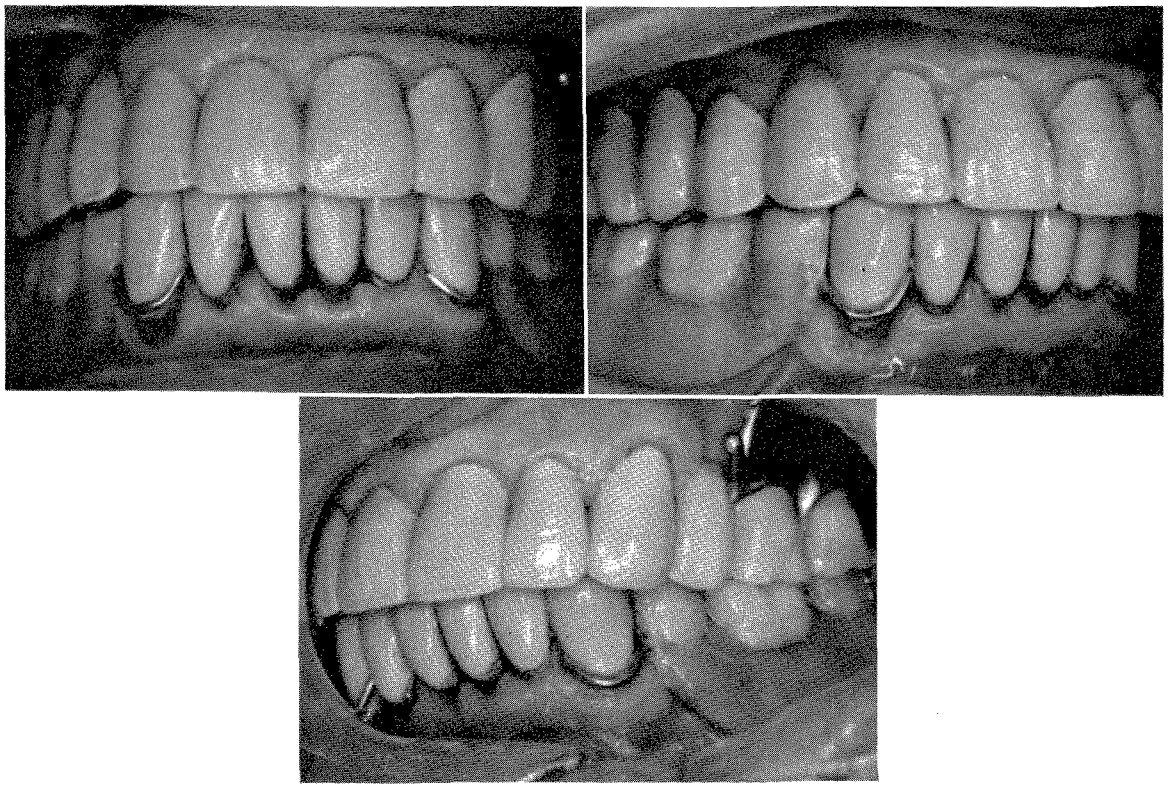


Fig. 1666. Three views of the mouth taken in July 1959.

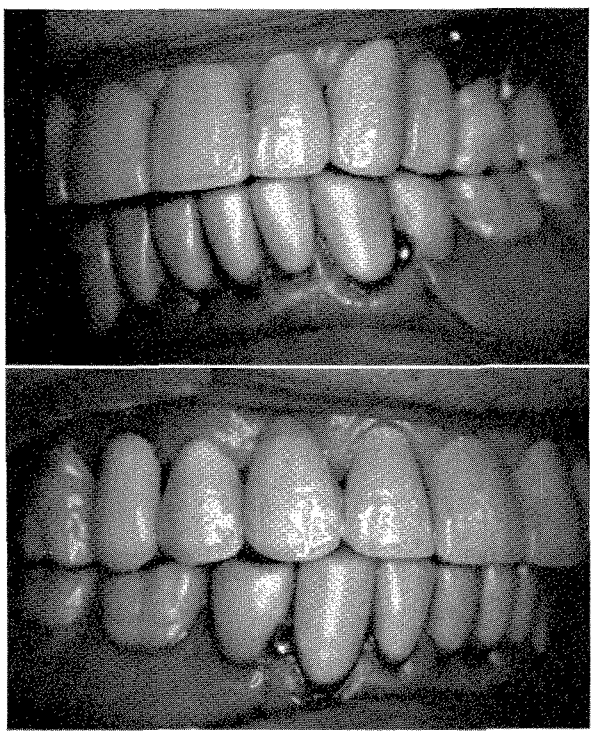


Fig. 1667. Left and right views taken in 1962. The patient was 78 years old. He died in December, 1962.

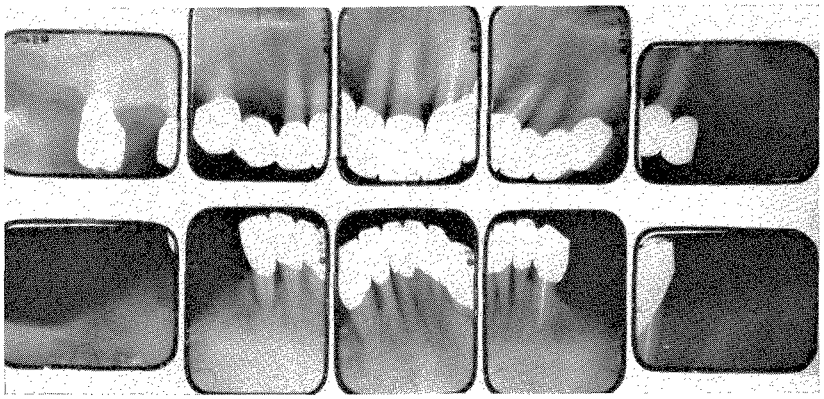


Fig. 1668. Roentgenograms taken in 1962.

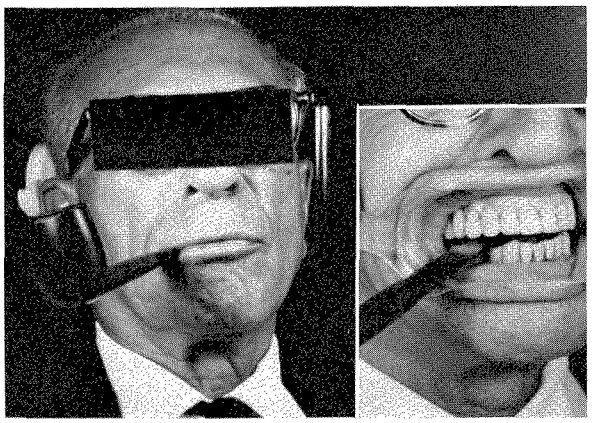


Fig. 1669. Two views of the leverage action of the pipe. These were taken in 1962. The patient continued this noxious habit with its evil effect upon his dentition until he died.

case was reported in 1951.* He continued to smoke his pipe to the very end. Once, again it becomes evident that excessive pressures accelerate dental deterioration. (Figs. 1655 to 1669.)

Case 21

The case of a 48-year-old man whose mouth was completely rehabilitated in 1945, was reported in 1951.† This case is the final case to be presented in which the dental deterioration was exacerbated by traumatic leverages of the pipe stem. The work consisted of upper and lower fixed splinting, in conjunction with upper and lower removable partial dentures. It was only by accident in 1950 that his pipe smoking habit was discovered. He came for the relief of an irritated mucous membrane. In order to determine whether the relief was adequate, he inserted a large pipe with a wide, thick stem and created pressure with it between his teeth.

*Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., pp. 1066-1078.
†Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., pp. 1080-1101.

This patient, although unusually intelligent, refused to relinquish his pipe. The extenuating circumstance in his case was that because he was totally blind his pipe had been a great source of comfort over the years. It finally became such a sensitive subject that it was no longer discussed. Very little could be done other than watch the destruction of the teeth and the prostheses.

Ten years after the completion of the oral rehabilitation, the mouth was again in a deplorable condition. The habit of clenching and bruxing plus poor mouth hygiene caused the removal of several teeth. In addition, his physical ailments caused a neurosis that further augmented the oral breakdown.

He was not seen for nearly three years from 1955 to 1958, during which time his mouth was entirely neglected. He had suffered a nervous breakdown. Finally in 1949, the removal of his remaining upper teeth and the insertion of a full upper denture were suggested. The splinting of the lower anterior teeth and the insertion of a lower lingual bar would have completed the prescription. He refused to have the upper teeth removed. Once again the situation of his pipe was discussed with the same negative result.

In August, 1959, his second oral reconstruction was completed. The upper work was a severe compromise. The patient in 1962 was 65 years old. In August, 1962, the upper anterior fixed partial denture was cracked in two by the severe leverage exerted by the pipe. He finally consented to the removal of the remaining upper teeth, but only after he was referred for two additional consultations with his own medical advisor and with the head of the oral diagnostic department of one of the local dental colleges. This patient was a self-confessed neurotic. His teeth were eroded and abraded when he first came for treatment seventeen years previously. At that time he was in his forties and was already missing thirteen teeth. His pipe habit hastened the destructive forces. He continued to exert these unfavorable leverages on his few remaining natural teeth. He had neglected his mouth over the years, but his serious physical problems necessitated many compromises.

The question may be asked whether the patient should have been permitted to influence the dentist into retaining his problematic upper teeth. The answer is that, after having been made aware of his problem, it was his decision not to have them removed, and he has been more content with this method of treatment. Maintaining a cordial doctor-patient relationship was not easy, yet with patience and understanding this has been accomplished. The temptation to discontinue was often considered, yet the patient's confidence and dependence, in spite of his cynicism and neurosis, dispelled this idea.

In November, 1962, the remaining upper teeth were removed, and an immediate full denture was inserted. With the continued use of the pipe, the palatal and labial mucosae are constantly irritated. This requires frequent adjustment. I suggested a space for holding the pipe in the final denture, but the patient moved it in an arc running from bicuspid to bicuspid. It would be impractical to open up this entire area. The next suggestion was to construct a pipe stem of stainless steel in order to keep the stem small. The patient remarked that he had many pipes and continually changed them.

The final upper denture was inserted in January, 1963, and was tissue-treated in an effort to make it comfortable. The problem this poses is formidable. The balance against the old lower prosthesis was far short of what it should be, but the patient was unwilling to have the lower work redone. His attitude was un-

pleasant and disagreeable. Although he continued to create leverage with the pipe stem, no positive relief was in sight other than his finally accepting the discomfort as being the lesser of two evils. The other evil and perhaps the greater one would be to give up his pipe. He also sorely regretted having permitted the extraction of his remaining upper teeth regardless of the pathology.

In retrospect, the retention of the upper infected teeth gave some degree of stabilization to the removable partial denture against the leverages created by the pipe. This is now lacking, and as a result the patient must readjust to a less stable environment. (Figs. 1670 to 1687.)

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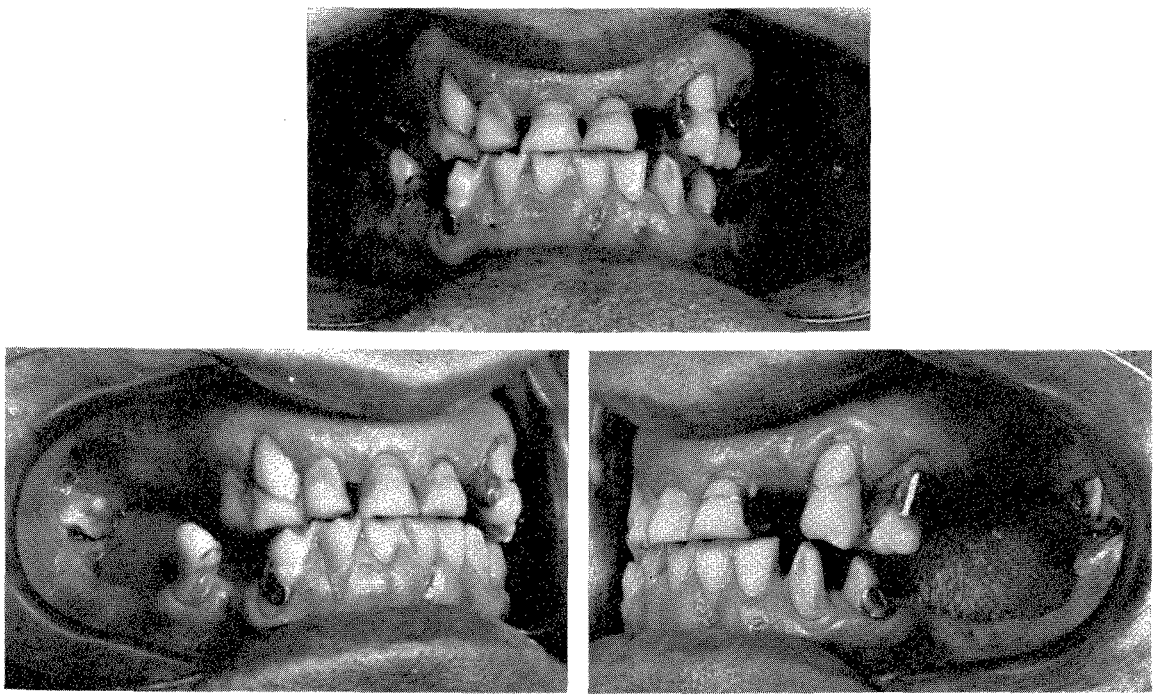

Fig. 1670. Three views of the mouth of a 48-year-old man. These were taken at the start of his oral rehabilitation which was done in 1945. (Figs. 1670 to 1687 are of the same case.)

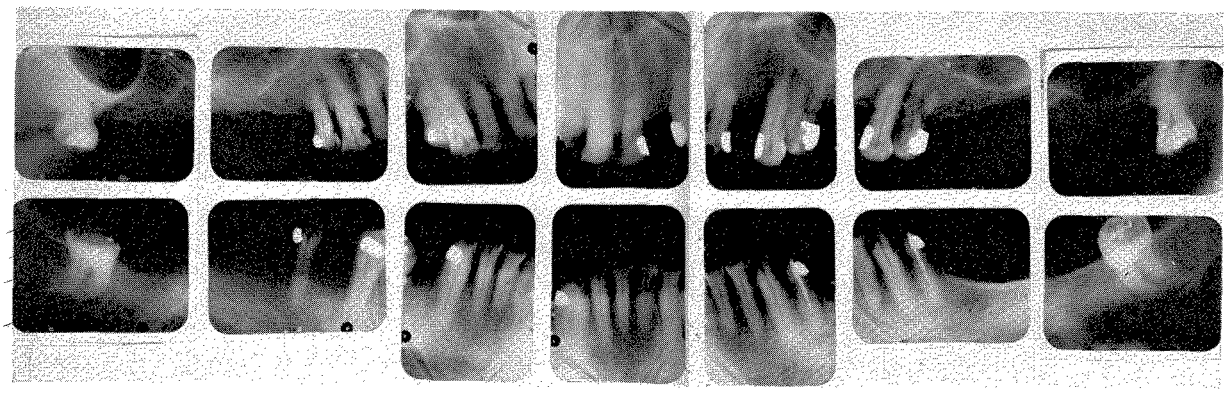

Fig. 1671. Roentgenograms taken in January, 1945, at the start of treatment.

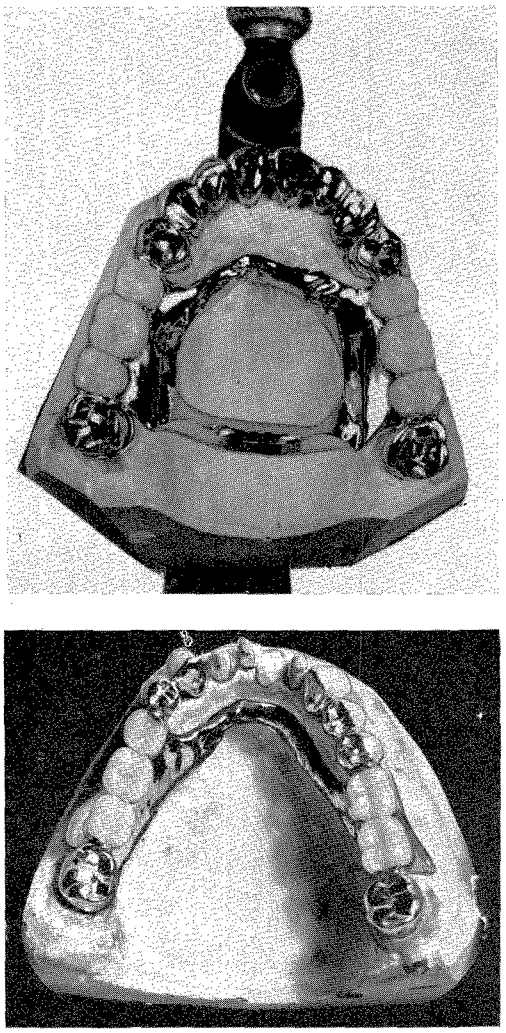

Fig. 1672. Final upper and lower prostheses at the completion of treatment. The lower anterior crowns had not yet been inserted.

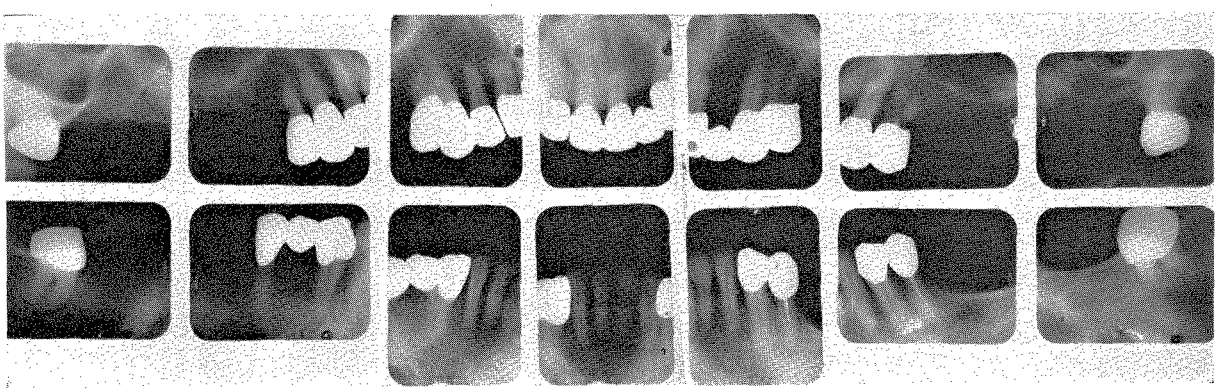

Fig. 1673. Roentgenograms at the completion of treatment. These were taken in May, 1945.

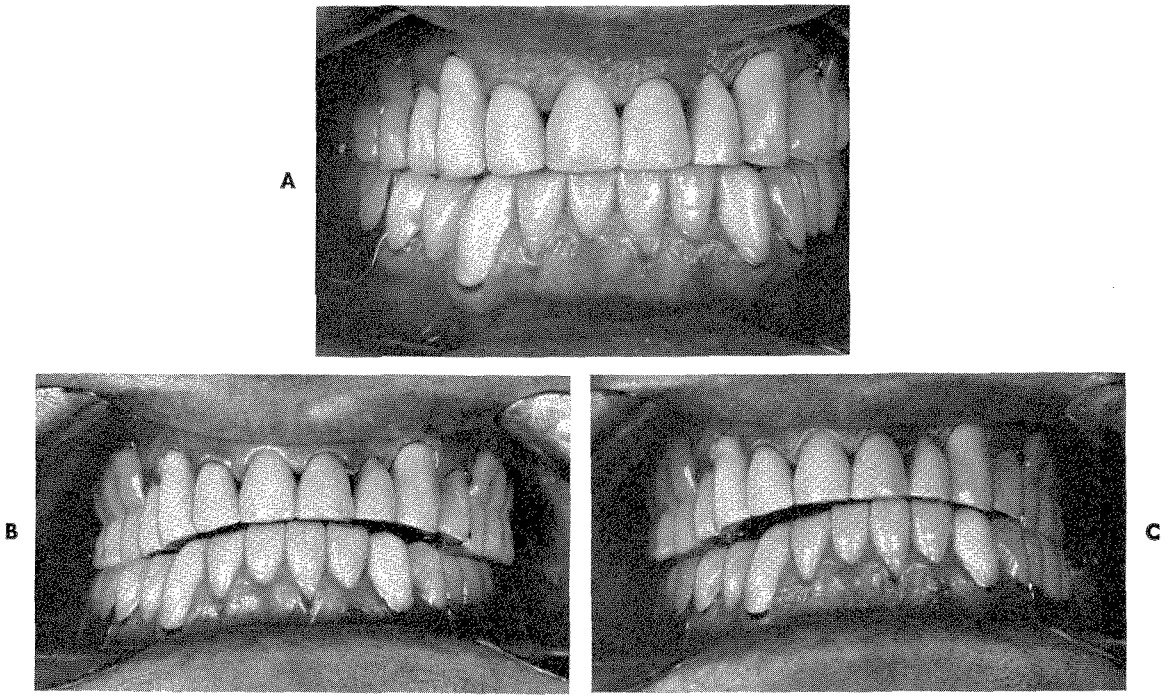

Fig. 1674. Three views of the completed work. **A,** Anterior view, centric occlusion. **B,** The right working and left balancing bites. **C,** The left working and right balancing bites.

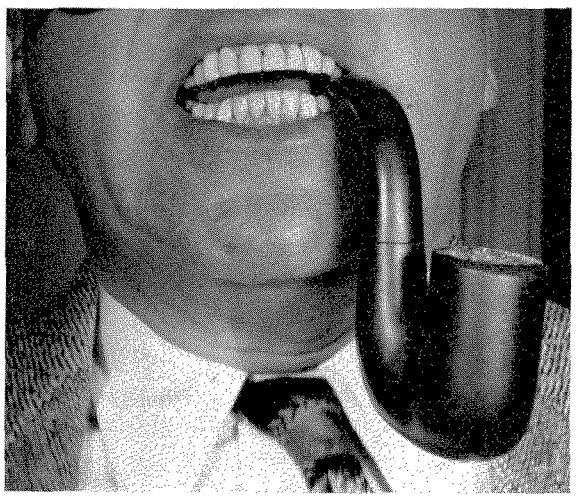

Fig. 1675. In 1950 the patient presented himself with an irritation of the lower right saddle, buccally. This was relieved, and when the patient inserted the bridge, he insisted upon finding out whether the area had been relieved sufficiently by taking out a large pipe and biting it between his teeth on that side of the mouth. The stem of the pipe was already chipped by the force of his bite. I insisted that he stop this pernicious habit, but he bluntly refused. He also informed me that he continually chewed gum. This pipe caused sustained leverage upon an already deteriorated mouth.

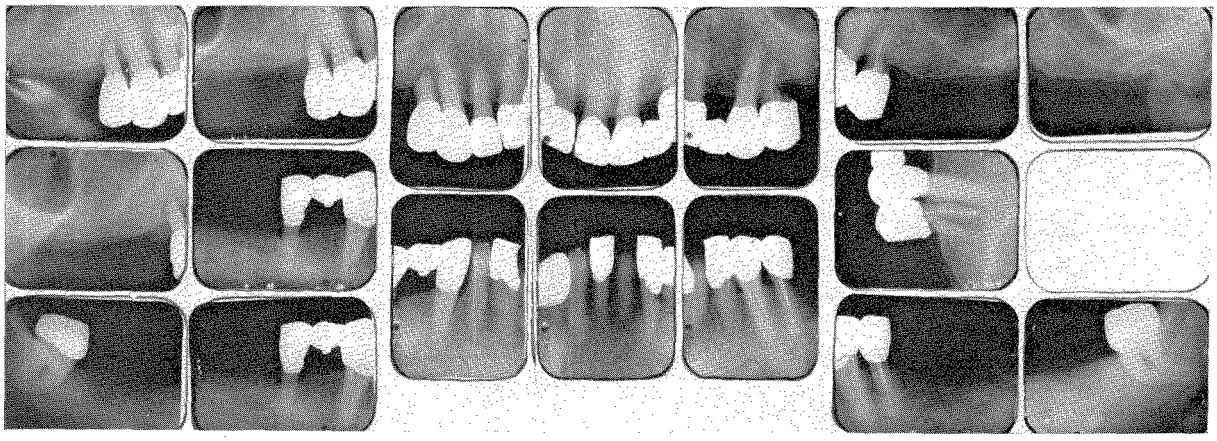

Fig. 1676. Roentgenograms taken in 1955. Both upper molars had been removed, and the upper right bicuspid was infected. (Compare this with Figs. 1671 and 1673.)

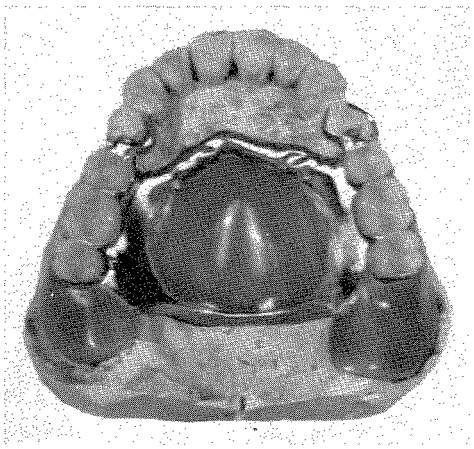

Fig. 1677. The upper removable partial denture in 1955. Both posterior molars had been removed, and the palatal area between the gold bars had been filled in with acrylic resin to provide a greater supporting area. (Compare this illustration with Fig. 1672.)

Fig. 1678. By 1957 the mouth was in an advanced state of deterioration. The patient was unwilling to have the work redone or to discontinue the use of his pipe. In addition, his method of vigorous brushing in an incorrect manner produced advanced wear of the acrylic veneers.

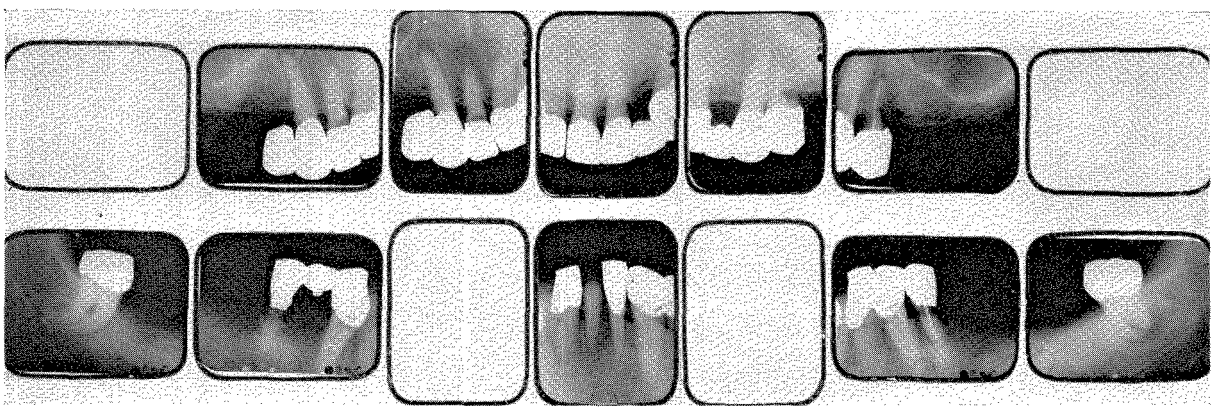

Fig. 1679. The roentgenograms taken in November, 1958, tell their own sad tale. This was thirteen years after the completion of the original work. The patient was now 58 years old.

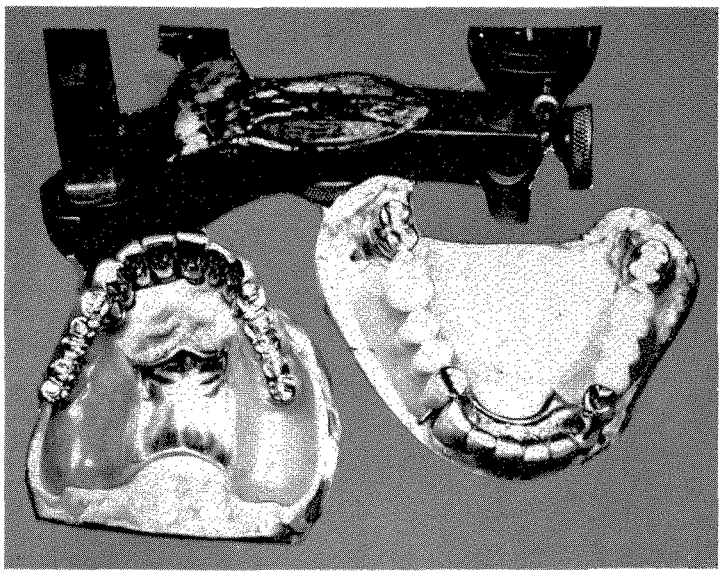

Fig. 1680. In spite of advice to the contrary, the patient insisted upon the retention of his problematic and infected upper teeth. In August, 1959, a new set of prostheses was inserted, as shown here.

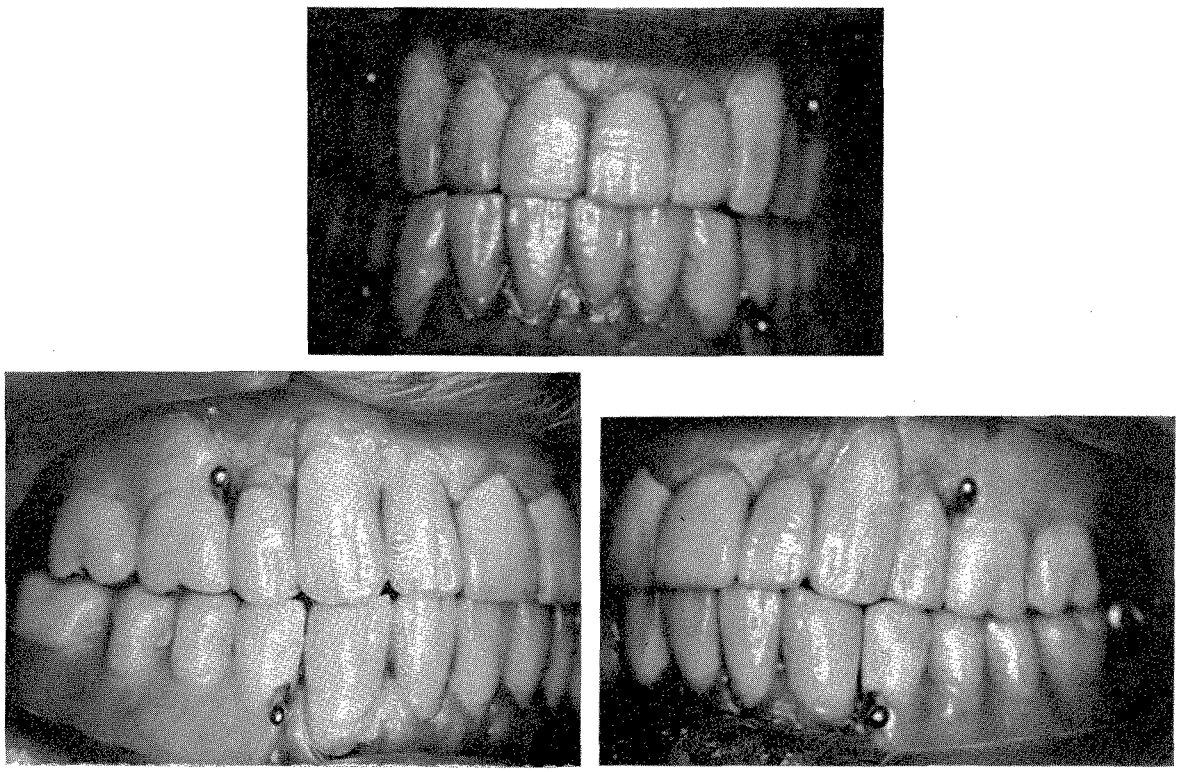

Fig. 1681. Three views of the completed work in August, 1959.

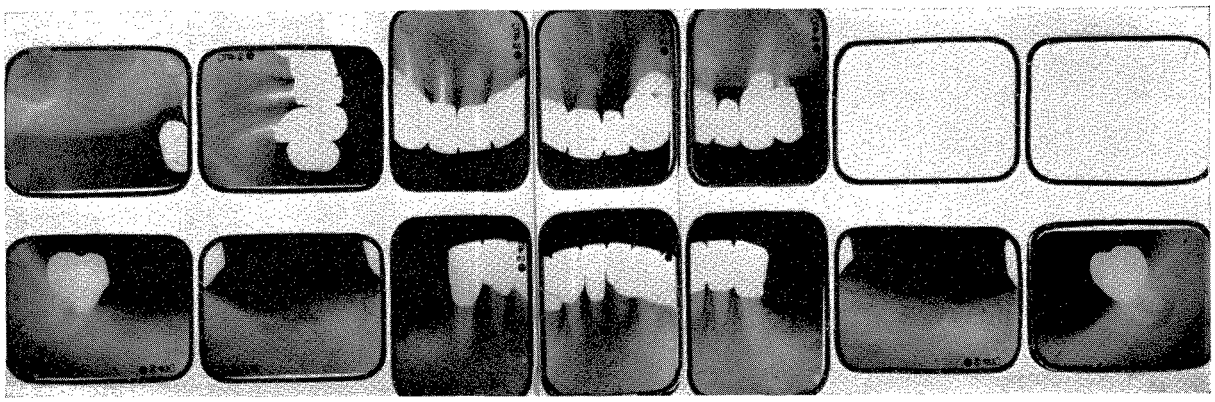

Fig. 1682. Roentgenograms taken of the completed work in October, 1959. The infected upper right lateral incisor and cuspid and the lower left molar have been treated and their root canals filled.

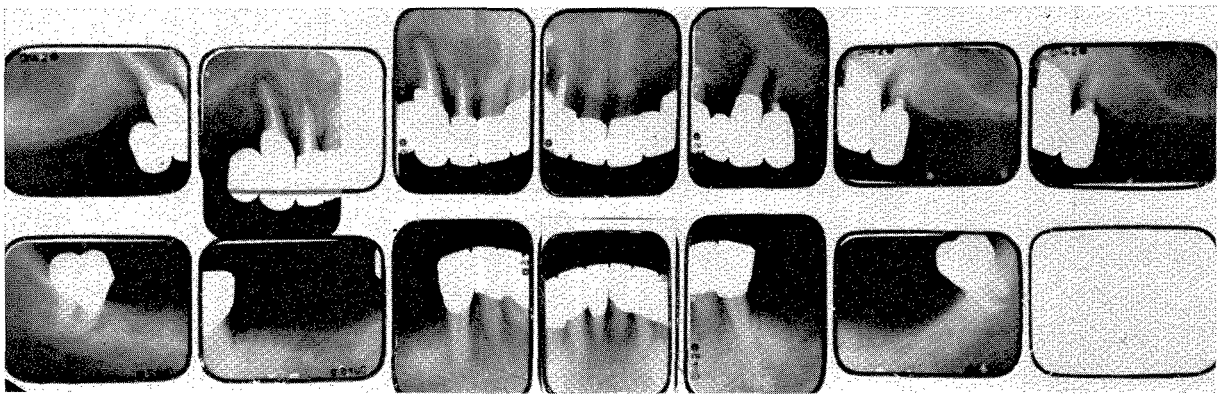

Fig. 1683. Roentgenograms taken in July, 1962. The patient was still unwilling to have his upper teeth removed even though they were severely infected.

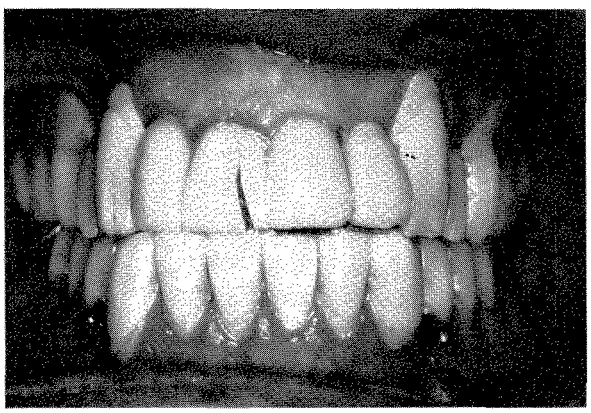

Fig. 1684. In September, 1962, the upper anterior fixed splint was cracked in half by the constant pressure of the pipe. The patient finally consented to have his upper teeth removed.

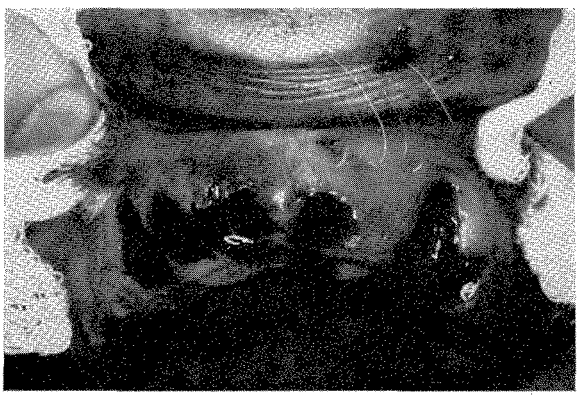

Fig. 1685. The upper teeth were removed in November, 1962.

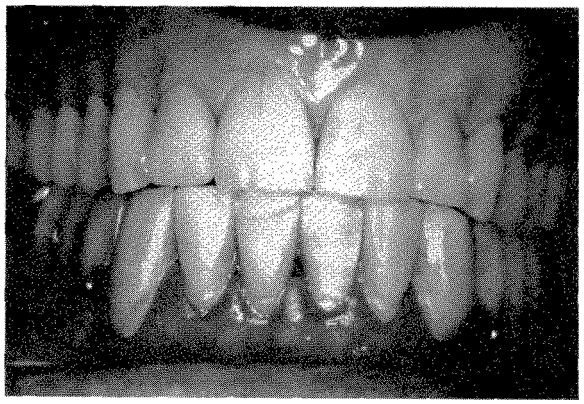

Fig. 1686. An immediate full upper denture was inserted. When the tissues heal, a final upper denture will be inserted.

Fig. 1687. The patient still continued to use his pipe, only now the force was expended against the palatal tissues through the full upper dentures.

OVERINDULGENCE IN USE OF LOZENGES AND COUGH DROPS

Case 22

There are some patients who have been treated for many years before the cause of the dental breakdown becomes apparent. One of these patients was seen for forty years before the reason for her unusually poor mouth hygiene was discovered. A large amount of creamy debris had always collected around and between her teeth. Much time was spent on instructing her in the correct manner of brushing her teeth and in the use of dental floss and rubber stimulators. She had always insisted that she was diligent in her efforts in maintaining a clean mouth.

The interproximal caries were numerous and constantly occurring. At the time of writing she was in her mid-seventies. It had been impossible to control the decay. This caused embarrassment, especially as her visits were periodical and regular. Recently, quite by accident, it was discovered that she kept a lozenge in her mouth

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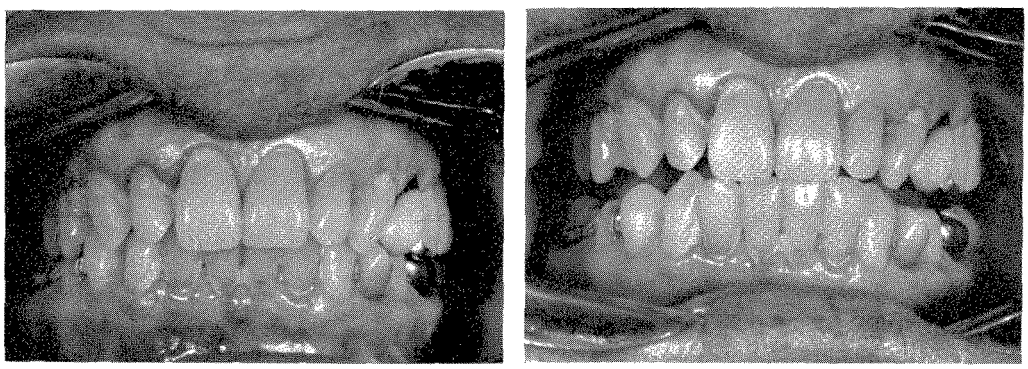

Fig. 1688. Two views of the mouth taken in 1951 when the patient was 66 years old. (Figs. 1688 to 1693 are of the same case.)

Fig. 1689. Roentgenograms taken in 1931 when the patient was 46 years old.

Fig. 1690. Roentgenograms taken in 1947 when the patient was 62 years old.

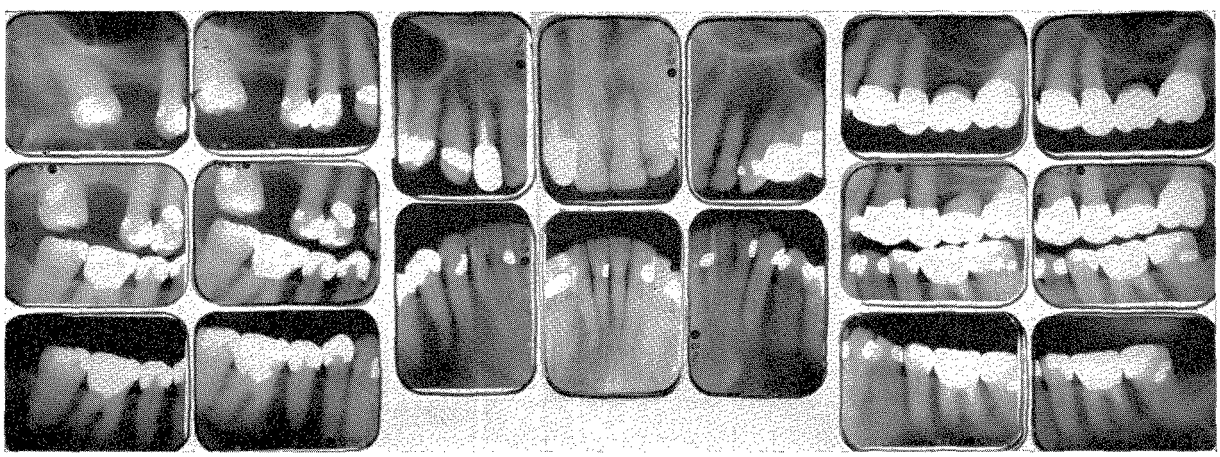

Fig. 1691. Roentgenograms taken in 1957 when the patient was 72 years old.

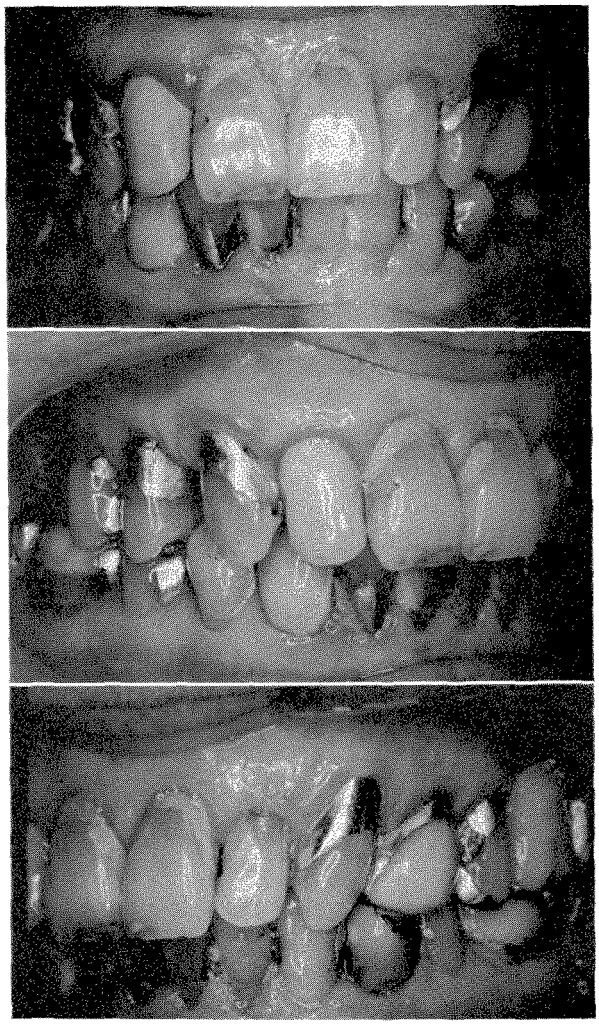

Fig. 1692. Three views of the mouth taken in 1962. The patient was 77 years old.

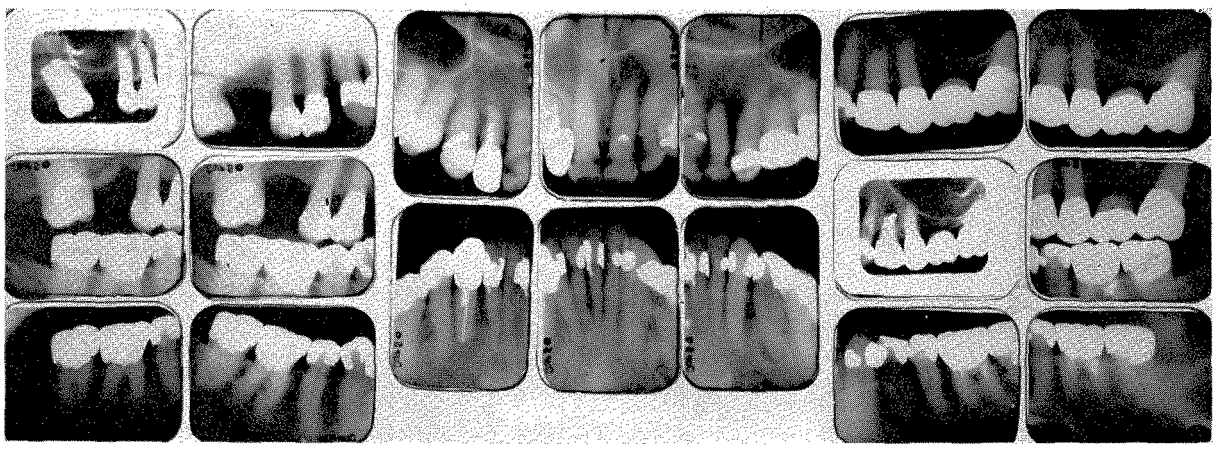

Fig. 1693. Roentgenograms taken in 1962. The upper left first bicuspid root was amputated in October, 1962, and its tip was filled with amalgam. The radiograph had been inserted in this series in place of one of the left bitewing films.

constantly because of a chronic throat irritation. The ingredients of the lozenges she used come from the elm tree. When moistened with saliva, the lozenge becomes sticky and slimy. This slime adhered closely to the tooth surface and collected debris that was difficult to remove. The result was a form of chemical erosion that readily accounted for the caries and poor hygiene. When this patient stopped chewing the lozenges, her mouth improved considerably, and caries were much less frequent. (Figs. 1688 to 1693.)

Case 23

The following case report is interesting because of the history that throws some light on what otherwise might seem to have been caused by faulty mechanics or a high degree of susceptibility to caries. A middle-aged woman was examined who had had several fixed prostheses inserted less than three years previous to her initial visit. Her roentgenograms disclosed rampant caries beneath many of the crowns and the abutments of one large fixed partial denture. Careful questioning disclosed that for twenty-five years she consumed a box of a certain brand of cough drops daily. These were sucked slowly because of a scratchy throat which in turn was due to a constant smoking habit. The alveolar bone was normal.

Much of the prosthesis had to be redone. Gum resections were performed where necessary. Crowns of porcelain bonded to metal were inserted where there were opposing crowns of porcelain bonded to metal. With the elimination of the use of the cough drops, it is assumed that the acute caries will also disappear. (Figs. 1694 to 1700.)

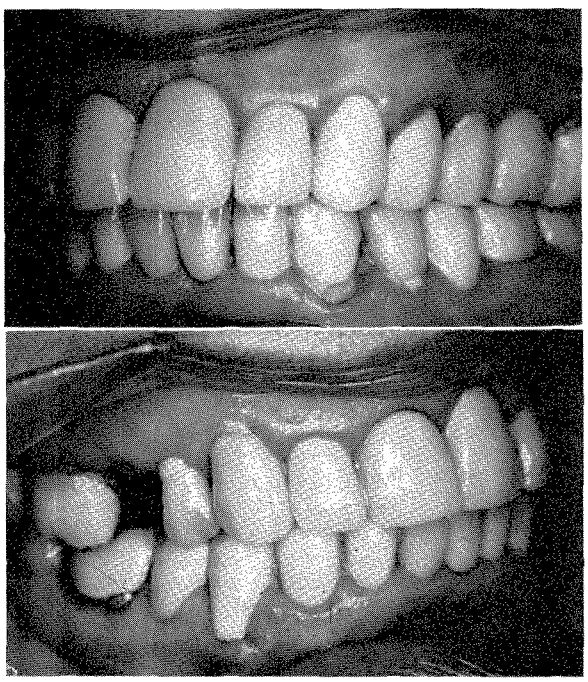

Fig. 1694. Two views of the mouth of a middle-aged woman. These were taken before treatment was started in August, 1959. (Figs. 1694 to 1700 are of the same case.)

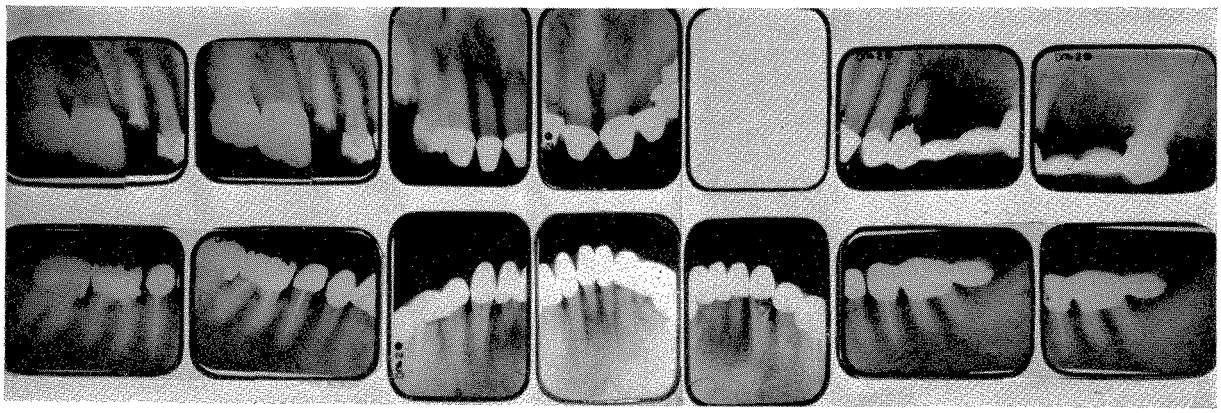

Fig. 1695. Roentgenograms taken in August, 1959, before treatment was started. The rampant caries may readily be detected. The prosthesis was inserted within the three years prior to August, 1959.

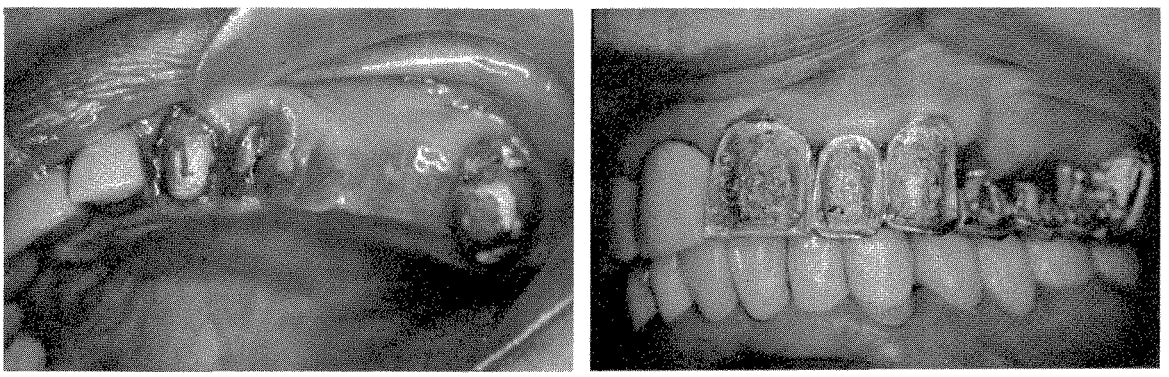

Fig. 1696. The mouth after the upper left prosthesis was removed. **A,** The upper left posterior section. Deep caries had separated the bicuspid root from its crown. It required removal. The lateral incisor and the cuspid were devitalized due to the deep caries. **B,** They were finally joined to the central incisor and to the second molar to form a seven-unit fixed partial denture. The frame of the fixed partial denture is shown in this photograph.

Fig. 1697. The lower right canine and bicuspids were deeply carious, and their soft tissues were resected as shown here. The muscle attachment was also severed to relieve the pull against the cervical gum tissue. The soft tissues healed normally. The teeth were finally covered with crowns made of porcelain bonded to platinum.

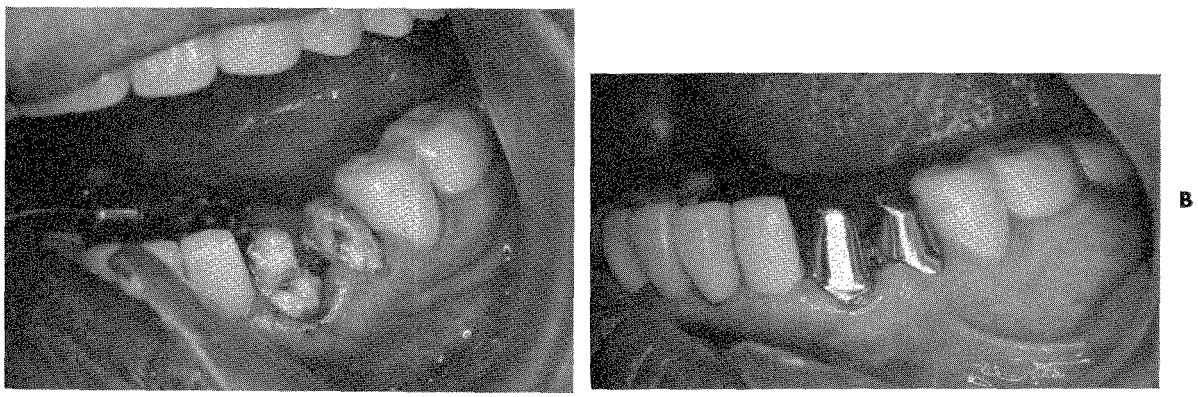

Fig. 1698. A, The lower left cuspid and first bicuspid were also attacked by deep caries. Their pulps were removed and the root canals filled. Porcelain bonded-to-platinum crowns finally were inserted. **B,** They are shown here with the platinum copings being fitted.

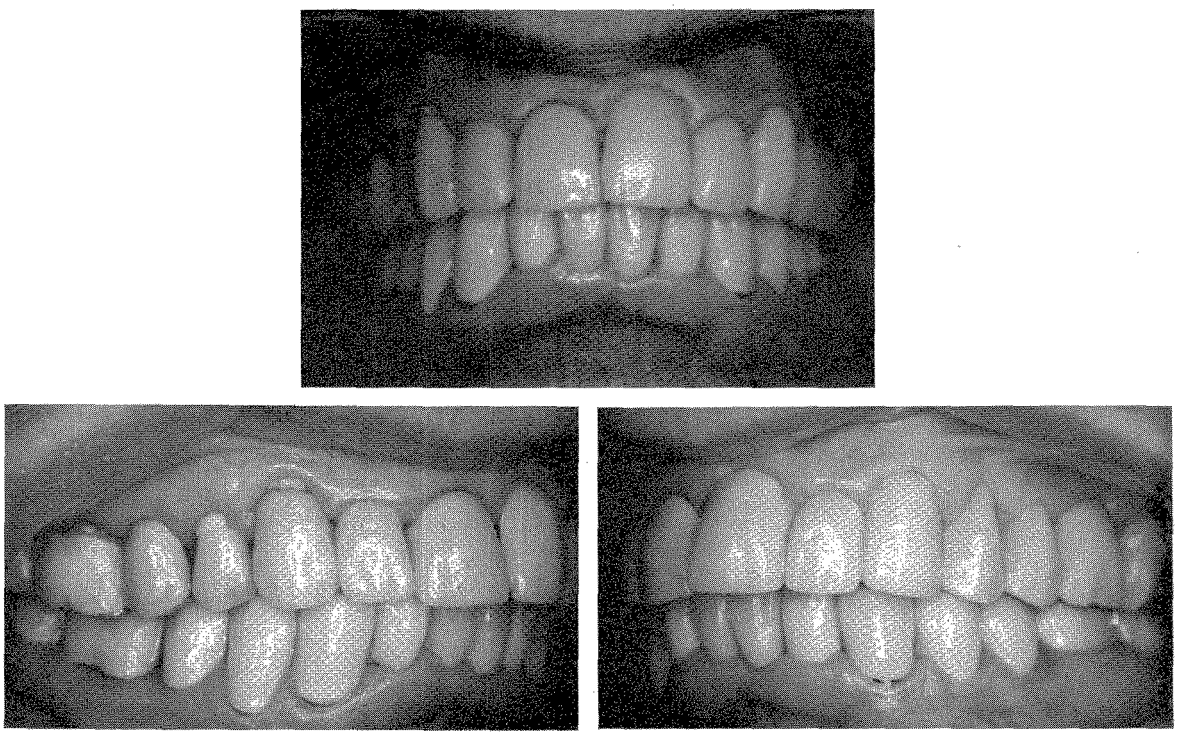

Fig. 1699. Three views of the teeth taken in 1961. Observe how well the gum tissues have healed since the original work. (Refer to Figs. 1696 and 1697.) This work was done in segments. Only a few teeth were completed at one time. Simple unilateral articulators were used.

Fig. 1700. Roentgenograms taken in 1962. The lower left molar which appeared suspicious upon presentation became infected and was being treated (December, 1963).

RESTORING BROKEN-DOWN NATURAL TEETH REQUIRES GREAT EFFORT

Considerable effort must be spent in restoring these carious teeth if their retention is desired. When the patient is cooperative, this effort is worthwhile. In any form of oral rehabilitation, this very necessary groundwork is time consuming and difficult. Nevertheless, it is just as important as coordinating the occlusion because without these teeth there would be no need for coordination unless it be for full dentures. To build up these broken-down crowns, it often becomes necessary to use metal posts and pins of various sizes and shapes. In some cases in which the remaining root is sufficiently long, gum and bone resections are performed in order to increase the size of the clinical crown. (Refer to Figs. 800 to 812, pp. 381 to 384.)

RESULT OF INTAKE OF ACIDS

In 1951 the results of the intake of acids upon the enamel and dentin of human teeth were reported.* These acids have many forms. Hydrochloric acid is used in combating stomach disorders and other ailments. If the dentist is unaware of its being used, he may be puzzled by the erosion of the natural tooth surfaces and the exposure of the otherwise well-fitting margins of his fillings.

Case 24

Hydrochloric acid

In 1947 the mouth of a middle-aged woman was reconstructed. Gold inlays were used to restore the lower posterior teeth. In 1948 the marginal fit of these inlays was faulty. The inlays stood out like little islands while the surrounding tooth structure was at a lower level. This is typical of acid erosion. The metal was

*Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., pp. 570-608.

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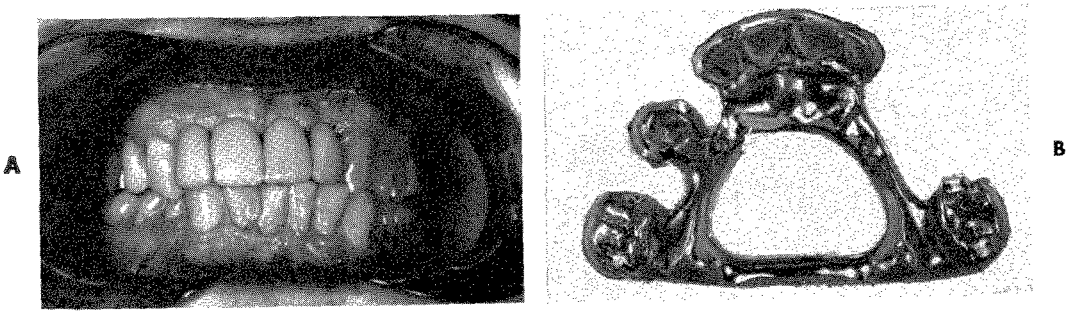


Fig. 1701. **A,** Anterior view of the mouth of a woman in her early fifties. This was taken in 1944. **B,** The removable partial denture that the patient had been wearing for several years. (Figs. 1701 to 1712 are of the same case.)

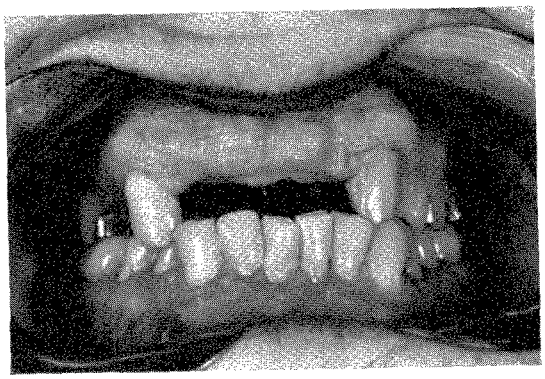


Fig. 1702. The upper removable partial denture has been removed.

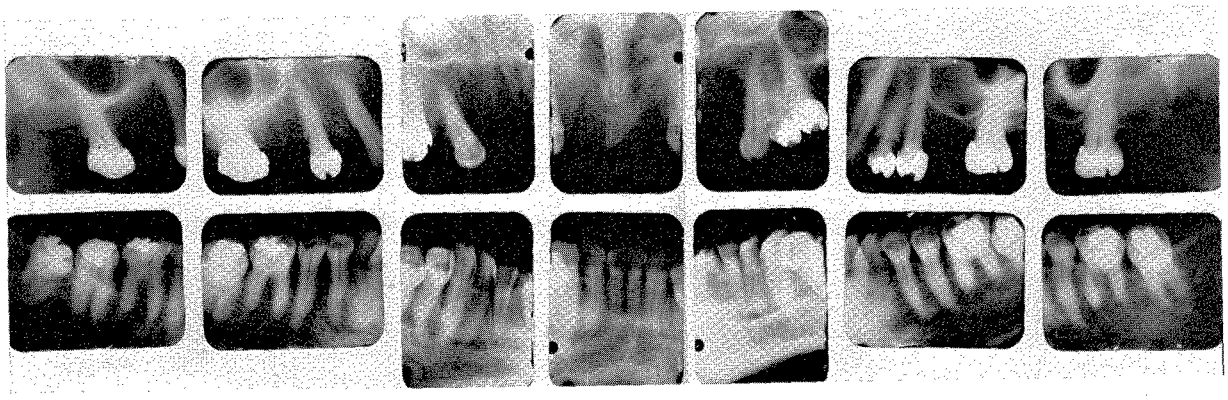


Fig. 1703. The roentgenograms that were taken in May, 1944.

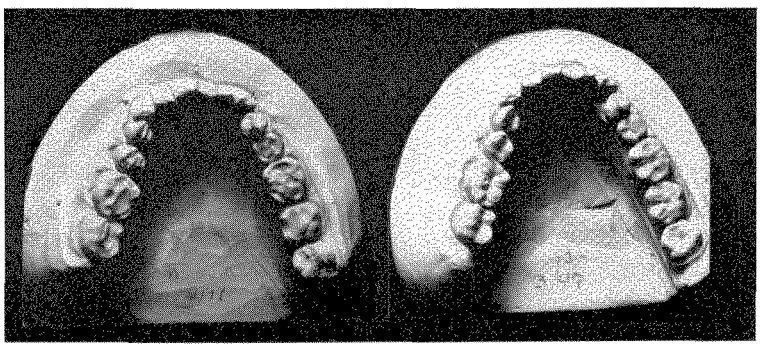


Fig. 1704. In March, 1947, lower posterior inlays were inserted using a hydrocolloid technique. The finished cast is shown on the right side in this illustration. In February, 1949, the teeth had receded from the gold inlays, leaving their margins exposed, as the cast on the left side demonstrates. This is indicative of acid erosion.

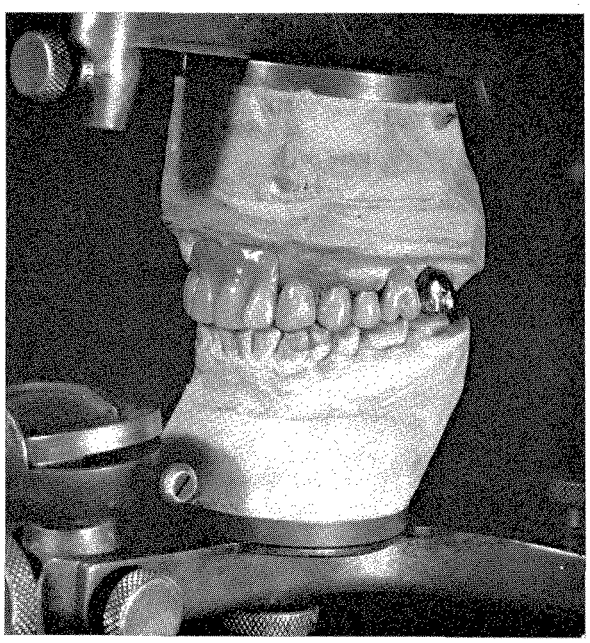


Fig. 1705. Complete rehabilitation was undertaken and completed in 1948.

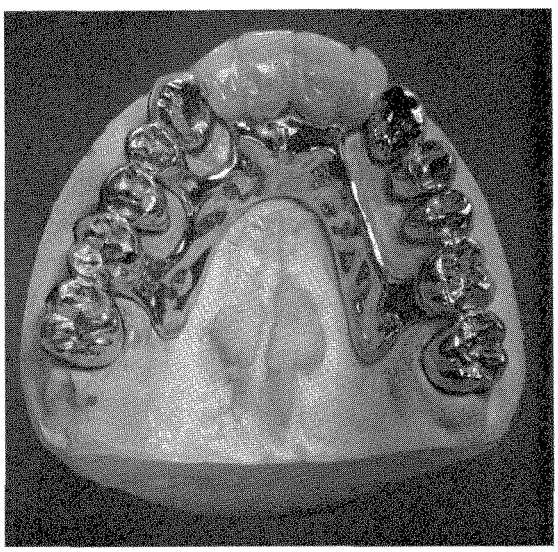


Fig. 1706. Palatal view of the upper prosthesis: the fixed and partial dentures on the cast.

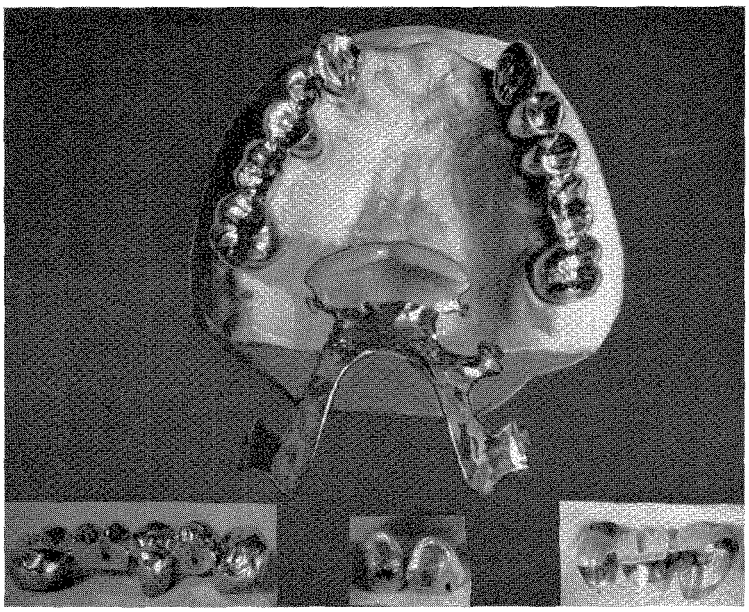


Fig. 1707. The removable partial denture has been removed from the cast. The fixed splints may be seen in the lower foreground. A large torus palatinus was present, but the case was designed to avoid it.

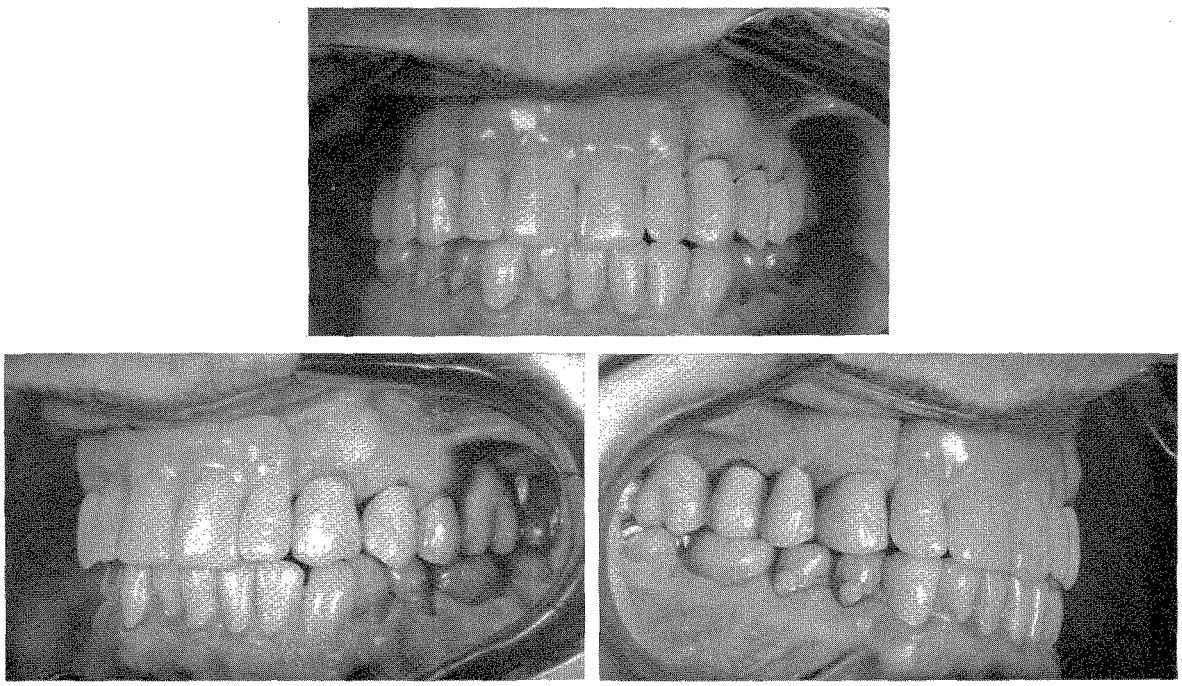


Fig. 1708. Three views of the completed work that were taken in 1948. At least five of the lower teeth were not yet covered with crowns.

Fig. 1709. Roentgenograms taken in June, 1948, at the completion of the rehabilitation.

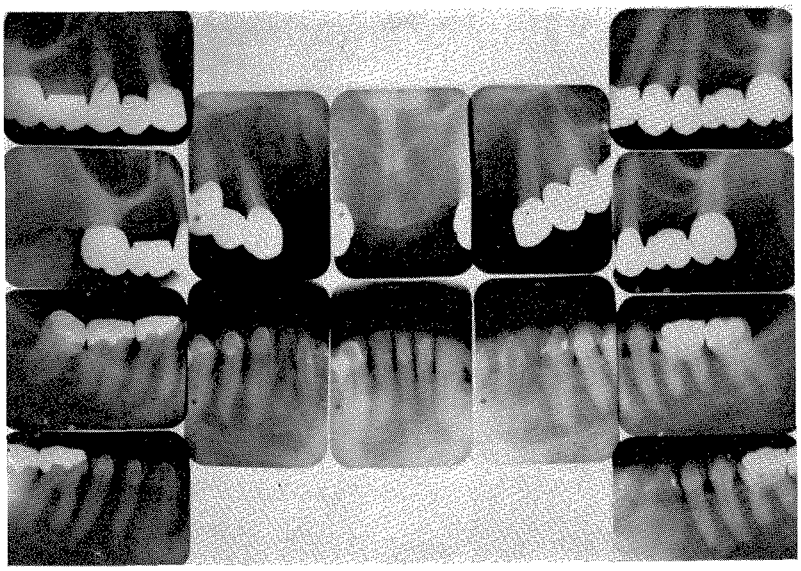


Fig. 1710. By 1954 only the lower molars were unprotected against the action of the hydrochloric acid. The remaining teeth had all been crowned, as these roentgenograms show.

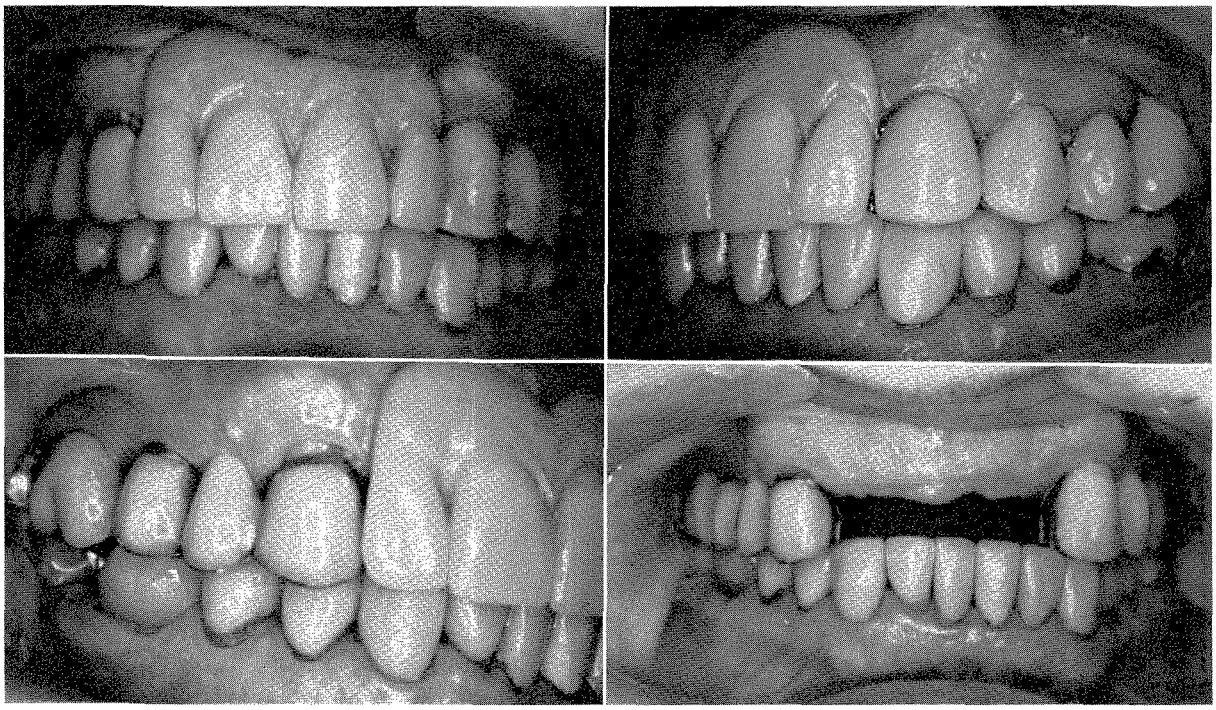


Fig. 1711. Four views of the teeth taken in 1962. In 1960 a new duplicate upper removable partial denture was constructed. In 1960 the upper left fixed partial denture was also remade. The patient was then past 70 years old.

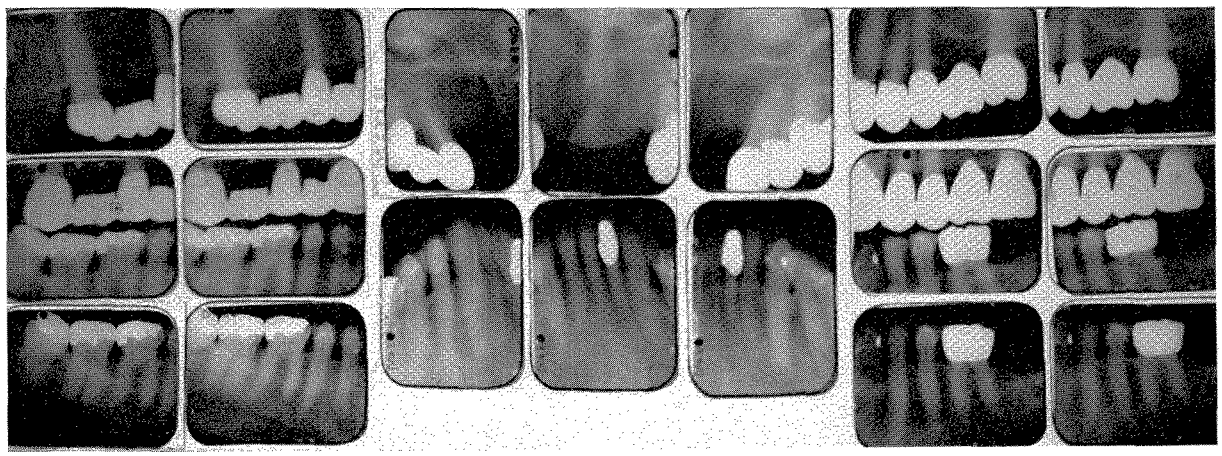


Fig. 1712. Roentgenograms taken in 1962.

not attacked by the acid, only the enamel and dentin. Upon careful questioning, it was finally discovered that the patient had been taking hydrochloric acid regularly by way of the mouth for a serious systemic disease. It was imperative that she continue to take it. As a result, all of her teeth had to be covered completely with crowns to prevent their destruction.* (Figs. 1701 to 1712.)

LEMON JUICE

Lemon juice has destroyed many mouths. It is usually taken in warm water before breakfast. The enamel is first affected and then, aided by the toothbrush, the dentin is softened and abraded. The destruction takes place gradually and is often undetected. The original cause may have taken place so long ago that it is difficult for the patient to give you the dates of the period of time when the lemon juice was imbibed.

Case 25

Early in 1960 a 50-year-old man came for consultation relative to the severe abrasion and erosion of his tooth structure. In his early twenties he had taken lemon juice in warm water daily for two years. Although for the previous thirty years no lemon juice had been taken, the protecting enamel layer had long since been dissolved and the destruction continued, at a slower pace, because the dentin no longer had its protective coating. (Figs. 1713 and 1714.)

Case 26

When there is a combination of periodontal pathology plus lemon juice erosion, the problem is more difficult to solve. The patient whose case will now be presented had been under specialized periodontal care for many years. At the present writing, he was in his mid-fifties. According to the past history, he had been drinking lemon juice in warm water every morning for many years. He stated that he continued to do this until only recently when he was advised against it. Aside from his periodontist, he had not had a general dentist.

Cooperation is needed between the specialties

This is a problem that our profession must solve. The patient maintains that he had never been referred for general dental care, nor had he ever been questioned concerning the habit of drinking lemon juice. His periodontist disagreed with both these contentions. In defense of the periodontist, it must be said that he was very cooperative and submitted all of the patient's previous records. In many cases the patient's former dentist is extremely reluctant to part with records, offering many excuses. Often none have ever been taken. It is only in exceptional cases that the old records are obtainable. Needless to say, they may be of considerable value in solving the patient's problems.

It was mentioned earlier in the text that the prescription for the oral rehabili-

*Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., p. 585.

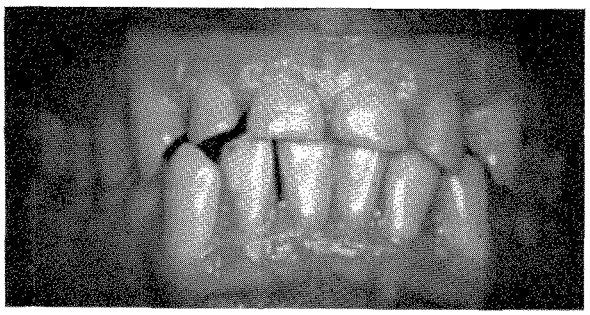


Fig. 1713. A man, 50 years old. Thirty years previously he had taken lemon juice in hot water every morning for a period of two years. This photograph was taken in 1960. (Figs. 1713 and 1714 are of the same case.)

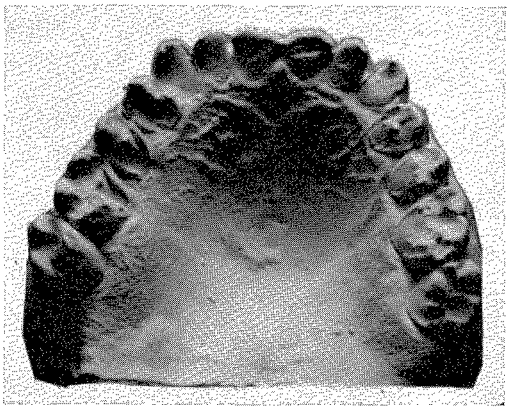


Fig. 1714. Casts of the teeth of the 50-year-old man shown in Fig. 1713. He had taken lemon juice in hot water daily for two years.

tation should be given by the prosthodontist. With his long experience in oral rehabilitation, he is well equipped to prescribe the patient's future prosthetic requirements. Most of these patients have either been referred to the periodontist by the general practitioner or by the prosthodontist. When the periodontist has completed his specialized treatment, the patient should again return to the general practitioner or the prosthodontist for regular postinsertion care. It is possible for this regular care to be divided between the prosthodontist, who acts as the general dentist, and the periodontist, but the postinsertion care should have only one supervisor in order not to confuse the patient. In this way duplication of treatment will be avoided, and any necessary treatment will not be omitted. If there is discord between the two specialties of periodontics and prosthodontics, the patient is penalized.

Present condition

The patient whose case is being presented was first examined in January, 1960. Only six upper and eleven lower natural teeth remained. The periodontal tissues were weak. He had developed an excentric functional bite. The chemical erosion that had been caused by the lemon juice had destroyed a great deal of tooth structure. The patient's vocation included public lecturing and selling. Therefore he wished to retain his natural teeth and was willing to assume any reasonable risk to do so.

Treatment

With this in mind, complete oral reintegration was prescribed. It was accomplished in three stages—the first and second transitional stages and the final work. A Hanau Model H articulator was used. Splinting was resorted to, and the mandibular teeth were restored by fixed prostheses. The maxillary prostheses consisted of a combination of fixed and removable partial dentures. The removable partial denture had extensive tissue coverage. An anterior plastic saddle extended under

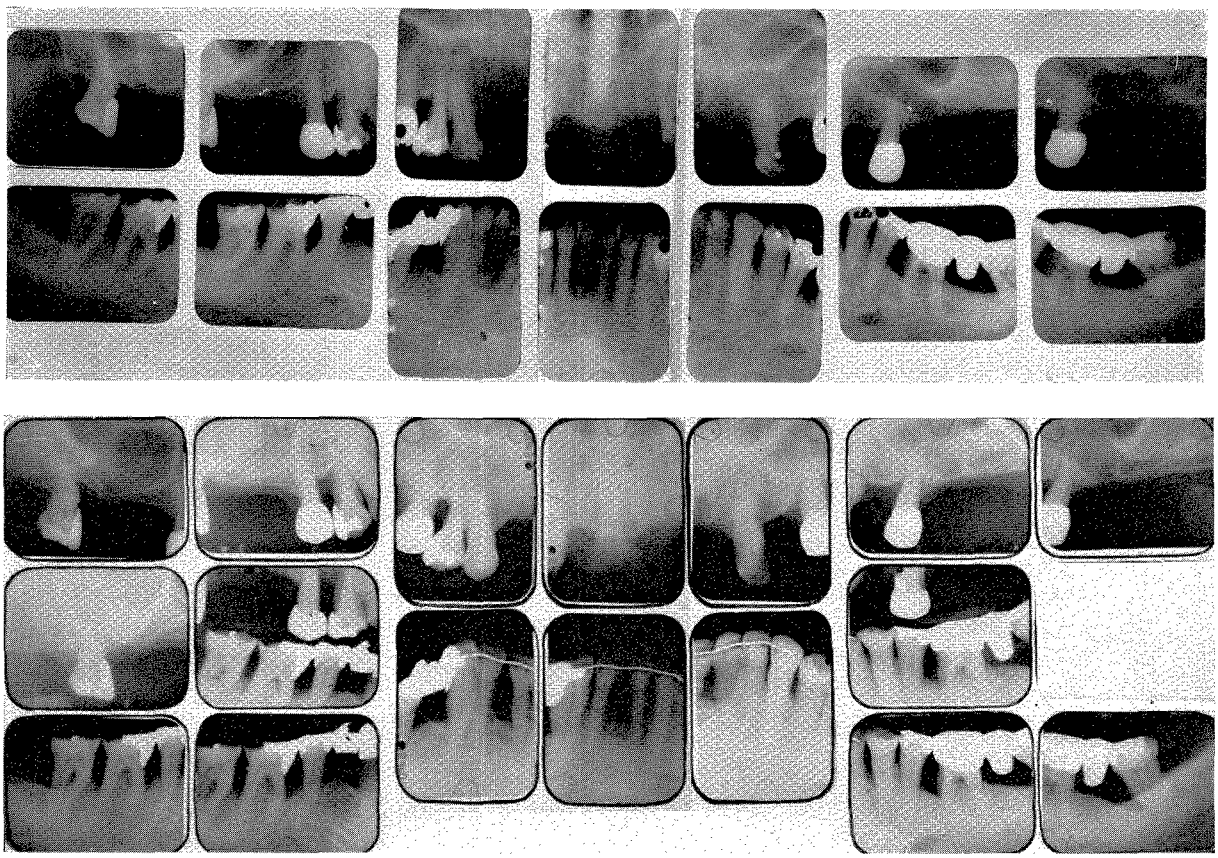
Text continued on p. 867.

A

B

Fig. 1715. A, Roentgenograms taken in May, 1941. **B,** Roentgenograms taken in November, 1949. **C,** Roentgenograms taken in August, 1955. **D,** Roentgenograms taken in January, 1960. Those shown in **D** were taken just before the rehabilitation of the mouth was undertaken. (Figs. 1715 to 1731 are of the same case.)

C



D

Fig. 1715—cont'd. For legend see opposite page.

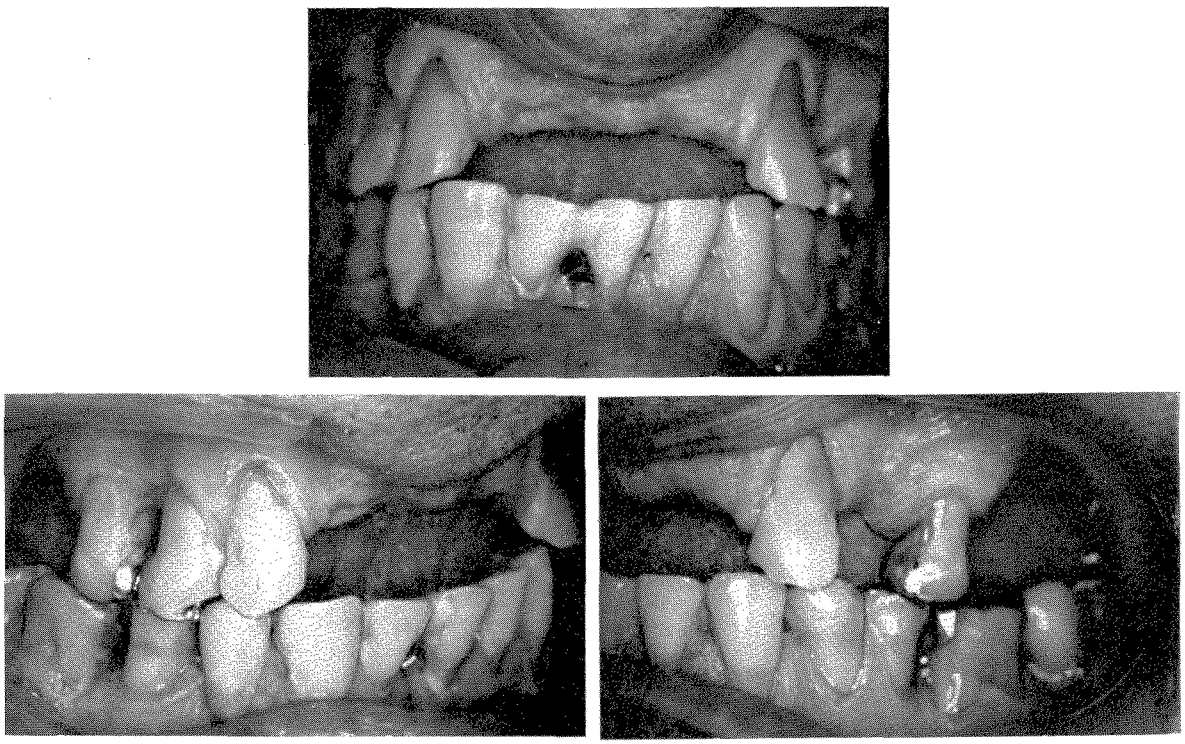


Fig. 1716. Three views of the mouth of a middle-aged man. These were taken in January, 1960. This is the same patient whose roentgenograms are shown in Fig. 1715.

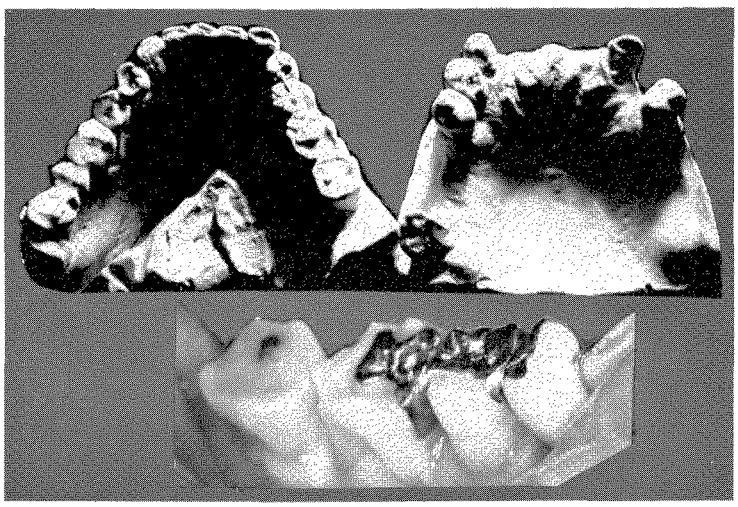


Fig. 1717. Casts showing acid erosion and abrasion. In the foreground are the lower right posterior teeth which have been dissolved by the acid. The gold inlays stand out like islands while the tooth structure dissolves away around them.

Fig. 1718. The teeth were all finally prepared by June, 1960.

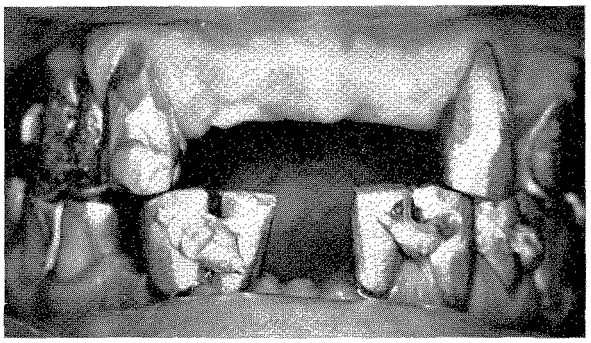


Fig. 1719. Low-fusing metal transfers were used to obtain centric relation, vertical dimension, and accurate positioning of the dies on their casts. These transfers were soldered together in the mouth in various groups as shown here.

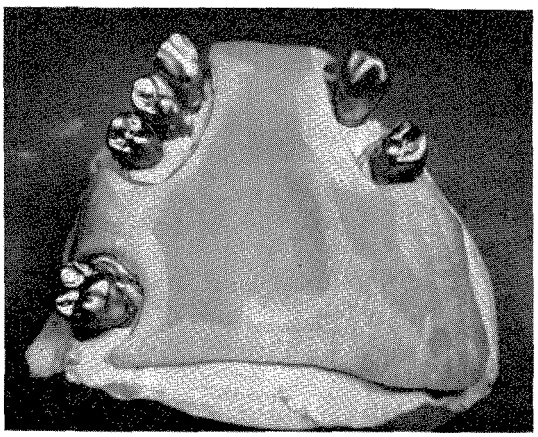


Fig. 1720. A special acrylic tray was made in which to obtain a mucostatic impression. The cast crowns shown in this illustration are final crowns.

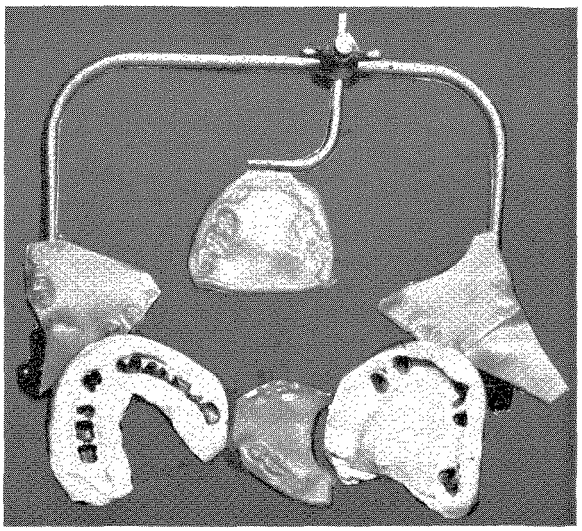


Fig. 1721. Records were taken several times during the successive stages of construction. They consisted of wax positional records, a face-bow, and plaster impression.

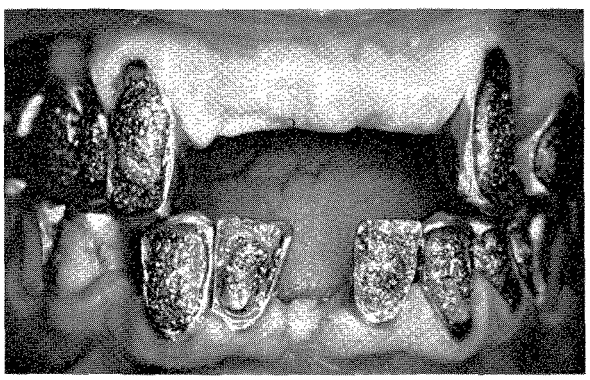


Fig. 1722. Try-ins of the prostheses also took place as frequently as was necessary as the work advanced toward completion.

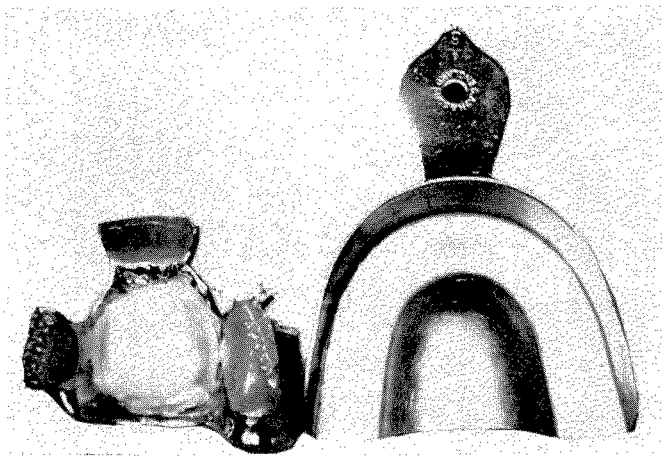


Fig. 1723. After the removable upper metal casting had been made, wax rims were attached to it. The over-all plaster impression was taken with the tray shown on the right side. The wax rims engaged the tray and held the casting under light pressure.

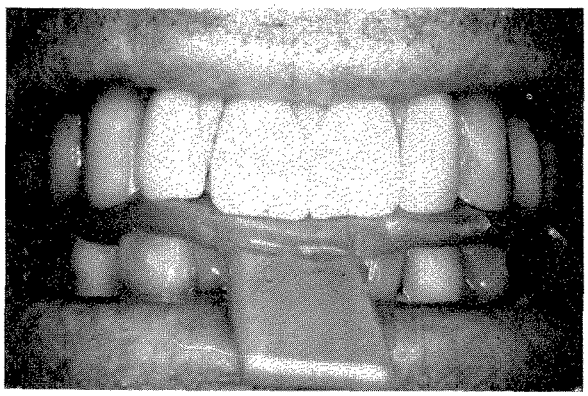


Fig. 1724. Wax checkbite records are always taken of the final work before it is completed.

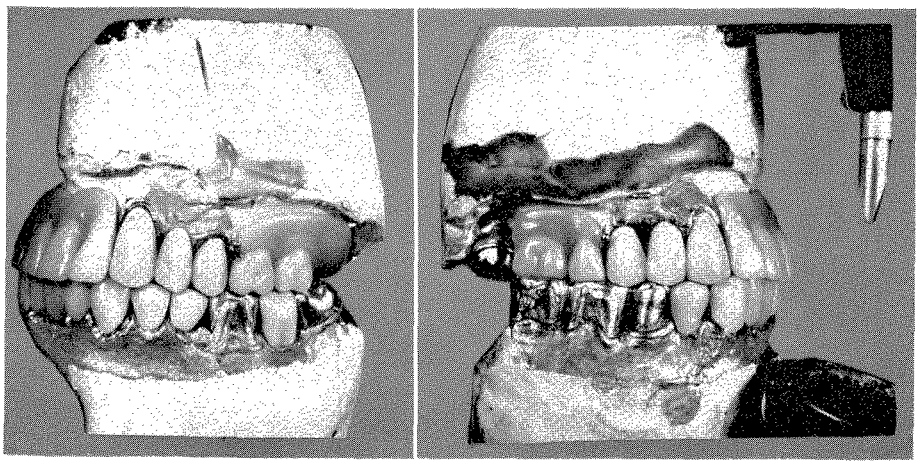


Fig. 1725. Left and right views of the final prostheses on the articulator.

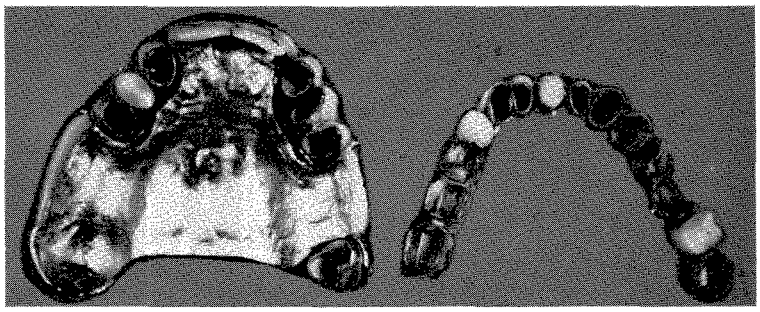


Fig. 1726. The final fixed and removable prostheses just prior to insertion.

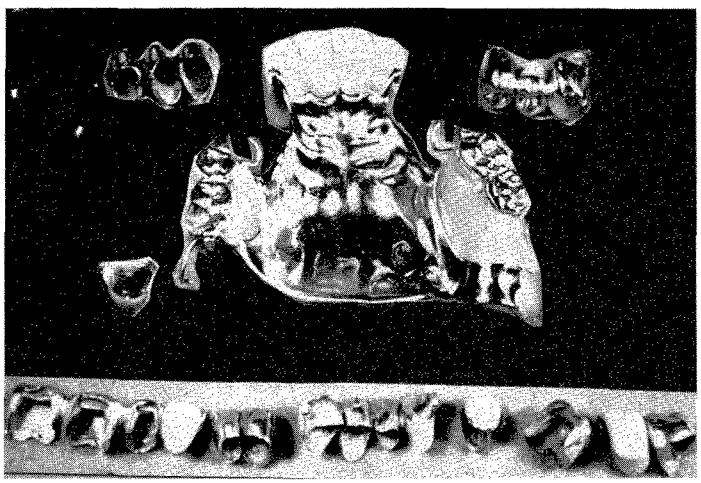
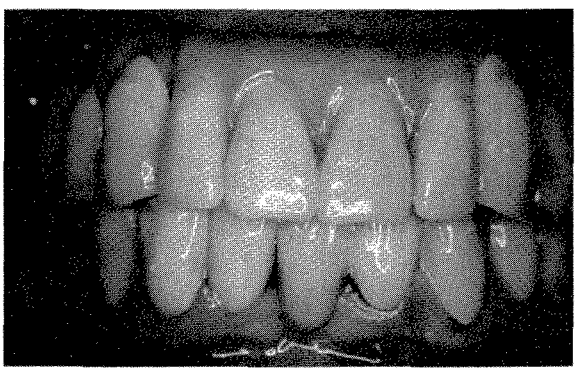
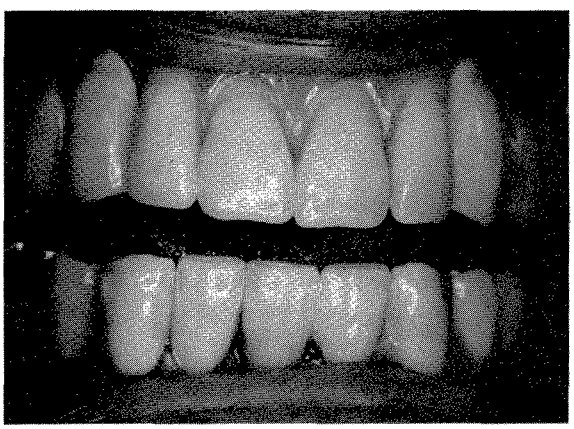


Fig. 1727. The completed work. This photograph was taken in August, 1960. The lower prostheses consisted of six separate parts which were connected by means of precision attachments and precision lugs to form one semirigid fourteen-unit fixed partial denture. (See Fig. 1726, **right side.**)

A





B

Fig. 1728. A, Anterior view of the completed work. **B,** Same as **A** except the mouth is open.

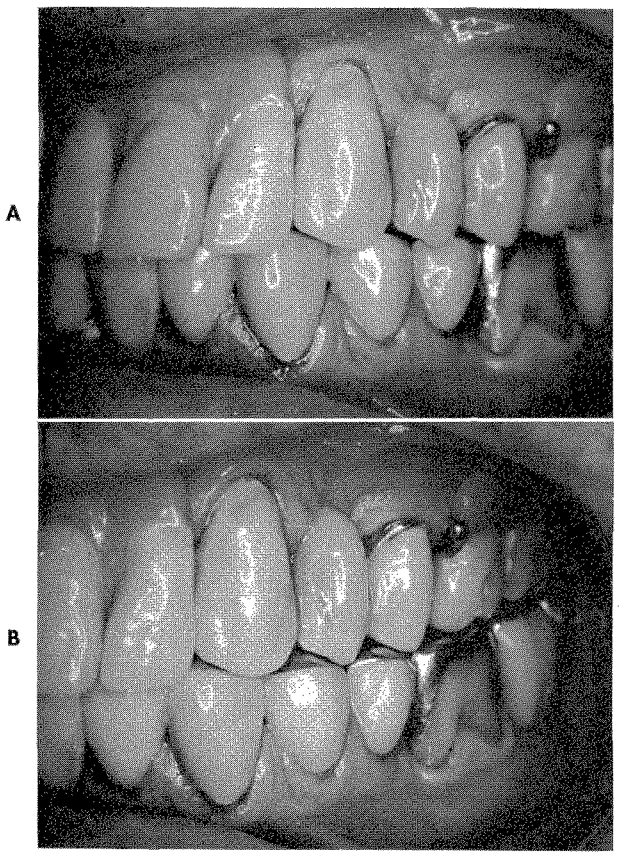


Fig. 1729. A, Completed work, left centric bite. **B,** Completed work, left working bite.

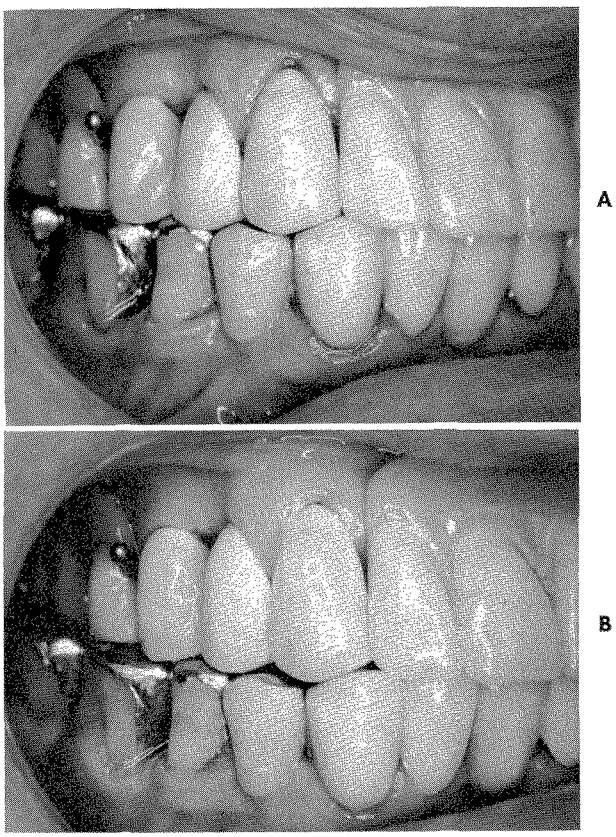


Fig. 1730. A, Completed work, right centric bite. **B,** Completed work, right working bite.

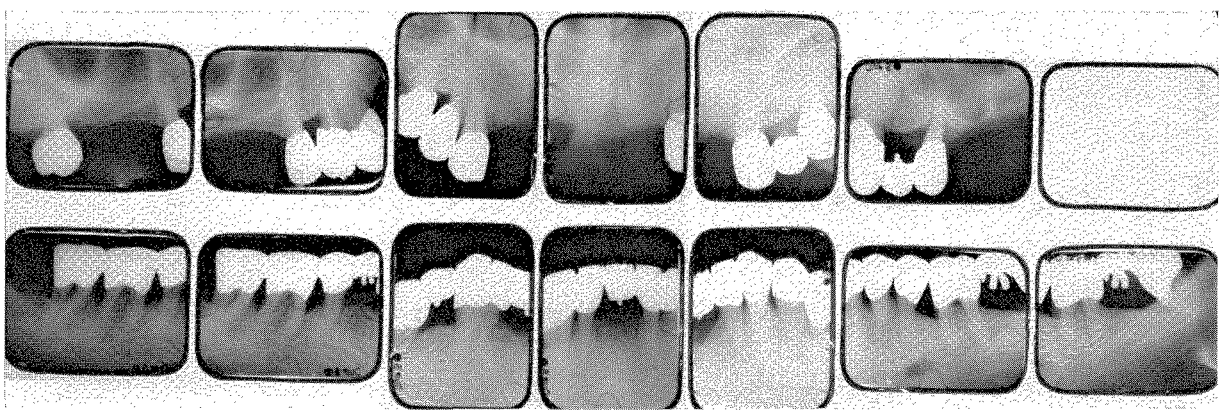


Fig. 1731. Roentgenograms taken in October, 1961. This is just over one year after insertion.

the lip and provided additional stabilization and retention. The final work was inserted in September, 1960.

An important problem to be considered was the longevity of the remaining six upper natural teeth. If it became necessary to remove the right molar, the upper removable partial denture would still function. If the right first bicuspid required removal, it would still function. Nothing further can be predicted other than a full denture at some future date. The patient was well aware of the nature of his problem. His oral hygiene was excellent. Office visits were made four times a year. This was a very cooperative patient, and a most congenial doctor-patient relationship existed. (Figs. 1715 to 1731.)

Chapter 14

MISCELLANEOUS CAUSES THAT CREATE DENTAL PROBLEMS (cont'd)

DENTAL PROBLEMS EXIST REGARDLESS OF THE ARTICULATOR (OR THE THEORY OF OCCLUSION)

We must guard ourselves against evaluating occlusal therapy in terms of some rigid mechanical concept. There is no one system that has a priority on perfection. There is no doubt that certain patients have conditions peculiarly favorable for the application of a specific theory. However, to apply any given system to the infinite variety and broad area of our prosthetic problems is not only futile but also dangerous.

GNATHOLOGY

The Gnathological Society was founded by Beverly McCollum in 1926. The following are some of their concepts and claims:

The gnathograph was the first instrument that was capable of duplicating the exact movements of the mandible. This instrument was invented in 1930.

The gnathoscope was the first instrument that was capable of recording the exact movement of the mandible. This articulator was invented in 1934.

Gnathology is the science that treats of the biologies of the masticatory mechanism.

The physiology of the mouth is actually expressed in the teeth. Therefore, the articulation of the teeth becomes the fundamental factor in an understanding of oral physiology.

Following are the fixed factors:

1. Harmony of the jaw
2. Mandibular centricity
3. Hinge axis
4. Character of the condyle paths
5. Slant of the condyle paths
6. Lateral movements of the mandible

Factors subject to change are the following:

1. Inclination of the occlusal plane
2. Curve of Spee
3. Curve of Wilson
4. Character of the cusps of the teeth
5. Dentolabial relations
6. Overbite and overjet

One of the primary purposes of the face-bow is to determine the opening and closing axis of the mandible, an imaginary line passing through the condyles, sometimes known as the condyle cord.

The articulator should produce not only the relative position of the mandible to the maxilla but also all the paths of motion to a definite and precise degree.

The hinge axis points, together with the orbital points, once established and permanently marked by the tattoo ink, form the basis of all future transfers or orientations of the models or dental arches or edentulous ridges on the articulator.

The opening and closing axis is constant to the mandibular teeth, and even when the mandible is protruded and opened, the line of the opening axis occupies the same relation to the head of the condyles as it did when the mandible was in centric relation. In other words, the opening and closing axis is a moving axis that moves with the mandible.

The adjustment of the articulation of the teeth must be in cooperation with the movements of the mandible as dictated by the curve of the condyle path.

If the so-called centers around which the lateral movements of the jaw rotate, lie back of the axis, then in the lateral movements of the mandible there is a definite sideshift in the condyle head. This is known as the Bennett movement.

The Bennett movement expresses itself forcefully in its demands upon the anatomy of the teeth.

McCollum emphasized the adjustability but inadaptability of the temporomandibular joints. He stated that they are not subject to the whims of the muscles and that the condyles are not floaters. He also emphasized that the combined joints, in spite of their being biological mechanisms, provide definite, measurable, recordable movements that can be reproduced in an artificial mechanical contrivance.

He stressed the constancy of the mandibular joint. The character of the condylar movements remains constant from day to day and year to year as long as the individual lives. They are the same in the mixed dentition as in the deciduous dentition and the same in the permanent dentition as in the mixed dentition. They

do not alter after the teeth are gone. They will not change from any natural or artificial misfit of the teeth unless due to disease or injury.*

The technique is extremely exacting, elaborate, and detailed. The movements of the mandible are recorded on six different glass slides. Claim is made that they are able to determine the full character of the condyle paths, their inclination and shape, the amount of the Bennett movements, the centric position of the mandible, the hinge axis, the maxillomandibular dimensions, and the plane of the dimensional references—the axis orbital plane. The paths recorded by these jaw movements are etched on glass slides. The entire recording instrument (gnathograph) is then transferred from the mouth to the articulator (gnathoscope) by means of a special mounting frame. The gnathoscope is then adjusted so that the movement of its arms is made definitely to follow the movements made by the patient and etched on the glass slides.

The entire occlusion is fabricated so that the tooth movements are coordinated with those of the temporomandibular joint. The work is completed on the articulator and inserted into the mouth at one time. The final prosthesis attempts to restore as completely as possible the functions of the mouth and embody the anatomical likeness of well-formed, unworn teeth.

Case 1†

In 1951 the following case was reported. It is shown in detail in order to demonstrate the technique. (Figs. 1732 to 1775.)

The patient, a woman, 51 years of age, presented herself for treatment with a badly broken-down occlusion. Photographs and radiograps were taken. Study models were made from alginate impressions. A cephalometric study in the form of oriented casts, radiographs, and photographs was made through the courtesy and kindness of Dr. Bercu Fischer before the work was started and after the reconstruction was completed. (These records are shown in Figs. 1766 and 1767.) Radiographs were also taken of the condyles in rest position and in occlusal contact before the work was started and after its completion.

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*McCollum, B. B.: Fundamentals involved in prescribing restorative remedies, D. Items Interest **61**:522-535; 641-648; 724-736; 852-863; 942-950, 1939.

†From Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., pp. 1115 to 1137, Figs. 1121 to 1157.

Text continued on p. 886.

Fig. 1732. Anterior view of the patient's mouth as she presented herself for treatment. Observe the severe abrasion. (Figs. 1732 to 1775 are of the same case.)

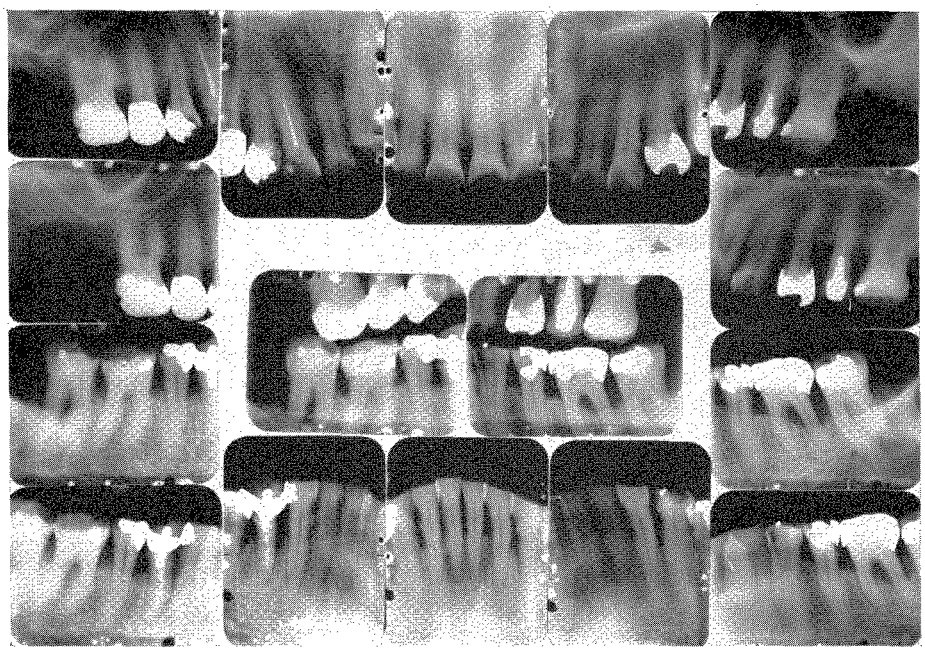


Fig. 1733. Radiographs of the patient's teeth at the start of the reconstruction. Observe the bifurcation involvement of the lower left first molar and the lower right second molar. Also observe the severe periodontal condition throughout the mouth.

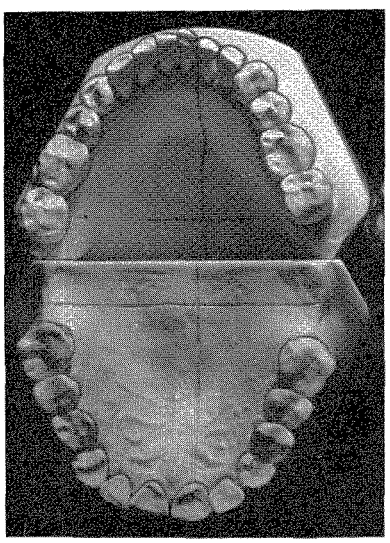


Fig. 1734. Occlusal view of the models of the teeth at the start of the work. Observe the severe uneven abrasion and attrition.

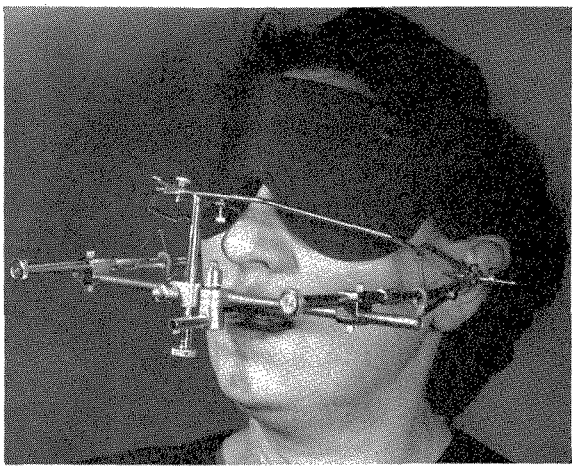


Fig. 1735. Accurate casts are made of the patient's teeth in stone. A face-bow registration is made to approximate the hinge axis of the condyles. A centric relation wax record is taken. The orbital indicator is shown in position. Modeling compound is used on the fork of the face-bow, and the teeth are accurately seated in this modeling compound so that the casts may be positioned accurately in the modeling compound. The upper model is now placed into its position in the upper portion of the face-bow. The face-bow is secured on the mounting frame in the same relationship that it bore in the mouth. The upper arm of the gnathoscope is removed and transferred to the mounting frames. The orbital indicator is placed in position on the mounting frame, and the upper arm is secured by means of artificial stone to the upper arm of the gnathoscope. When it is set, the upper arm on the gnathoscope is removed and carried back to the gnathoscope. The lower model is then mounted to the upper model on the gnathoscope by means of a centric relation wax record which has been taken in the mouth. The purpose of mounting the upper and lower models on the gnathoscope at this particular time is to make two metallic clutches with which the movements of the patient's jaws are going to be recorded.

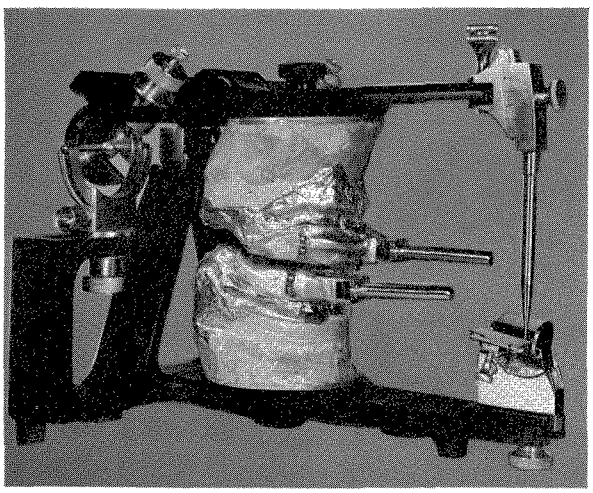


Fig. 1736. The models are first tin-foiled and then waxed up in the form that the clutches will finally take. They are cast in a special base metal. The studs are finally placed anteriorly. It is on these studs that a recording device will be placed. The screws at the side of the clutches enable the operator to remove the clutches in two pieces.

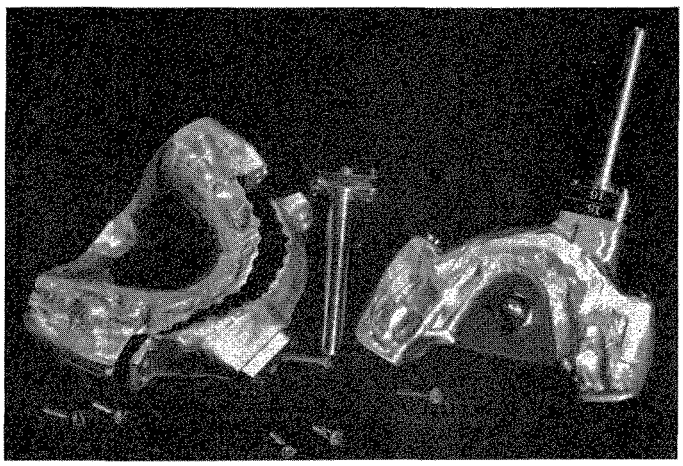


Fig. 1737. The upper and lower clutches are shown here taken off the models. The lower clutch still has the anterior stud, which is removable, in position. The screws to disassemble the lower clutch into its two component parts may be seen at the side. The center tracing pin is also shown. The upper clutch (on the left) has been disassembled to show its two different parts. The anterior stud has also been removed. The purpose of the central-bearing instrument is not to record the Gothic arch but simply to separate the jaws so that the lateral and protrusive movements will not be interfered with by any premature contact other than that which the central-bearing instrument provides. These clutches are now taken to the mouth and cemented with a temporary cement.

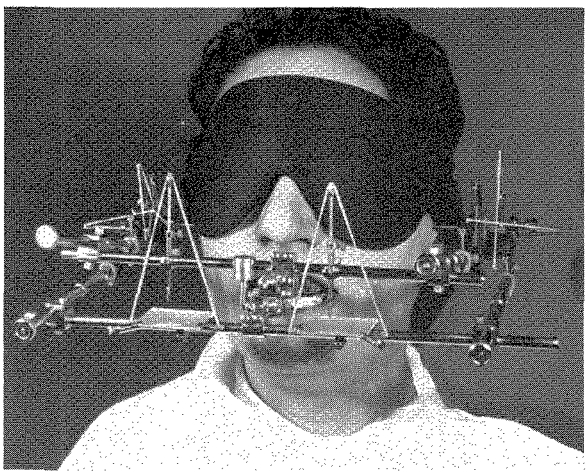


Fig. 1738. The clutches were cemented in the mouth with a temporary cement. The gnathograph is shown here in position. By means of this instrument the patient is able to register the jaw movements. There are two horizontal styluses in the condyle region which record the condyle paths. There are two vertical styluses in the same region which record the Bennett path. The two vertical styluses in front record the so-called Gothic arch tracings of the lateral jaw movement. These help to locate the vertical axes of the mandible. The axis orbital indicator is not shown in this particular illustration, but it is placed in position before the instrument is removed from the mouth. Before the jaw movements are traced here on the six tracing plates shown, the face-bow registration is made, and the transverse hinge axis of the mandible is established. Once the exit of the hinge axis of the mandible is established, it is tattooed on the face, both on the right and on the left sides so that it can always be referred to. The right and left arms of the instrument which recorded the hinge axis are then removed, and the two additional arms of the gnathograph are placed in position to make the second recording as shown here. The axis orbital indicator is then placed in position on the upper arm. After the recordings are made, the vertical rods (vise grips) are placed in position anteriorly on the transverse bars, one on the upper and the other on the lower bar, so that the upper and lower arms of the gnathograph may be cemented together in centric relation and removed in one piece so as not to disturb this relationship. The studs are unscrewed, and the gnathograph is removed from the mouth. The upper clutch is then unscrewed and removed in two pieces, as is the lower clutch. After the removal of the clutches, they are reassembled and placed by means of these studs again upon the gnathograph outside the mouth.

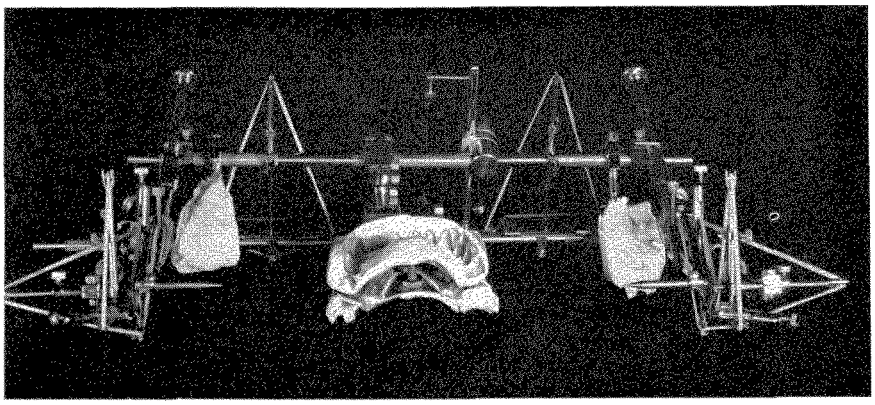


Fig. 1739. The gnathograph is now reassembled outside the mouth. The stone cementing the upper and lower arms together, which enables the operator to remove the gnathograph in one piece, is shown clearly. The clutches have been reassembled on the instrument. This is a view looking from the back forward.

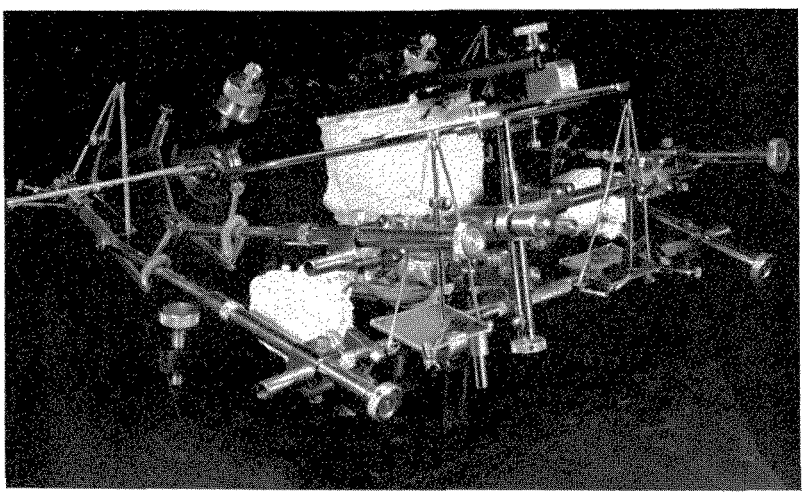


Fig. 1740. The gnathograph is placed in position upon the mounting frame by means of a toggle joint. The upper arm of the gnathoscope is removed from the articulator and placed in position on the mounting frame. The axis orbital indicator is placed in position on the mounting frame. The upper clutch is then attached to the upper arm of the gnathoscope by means of artificial stone as is shown here. The upper arm of the gnathoscope is then removed, together with the gnathograph, and placed in position on the gnathoscope. The lower clutch is then joined to the lower arm of the gnathoscope by means of artificial stone, and the movements of the gnathoscope are made to conform to the movements as recorded on the last tracing plates of the gnathograph. These, it will be remembered, were the same movements that were created by the patient and, when completed, were etched in the glass recording plates by means of hydrofluoric acid. When the gnathoscope conforms completely with the movements of the styluses as recorded by the gnathograph, then the gnathograph is removed from the gnathoscope, and the articulator is capable of performing the movements that the patient made. All the future work is performed upon the gnathoscope, not changing any of its recorded movements.

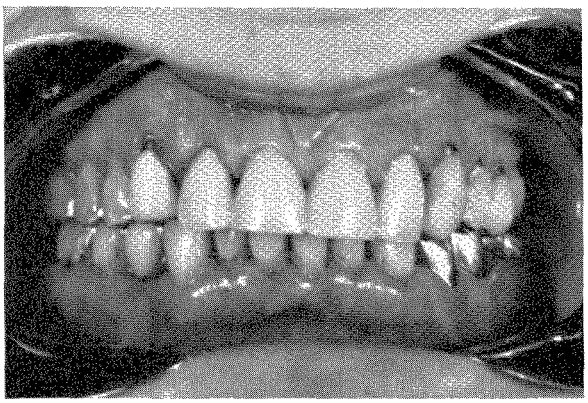


Fig. 1741. Temporary work has been placed in the mouth as shown in this illustration. Metallic castings have been made for all the posterior teeth and joined together in the form of splints. A plastic splint has been made for the upper four anterior teeth. The lower incisors have been rebeveled. The placing in of the temporary work after the removal of the old work that has been in the patient's mouth makes it possible for the patient to remain comfortable during the procedure and to be able to chew properly, and also ensures cleanliness of the teeth as well as preventing the migration of the teeth during the procedure. After the teeth have been completely prepared for the final castings, another face-bow recording is made.

Fig. 1742. Close-up view showing the tattoo marks just anterior to the tragus of the ear. This is a registration of the transverse hinge axis. The stylus of the face-bow is shown pointing directly to the tattoo marks. In addition to the face-bow registration, two centric relation wax records are taken.

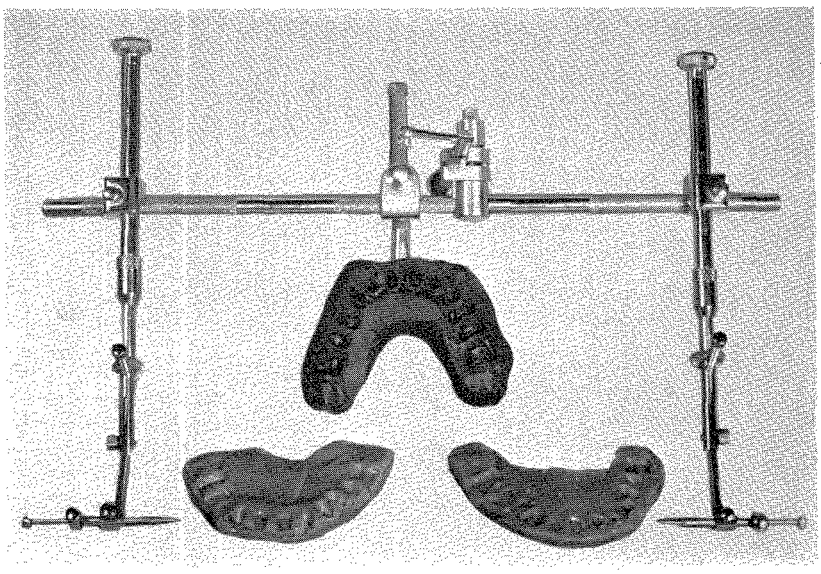


Fig. 1743. The face-bow after it had been removed from the mouth with the two centric relation wax records. The indentation of the teeth is shown clearly in the modeling compound on the fork of the face-bow. The upper working casts must be set accurately into position in the face-bow before it can be mounted on the mounting frame. The orbital indicator rod is shown to the right of the fork.

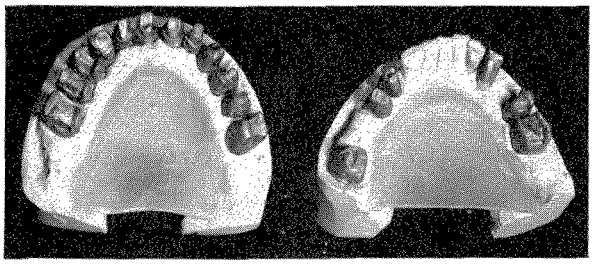
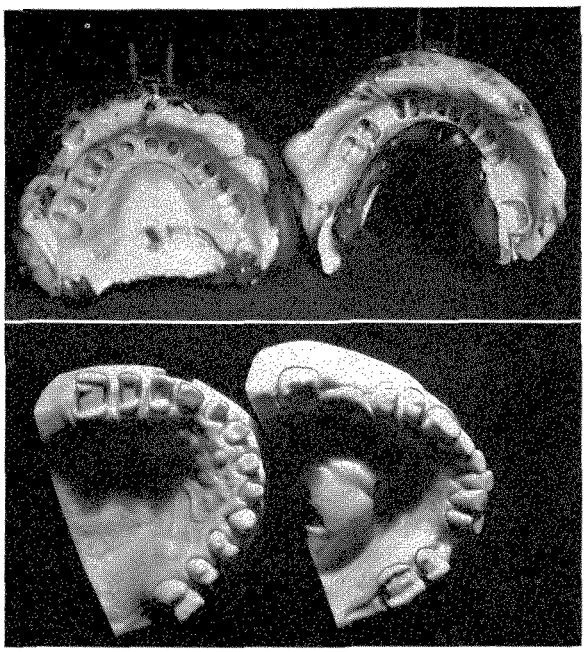


Fig. 1744. Modeling compound copper band impressions have been made of all the preparations, and copper-plated dies have also been made. A combination compound and wax impression has been taken in order to make these working casts. These casts and dies were not mounted on the gnathoscope, but they were used whenever necessary to complete the margins of the castings that were fabricated upon the models shown in Fig. 1746. It is sometimes difficult to finish the cervical margins of full crowns upon stone dies made from a hydrogel impression. The wax-up is made upon the stone model for more accurate positioning, etc. The margins are then completed where necessary on the copper-plated dies and are transferred back to the stone cast.

Fig. 1745

Fig. 1746



Figs. 1745 and 1746. Upper and lower impressions are shown here. These have been taken in trays filled with hydrocolloid. The periphery of the tray is first filled with modeling compound. These impressions are poured in a stone, and the completed casts are shown in Fig. 1746. The teeth have been prepared in the following manner: the lower right first molar and second bicuspid for three-quarter crowns; the lower right cupsid for a Carmichael crown; the gold was to extend over the incisal edge; the lower left second molar, first and second bicuspids for full-cast crowns; the incisal tip of the lower left canine for a gold inlay; the upper right first molar for a modified three-quarter crown; the upper left first molar for a three-quarter crown; the upper right first and second bicuspids for three-quarter crowns; the upper right canine for a full-cast crown that was to contain a plastic veneer; the upper left canine, first and second bicuspids for full-cast crowns that were to contain plastic veneers. The preparations of each posterior quadrant of the mouth were parallel because it was decided to join all the castings together for greater strength. The waxing-up was done on these stone models; the margins of the cast crowns were fitted on the copper dies and completed upon these dies.

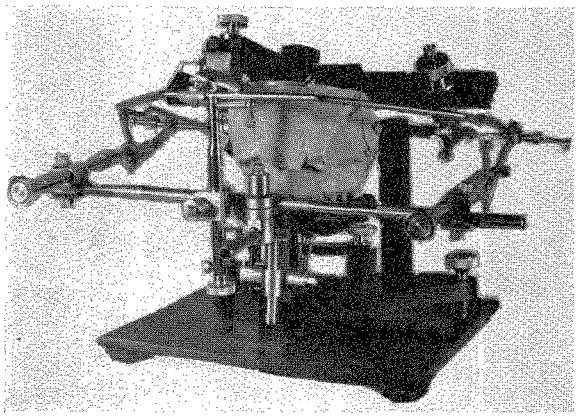


Fig. 1747. The face-bow is placed in position on the mounting frame. The upper working cast was placed in position in the face-bow. The upper arm of the gnathoscope was then placed in position on the mounting device. The axis orbital indicator was placed in position on the mounting device. The upper working cast was then attached to the upper frame of the gnathoscope by means of artificial stone. The upper frame of the gnathoscope was then removed and placed back upon the articulator.

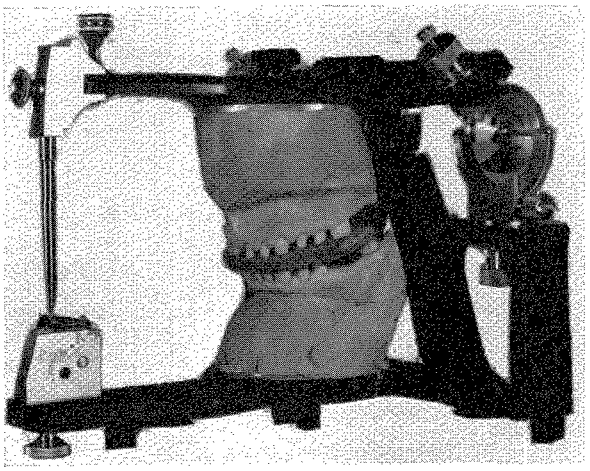


Fig. 1748. By means of a centric relation wax record which was taken in the mouth, the lower cast was mounted to the lower frame of the gnathoscope and to the upper model. The wax bite was then removed, and the coordination of the occlusion was started. The first procedure was to work out incisal guidance. This was done in wax and then cast in silver in the form of a splint going from the upper right lateral incisor to the upper left lateral incisor. With the incisal guidance splint in position, the posterior occlusion was worked out and completely coordinated with the movements of the gnathoscope. Maximum contact was obtained in the lateral and protrusive ranges.

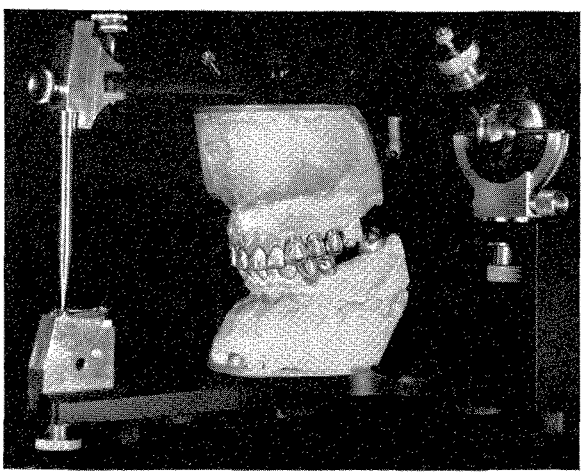


Fig. 1749. After the entire occlusion was worked out and coordinated in wax, the posterior castings were completed and placed back on the model as shown here. All the castings were then assembled in the mouth. Radiographs were taken to check cervical fit. A new face-bow registration was made. Two centric relation wax records were taken at this time, one to check against the other. A full upper and lower plaster impression was taken to engage the castings. The castings were then removed from the mouth, placed in their respective positions in the upper and lower plaster impression, and two new working casts were made.

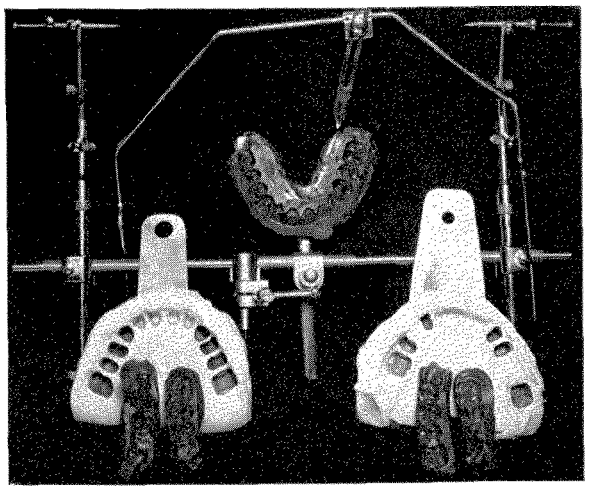


Fig. 1750. The new face-bow recording is shown here, together with the axis orbital indicator. The two sets of centric relation wax records are shown, and the upper and lower plaster impressions with the castings in position just prior to pouring stone casts from them are also shown. The new working casts will be mounted as before, namely, first by means of the face-bow on the mounting device; then the upper model will be mounted to the upper arm of the gnathoscope. The upper arm of the gnathoscope will then be carried back to the articulator and the lower working cast mounted to it by means of the centric relation wax record.

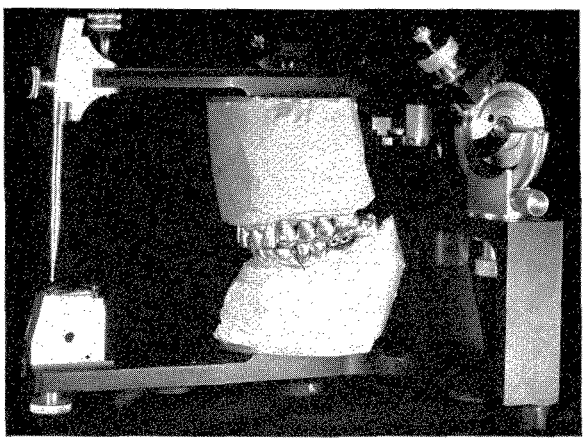


Fig. 1751. New working models back on the gnathoscope. The lower posterior bridges were completed, and the occlusion was further synthesized to coordinate with the articulator movements. This work is then carried back to the mouth and checked for perfection of the occlusion. If the occlusion is not perfect, another checkbite is taken, and the casts are again remounted upon the gnathoscope. When the occlusion is perfected and found to be satisfactory, then work is finished by completing the plastic veneers and the upper anterior porcelain jacket crowns.

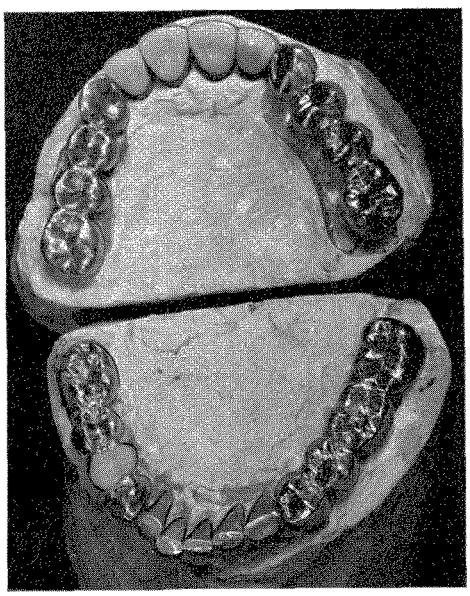


Fig. 1752. An occlusal view of the completed work. Observe that the cusps and ridges do not present flat planes but curved surfaces that touch each other in points as two balls rather than flat surfaces that touch each other as planes.

Fig. 1753

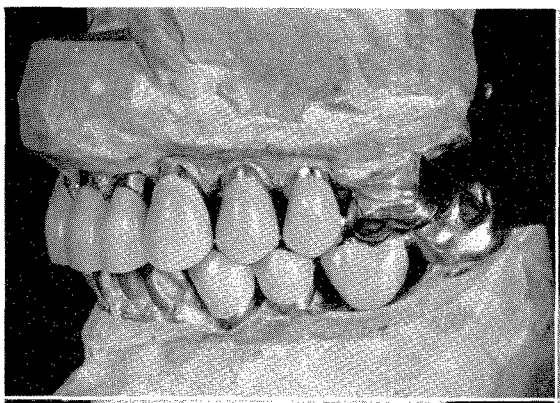


Fig. 1754

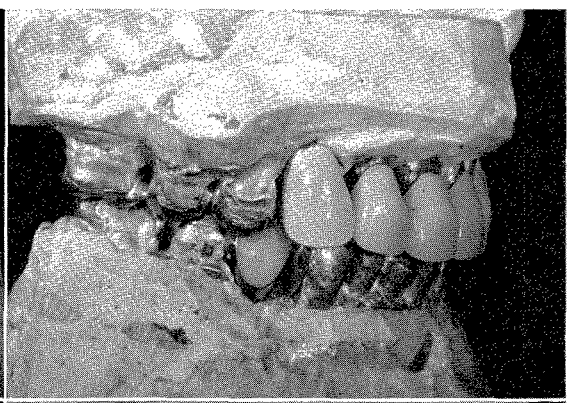


Fig. 1755

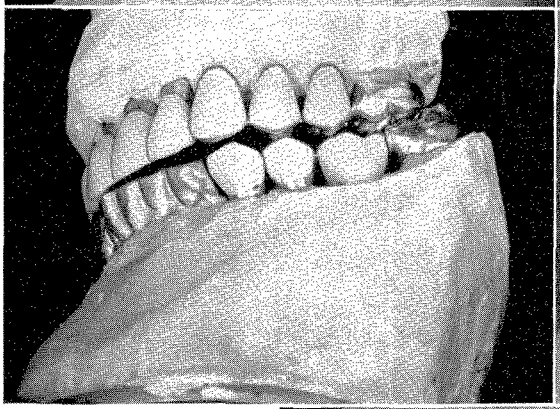
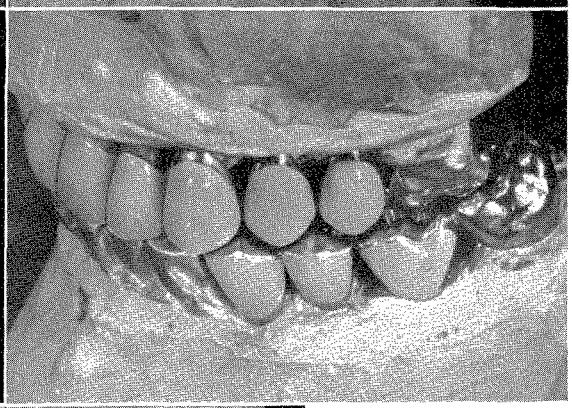


Fig. 1756



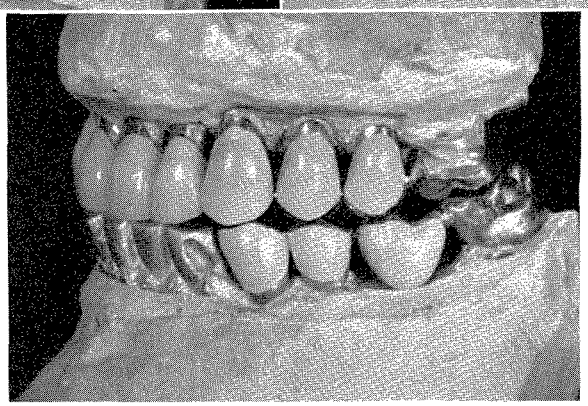


Fig. 1757

Fig. 1753. The left side of the completed work. Observe the intercuspation of the upper and lower teeth. It was decided not to replace the missing upper molars because that would have necessitated removable bridgework, and inasmuch as the periodontal condition was so unfavorable, it was decided to omit the missing molars.

Fig. 1754. The right side of the completed work.

Fig. 1755. The left balancing bite. Observe the continuous contact between the upper and lower cusps over a broad surface area.

Fig. 1756. The left working bite. Also observe the continuous contact of the cusps over a broad working surface.

Fig. 1757. Protrusive contact. Also observe the continuous contact in protrusion throughout the entire length of the arch.

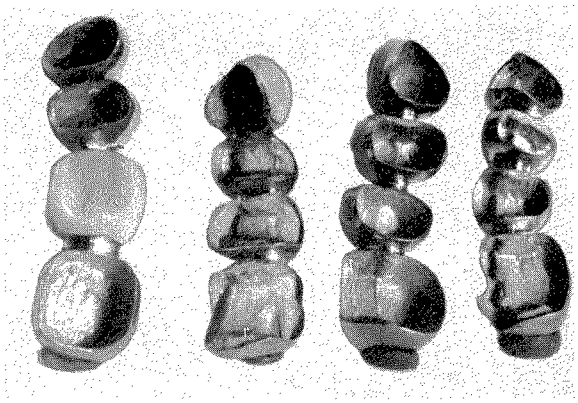


Fig. 1758. The posterior work off the cast ready for cementation in the mouth. In each posterior quadrant of the arch the restored work has been soldered together to provide greater strength and to act as a splint for the extremely weak posterior teeth. In this manner great rigidity is provided for the weak, loose posterior teeth. The old temporary splints and bridges are now removed from the mouth, the teeth are cleaned thoroughly with warm water and alcohol and varnished, and the new work is cemented in position.

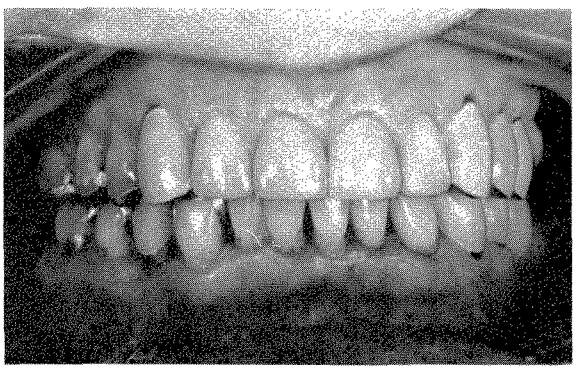


Fig. 1759

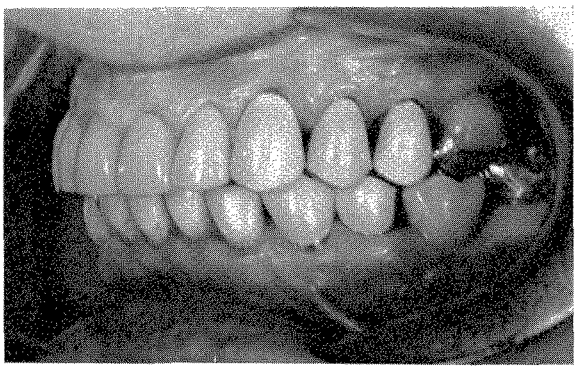
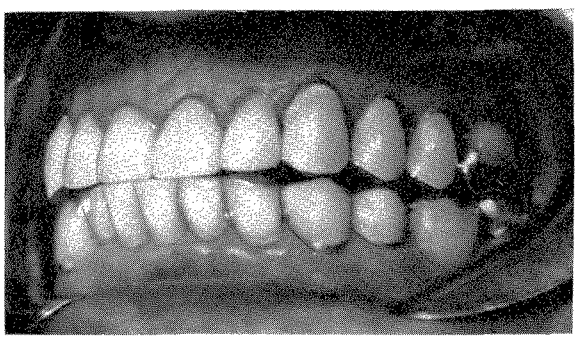


Fig. 1760

Fig. 1759. Anterior view of the completed work in the mouth.
Fig. 1760. The left side of the completed work in the mouth.

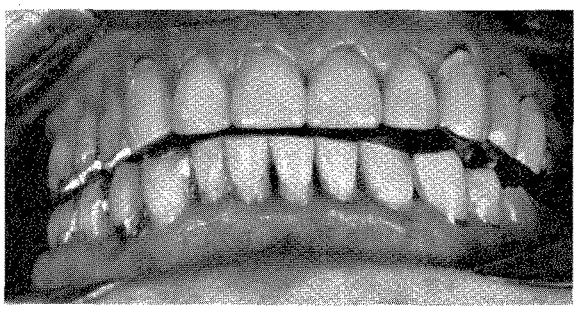
A



B

Fig. 1761. A, The right side of the completed work in the mouth. **B,** Continuous anterior and posterior contact is shown here in the protrusive bite from the left cuspid to the posterior molar.

Fig. 1762



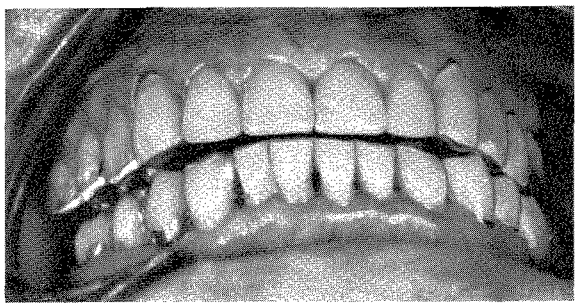


Fig. 1763

Fig. 1762 and 1763. The right and left balancing and working bites. Observe the continuous contact posteriorly. Observe also that in the left working bite the contact extends from the incisal gold inlay in the lower left cuspid all the way back to the posterior molar.

Fig. 1764. An occlusal view of the completed work. The surfaces of the restored teeth do not resemble flat planes but, rather, curved surfaces. This makes possible continued point contacts rather than flat surface contacts. Also observe the interproximal contacts and the transverse ridges, as well as the entire surface anatomy.

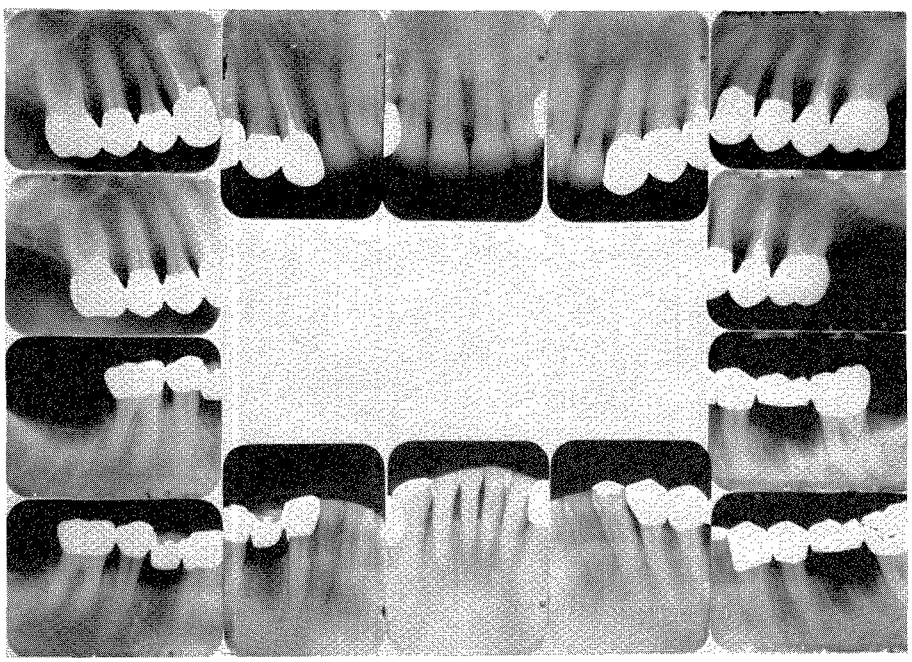


Fig. 1765. The radiographs of the completed reconstruction. Compare these with the radiographs of the work at the start of the case. (See Fig. 1733.)

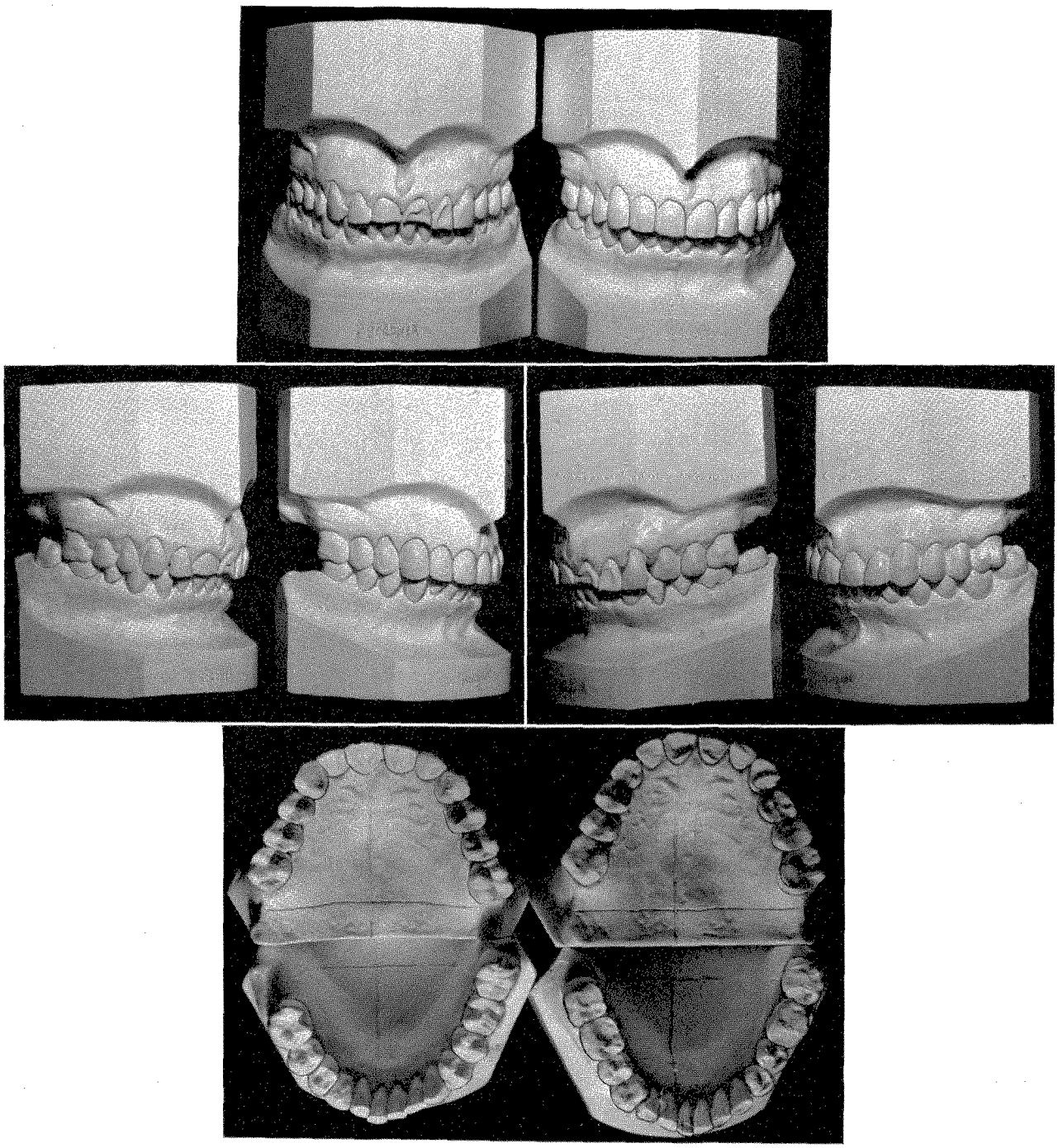


Fig. 1766. By means of a machine known as the dentiphore, oriented plaster casts of the teeth were made before the work was started and after the work was completed. The casts were related to the four planes of the human head, namely the Frankfort horizontal, the median sagittal, the auricular, and the orbital planes. By a comparison of the casts, any changes in the vertical positions of the teeth can be recorded. Changes in the overbite or in the axial position of the teeth can also be noted. Observe the medial plane on the lower casts. It divides the arch into two unequal halves. (Casts made by Dr. Bercu Fischer.)

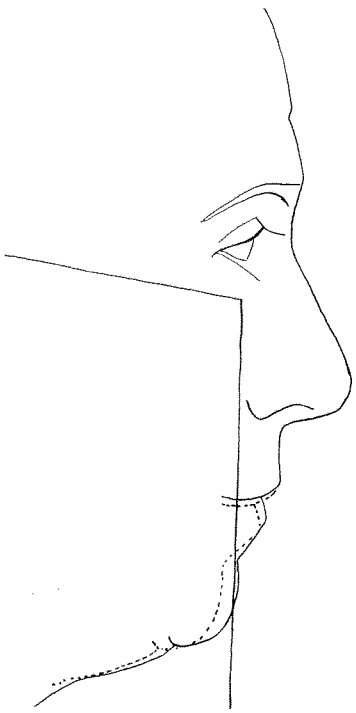
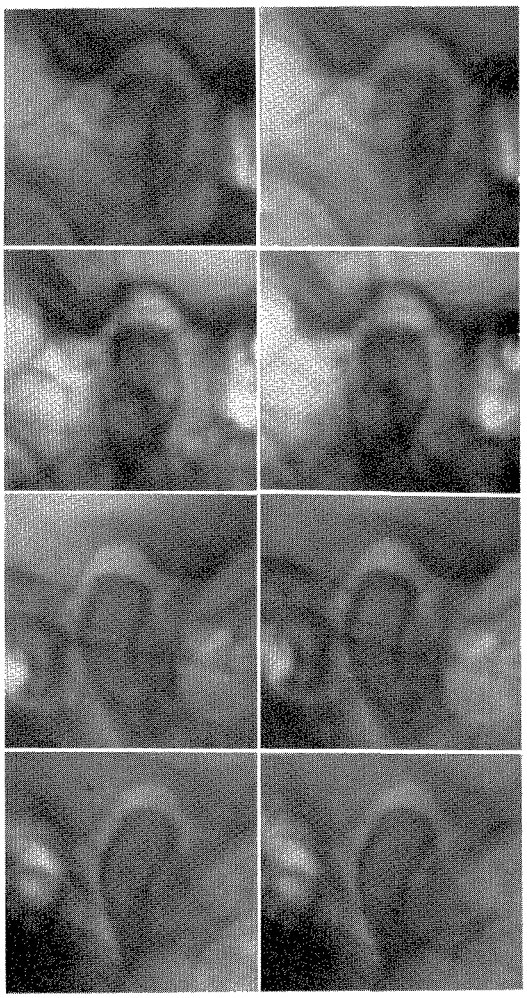


Fig. 1767. By means of the cephalophore and a miniature camera, standardized oriented facial and dental photographs and radiographs have been taken and accurately related to the eye-ear and median planes and to the orbital planes of the patient. Comparisons are then made by the lines registered on the photographs and radiographs before the work was started and after its completion. The solid line represents the facial profile at the start of work. The dotted line represents the facial profile at the completion. There has been a posteroinferior displacement of the mandible rotating about the condylar hinge axis in the completed case. This gives the apparent impression that the vertical dimension has been raised. Actually the mandible has simply rotated backward and downward. (Diagrams made by Dr. Bercu Fischer.)



Figs. 1768. By means of the Lindblom positioning device, radiographs of the condyles with the mandible in its rest position and with the teeth in contact were taken before the work was started and after the work was completed. On the left side, the mandible is in its rest position. On the right side, the teeth are in contact. The two upper films are those of the left condyle at the start, whereas in the second row from the top are the same condyles at the completion of the work. The third row from the top represents the right condyle at the start of the work, whereas the bottom row represents the right condyle at the completion of the work. Observe that there is only a hinge movement from rest position to contact position, with little or no condylar displacement.

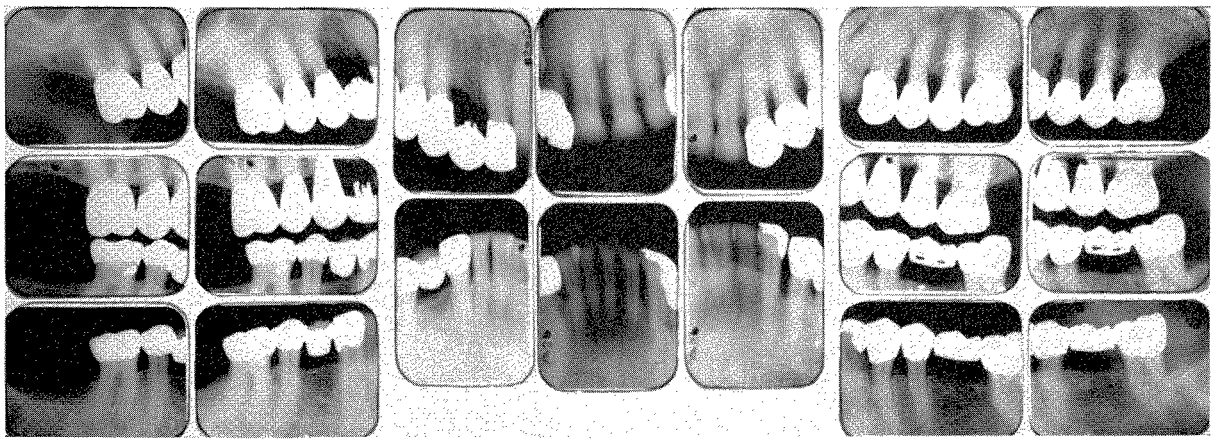


Fig. 1769. Roentgenograms taken in 1958 reveal some of the periodontal pockets shown in the original 1949 radiographs.

Fig. 1770

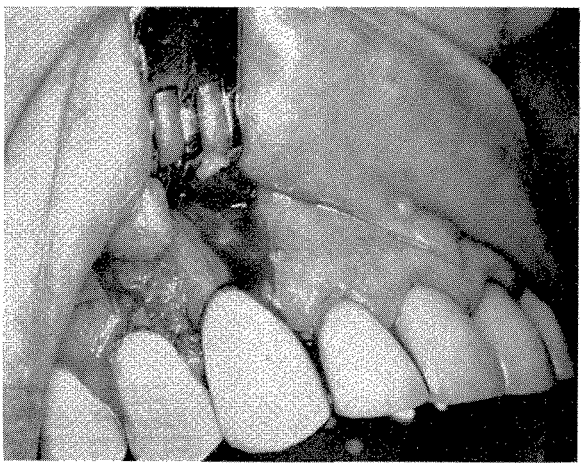


Fig. 1771

Fig. 1770. In January, 1957, the upper right cuspid was removed because of a split root. This is discernible in the photograph. The new bridge extended from the right lateral incisor to the right second bicuspid.

Fig. 1771. The new upper right bridge.

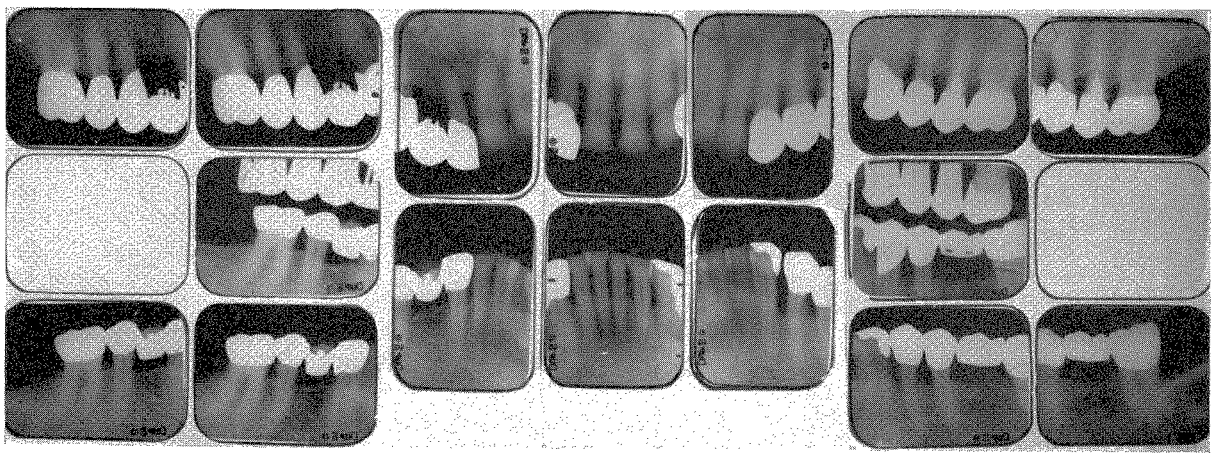


Fig. 1772. Roentgenograms taken in 1961.

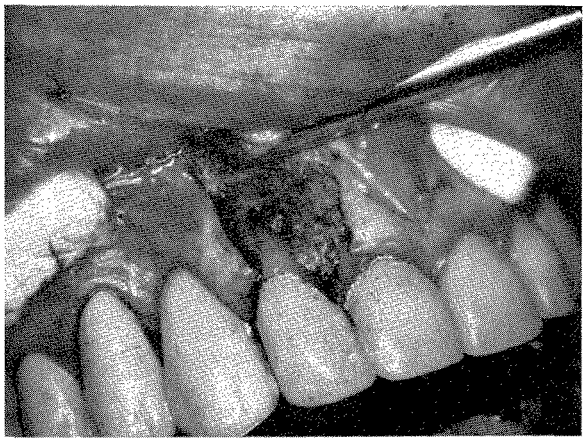


Fig. 1773. In March, 1961, the upper right lateral incisor developed a periodontal abscess. This was exposed by a labial gum flap and curetted. An attempt was then made to retain this lateral incisor by giving it the additional support of the right central incisor. The patient strenuously objected to having any additional teeth included in the bridgework.

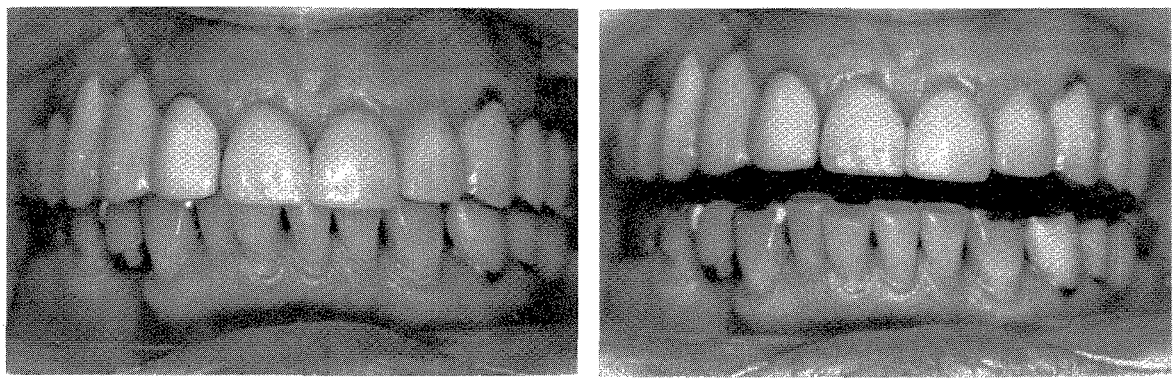


Fig. 1774. Mouth open and closed. These photographs were taken in January, 1961.

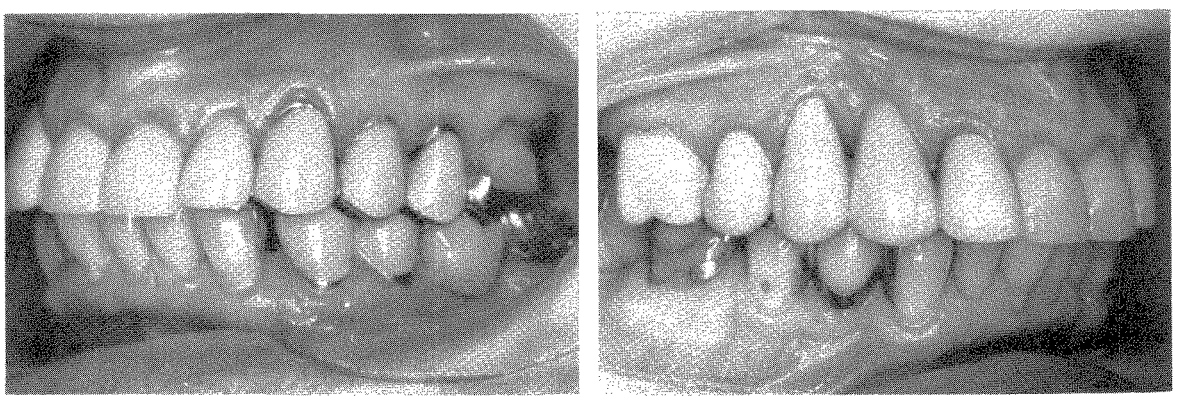


Fig. 1775. Left and right sides taken in January, 1961. The patient was then 63 years old.

Case 1—cont'd

Present condition

In the maxillae the following teeth were missing: the right second and third molars and the left second and third molars. In the mandible the following teeth were missing: both third molars. The occlusal surfaces of the teeth were badly abraded. The labial surfaces of the anterior teeth were abraded. The radiographs disclosed a severe periodontal condition. There were deep pockets upon all the upper posterior teeth. The bifurcation was extensively involved in the lower second molar and lower left first molar. In addition, the lower right first bicuspid was devitalized and infected. The upper canine and the upper left second bicuspid were also devitalized. The entire musculature of the patient, the facial muscles, and the masticatory muscles were hypertonic. She seemed to be under severe tension. She was a business woman and undoubtedly suffered from grinding her teeth both day and night. She had very powerful facial muscles which undoubtedly contributed to the destruction of the teeth by their hypertonicity, permitting this extensive night grinding. The patient was aware of the grinding but could do nothing about it.

Prescription

Decision was made to rehabilitate the entire mouth by means of complete occlusal reconstruction.

Procedure

A description of the procedure will be given in the legends to the illustrations, so that it will be unnecessary to refer to it here.

The following teeth were extracted: the lower right second molar and first bicuspid and the lower left first molar. Root canal therapy was instituted upon the upper right canine and upper right second bicuspid.

The gnathograph and the gnathoscope were used during the entire procedure. The patient was made comfortable by means of gold splints which extended from the cuspid to the molar and covered the four posterior quadrants of the mouth. This also included an upper anterior splint of plastic material covering the incisors. (Fig. 1741.)

Postinsertion history

In 1955 the upper right second bicuspid was fractured, making it necessary to remove the splint. The new crowns were not splinted. In 1957 the upper right cuspid root fractured. This root was nonvital at the beginning of treatment. Its removal left a concavity in the alveolar bone due to the resorption following the infection. It was replaced by a fixed bridge using both bicuspids and the lateral incisor as abutments. In 1961 the upper right lateral incisor developed a periodontal abscess that was exposed and removed. The tooth was placed on probation and was supported by the central incisor during the probation period.

Results unsatisfactory

Regardless of the time and effort spent, to say nothing of the elaborate technique, the outcome of this case was entirely unsatisfactory and unrewarding to me. The patient had been subject to clenching and bruxing habits that continued in spite of the oral rehabilitation. The registrations of the mandibular movements were extremely difficult to obtain because her muscular movements were jerky, spastic, and lacked coordination.

She never expressed encouragement during or after the difficult treatment period. Although the esthetics of the completed work was pleasing and left little to be desired, it has never been satisfactory to the patient. The continued clenching and bruxing resulted in a slight shifting in the position of the lower incisors. The patient refused to wear an acrylic night guard.

She was last seen in the summer of 1961, when the entire right side needed reconstruction. She was apprehensive and continually refused to permit the use of the upper central and lateral incisors in the making of the new bridge that was required to support the missing right cuspid and the problematic right lateral incisor. Encouragement had always been given to her to come regularly for gum treatments and roentgenograms. In spite of a well-equilibrated interocclusal relationship, the periodontal pockets in the upper posterior regions never cleared up and required regular currettage. The clenching and bruxing habits may have accounted for this.

This case demonstrates that even though only one tooth had been removed in ten years, the results were still entirely unsatisfactory. There are often certain neuroses in the patient's background that cannot be overcome. This being so, no matter what concept of occlusion is used, the results are a failure from both the patient's and the dentist's point of view. When the dentist is reasonably sure that his performance has been well thought out and executed and he does not receive encouragement from the patient, his work is meaningless, and there is no further incentive to continue his limited energies in behalf of the patient.

Relative to the use of articulators, it has already been demonstrated in this text that failures can result regardless of the articulator or the theory of occlusion.

MOST-RETRUDED POSITION OF MANDIBLE

Case 2

It is difficult to forget a patient who was examined by me, just prior to doing some extensive restorative work, who told the following story as part of her past dental history report. She had had some difficulty with her occlusion, and in 1947 went to California to have Beverly McCollum examine her mouth. Because he was undertaking no clinical cases himself, she returned to her home in the east and had her rehabilitation done by a dentist who used gnathological concepts and methodology.

According to her story, the treatment was brutal. Her mandible was "juggled, pushed, and shoved back" until she became hysterical. She left the dental office on many occasions and wept. The dentist finally managed to place her jaws in a single posterior position that was painful, thoroughly uncomfortable, and incorrect.

She was able to close her jaws only one way. The dentist would never listen to her complaints and was so severe in his treatment that she became afraid of him. The bridges on the right side, according to her story, became loose not long after their insertion. When they were removed by another dentist, the bleeding was profuse where the abutments had dug into the soft tissues in the saddle areas. She had complained bitterly when these bridges were inserted, and they were painful until they loosened.

Her mandible was finally released from its posterior position, and new bridges were inserted. Only after this was done was she made comfortable. Her story ended with the plea that if I was going to start pushing her jaw backward and putting her mandible in a vise that she would not submit to this kind of treatment ever again because one harrowing experience was sufficient for one lifetime.

As a further substantiation of the statement that failures can result regardless of the articulator or the theory of occlusion, the following case is submitted.

Case 3

The patient, a man in his mid-fifties, was referred for consultation in 1955. His mouth was reconstructed in 1953 in accordance with the principles of gnathology.

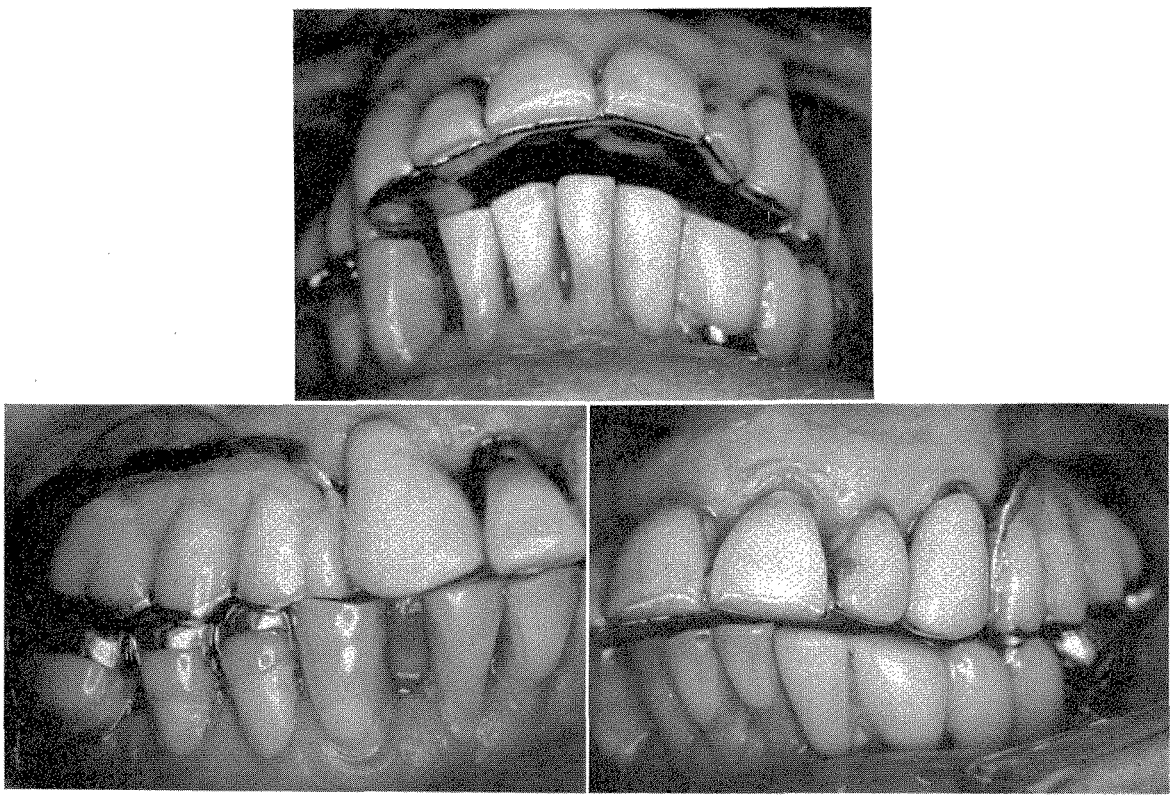


Fig. 1776. Three views of the mouth of a middle-aged man. These photographs were taken in 1955. In 1953 these teeth had been reconstructed using a gnathological technique and in accordance with the principles of gnathology. Although there were six upper anterior teeth present, only the cuspids were used to support the upper removable partial denture. The left cuspid was nonvital and harbored an apical infection. (Figs. 1776 to 1778 are of the same case.)

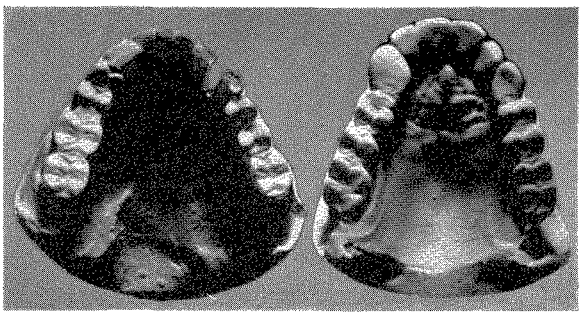


Fig. 1777. An occlusal view of the casts of the completed rehabilitation. In spite of the apical infection and deep-seated periodontal pathology, observe the broad occlusal platforms that could serve only to increase occlusal pressures. If gnathological principles of oral reintegration are adhered to, these broad occlusal surfaces must be employed in some cases in order to obtain simultaneous multitudinous interocclusal contacts in all centric and excentric positions of the mandible. These concepts can be traumatic, as this case demonstrates.

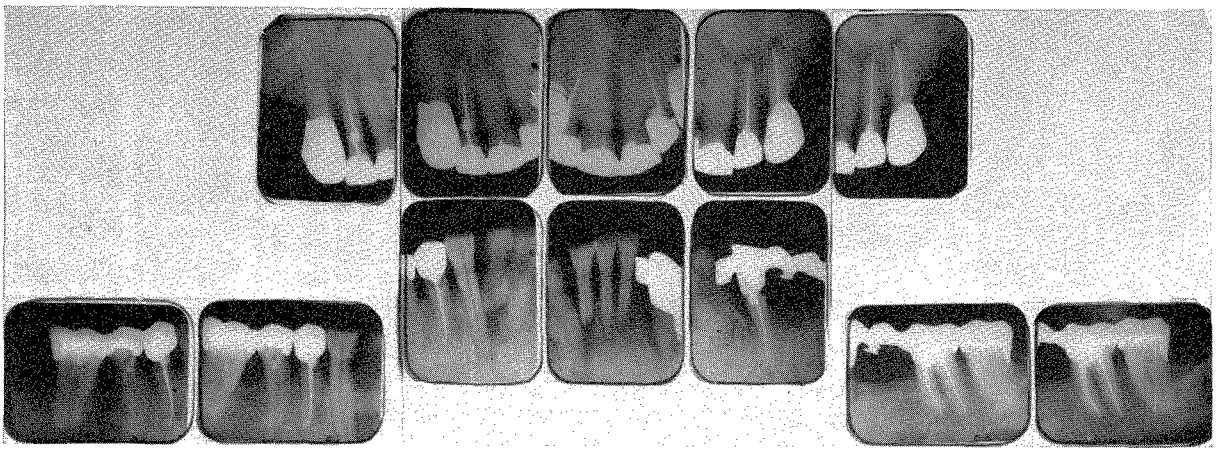


Fig. 1778. Roentgenograms taken in May, 1955. This was two years after the work was completed. Observe the multiple infections present.

The instrument upon which it was constructed was the gnathoscope. This case would have been considered a failure had it been similarly reconstructed using any other philosophy of occlusion and any other instrument. Articulators are only tools to be used as aids. It is the intelligence and experience of the dentist that are the most important factors.

One fact does stand out in the case just cited. Gnathologists do not resort to splinting in the greater majority of their cases. It would seem to me that, by failing to do so, they do not take advantage of a great means for obtaining additional support for the remaining natural teeth. (Figs. 1776 to 1778.)

Another complete case of oral rehabilitation executed in accordance with the principles of gnathology and using the gnathoscope was reported previously in the chapter on open bite. This case failed because of the continued habits of tongue

thrusting and of false swallowing, possibly aided by an abnormal frenum attached to the tongue. The theory of occlusion or the articulator upon which it was constructed did not prevent the recurrence of the original open bite and the failure of the work. (Refer to pp. 574 to 583, Figs. 1216 to 1238.)

Case 4

Another failure that was observed in January, 1953, was that of a middle-aged woman whose oral reintegration was completed by a dentist in California in 1952. The work was well planned and executed. It had also been constructed on the gnathoscope in accordance with the principles of gnathology. The patient had been uncomfortable ever since. The roentgenograms that were taken in 1953 revealed normal bone structure. Seven lower natural teeth were in position. When this patient was re-examined in June, 1955, she had lost three of her seven lower teeth. Those that were lost were the three abutment teeth. Only the lower four incisors remained. Once again, as in the previous case cited, only single abutments were resorted to in the case of the lower teeth. Double abutments would have provided much greater support.

This brings into focus another debatable subject. Is it justifiable to retain only a few natural teeth remaining in one arch? In the case just discussed, the lower four incisors had to be considered. There seems to be good reasoning in attempting to retain lower teeth even though they are few in number. It is generally agreed that a lower complete denture is more difficult to wear than an upper complete denture. If the lower teeth are retained, their longevity may be increased by the removal of a few upper natural teeth in order to permit the insertion of a full upper denture. With the insertion of a full upper denture, the pressure that is exerted upon the lower removable partial denture is eased. This is desirable. In addition, full upper dentures are more readily tolerated, the expense of the total work is reduced considerably, and the amount of time and energy expended is lessened.

Although in the case being reported there was no full upper denture, still the decision was made to retain the lower four incisors. The patient was very willing to take her chances with the longevity of these teeth. The maxillary teeth were used as the opposing pattern. The incisors were crowned, and the crowns were soldered together. One throw-off was attached to either end. This made a six-unit lower anterior splint. The lower lingual bar was constructed using a Hanau Model H articulator. The work was completed and inserted in July, 1955.

Six years elapsed with no apparent deterioration of the lower incisors. The patient lived in the midwest and was last seen in December, 1960. Unfortunately, the upper natural teeth, supporting an upper removable partial denture, developed caries and periodontal pockets. The patient was retired and unable to remain in New York to have the upper work redone.

It is not possible to make any definite statements as to the cause of failure in so short a time after the original reconstruction in 1952. Certainly, the fact that the gnathoscope was used in the construction did not save it from failing. Perhaps a greater number of natural teeth should have been used to divide the load. Perhaps the cusps were too high and not well coordinated. It is also possible that abnormal tensions were present due to the unavoidable stresses from conducting a large business. These emotions induced bruxing and clenching habits. More likely,

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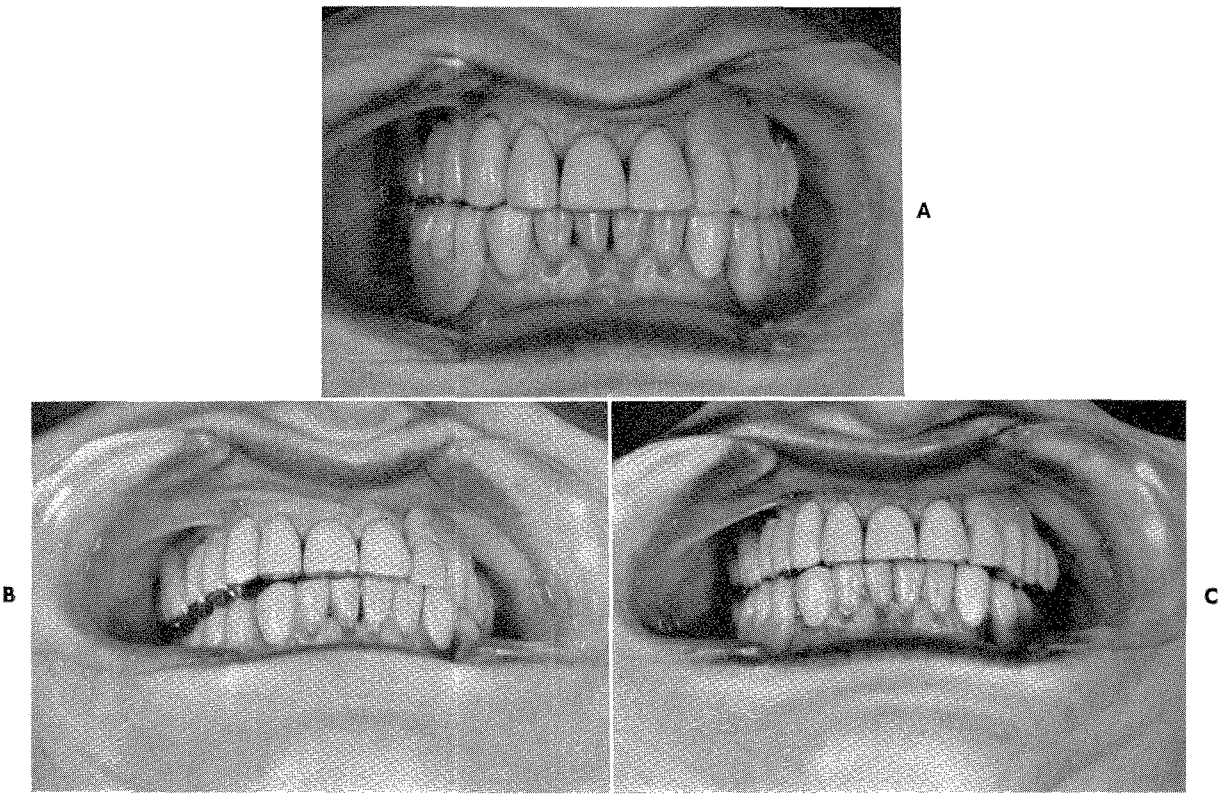

Fig. 1779. Three views of the mouth of a middle-aged woman who was examined by me in 1953. The oral rehabilitation had been completed six months previously, in June, 1952. **A**, Anterior view, centric occlusion. In **B** and **C** the working and balancing bites are shown. Gnathological concepts and technique were used in this reconstruction. (Figs. 1779 to 1788 are of the same case.)

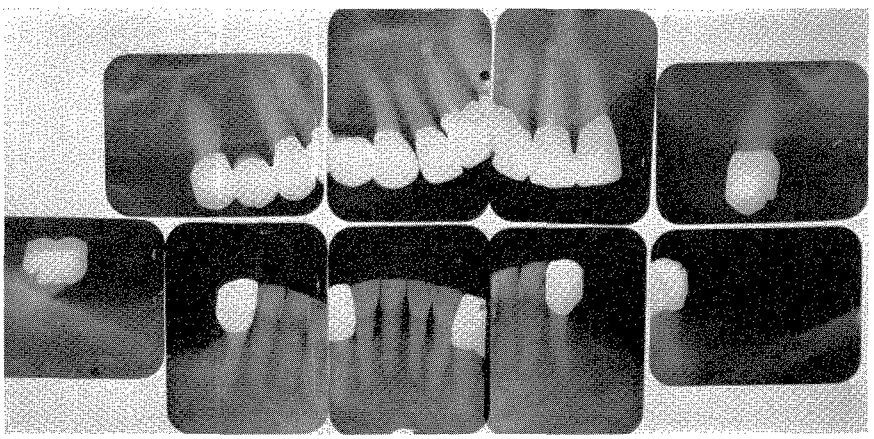

Fig. 1780. Roentgenograms taken in January, 1953, six months after the completion of the rehabilitation.

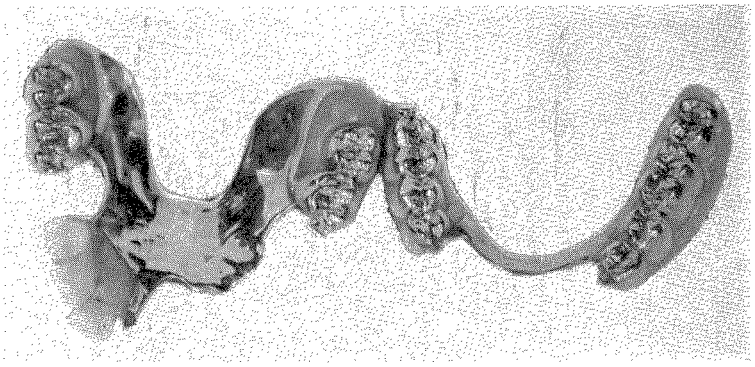

Fig. 1781. The upper and lower removable partial dentures were well constructed.

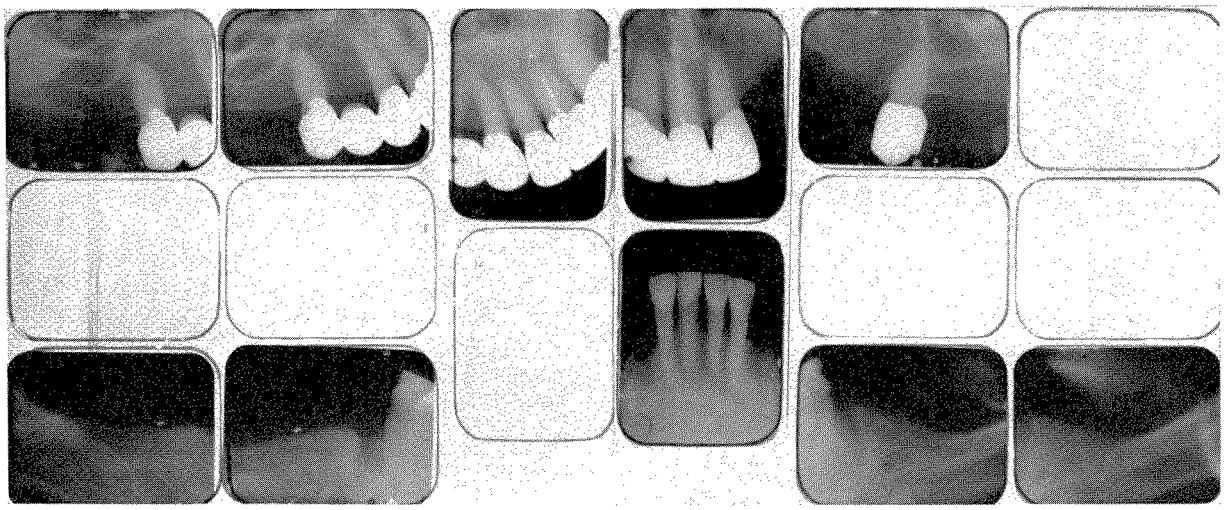

Fig. 1782. Roentgenograms taken in June, 1955. The lower three abutment teeth were lost since the 1953 examination.

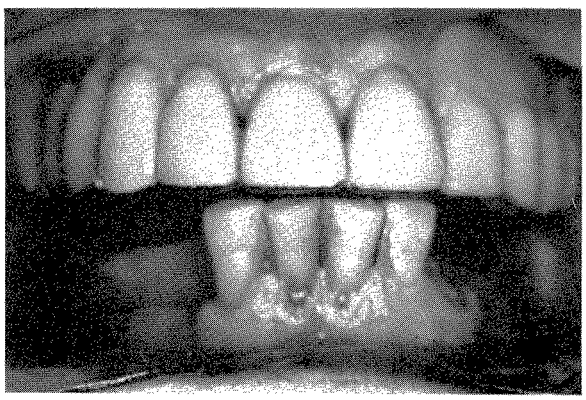

Fig. 1783. Front view of the mouth in July, 1955. Only four lower incisors remained.

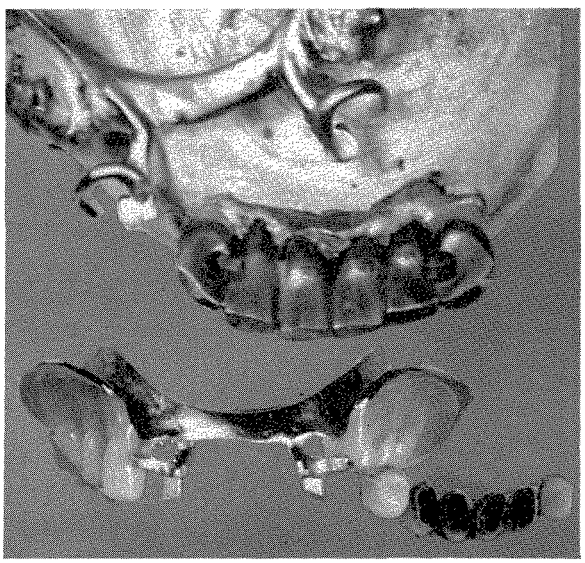

Fig. 1784. Two views of the new lower fixed and removable partial dentures. Limited movement was attained. The fixed part contained two throw-offs, one at either end.

Fig. 1785. The work was constructed on a Hanau Model H articulator.

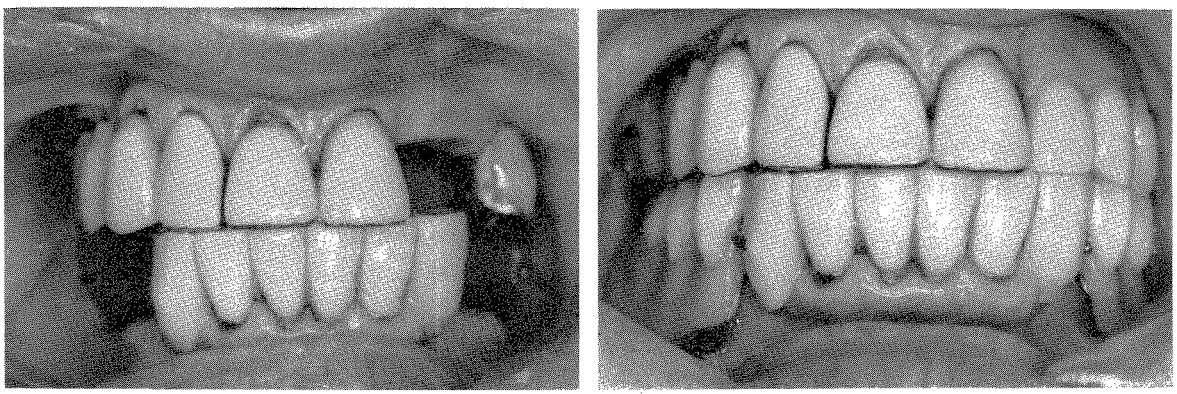

Fig. 1786. Two views of the mouth taken in October, 1960. This is five years after the completion of the lower work. It is still in excellent condition.

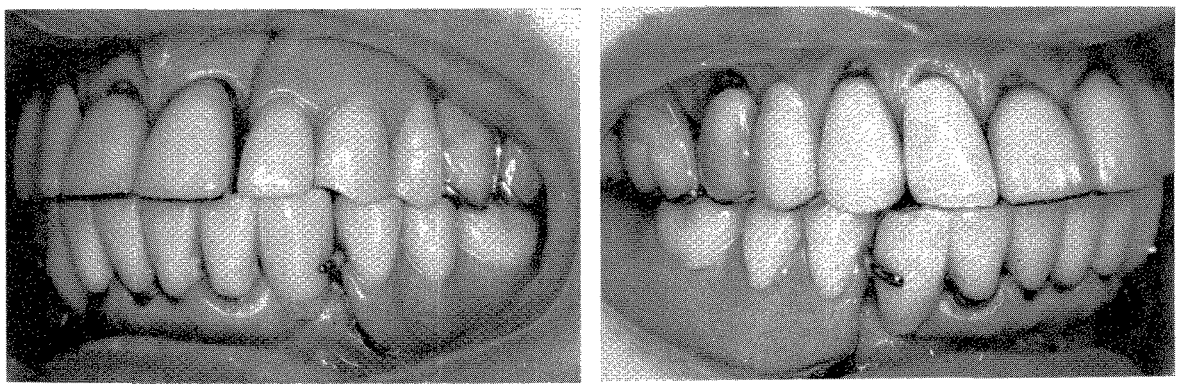

Fig. 1787. Left and right views of the completed lower work. These were also taken in October, 1960, which was five years after insertion.

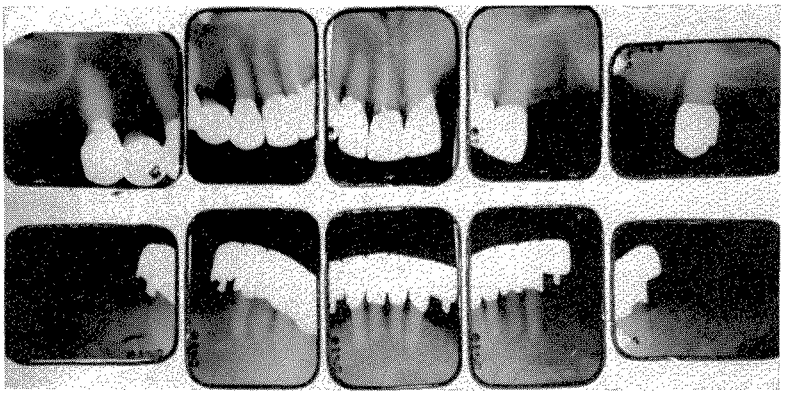

Fig. 1788. Roentgenograms taken in October, 1960. The lower teeth are in excellent condition. The upper teeth are deteriorating.

a combination of all the above etiological factors played their part. (Figs. 1779 to 1788.)

NO SINGLE CONCEPT OF OCCLUSION CAN TAKE CARE OF WIDE VARIETY OF MALOCCLUSIONS

It has been stated before that there is no one philosophy of occlusion that is capable of taking care of the great variety of malocclusions that present themselves to us for a solution. It is impossible for all cases to be solved by one particular concept. Complicated instruments are difficult to adjust. The registrations are very demanding in their accuracy. Not too many operators have the scientific acumen to transfer the movements of the mandible correctly to the head recorder and from it to the articulator in order to duplicate the exact movements of the patient. Only very few dental technicians are capable of coordinating an occlusion on the articulator even if it were to be conceded that it was correctly set. In the final analysis, any dental service should be such that it can be provided effectively by the largest number of dentists to the greatest number of patients consistent with the rendering of a true health service. This means that the service should remain a general practice service with only the unusual cases being restricted to specialist in prosthodontics.

RETENTION OF FEW NATURAL TEETH VS. FULL DENTURES

It is not difficult to determine the wishes of some patients. By means of questions and answers, the dentist is soon able to obtain an insight into their individual dental requirements. He should be sympathetic and understanding. To many patients, the loss of all their teeth is a catastrophe. They are willing to retain a few, if this is at all possible, because not only do they require these teeth for their physical needs, but they also require them as much for their psychological well-being. Where only a few teeth remain, it is often possible, as has been shown previously, to retain them for indefinite periods. (Figs. 157 to 180, pp. 83 to 92.)

Case 5

In 1956 a middle-aged woman presented herself for dental treatment. She had two problems. While eating or speaking, her lower lingual bar moved up and down with her tongue, and she feared lest she would have to wear a full upper denture. This had been advised previously. Only four upper usable teeth remained, two central incisors and a right cuspid plus an upper left peg-shaped small third molar. By splinting the upper anterior teeth and by using a modified Sherer attachment, an upper removable partial denture was constructed that not only possessed moderate stabilization and retention but also was functional. The steps were executed carefully. Extensive tissue coverage was resorted to. The upper right tuberosity was entirely engaged. The removable casting was rigid. Lingual retaining wires were added to the male attachments.

This work was inserted in June, 1956. The original lower prosthesis was retained, but its excessive movement was controlled by the addition of wire lingual retention arms. The borders of the lower removable partial denture were freed from

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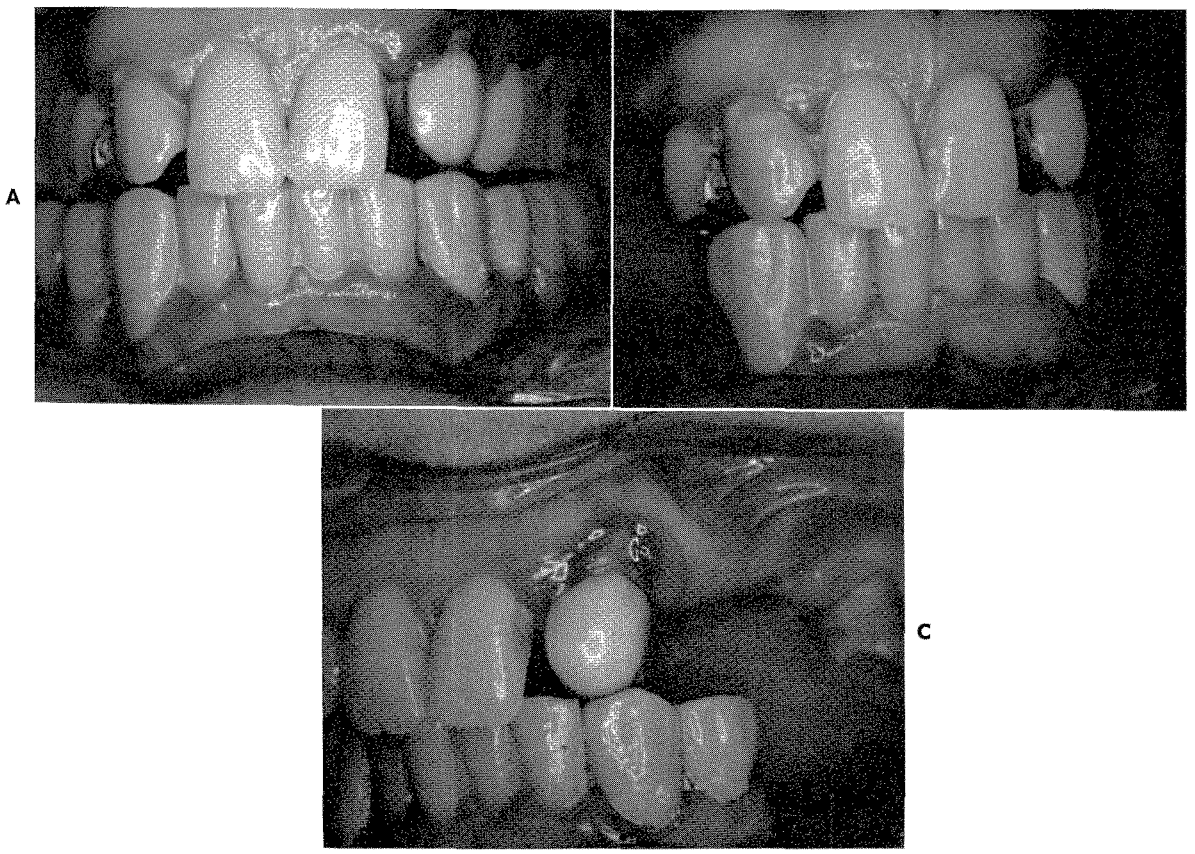

Fig. 1789. Three views of the mouth of a middle-aged woman taken in March, 1956. **A**, The lower posterior teeth are in place. They were replaced a short time previously by means of a lower lingual bar with precision attachments as the retainers. An old upper removable partial denture is in position. **B** and **C** are right and left views with the removable partial dentures removed. The upper left cuspid and right bicuspid were infected and had to be removed. The left third molar was mobile and had a single small tapered root. It was retained with a very dubious prognosis. (Figs. 1789 to 1798 are of the same case.)

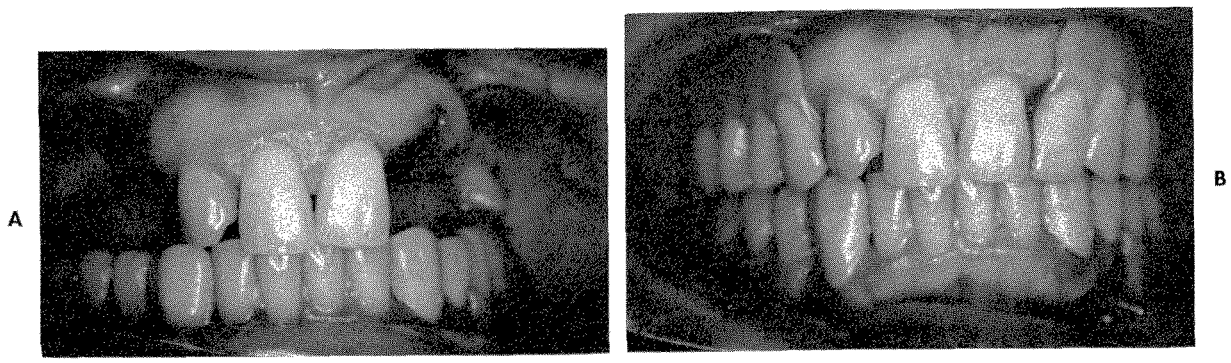

Fig. 1790. A, Only four upper teeth were retained. **B,** An immediate upper removable partial denture was inserted. There were no direct retainers. It was held in position by the extensive tissue coverage and its adaptations.

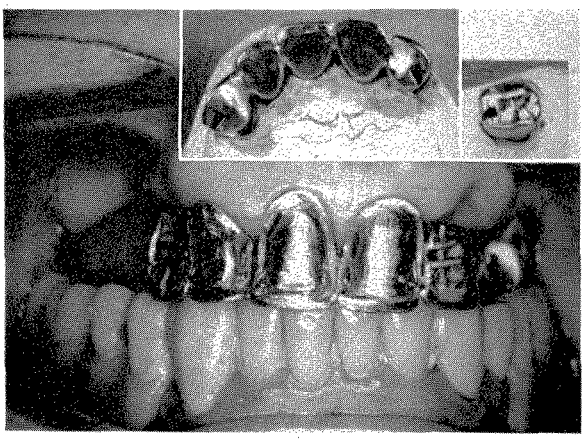

Fig. 1791. The upper fixed anterior splint had one throw-off on either end. The Sherer type of precision rest was employed. This contained a lingual arm that acted as a tightening device and permitted limited controlled movement. The inset shows an occlusal view.

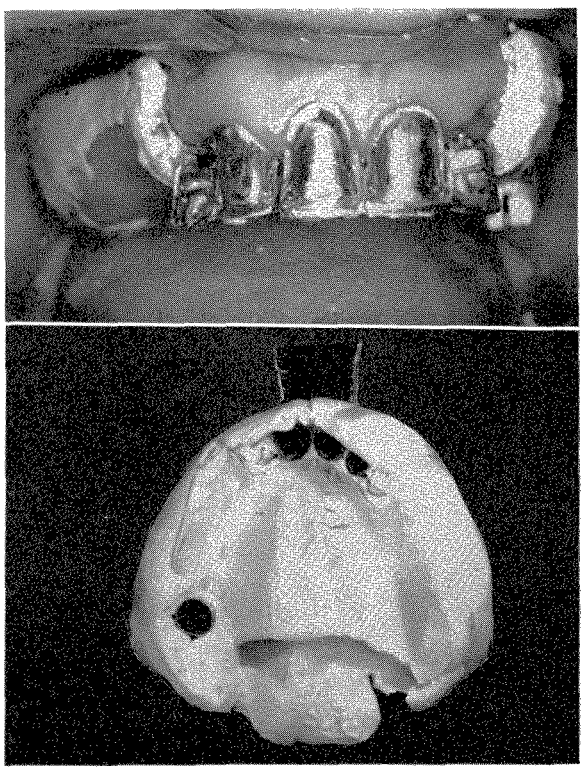

Fig. 1792. The impression for the removable partial denture was taken in two parts. A prepared acrylic tray containing Ackerman's paste is shown above in these photographs. This is the first part. An over-all impression was then taken with plaster of Paris. This is shown below.

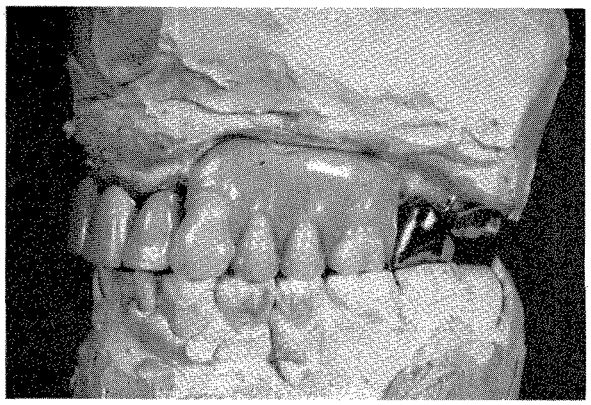

Fig. 1793. Left lateral view of the completed upper prosthesis on the cast.

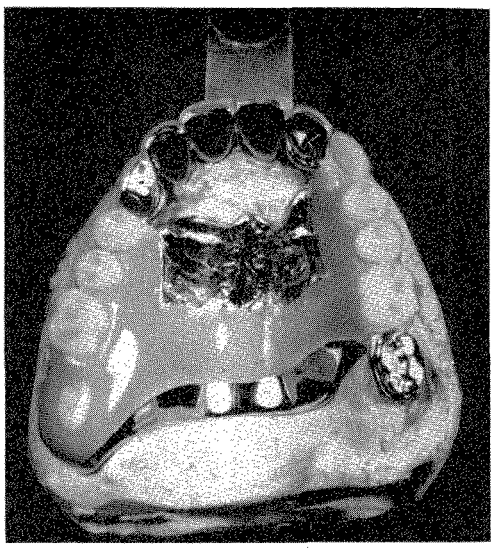

Fig. 1794. Palatal view of the completed upper prosthesis on the cast.

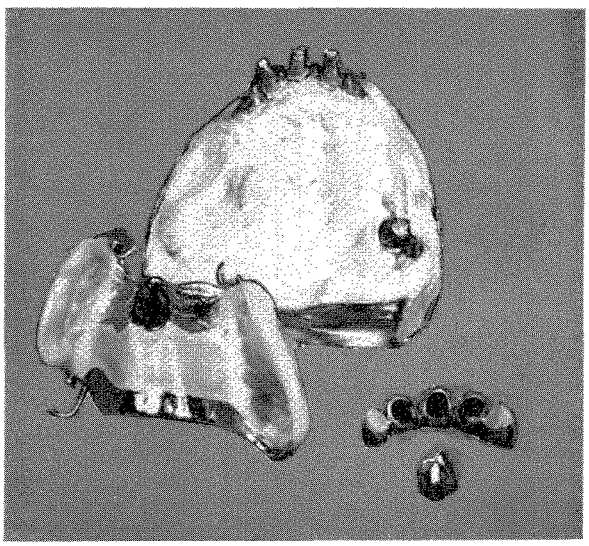

Fig. 1795. The completed upper prosthesis removed from the cast.

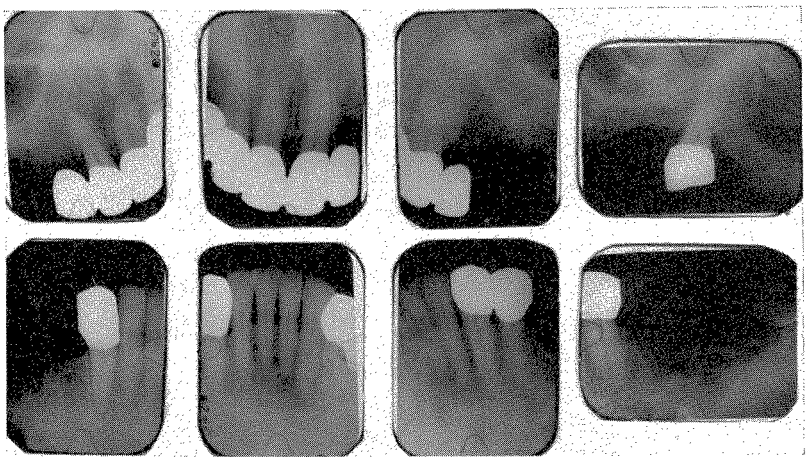

Fig. 1796. Roentgenograms taken in March, 1957, of the completed work. These were taken one year after completion.

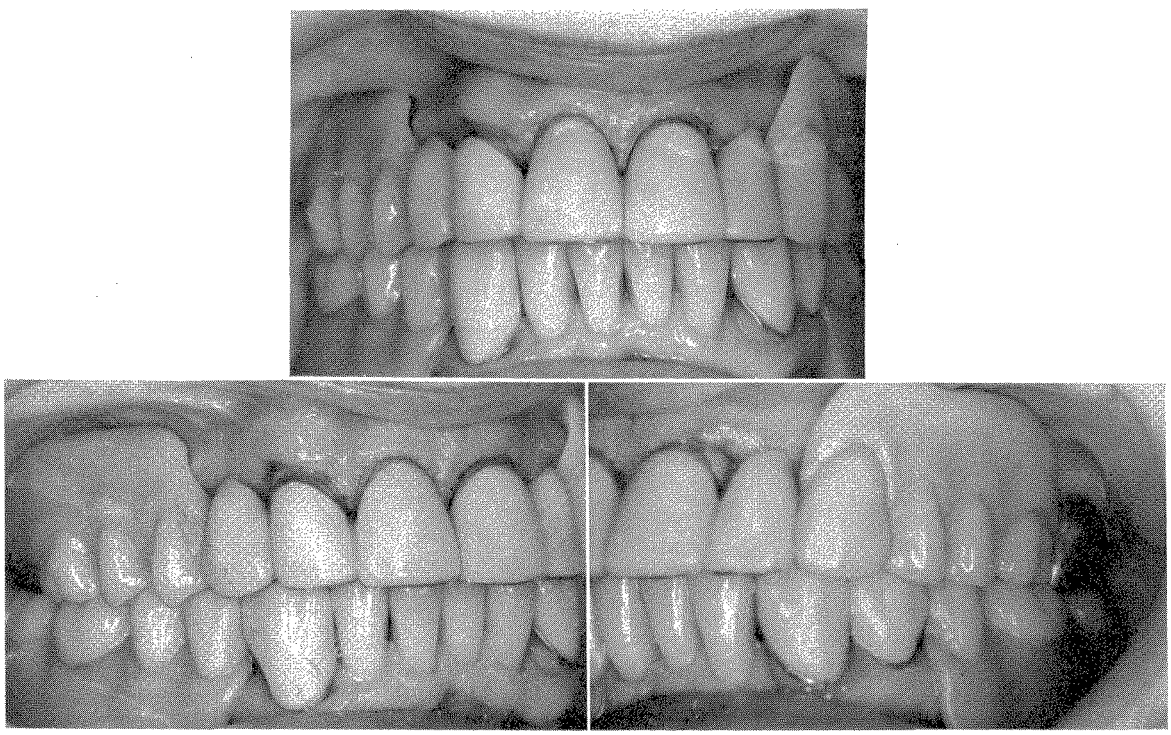

Fig. 1797. Three views of the mouth taken in 1962. This was five years postinsertion.

Fig. 1798. Roentgenograms taken in 1962. This was five years after the completion of the work.

muscle impingement. The upper prosthesis at the time of writing was six years old. There had been some cervical caries associated with the anterior teeth. With this exception, the work was satisfactory, and the patient was well pleased with the result. (Figs. 1789 to 1798.)

POSTINSERTION CARE EXTREMELY IMPORTANT

An important aspect that must be stressed continually is the postinsertion care. These extensive restorations must be examined carefully for cervical caries due to the difficulty of maintaining adequate oral hygiene. Where these principles are observed, the longevity is lengthened, and as a result, both patient and dentist are benefited. Some few people have the idea that once their mouths have been reconstructed, no further postinsertion upkeep is necessary. Nothing can be further from the truth. Postinsertion care must continue for the rest of their lives if their investment is to be safeguarded. These people must be made to realize that their teeth are subject to any of the hazards that may attack normal teeth and their surrounding structures, and although extensive dental work should not be necessary, periodical radiographs, prophylaxis, and any other minor treatment that may be necessary must be regularly attended to. They must also be made to realize that the longevity of the work depends upon its use and abuse in addition to other intangible factors that have been enumerated within the text. After ten or fifteen years of service, depending upon the case, it may be necessary again to rehabilitate these mouths. In most instances this is all that can be expected, inasmuch as the original working foundation was weak. In dealing with the younger patients where more natural teeth are present, presenting a stronger foundation, the chance of longevity is greater. The responsibility should be equally divided between the patient and the dentist, so that this great health service can be evaluated properly.

Case 6

Past history

In the case about to be reported, we are faced with a number of problems. A woman in her mid-sixties was treated in June, 1956. She had suffered for many

years from periodontal disease. Specialized treatment had been given, but the disease still was very evident. Actually, from the patient's history, regardless of the form of treatment she had received, periodontal pathology had always been present during her adulthood. There is not sufficient evidence for me to state that this was another case of periodontal disease with a systemic background, but this is to be suspected.

Problem of maintaining adequate oral hygiene

When this patient was first examined, the oral hygiene was poor. It may be stated at the onset of this report that although the will was there, the oral hygiene continued to be woefully inadequate up to the time of writing (January, 1963). Some patients have the understanding and the ability to maintain a high degree of oral cleanliness when once instructed. Others have the understanding but lack the ability to carry out the technique. Age has often proved a great deterrent in maintaining good oral hygiene, perhaps because of the diminishing powers of muscular coordination. Poor oral hygiene can cause the failure of an otherwise successful result. It is well to remember that extensive restorative procedures require extra efforts in mouth hygiene because of the artificial prosthesis. This is especially so where large fixed splints have been resorted to. Removable prosthesis retained by clasps often provides food traps that make good hygiene almost impossible. Most patients are willing to cooperate, but many are not capable of doing so.

When this case was finally evaluated, only four upper teeth remained. A full upper denture was prescribed. The patient, however, was unwilling to have these teeth removed if there was any possibility of retaining them for as short a period as two or three years. A sincere effort was made to convince her that it would be much more practical to have them removed, especially since the upper left bicuspid was nonvital and of questionable prognosis. In addition, the upper left molar had to be removed because of a trifurcation involvement, and most of the missing teeth had been lost because of deep-seated periodontal pathology. In spite of all these admonitions, the patient decided to have these upper teeth retained.

Procedure

The upper teeth were all splinted together to form a one-unit fixed partial denture. The other missing posterior teeth were replaced with a partial removable denture. This was retained by means of precision attachments.

The lower posterior bicuspid and cuspid, which were to serve as abutments for a right and left partial fixed splint, first had their soft tissues treated by means of gum resections. After allowing a sufficient length of time for healing, two fixed splints were inserted, each having a posterior terminal throw-off. The second molars were not replaced either on the lower fixed splint or on the upper removable partial denture. This was done both for mechanical reasons and to limit function because of structural weakness.

The work was completed in June, 1958. A Hanau Model H articulator was used. The occlusion was coordinated. The patient was given explicit instructions as to how to maintain proper mouth hygiene. In 1962, four years since the com-

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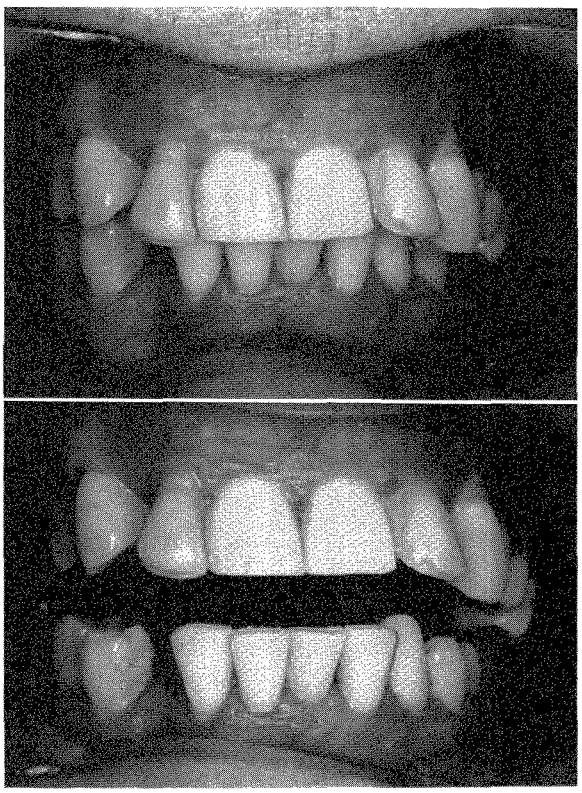

Fig. 1799. Two front views of the mouth of a woman in her mid-sixties. These were taken in June, 1956. (Figs. 1799 to 1808 are of the same case.)

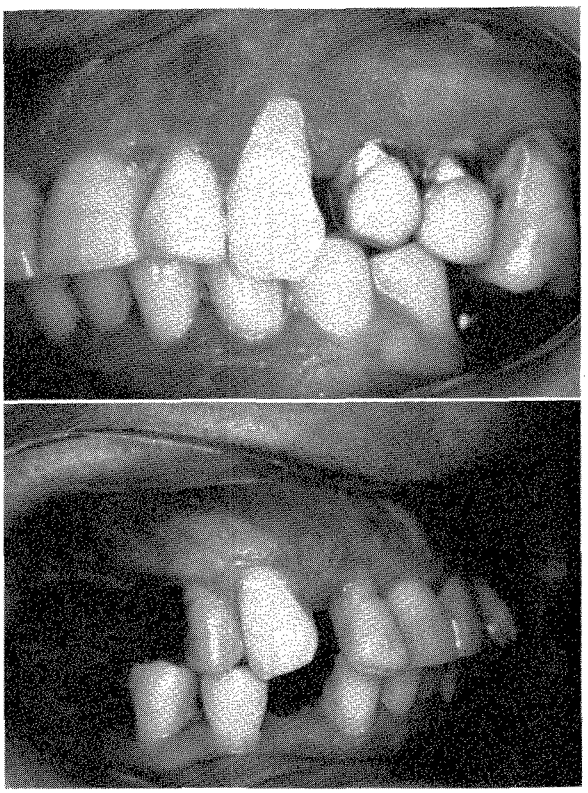

Fig. 1800. Left and right views at the start of treatment.

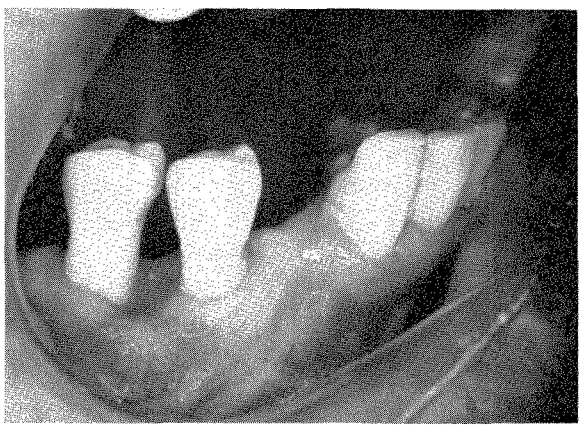

Fig. 1801. The periodontal tissues were treated first. In this photograph the tissues are healing. Compare this with Fig. 1800.

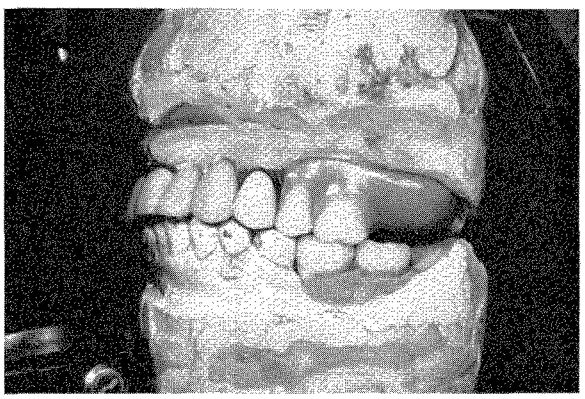

Fig. 1802. The occlusion was coordinated on a Hanau Model H articulator.

Fig. 1803

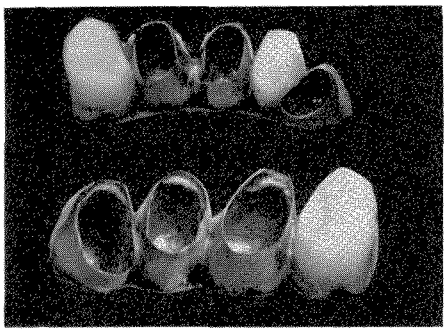

Fig. 1804

Fig. 1803. Palatal view of the completed upper prostheses. Only four upper natural teeth were retained.
Fig. 1804. Lower right and left fixed partial dentures. Each supported one throw-off.

Fig. 1805. Three views of the completed work.

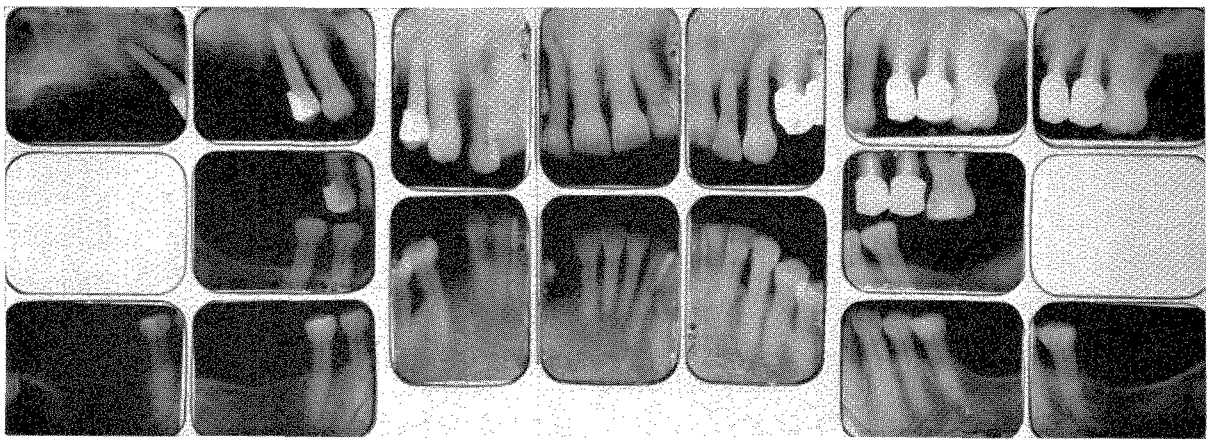

Fig. 1806. Roentgenograms taken in June, 1956. The work was started in February, 1957. Observe the severe periodontal disease.

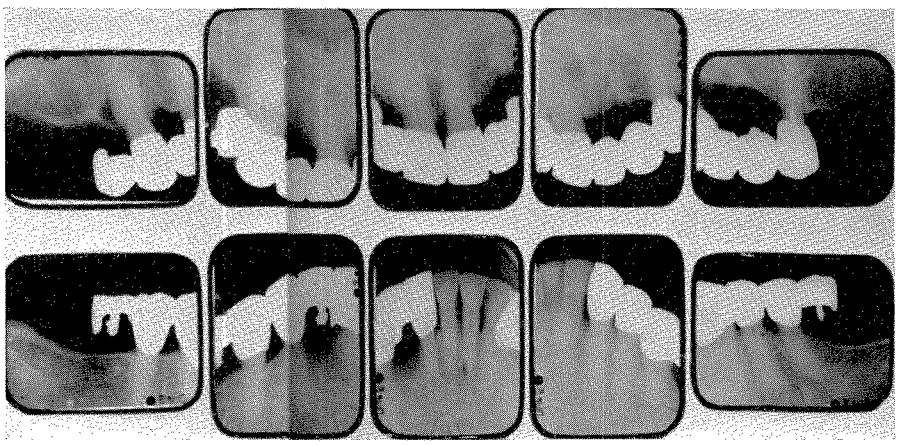

Fig. 1807. Roentgenograms taken in 1958. The work was completed in May, 1958.

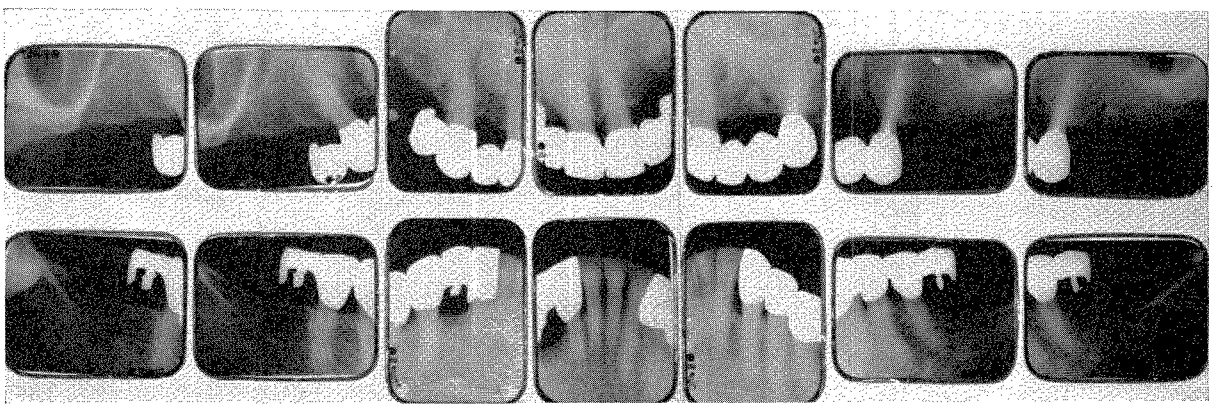

Fig. 1808. Roentgenograms taken in October, 1962. This was four and one half years after completion.

pletion of the work, the patient was gratified that her upper teeth were still in good condition. The only unsatisfactory sequel was the poor hygiene that was causing the gums associated with the lower posterior teeth to be inflamed. The patient at the time of writing was 71 years old and felt confident that she made the correct choice in retaining her upper teeth. Paradoxically, it is the lower supporting structures that are inflamed rather than the upper comparatively weak teeth. There is no reason to assume that these upper teeth will not continue to serve for some time to come. (Figs. 1799 to 1808.)

Case 7

Each patient presents his own peculiar problem. The patient whose lower partial denture is shown in Fig. 1814 had an original severe vertical overlap. His upper and most of his lower teeth were removed fourteen years previously. The roentgenograms of this patient are shown over a thirty-year period. Even in 1932, his oral structures were in poor condition. He took care of his teeth only spasmodically. His deep vertical overbite also helped in the gradual disintegration of his oral structures. In 1962 he was 75 years old. Only three lower teeth remained to support his lower denture. The left first bicuspid had an overlay crown on the removable partial denture. These natural teeth had been supporting the removable partial denture for several years. They provided resistance to the dislodging forces. (Figs. 1809 to 1815.)

Fig. 1809. Roentgenograms of the teeth of a 45-year-old man. These were taken in 1932. (Figs. 1809 to 1815 are of the same case.)

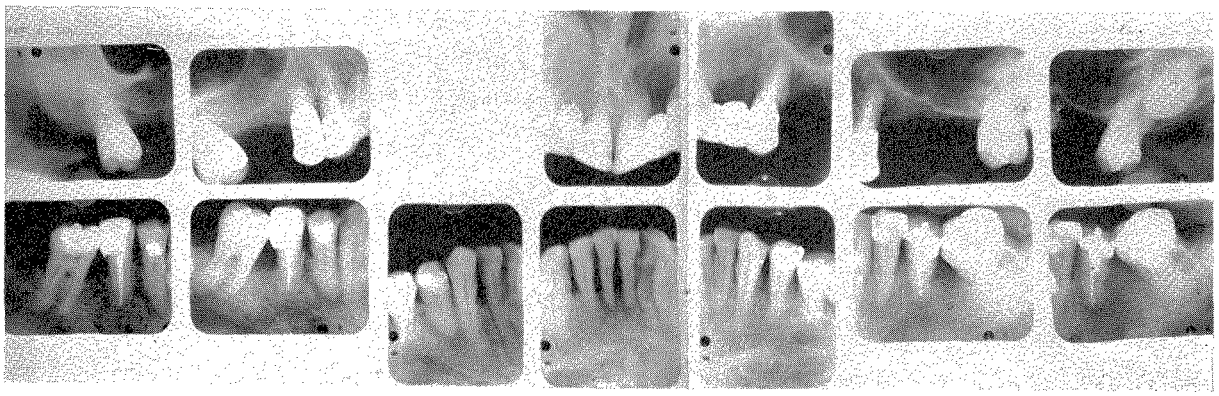

Fig. 1810. Roentgenograms of the teeth taken in 1939.

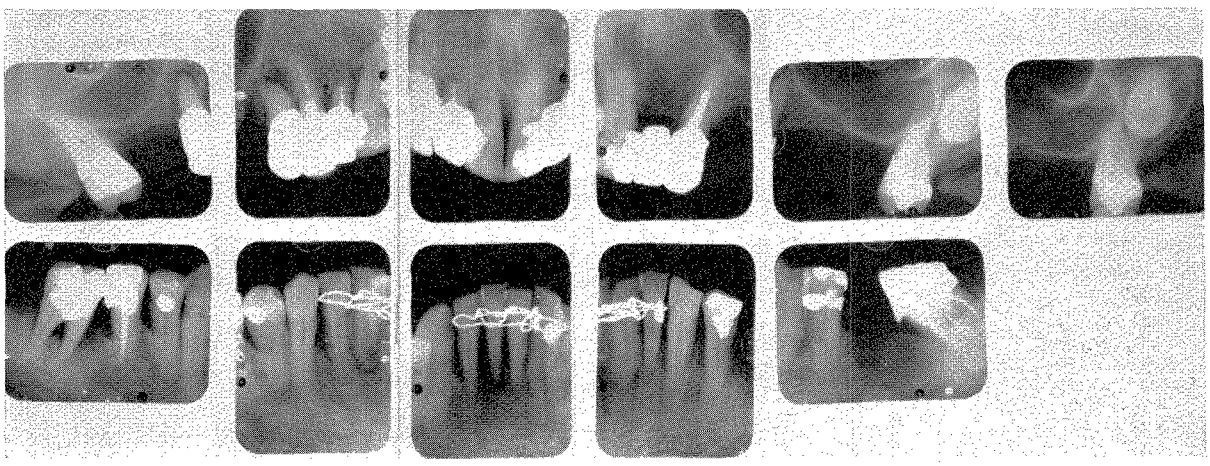

Fig. 1811. Roentgenograms of the teeth taken in 1948.

Fig. 1812. A photograph of the mouth just prior to the extraction of the remaining upper teeth and the insertion of the upper temporary denture. The extent of the vertical overbite is evident. The inset in the foreground shows the temporary denture in position. These photographs were taken in 1948.

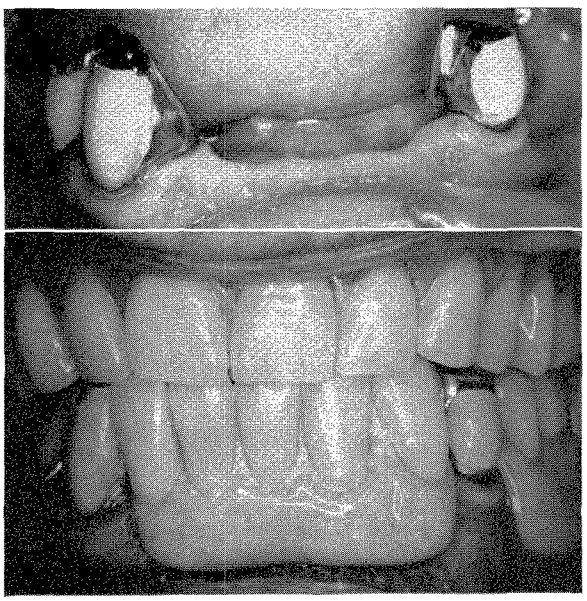

Fig. 1813. Two front views of the mouth taken in 1961. The left bicuspid had tapered grooves mesially and distally to engage the overlay three-quarter crown that is on the removable partial denture. The patient was then 75 years old (1962).

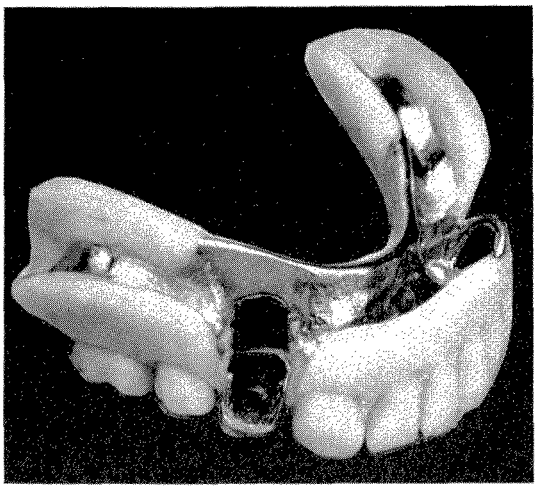

Fig. 1814. The lower removable partial denture.

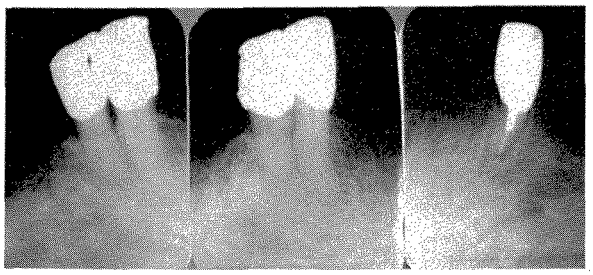

Fig. 1815. These three lower teeth supported a lower removable partial denture for several years. These radiographs were taken in 1960.

Case 8

This patient had been treated since 1930, at which time a large cyst was removed from the body of the mandible on the left side. In 1936 upper and lower removable partial dentures were inserted. Clasps were used as the retaining devices. Small upper right and lower left lateral incisors were employed as abutments. There was no splinting.

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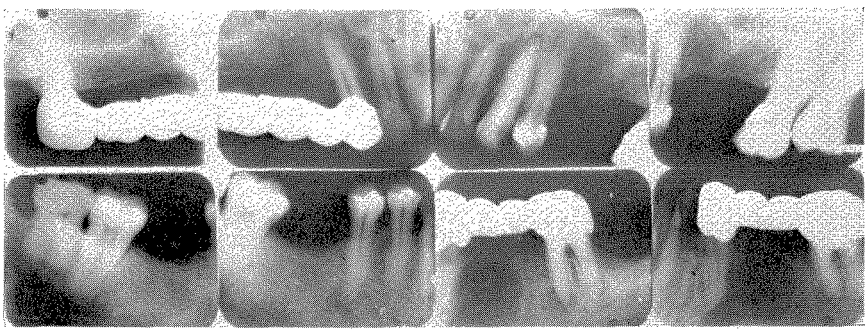

Fig. 1816. Roentgenograms taken in 1930. The patient was 49 years old when these were taken. The large cyst seen on the left side of the mandible was removed just after these radiographs were taken. (Figs. 1816 to 1824 are of the same case.)

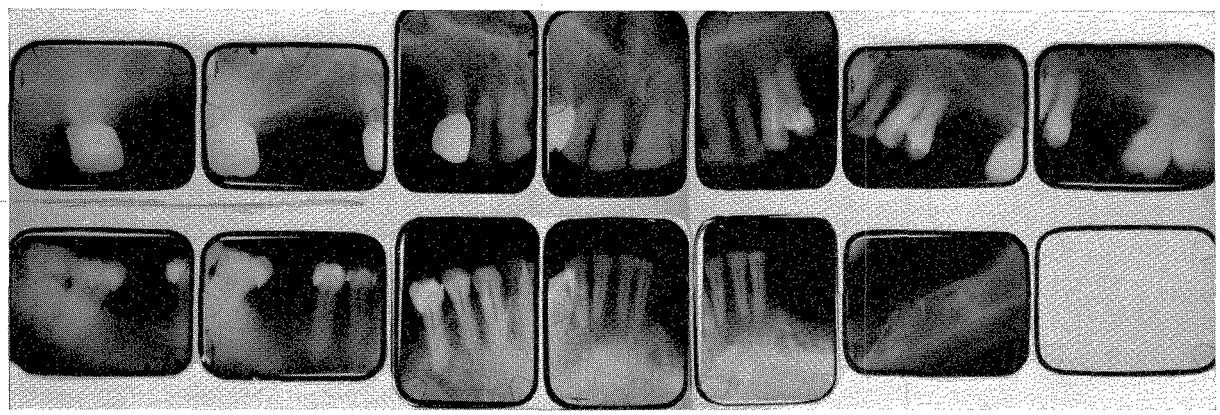

Fig. 1817. Roentgenograms taken in 1933.

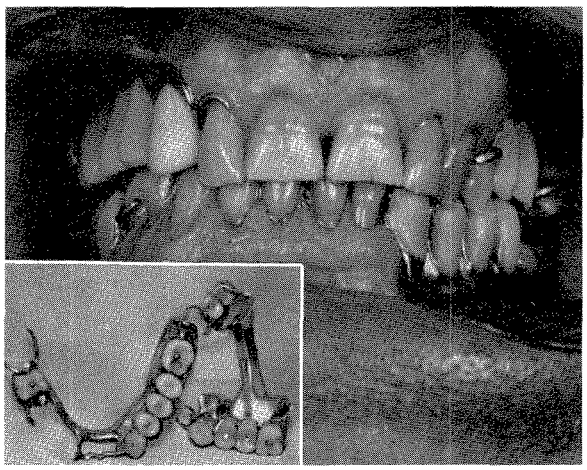

Fig. 1818. Front view of the mouth as it looked in 1936. The inset shows the removable partial dentures that were being raised.

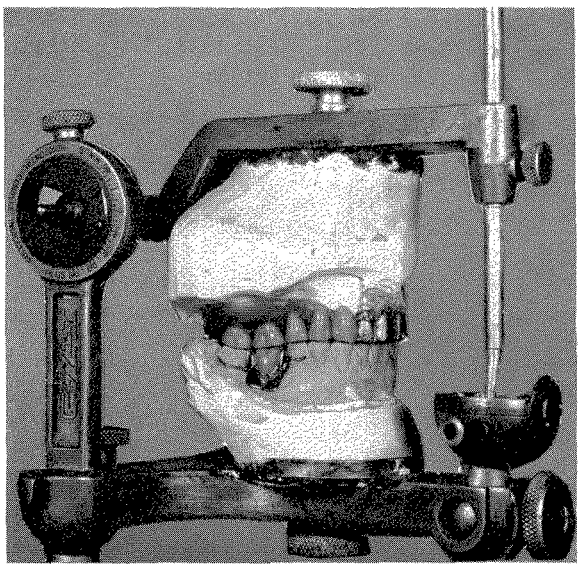

Fig. 1819

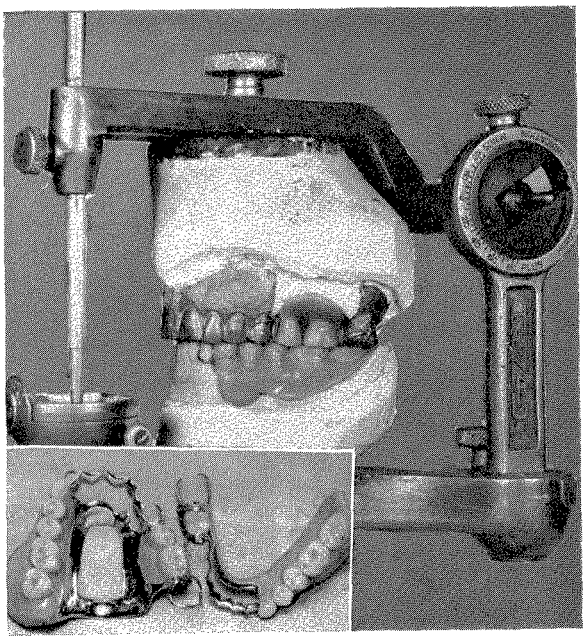

Fig. 1820

Figs. 1819 and 1820. A complete reconstruction was resorted to in 1941. Clasps were used as the retaining devices. In Fig. 1820 the inset shows the removable partial dentures.

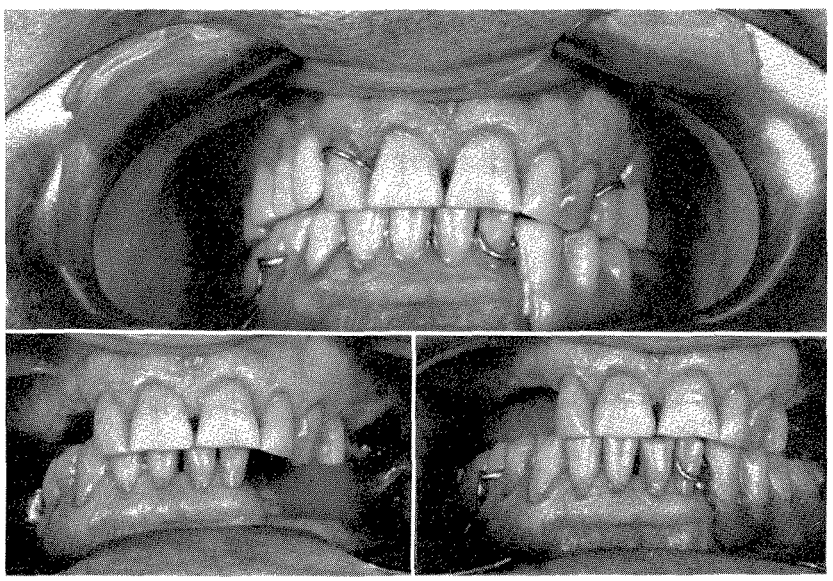

Fig. 1821. A front view of the mouth as it looked in 1943. This was two years after the reconstruction had been completed. The lower left inset shows the mouth in March, 1941, before the work was started. The lower right inset shows the lower prosthesis in position, and the amount the vertical dimension was increased in 1941.

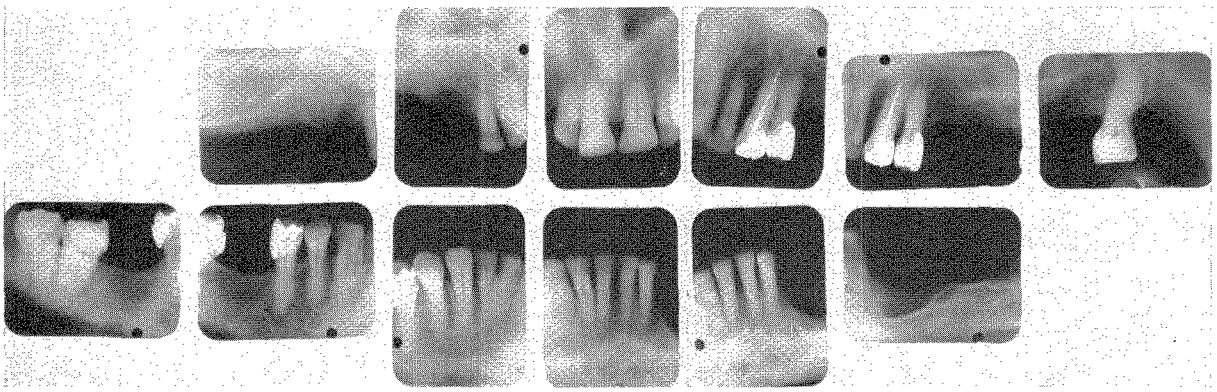

Fig. 1822. These roentgenograms were taken in 1945. This was four years after the completion of the oral rehabilitation.

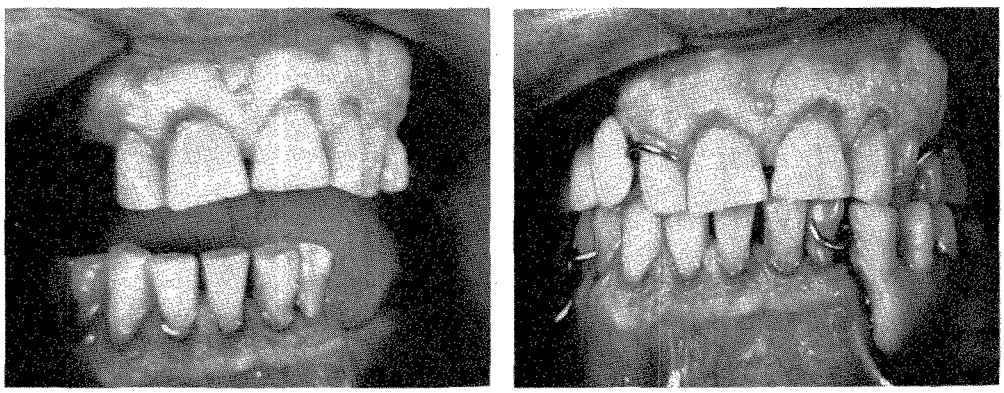

Fig. 1823. Two front views of the mouth taken in March, 1960. The same prosthesis is being worn as was inserted in 1941. The patient at this time was 81 years old (1962). Compare these illustrations with those shown in Fig. 1821.

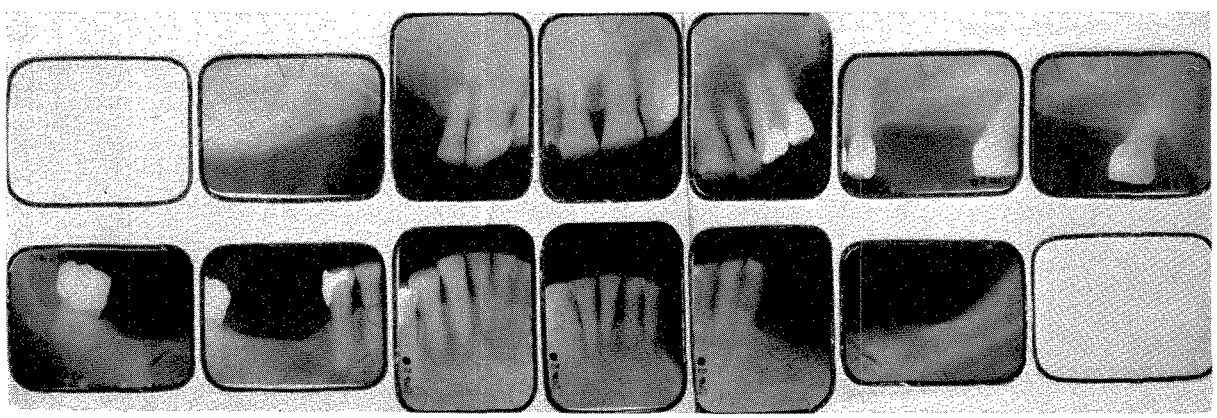

Fig. 1824. These roentgenograms were taken in March, 1960. The bone structure was excellent.

This patient died in October, 1962. He was over 80 years old. The original removable partial dentures were still being worn, and the lateral incisors were still in place and in healthy condition. The prosthesis had been used for twenty-six years. (Figs. 1816 to 1824.)

VARYING DEGREE OF MOVEMENT PROVIDED BY USE OF DIFFERENT FORMS OF RETAINERS

In comparing some of these cases in which removable partial dentures were employed, successful results were often attained in spite of the difference in the action of the retainers. In some, the Chayes or Stern type of precision attachments were used. These permit some, but very little movement, of the denture. Semi-precision attachments, such as the Sherer, were used in others. These permit greater movement of the partial denture, whereas clasps permit the greatest movement. All three types seem to be successful in many of the cases presented. This may result from the difference in tissue resiliency in each case.

Case 9

Past history

In 1947 the case of a patient who had the lower posterior teeth and all of the upper teeth removed in 1935 was reported.* At that time a full upper denture and a lower lingual bar had been inserted. In 1944 the prosthesis was remade following extensive bone resorption that had taken place since the original extractions. The lingual bar had been retained in each instance by means of clasps on the cuspid teeth. There had been no splinting. In December, 1950, the work was again remade. This time the lower anterior teeth were individually crowned, and the six crowns were soldered together. Only the right cuspid was nonvital. Ten years later the question of complete dentures was discussed. Five lower teeth still remained.

Discussion

The patient should be guided but permitted to make the final decision. For those patients who are able to accommodate to full dentures, there is no problem, but for the greater majority, who prefer their natural teeth, the point in question is whether the trouble and expense will be justified. Once again, the patient should be consulted. It is impossible to judge how deeply these few remaining teeth are valued. However, the assets and liabilities should be explained carefully, and the best course of action, in the particular case on hand, undertaken. In 1961, the lower splint was removed and the natural teeth restored by pulp therapy, fillings, and gum resections. A new lower splint was constructed, and the new prosthesis was inserted in May, 1961. The patient was 70 years old in 1962.

These lower anterior teeth had been giving excellent service for twenty-six years and would continue to do so providing the patient exercised effective mouth hygiene and the dentist contributed his share toward their care. In this manner, each member of the partnership makes his contribution. (Figs. 1825 to 1846.)

*Schweitzer, J. M.: Restorative dentistry, St. Louis, 1947, The C. V. Mosby Co., p. 414.

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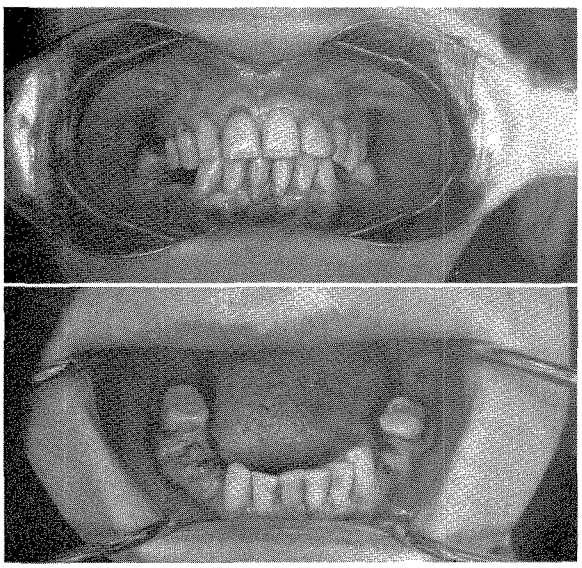


Fig. 1825. Two views of the mouth of a 44-year-old woman. These photographs were taken in October, 1935. (Figs. 1825 to 1846 are of the same case.)

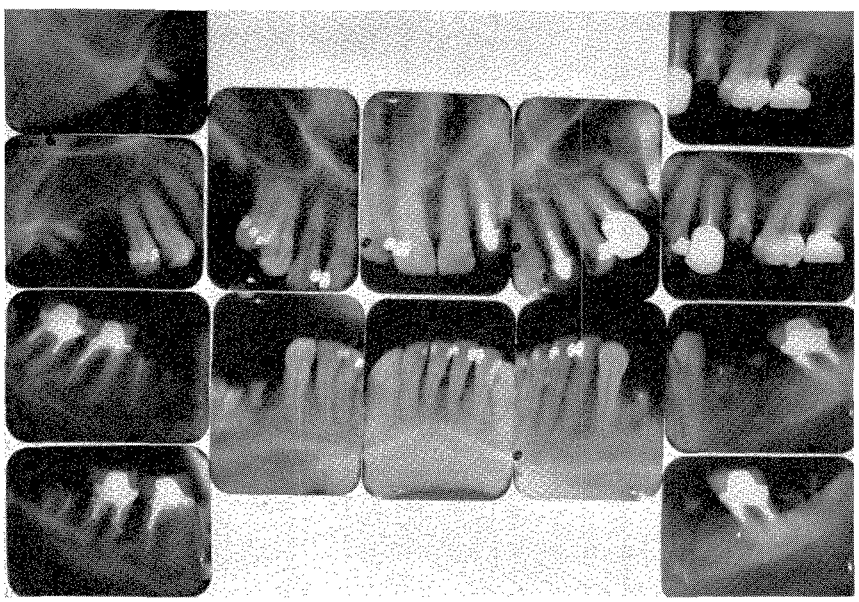


Fig. 1826. Roentgenograms taken at the start of the work in 1935.

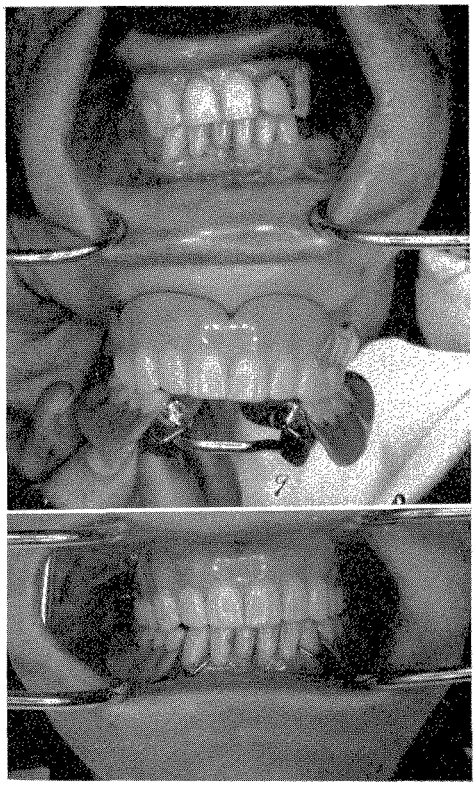


Fig. 1827. Full upper and lower lingual bars were constructed for her. They were inserted in 1937. A Hagman balancer articulator was used for the reconstruction.

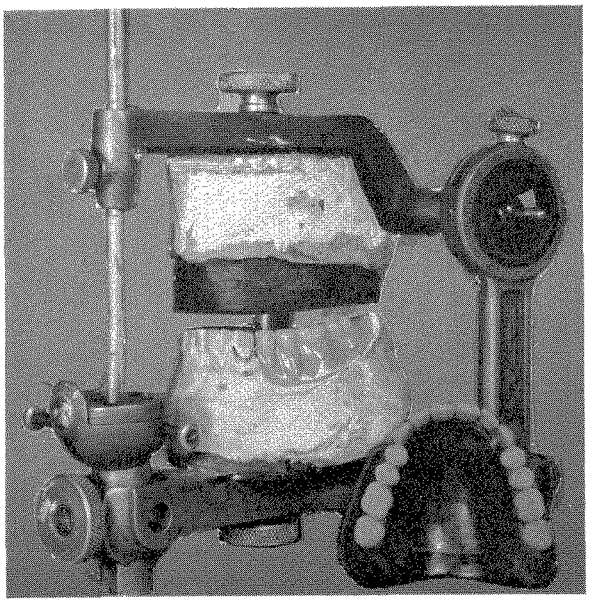
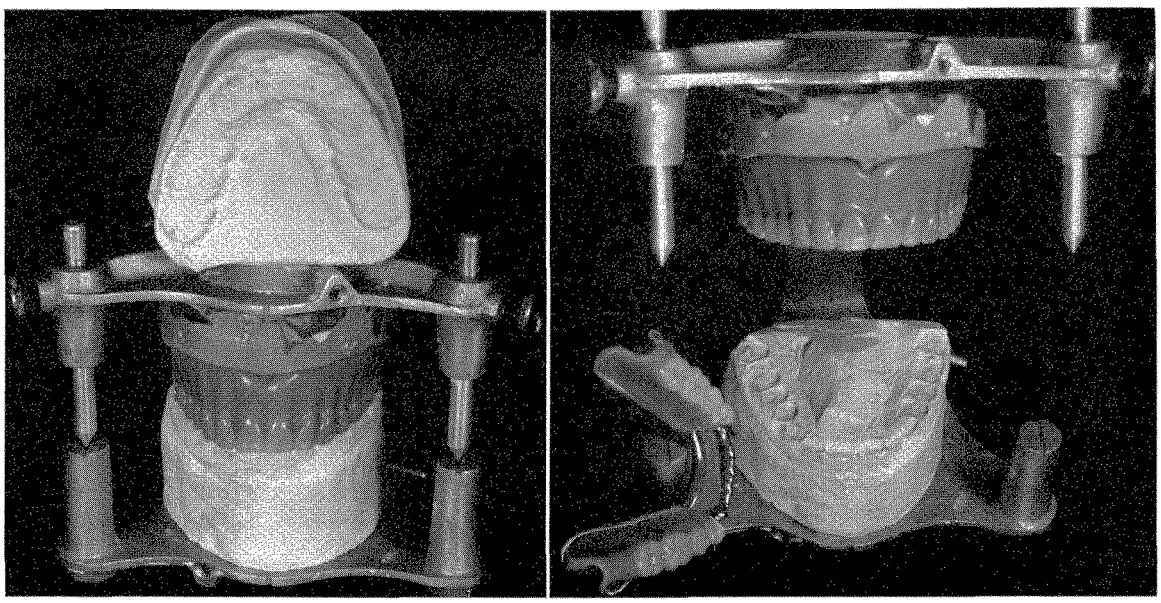


Fig. 1828. In 1942 a new set of dentures was constructed using a Hanau Model H articulator to start. This was followed by a chew-in functional technique. The upper modeling compound base will be employed for the chew-in. The upper setup is shown in the right foreground. The lower prosthesis has been completed.

A



B

Fig. 1829. A, The chew-in functional technique is shown here. The upper teeth are ground to fit the functional core and the lower teeth. In **A** they fit the lower teeth, whereas in **B** the functional core is shown above the positional articulator.

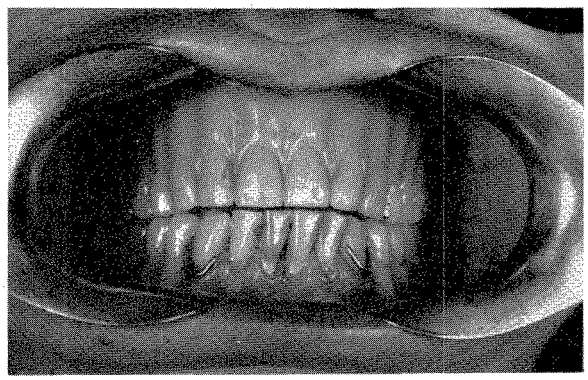


Fig. 1830. The completed work was inserted in October, 1942.

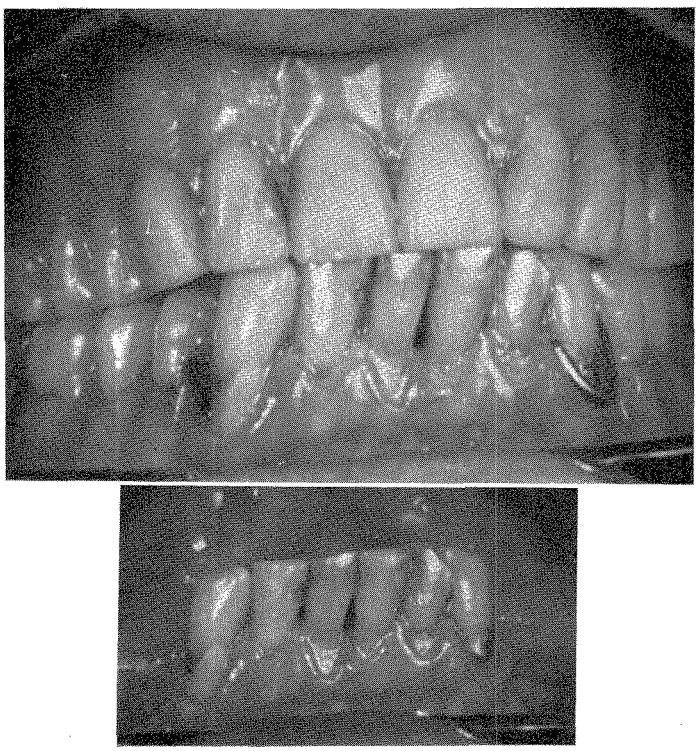


Fig. 1831. The mouth as it looked in October, 1950.

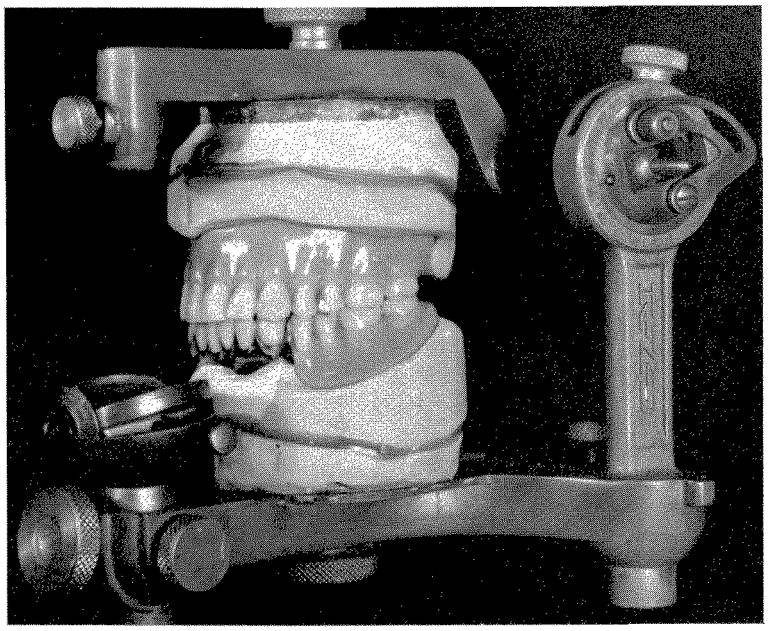


Fig. 1832. In December, 1950, a third set of dentures was made for her. This time all the lower teeth were crowned and splinted together, and precision lugs and rests were employed. The Hanau Model H articulator was used.

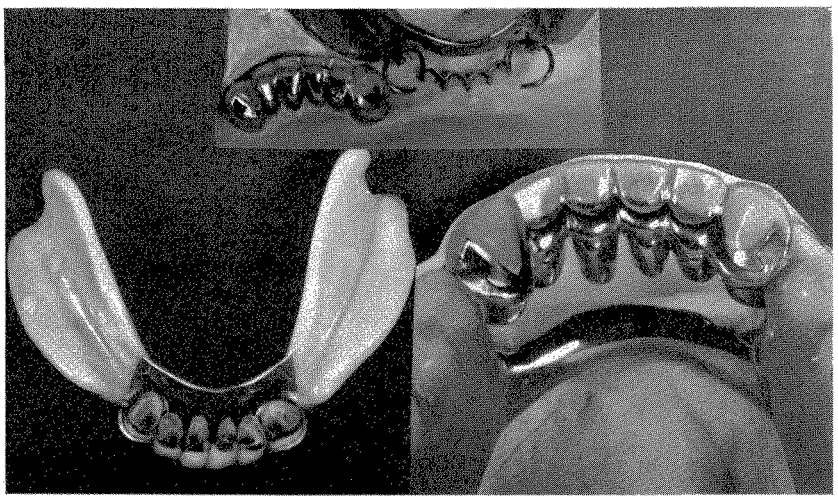


Fig. 1833. A close-up of the lingual continuous claps and the precision lugs and lug rests. The anterior teeth were gold veneer crowns splinted together.

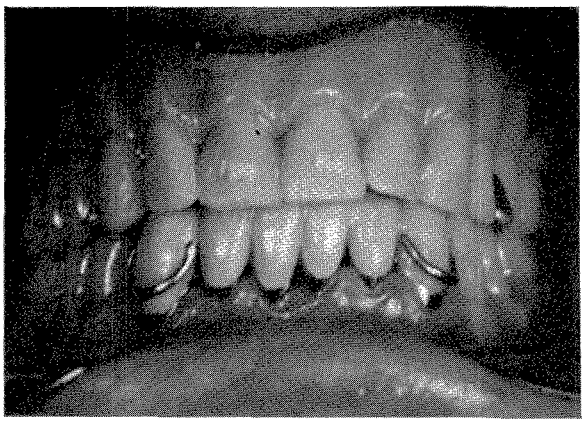


Fig. 1834. A front view of the completed work is shown here. This was taken in December, 1950.

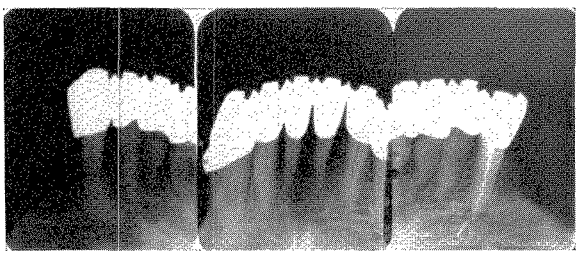


Fig. 1835. Roentgenograms as of December, 1950.

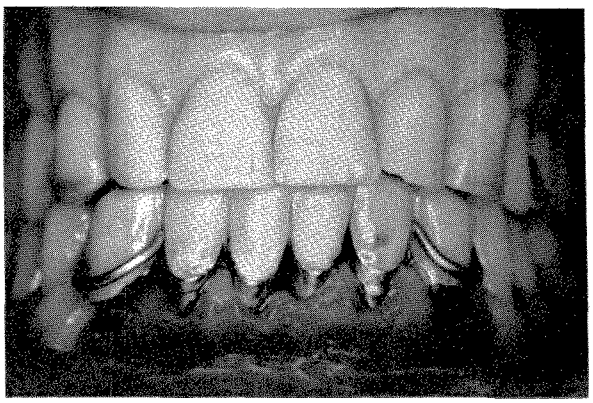


Fig. 1836. Front view of the mouth taken in January, 1961. The old splint had been in position for ten years. Only the lower right cuspid had been removed.

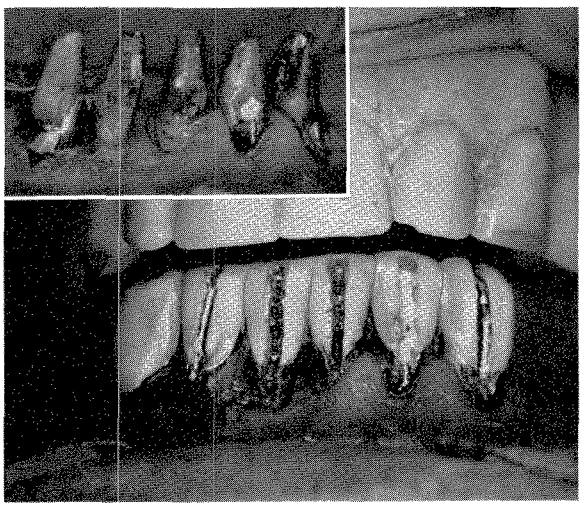


Fig. 1837. The crowns were sectioned, and the old splint was removed. The inset shows what the teeth looked like upon removal of the splint.

Fig. 1838. Roentgenograms taken in February, 1961, after the splint was removed.

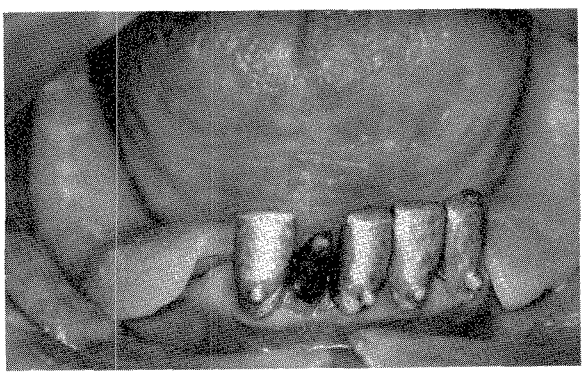


Fig. 1839. Low-fusing metal transfers registered tooth position. A specially constructed acrylic tray was used in taking the mucostatic double impression.

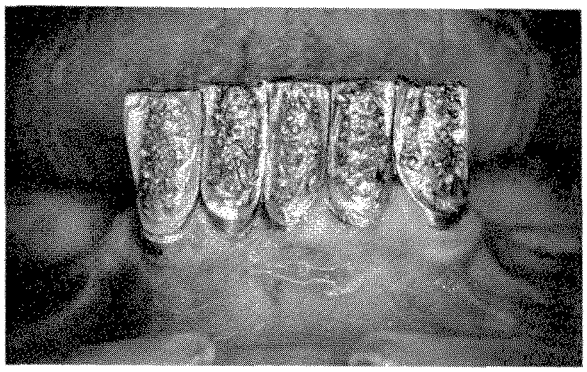


Fig. 1840. The lower anterior teeth were covered and finally splinted together for additional strength.

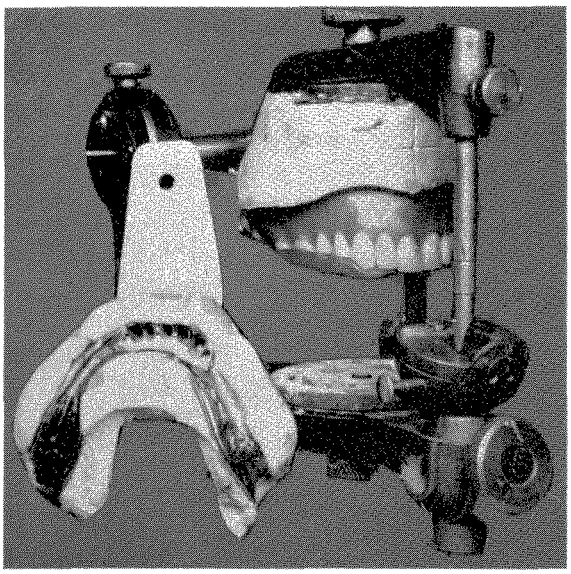


Fig. 1841. The lower fixed and removable parts were related by means of an over-all plaster impression. From this impression, which is shown in the lower left foreground, a cast was poured, and the connectors were joined to the removable part.

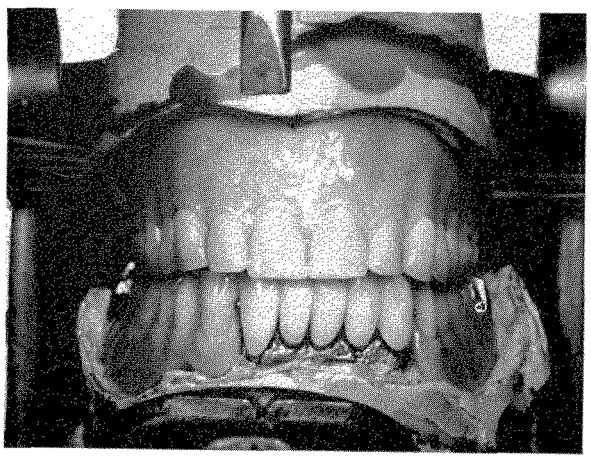


Fig. 1842. The completed prostheses are shown here.

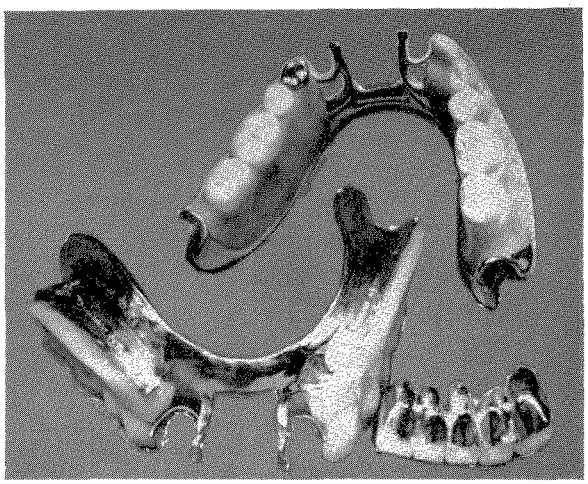


Fig. 1843. A close-up of the completed lower work showing two views of the removable partial denture and one view of the fixed five-unit partial denture.

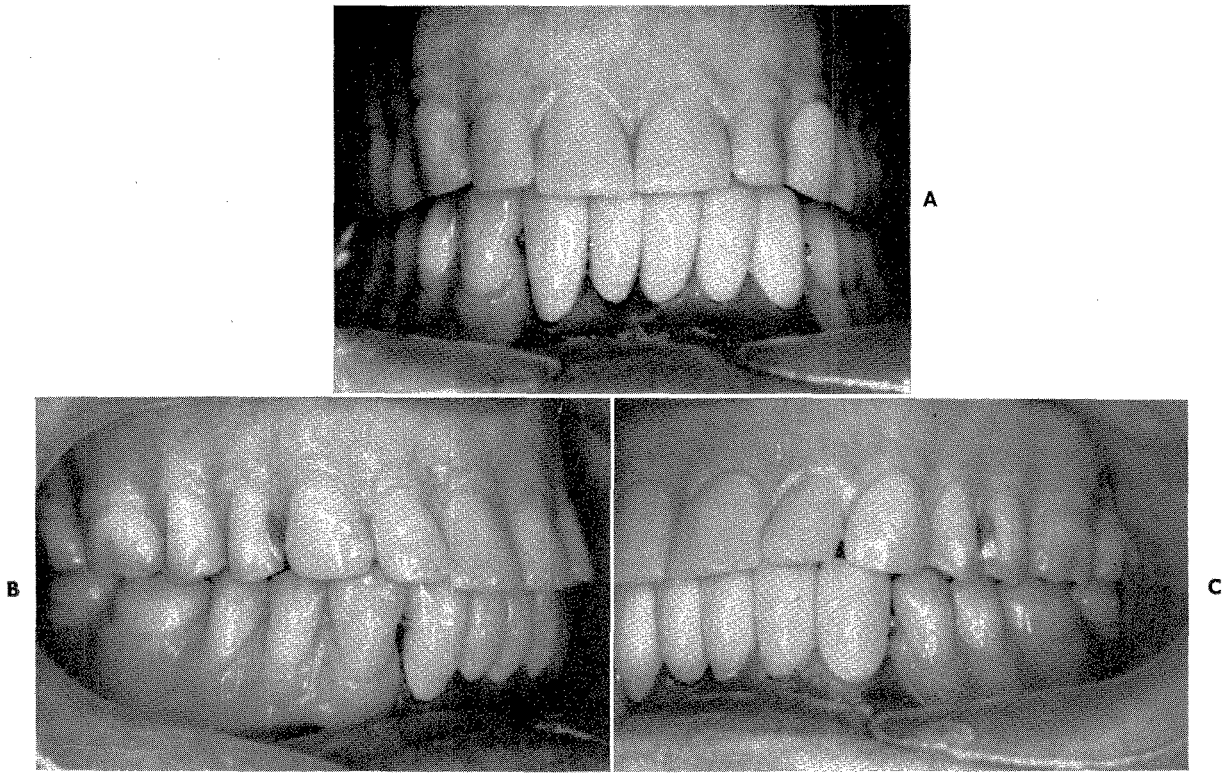


Fig. 1844. The dentures were inserted in May, 1961. Several views are shown here. **A**, Centric bite, anterior. **B**, Centric bite, right side. **C**, Centric bite, left side.

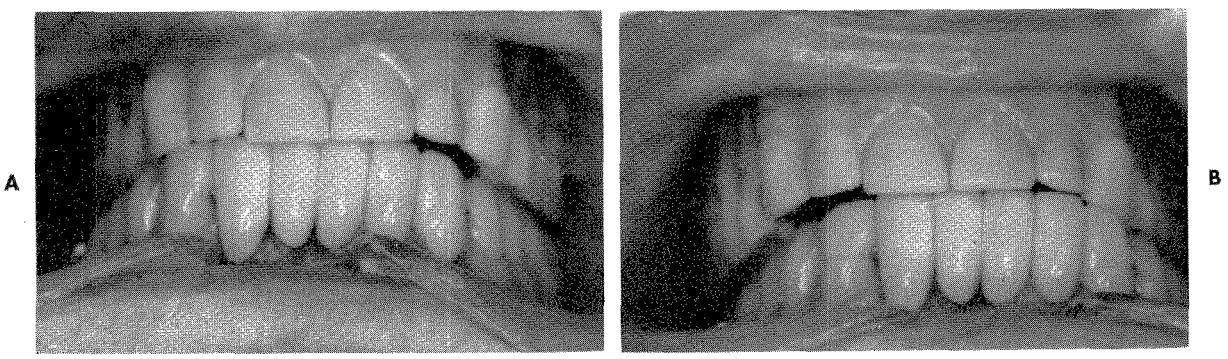


Fig. 1845. **A**, Right working and balancing bites. **B**, Left working and balancing bites.

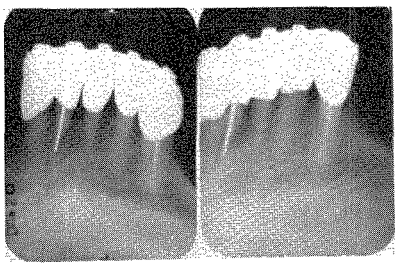


Fig. 1846. Roentgenograms taken in September, 1963. The patient is now 71 years old.

Case 10

Past history

In September, 1951, a 65-year-old man was referred for dental treatment. He had been wearing an ill-fitting upper removable partial denture that restored five posterior teeth. A deep vertical overbit and a large horizontal overjet were present. His lower incisors contacted the lingual palatal gum. The anterior gold bar of the removable denture had settled and served to spread the upper anterior teeth. The clasps were faulty. This bridge had been worn for many years. An acute curve of Spee was also present. The lower lip was found habitually to rest beneath the upper anterior teeth, thereby perpetuating the malocclusion. Extensive recession had exposed large areas of tooth surfaces.

This patient had been under medical care. He was nervous and difficult. Up to the time of writing he claimed that his prosthesis did not annoy him. The 1951 roentgenograms disclosed periodontal disease accompanied by great loss of bone associated with the maxillary teeth. Deep pockets were also present in his mandibular teeth. The advisability of reconstructing his mouth was first discussed with his medical advisor. This was rejected because of complications it might produce owing to his poor health.

Treatment and evaluation since 1951

Regular prophylaxis and conformative dentistry were resorted to in 1951. The upper right second bicuspid had to be removed, and it was added to the removable partial denture in 1953. The lower right first molar was removed and replaced in 1959, but it was not until 1961, when he was 75 years old, that any large-scale work was necessary. His 1961 roentgenograms indicated infections as a result of the deep periodontal pockets, associated with the upper left central incisor, lateral incisor, cuspid, and first bicuspids. He and his physician finally agreed that these teeth should be removed. This was done on Sept. 27, 1961, and a temporary partial denture was inserted making every effort to retain the original interocclusal relationship. Although only four upper teeth remained, it was decided to retain them rather than resort to a full upper denture at this time.

Recent treatment and discussion

In the final construction, a strong gold casting was made for the anterior portion of his palate with no impingement upon the gum tissue lingual to the remaining teeth. His deep irregular rugae served as good retention and stabilization for this palatal metal casting. A heavy rounded metal strip ran labially and buccally high up in the vestibule. This was made a part of the palatal casting and extended from the right to the left flanges of acrylic. A special labial clasp extended from a gold arm in the labial flange and contacted the right central incisor. The original bite was maintained. The palatal coverage was extensive. This partial denture was inserted on Oct. 22, 1961. The postinsertion adjustment was insignificant, and the patient was pleased with the result.

These four remaining upper teeth may serve to retain this prosthesis for some time. With his type of malocclusion a full upper denture could cause a great deal

of trouble. The lower incisors contacted the soft tissue behind the upper incisors. To open the bite in order to free the locked occlusion, the patient would be subject to a change in his occlusal pattern. At the age of 75, he may not be able to adjust to this.

To extract the lower anterior teeth did not seem intelligent in view of his age and infirmity. The simplest way out of this dilemma seemed to be to retain the remaining upper teeth for as long as possible. In addition, by utilizing extensive palatal coverage when the time arrived and a full denture must be worn, it would be easier for him to accommodate it. He was also being slowly mentally conditioned instead of being precipitated into a large-scale change.

In the evaluation, full coverage and splinting were considered in relation to the four teeth retained. The responsibility of this much more complex procedure was not deemed advisable. The labial metal bar gave considerable support in retention and stabilization and in no manner complicated the insertion of the prosthesis.

In 1961 the lower right second molar became infected and developed a buccal

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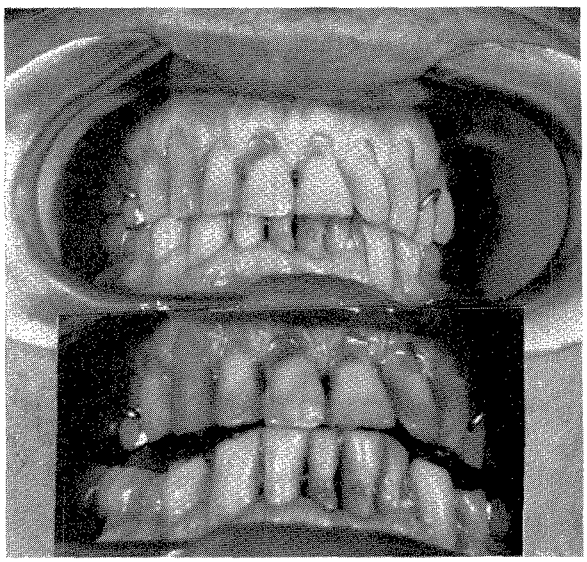
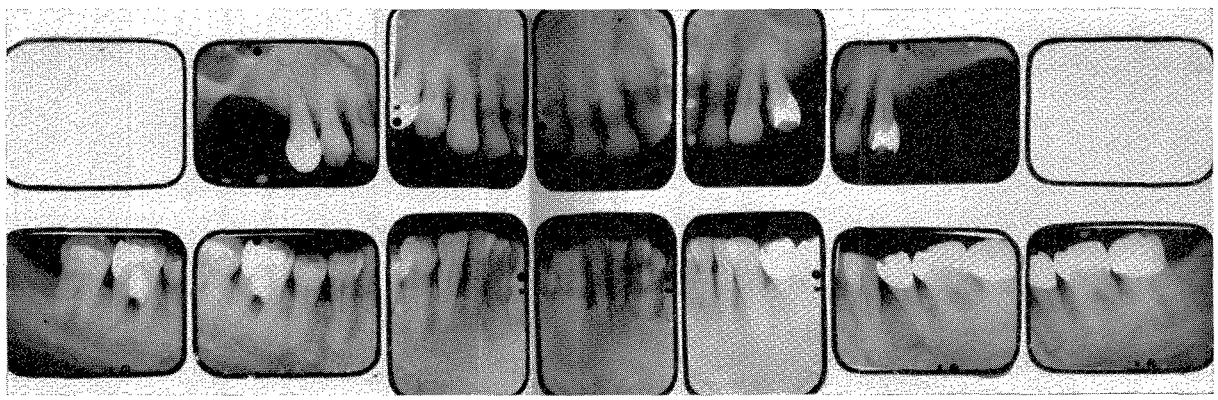


A



B

Fig. 1847. **A**, Photograph of the mouth of a 65-year-old man with a deep vertical and horizontal overbite taken in 1951 (Angle Class II, Division 1 malocclusion). **B**, The roentgenograms that were taken in 1951 when the patient was first examined. (Figs. 1847 to 1855 are of the same case.)

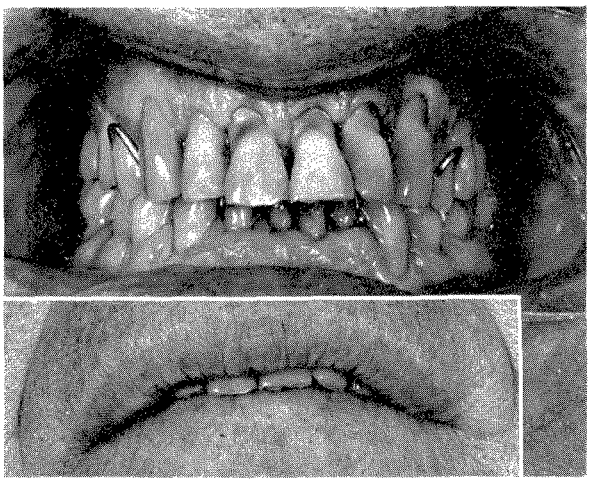
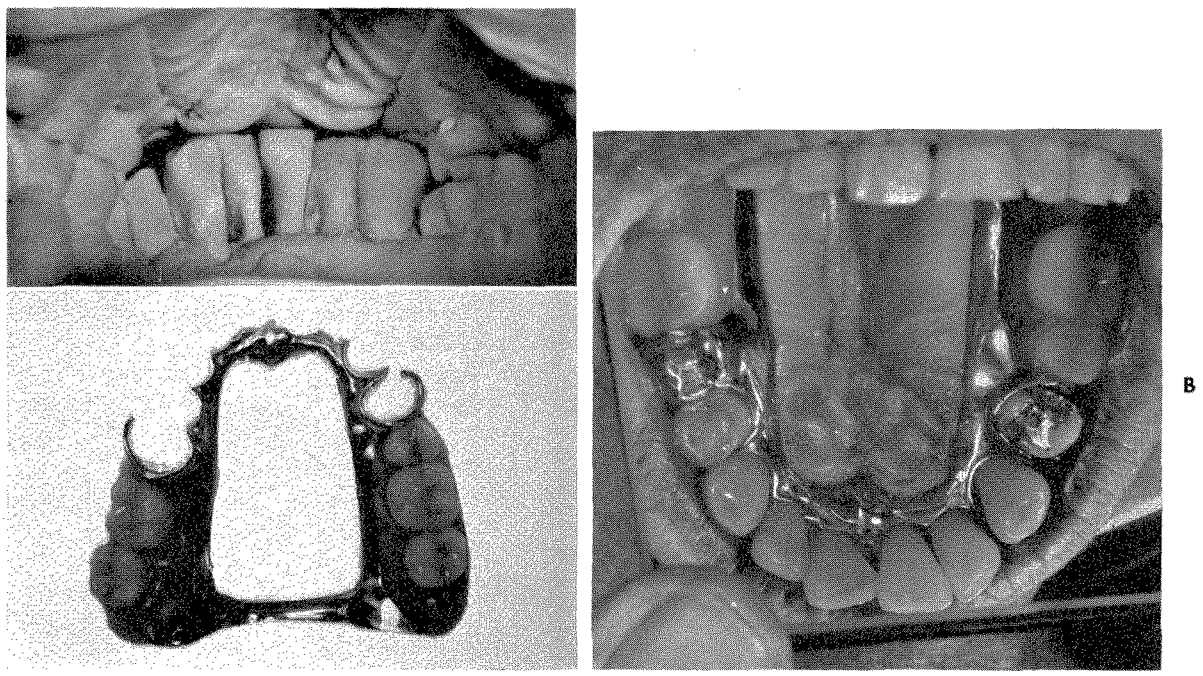


Fig. 1848. The lower lip habitually rested under the upper teeth, perpetuating the malocclusion. These photographs were taken in September, 1953. The upper right second bicuspid had been removed.



A

B

Fig. 1849. A, The upper removable partial denture had been worn for several years. It was in place when I first examined this patient in 1951. The patient was very comfortable with this prosthesis. After consultation with the patient's medical advisor, I was unwilling to assume the responsibility of changing the denture or of altering the interocclusal relationship. The upper photograph is a palatal view of the cast that shows the lower incisors almost in contact with the upper anterior rugae. **B,** A palatal view of the removable partial denture that had been worn for a long time. It served to push the anterior teeth forward. (Refer to Fig. 1848.)

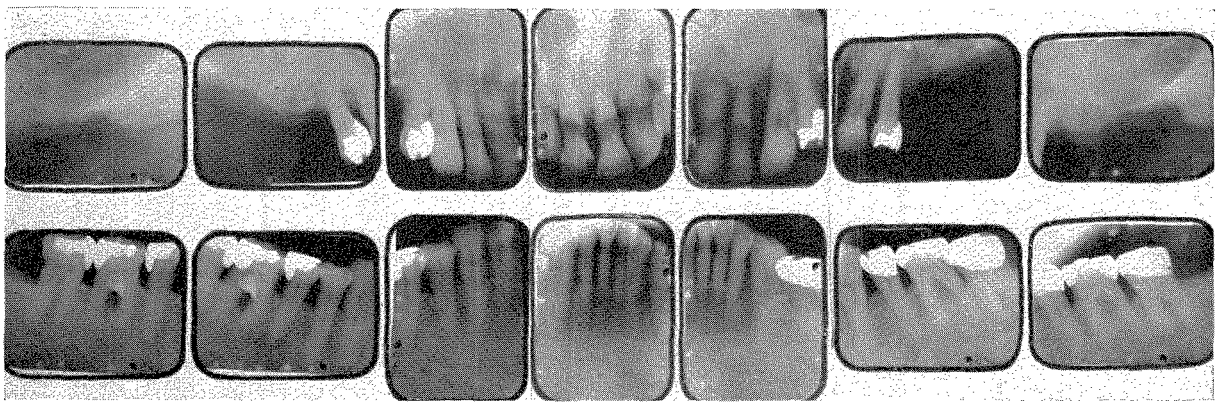


Fig. 1850. The roentgenograms shown here were taken in October, 1958. In the previous seven years, only the upper right first bicuspid was lost, in spite of the malocclusion and inadequate removable partial denture. The patient was 72 years old when these photographs were taken (1958).

Fig. 1851. These roentgenograms were taken in September, 1961. The patient was 75 years old. It was considered advisable to remove the infected upper left central and lateral incisors, cuspid, and first bicuspids. The lower right first molar was removed in 1959 and replaced by means of a fixed partial denture.

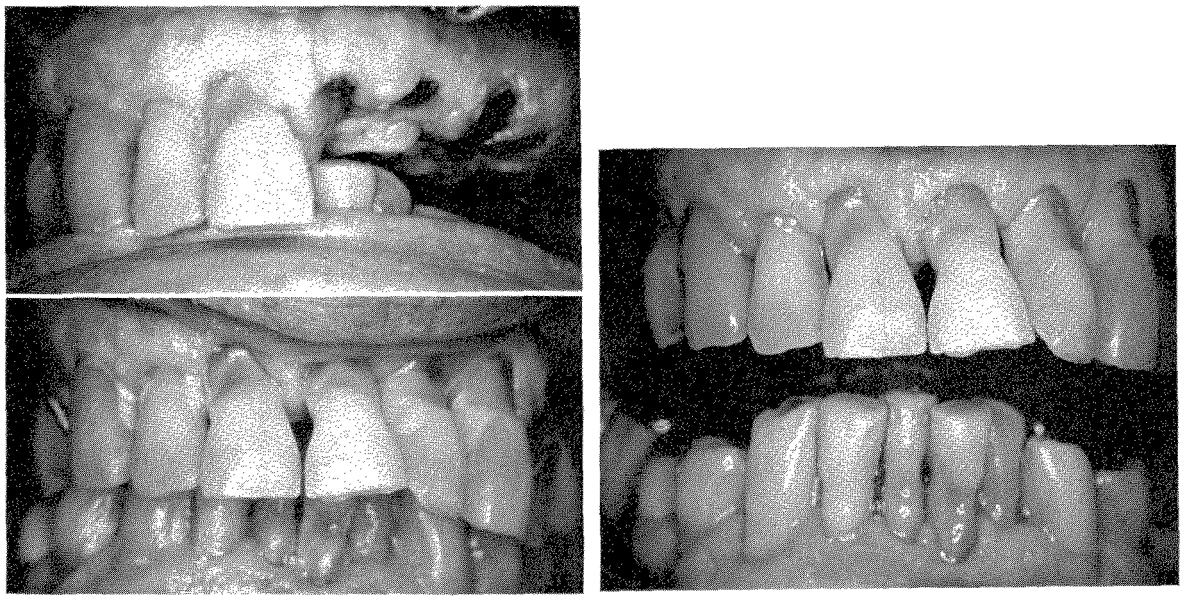


Fig. 1852. September, 1961, before and after the removal of the four upper left teeth. The extreme vertical overbite is also shown.

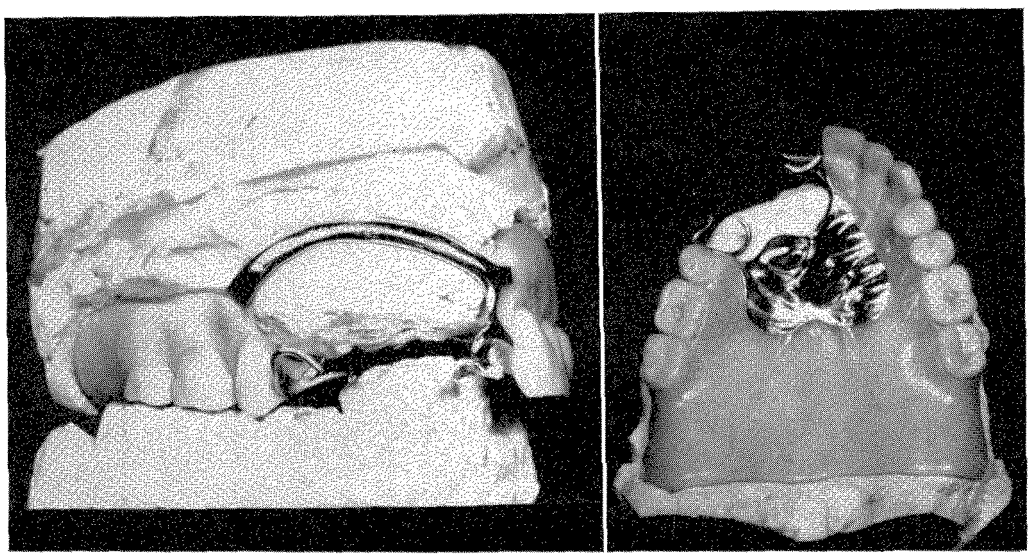


Fig. 1853. The overbite was so extreme that a full upper denture would be hazardous. Under these circumstances the upper four remaining teeth were retained, and a removable partial denture was built around them. Two views of the partial denture are shown here. Full palatal coverage and a gold anterior palatal casting provided sufficient strength where the lower anterior teeth engaged the palate. The labial and buccal bar provided retention and additional support.

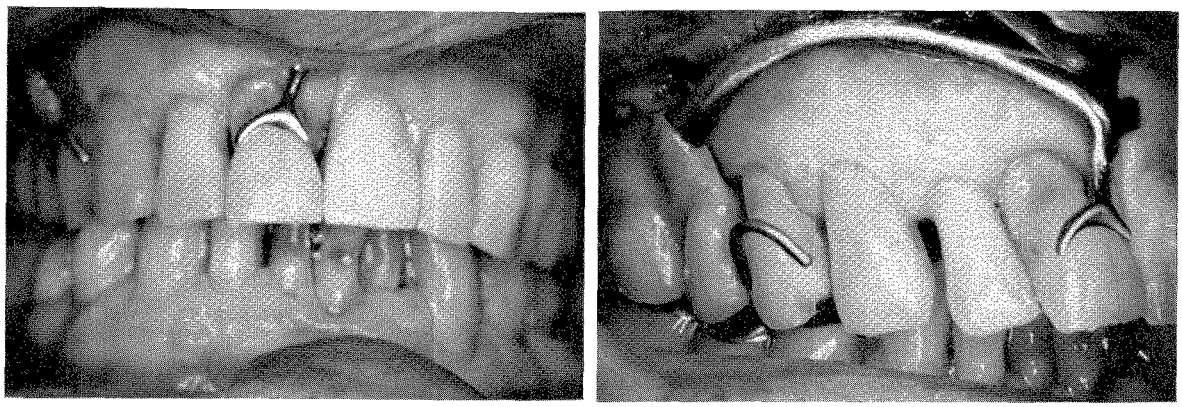


Fig. 1854. Two views of the removable upper partial denture in the mouth. These were taken in October, 1961.

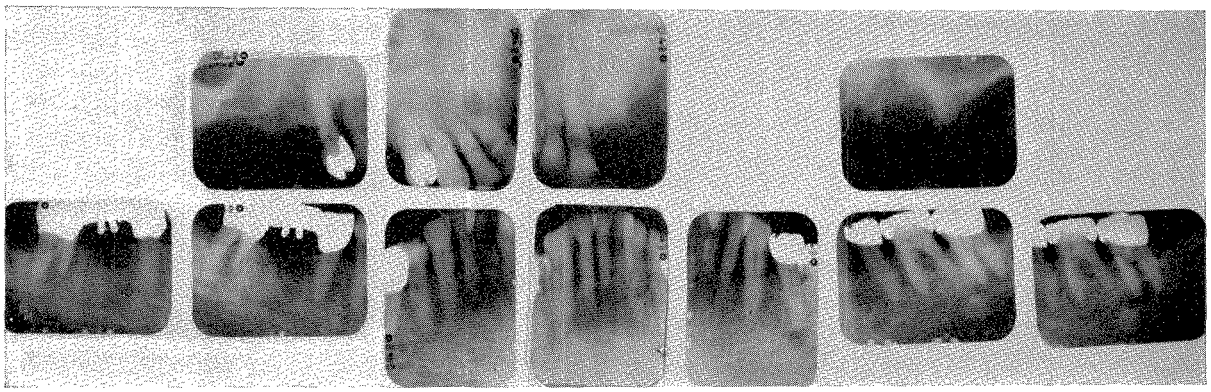


Fig. 1855. Roentgenograms taken in 1962. The patient was then 76 years old. The lower right second molar was infected, but his physician refused to consider having this tooth removed.

fistula. His former medical doctor died in 1960. He was reluctant to have the infected tooth either removed or treated. His new medical advisor did not consider the possibility of infection from this tooth nearly as important as this patient's mental health. Under these circumstances I could not exert any further pressure. (Figs. 1847 to 1855.)

RE-EVALUATION OF EFFECTS OF FOCAL INFECTION

Every now and then we come in contact with a physician (M.D.) who does not consider the dental infections to be as serious as the dental profession believes them to be. For example, one physician in my practice had several apical abscesses and one draining fistula associated with his teeth. He stated positively that he preferred to have these nontreatable teeth remain rather than to have them removed. He reasoned that he was able to neutralize their ill effects by the use of antibiotics when the infections became acute and flared up. He had done this on several occasions in the past with effective results insofar as the acute symptoms were relieved. To extract these teeth would mean the insertion of a removable

partial denture. He felt that the possible evil of the latter was far greater than the retention of the infected teeth. He did not fear the effects of the infection upon his system as long as he was able to use the antibiotics.

Regardless of the fact that I did not agree with this, the physician who is concerned had great prestige as an internist. He claimed that the medical profession does not consider focal infection in the same light as they did in the twenties and thirties. Today they think that these infections can be neutralized by the miracle drugs and the antibiotics. This must be borne in mind when consulting with the patient's medical advisors. Of course this is not the thinking of all of them. This subject should be given greater publicity by the medical profession so that some definite stand would be taken in order to avoid confusion.

The letter that follows gives the point of view of one member of the medical profession relative to dental infections:

"When an acute periodontal infection is accompanied by fever and other systemic manifestations, the use of appropriate antibiotics is usually effective in controlling, if not completely eradicating, the infection. The subsidence of fever, normal blood count and sedimentation rate and the patient's freedom from symptoms make it unlikely that the remnant of this infection in the form of residual fibrosis or granuloma is producing any important systemic deterioration. Because of the effectiveness of antibiotic therapy, it seems prudent in many cases, particularly in elderly cardiacs, to chance a flare-up and to treat it with antibiotics again.

"The presence of periodontal and periapical infection represents a threat to persons with acquired valvular and congenital heart disease. In most instances rheumatic fever will have been found to be the cause of the injured valves. In a rare case, the presence of a mural thrombus secondary to myocardial infarction may be a potential site for bacterial propagation. The management of infections in this group of patients involves preoperative and postoperative introduction of bacterial antibiotics.

"The view of focal infection as propounded by Billings has not proved to be of sufficient importance in this antibiotic era to warrant the removal of areas which are potentially infective.

"The management we propose for these smoldering and well-circumscribed infections has its parallel in the treatment of lymphangitis of the lower extremities and chronic bronchitis. In these conditions periodic use of antibiotics in order to prevent exacerbation of infection has proved very valuable."

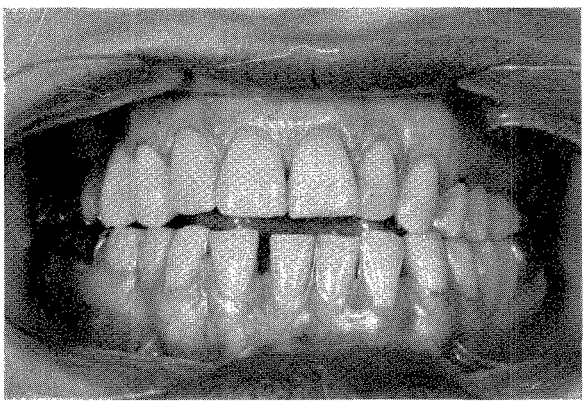
DIFFERENT KINDS OF PROBLEMATIC TEETH

A great deal has been written in this text relative to the retention of problematic teeth whose futures are questionable. (See pp. 68, 214, 229, 237, and 476.) What also must be considered is the difference between the retention of problematic teeth with strong supporting structures that are nonvital and suspicious for infection but in which the restorative work is well constructed, especially if the patients are young, as against the retention of problematic teeth with definite recognizable clinical and radiographic evidence of periodontal and/or apical infections and in which the restorative work has been poorly constructed. An example of the former will now be presented.

Case 11

A 37-year-old woman was first seen in September, 1952. She was missing eleven teeth, and of the twenty-one that remained, ten were nonvital. Of these ten only the upper left first bicuspid gave radiographic evidence of actual apical infection. The patient presented an open bite that was influenced by a faulty tongue thrusting habit. The supporting structures were strong and the teeth firm. The extraction of the problematic teeth would have resulted in either large removable partial dentures, or even, in the case of the upper teeth, in a full denture. The patient was made aware of her problem and decided to retain all her present teeth rather than submit herself to the possibility of surgery and its consequences. I was quite willing to go along with her decision, feeling that in this particular case her choice was perhaps the best one.

As time went on, it became necessary to replace the four posterior fixed bridges. As they were replaced (this took place over a ten-year period), the infected upper left bicuspid was removed, and several roots were retreated. The patient was then 48 years old. She thoroughly understood her problem and was grateful for the treatment she received, feeling that the decision not to remove her nonvital teeth was



A

B

Fig. 1856. **A**, The mouth as it looked in 1953. The patient was then 38 years old. **B**, The roentgenograms as they were in 1952. There were ten nonvital teeth present. Eleven teeth were missing. The remaining teeth were well supported with alveolar bone. (Figs. 1856 and 1857 are of the same case.)

A

B

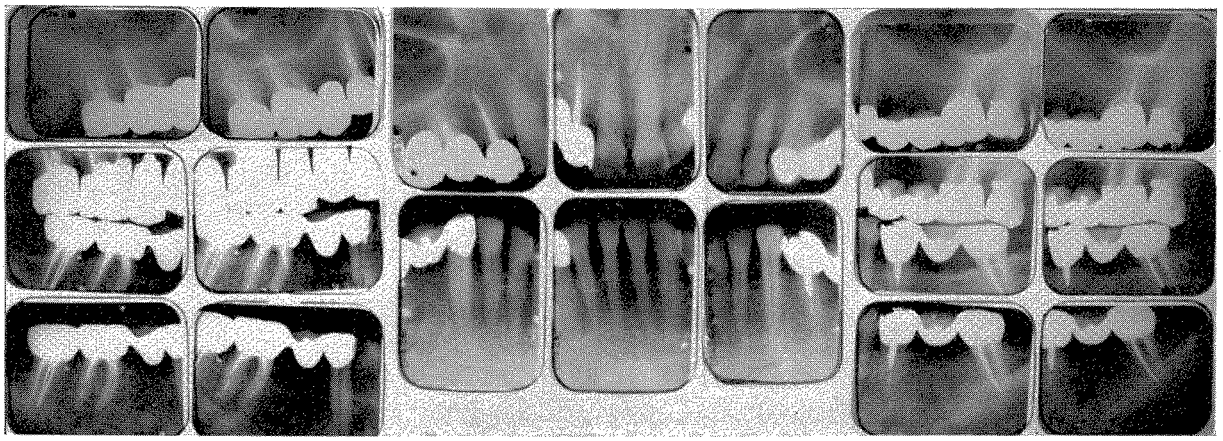


Fig. 1857. **A**, The mouth as it looked at the time of writing. The patient was 48 years old. **B**, The roentgenograms that were taken in 1963. In comparison with the 1953 roentgenograms, the infected upper left bicuspid had been removed, and several roots had been retreated as the old posterior bridges were replaced over the ten-year period.

an intelligent one. Her eccentric occlusion was not appreciably changed nor was her function interfered with. (Figs. 1856 and 1857.)

When this problem comes up for evaluation, different solutions must be considered. Although the retention of these nonvital teeth cannot be considered as routine practice, we are still not entirely sure which evil produces the greatest trauma to the system, and until we are sure, these problems will always be with us.

RETENTION IN ELDERLY PATIENTS OF FEW TEETH PERIODONTALLY INVOLVED

Patients who have only a few remaining teeth in the maxillary or mandibular arch start with a great disadvantage. With this in mind, they deserve a careful appraisal of the future possibilities should they elect to retain these teeth.

The periodontist is qualified to evaluate the periodontal tissues. Teeth that are too risky should be removed. If both the periodontist and the prosthodontist

present their combined knowledge, the patient is in a better position to judge what is most practical.

There are times when, because of previous good fortune in handling a somewhat similar case, the dentist may be lulled into a false sense of security. The intelligent dentist guards against this for the following reasons.

A great injustice may be inflicted upon the patient because of the considerable amount of time, energy, and expense he is subjected to. There is also the possibility of retaining infected teeth. The dentist must also consider that he may jeopardize his own reputation, in addition to wasting his time and energy, in an attempt to solve these problems. It may be wise to consider some other safer procedure or to refuse to undertake the work. Periodontists are equally as guilty as prosthodontists and general practitioners in encouraging the retention of many problematic teeth that otherwise would have been removed for the safety of the health of the patient.

In cases in which the few remaining teeth are in the maxilla, the problem is less difficult than if the mandibular teeth are involved. In fact, the longevity of a few periodontally involved mandibular teeth is greatly enhanced by the removal of the maxillary teeth. This, in effect, necessitates the insertion of a full upper denture resulting in the decrease in occlusal pressures upon the lower teeth. A greater proportion of people are able to accommodate a full upper denture. When confronted by a decision concerning the sacrifice of the upper versus the lower few natural remaining teeth, elimination of the upper teeth is prefered in the great majority of cases.

Case 12

In October, 1951, a 60-year-old woman came for dental treatment. Her teeth were in an advanced stage of deterioration. The lower arch was unusually wide, suggesting a tongue thrusting and false swallowing habit. Only five upper anterior teeth remained, and of these the left cuspid had a deep periodontal pocket. Four lower posterior teeth were missing, and the left molar was infected. The right first molar was in buccoversion. Lack of proper care caused many teeth to be removed. Other than the upper left cuspid, which had been subjected to occlusal trauma, the periodontal tissues were normal.

The patient wished to know what longevity could be expected if the remaining upper teeth were retained. A maximum time of five years was predicted. With this in mind, she decided against extraction. The maxillary teeth were not infected. With the exception of the upper left cuspid, their periodontal structures were normal in spite of their having been abused by previous ill-fitting removable partial dentures.

Treatment

Treatment was started in November, 1951, and completed in February, 1952. The lower right first molar and the lower left second molars were removed. This was done deliberately in order to decrease the pressure upon the upper free-end saddles. The work was constructed on a Hanau Model H articulator. Mucostatic impressions were taken in specially cast trays. The interocclusal cusp relations

were integrated carefully. Splinting and extensive tissue coverage were resorted to. Reduction of function was further accomplished by the elimination of several posterior tooth units in the final restorations.

Postinsertion events

In 1957 the upper right cuspid became sensitive. Its pulp was removed and the root canal filled through the gold crown. In March, 1958, severe pain symptoms again developed in the upper right cuspid-lateral incisor area. This side of the fixed splint felt loose. The entire splint was removed in order to investigate. The right cuspid and lateral incisor had fractured at the gum line. The decision now had to be made as to whether to remove the upper remaining teeth or retain them and remake the

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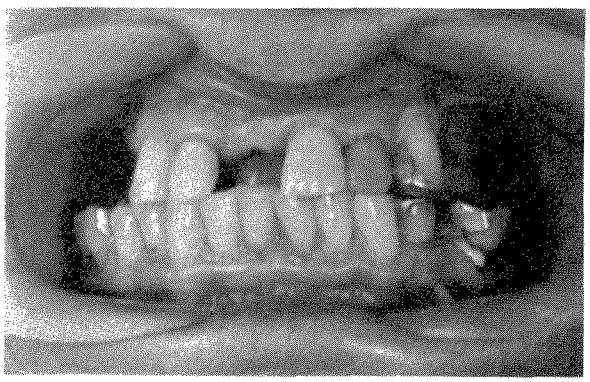

Fig. 1858. Front view of the mouth of a 60-year-old woman, taken in 1951. (Figs. 1858 to 1874 are of the same case.)

Fig. 1859. Roentgenograms taken in September, 1951, before treatment was instituted.

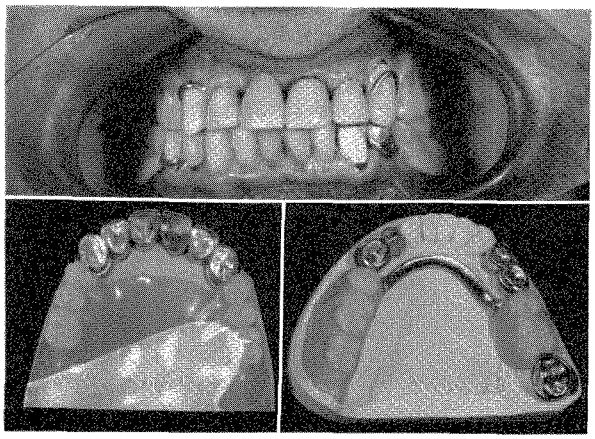

Fig. 1860. The transitional work was completed by February, 1952. It is shown here on the casts and in the mouth.

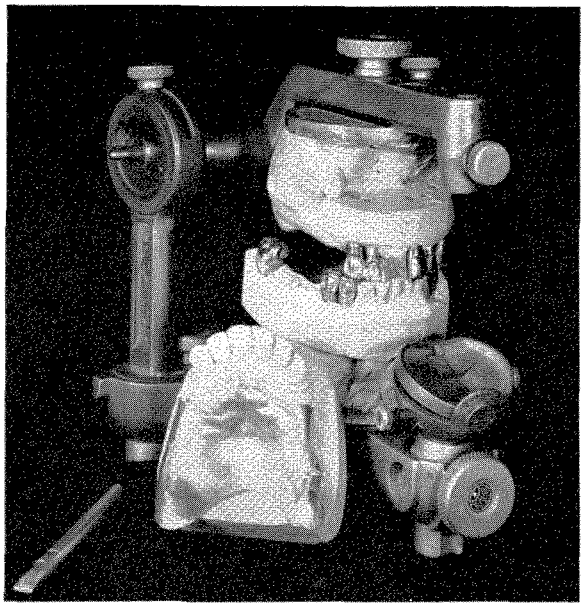

Fig. 1861. The upper and lower gold veneer crowns were constructed on a Hanau Model H articulator. These will serve as the final abutment castings. In the foreground on the maxillary cast is seen the cast aluminum tray with which to take the muscostatic upper impression.

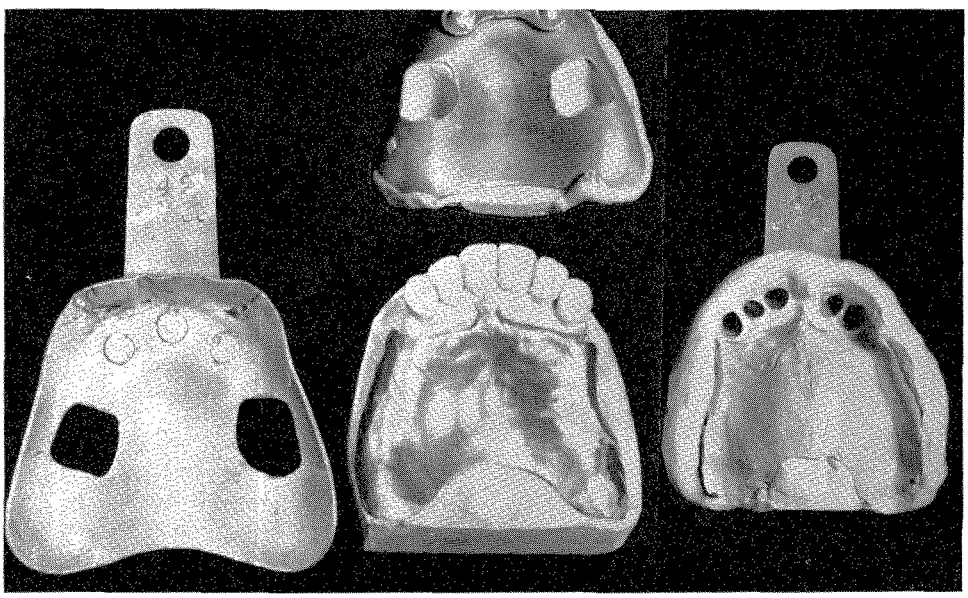

Fig. 1862. Upper and lower mucostatic impressions were taken using a specially cast tray shown in the center and also in Fig. 1861. The first impression was taken in Ackerman's paste. The over-all tray is on the left. It has two holes for the fingers to engage the primary impression and to hold it in place while the over-all plaster impression, shown on the right side, was taken. The upper figure shows the side of the tray held by the fingers. The lower impression was taken using the same method.

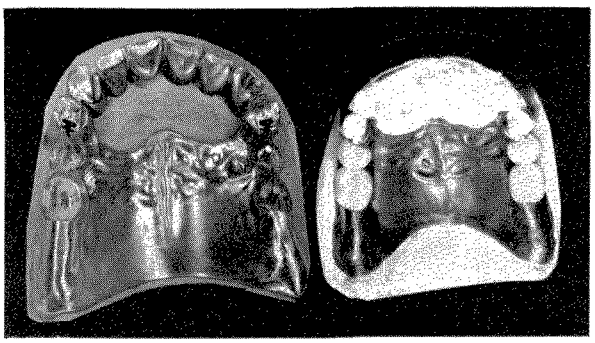

Fig. 1863. The wax-up is shown on the right side. The anterior castings were soldered together (on the left side). The female attachments were inserted. The casting is also shown. The male attachments had not yet been added.

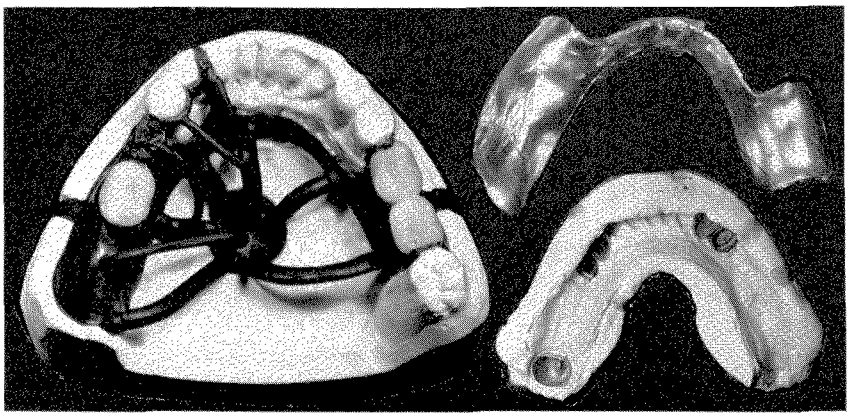

Fig. 1864. The cast lower tray is shown above and to the right. The double lower impression is shown below to the right, whereas the wax-up is shown to the left.

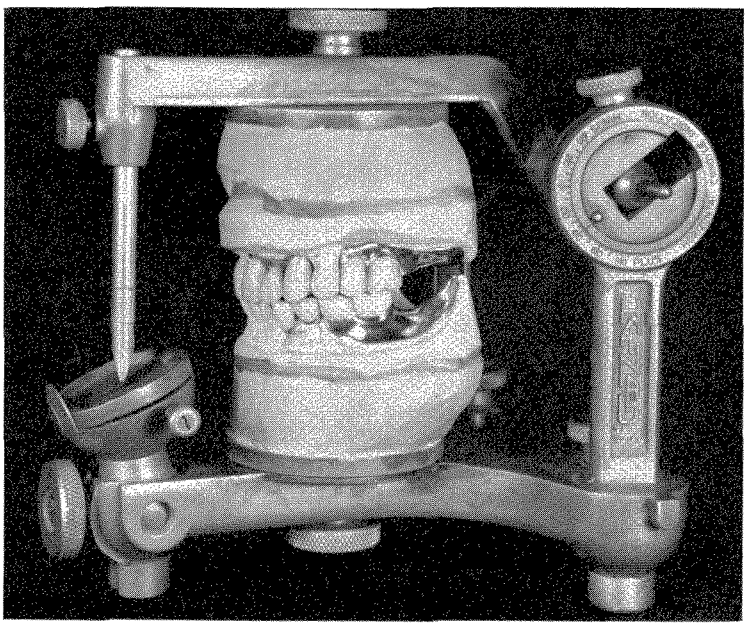

Fig. 1865. The completed work on the articulator (left side). The second molars had been omitted to reduce function. (Read text.)

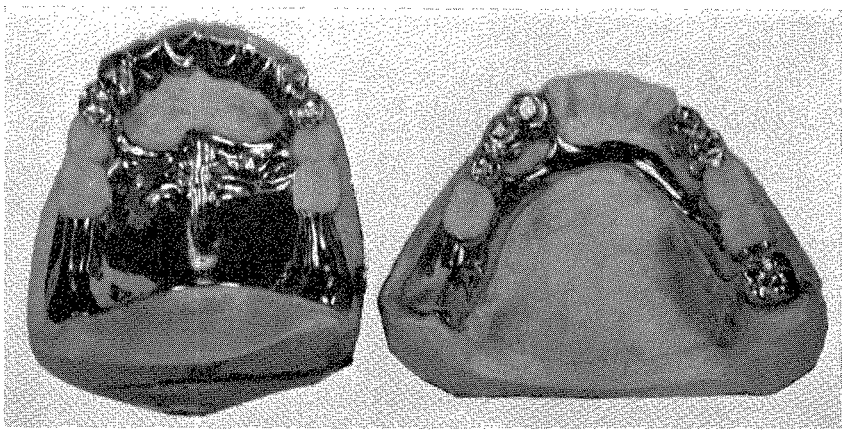

Fig. 1866. Occlusal view of the completed work. The upper and lower second molars had been intentionally left off to decrease function because of structural weakness.

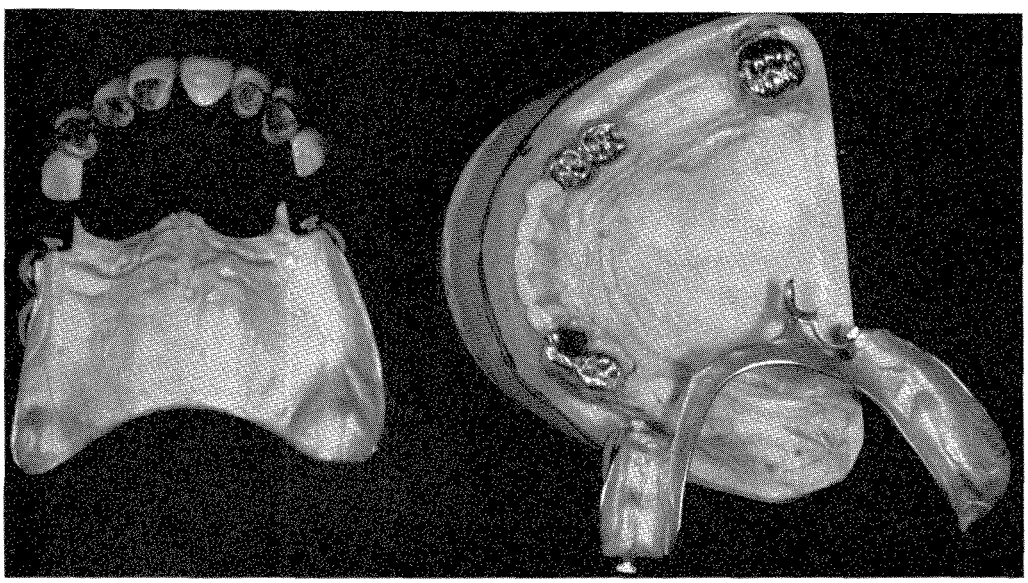

Fig. 1867. Left side, Upper fixed and removable partial dentures off their cast. The palatal surface is not polished. The lingual extensions complete the first bicuspids and act as indirect retainers. The female precision attachments are in the throw-offs. **Right side,** The lower removable partial denture is shown off the cast. The tissue side is unpolished. Double abutments were used. The casting is rigid.

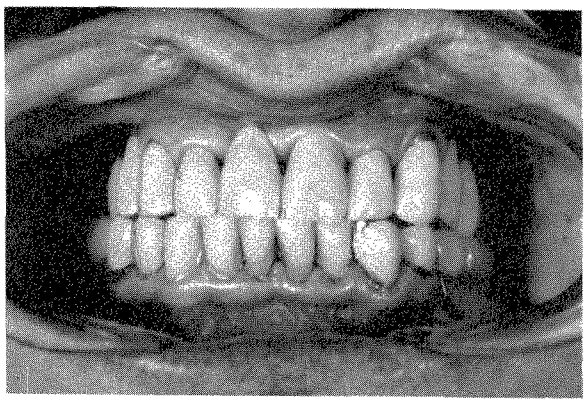

Fig. 1868. Front view of the completed work. This was inserted in March, 1952.

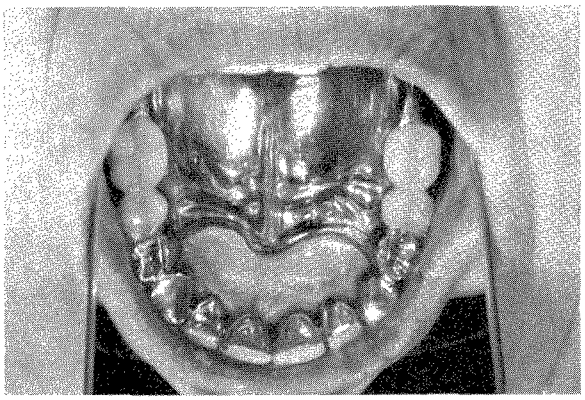

Fig. 1869. Palatal view of the completed prosthesis. The anterior edge of the casting lies behind a large ruga so that it cannot be discerned by the tongue. The lingual surface of the first bicuspid throw-offs is formed by the extensions from the removable partial denture. (See Fig. 1867.)

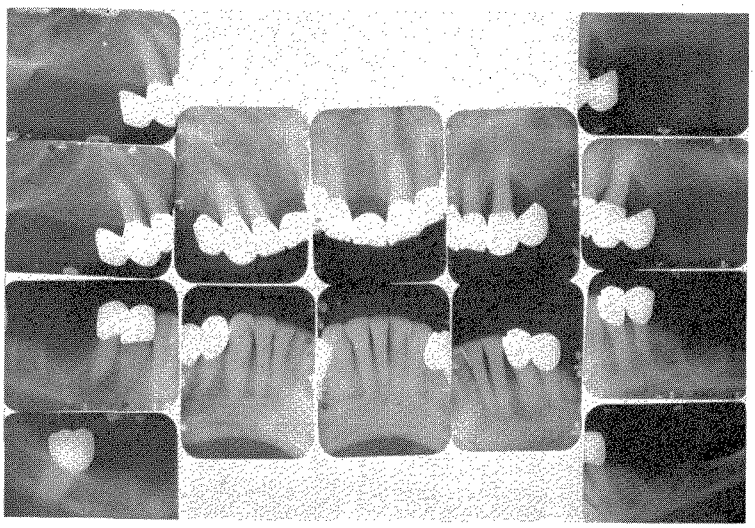

Fig. 1870. Roentgenograms of the completed work. These were taken in March, 1952.

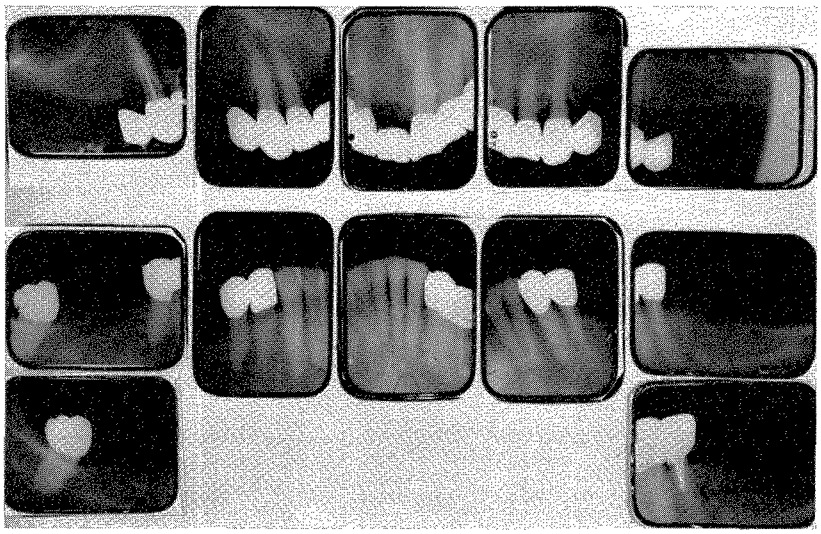

Fig. 1871. Roentgenograms taken in September, 1956, just four and one half years after completion. In 1956 the lower left first bicuspid was devitalized due to caries. In 1957 the upper right cuspid was devitalized. Both teeth were treated and retained. The lower right roentgenogram shows a new casting in the root and the two-tooth splint. The upper left roentgenogram shows the cuspid root canal filled.

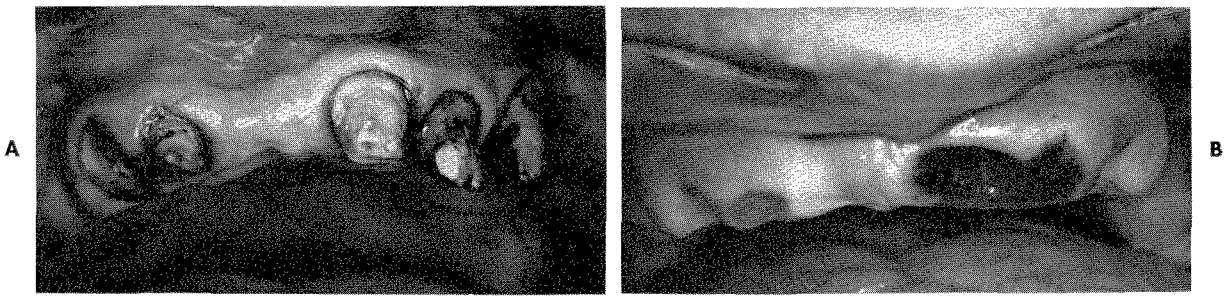

Fig. 1872. A, In March, 1958, the right cuspid and lateral incisors had fractured at their gum line; the upper work had been in place for six years. **B,** in April, 1958, the upper anterior teeth were removed.

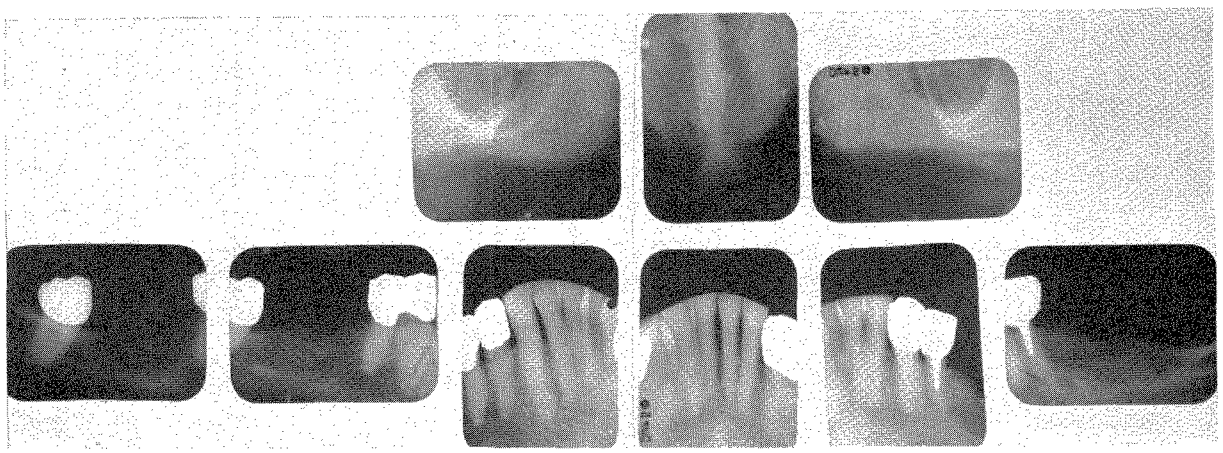

Fig. 1873. Roentgenograms taken in 1962.

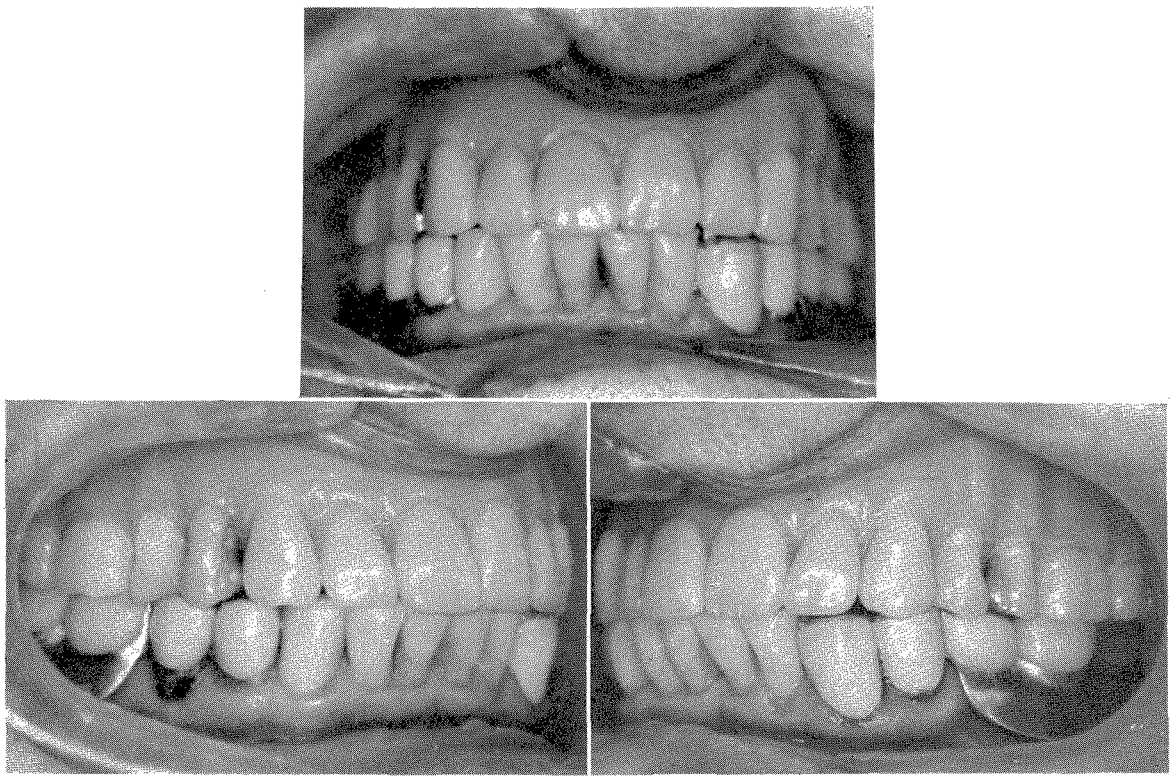

Fig. 1874. Three views of the mouth in 1962. A full upper denture is in position. The patient was then 72 years old.

entire upper prostheses. The five years that had been predicted had passed, and the patient was 68 years old.

Two of the five remaining upper teeth had become nonvital. The right cuspid root had fractured as a probable result of the weakening of its crown when it roots canal had been treated in 1957. Nonvital teeth lose elasticity and are more susceptible to fracture than vital ones. The lateral incisor, which was originally covered with a porcelain jacket crown, was then unable to resist the torque resulting from the strain of the occlusion and the partial removable prosthesis. As a result, it too had fractured.

After careful evaluation of the problem, the decision to remove these teeth was made. This was accepted by the patient and was accomplished in April, 1958. The final full upper denture was inserted in August, 1958. Considering the previous statement relative to the lessened amount of occlusal trauma that can be exerted by a full upper denture, the lower reconstruction should now have greater longevity. It was considered more practical to retain the lower prosthesis and to use the lower occlusal plane as a pattern for the upper denture rather than again reconstruct these teeth. On the other hand, better coordination of the occlusion could have been obtained had the upper denture and the lower work been completed at the same time.

Upon recent inquiry, the patient was very pleased with the decision to remove the remaining upper natural teeth and had no difficulty in adjusting to the full upper denture. (Figs. 1858 to 1874.)

PROBLEMS ASSOCIATED WITH REDOING OR DUPLICATING REMOVABLE AND FIXED PARTIAL DENTURES

Difficulties arise when it becomes necessary to repair or to remake extensive prosthetic restorations that have been previously retained by means of some form of precision attachment. No matter how carefully the attempt to duplicate the previous restoration is made, there is usually some alteration that takes place. The dentist then finds himself in serious difficulty. Many hours can be consumed in these tasks. Under this heading comes the precision attachment removable partial denture that the patient wishes to have duplicated in order to have it as a spare for emergencies. It is not usually possible to construct a fully satisfactory duplicate in instances in which the abutment castings with the female members of the precision attachment assemblages have already been cemented in the mouth. The patient may be uncomfortable, and the dentist may have an unjust feeling of responsibility and frustration. This can happen to a capable operator and technician.

In some of the older cases, the female attachment becomes worn, and the removable partial denture loosens. Even when the new male attachments are inserted, they cannot completely take up the difference. To seat the new male attachments correctly in the loose boxes and have them maintain parallelism is also difficult. It is usually necessary to attach them, one at a time, by means of acrylic, directly in the mouth to be sure the partial denture is able to be inserted.

While theoretically it should not be difficult to duplicate a precision attachment partial denture, especially one that is retained by three or more attachments, clinically it is an arduous and time-consuming procedure.

Case 13

Past history

Not long ago a middle-aged woman presented herself with a problem case that involved the duplication and the remaking of her upper and lower fixed and removable partial dentures. The oral reconstruction had been completed ten years previously following a traumatic accident. Only four maxillary teeth had been retained, the left lateral incisor and cuspid and the right first and second molars. In the mandible there remained the six lower anterior teeth and a left first bicuspid.

Chief complaint

In order to retain her upper partial denture, the patient had been using an adhesive powder. A further complaint was the poor esthetics that the teeth now presented. The plastic incisal tips of the lower central and lateral incisors were considerably abraded. Roentgenograms also disclosed caries and infection.

Treatment planning

There are several important factors to be considered in evaluating a case of this nature. The traumatic accident that had taken place ten years previously had completely broken down the oral structures. By using good judgment augmented by good mechanics, the mouth had been restored to reasonably good esthetics and function considering the little there was to work with. If this mouth was again to be reintegrated, it seemed logical to copy the present prescription as closely as possible. With this in mind, the new restorations were planned carefully.

All precautions were taken not to disturb the present equilibrium. The goal was as follows: (1) to remove all caries and infection, (2) to maintain the same occlusion and vertical dimension, (3) to provide an upper removable partial denture with good esthetics and retention, and (4) not to disturb the temporomandibular joints that had been injured by the previous accident.

Regarding removal of old fixed partial dentures

When a fixed seven-unit splint that had been constructed using full crowns must be removed, great care must be exercised in order not to further weaken or accidently extract one or more of the remaining teeth. Its removal is best accomplished by cutting each one of the metal crowns completely in half. This, however, is not feasible because cutting the crowns in two completely destroys the bridge and eliminates the possibility of using it as a temporary bridge. In this case, the crowns were only partly cut so that the bridge, after its removal, could still be repaired and reused. The continued use of the old bridge was also necessary because the precision attachments it contained supported the lower lingual bar. Although it is possible to duplicate the female attachment in acrylic, it is still more practical if the old fixed partial denture can be used as a transitional device.

Three lower teeth were found to be carious. The lower left first bicuspid was infected and so deeply involved with caries that its removal was necessary. By completing the lower work first, the upper occlusal surfaces were able to be used as the pattern. The same vertical dimension was maintained. The completed lower work was inserted in July, 1960.

The upper work began in October, 1960, and was completed in December. Excessive hypertrophic gum tissue was surgically removed from the upper ridges. The labial frenum was severed to permit the use of a labial saddle that extended beneath the lip and allowed better stabilization and retention. The esthetics was also enhanced. The upper and lower anterior teeth did not contact either in the old or the new partial dentures.

Problems encountered

There remained many real problems involved in this case. The patient wished to have a lower lingual bar that was well stabilized and retentive. This would indicate that more tooth support was necessary. However, the teeth were very weak, and tightening the retainers would only hasten their destruction. The alveolar ridges, on the other hand, suffered a great loss of bone and could not be too severely strained. The patient had to accept a compromise and permit the small

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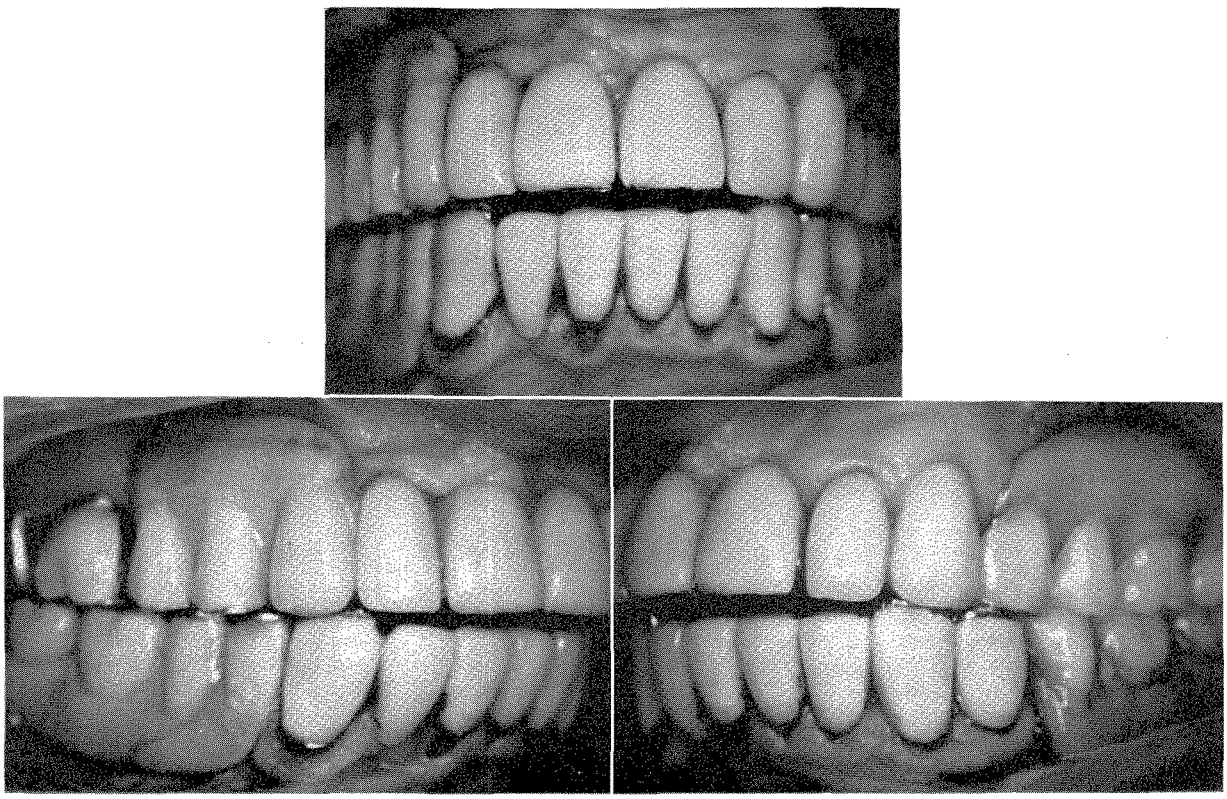

Fig. 1875. Three views of the mouth of a middle-aged woman. This mouth was rehabilitated ten years previously. (Figs. 1875 to 1888 are of the same case.)

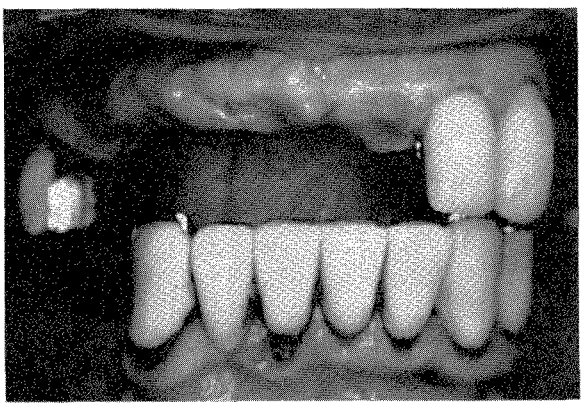

Fig. 1876. The upper removable partial denture was supported by only three remaining teeth.

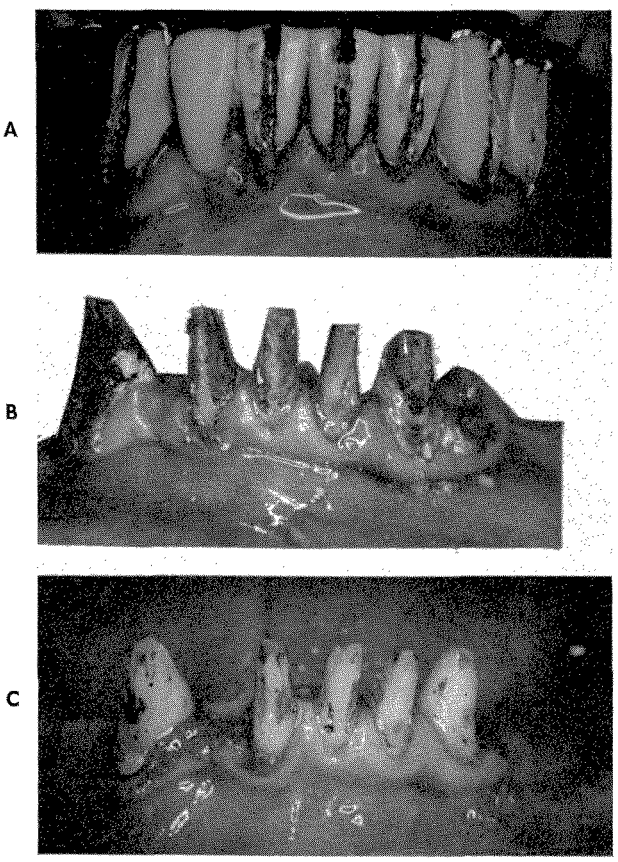

Fig. 1877. Three stages in the removal of the lower anterior seven-unit splint. **A,** Cutting the crowns. **B,** Just after the splint had been removed. The left bicuspid crown was so deeply involved in caries that it was removed. The right cuspid was also deeply involved in caries. **C,** The bicuspid had been removed and the teeth cleaned up. Care must be exercised in removing these splints because they are usually repaired at the same sitting and used as transitional splints.

Fig. 1878. Roentgenograms taken in May, 1960, before work was undertaken. Caries may be detected in both the upper teeth and in several lower teeth.

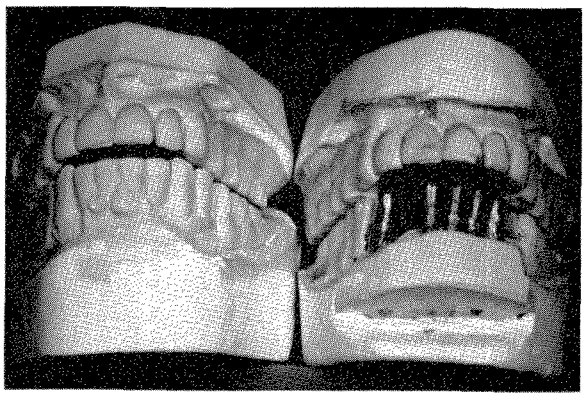

Fig. 1879. The vertical dimension of the old work was retained. The old cast is on the left side. The anterior open bite was also maintained.

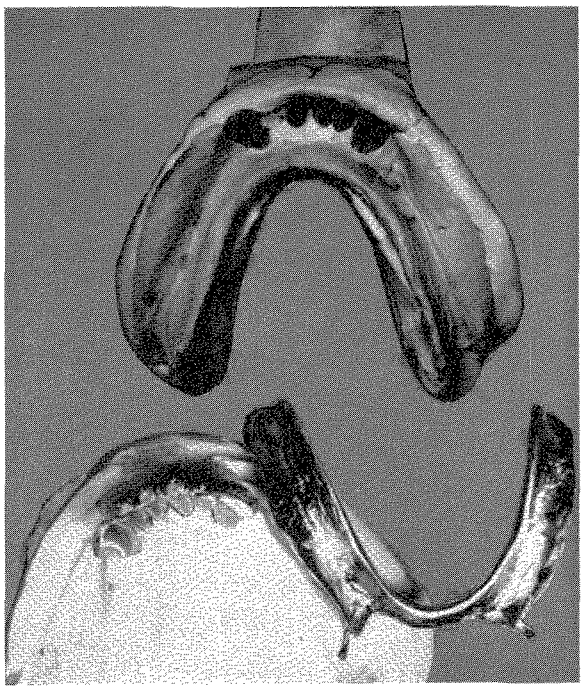

Fig. 1880. Upper, A double mucostatic impression was taken in a prepared tray. The material used for the impression of the tissues was rubber. **Lower,** The metal casting is shown beside the anterior splint. The two parts had not yet been related. (See Fig. 188.1)

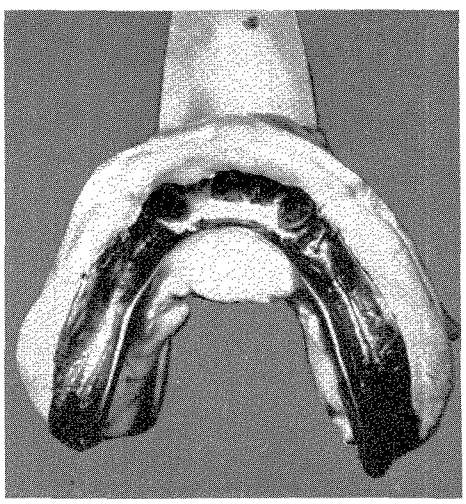

Fig. 1881. A special plaster impression is taken to relate the fixed and removable partial denture. Then the precision attachments will be added.

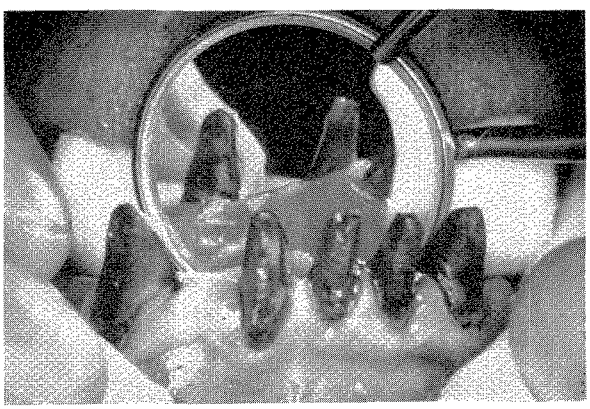

Fig. 1882. The gums had been resected and the cavities filled. Silver nitrate had been applied to each tooth. The prosthesis will now be inserted.

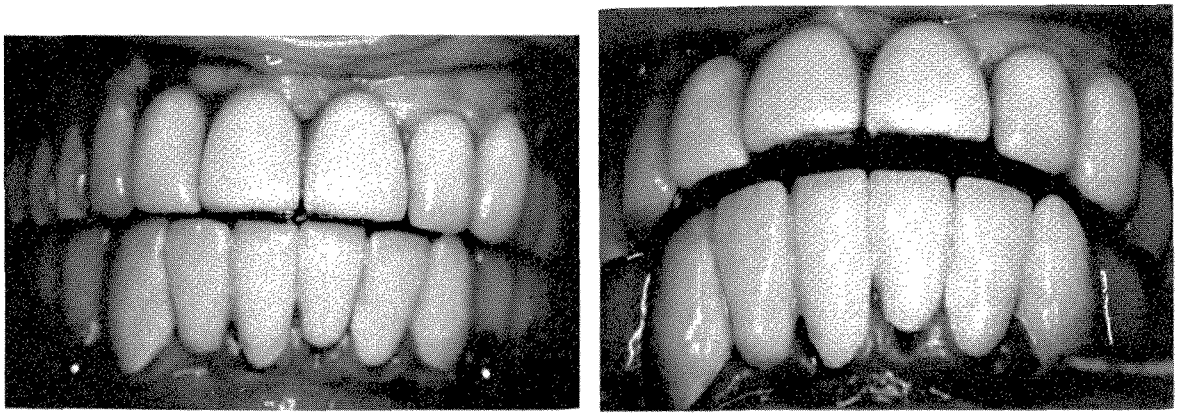

Fig. 1883. Two views of the completed lower work. The vertical dimension and anterior open bite had been maintained.

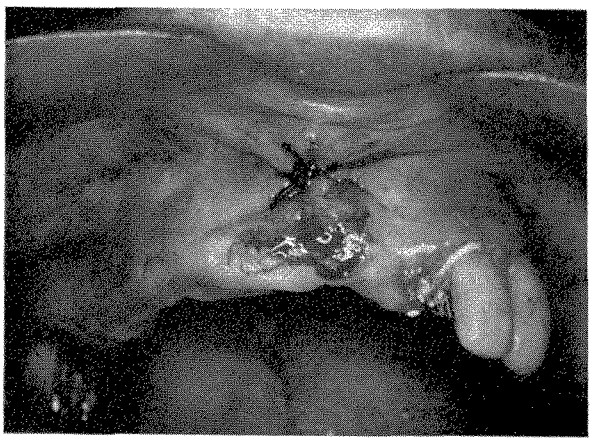

Fig. 1884. The anterior frenum had been cut in order to permit a labial saddle. This will enhance the esthetics and help the retention.

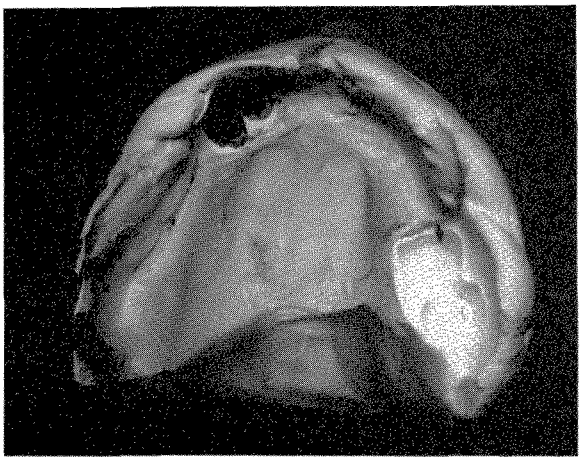

Fig. 1885. A double mucostatic impression was taken. The upper casting will be made from this impression.

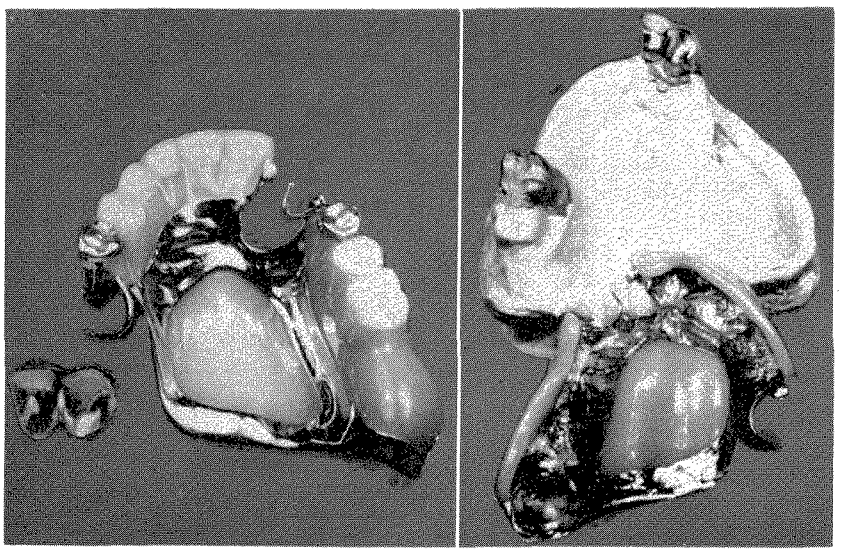

Fig. 1886. Two views of the completed upper work on and off the cast.

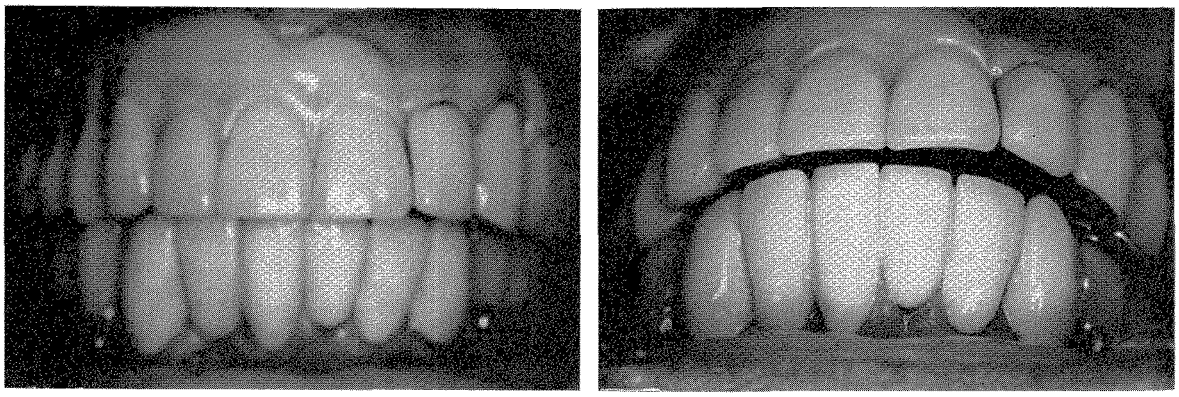

Fig. 1887. Two views of the completed upper work in the mouth. **Below,** The horizontal overjet is shown.

Fig. 1888. Completed roentgenograms taken in 1960.

degree of mobility of her removable prosthesis. She was aware of the inherent dangers and accepted her share of the responsibility with reluctance, but understanding. It is reasonable to assume that when she arrives at the full denture stage, she will face it with courage and fortitude. (Figs. 1875 to 1888.)

PROBLEMS ASSOCIATED WITH AGING

The aging process has many ramifications. Some people age with such grace that the actual physical deterioration is very gradual. These people may retain their mental alertness to the very end. It is only after long absences that their friends are aware of their aging. Other people age very rapidly. Their mental faculties may deteriorate much sooner than their physical abilities. Class reunions tell tales that are difficult but necessary to face up to. As time passes, the name cards on the lapels must be printed larger and clearer.

When physical degeneration sets in, the dental structures suffer with the rest of the body. This implies that regardless of how well the dental work was planned and executed, as the body ages, this work is subject to deterioration. Extra efforts are now necessary in order to protect the oral structures and maintain adequate oral function. Unfortunately, a paradox presents itself. At this particular time of their lives, when extraordinary care is needed, many of these individuals lose the

desire and the ability to take care of their mouths. They provide us no assistance in the prevention of the deleterious effects which the aging process inflicts upon them. Some who desire to help in this problem lack the powers of coordination necessary to effect adequate mouth hygiene. In addition, they have a lower tolerance for drawn out and extensive procedures.

Another evil effect of the aging process is the recession of the interproximal gum tissue, leaving large, open embrasures that permit the entrance of all kinds of debris. This foreign material causes extensive caries that in turn undermines the natural teeth and destroys the dental restorations. These elderly people make every effort to maintain good oral hygiene, but is is beyond their capabilities. They must be treated with sympathy and understanding. If possible, they should be required to come more frequently for prophylaxis and examination.

Case 14

In 1932 dental services were first rendered to a 53-year-old man. He suffered from periodontal disease as well as caries and infections. He was in financial difficulty and came for emergency treatment only until the late 1940's. By that time he had lost several teeth, and the periodontal disease was more severe. In 1949, at the age of 70, a nine-unit upper splint was inserted.* No upper molars were replaced. The patient always had a tongue thrusting habit that had separated his teeth and widened his arches. This had also caused a tip-to-tip occlusion. The patient was extremely grateful not to have to wear any form of removable prosthesis.

In 1951 a lower ten-unit splint was inserted. No molars were replaced. His function was adequate, but his hygiene was poor. Cervical caries necessitated continual fillings and checkups. In 1959, the upper splint, which was ten years old, was removed. The patient was then 80 years old and still very alert. He attended business daily and was always grateful for not having to wear removable partial or full dentures. At that time, another nine-unit fixed splint was inserted to replace the old one. Five supporting teeth still remained.

*Schweitzer, J. M.: Oral rehabilitation, St. Louis, 1951, The C. V. Mosby Co., p. 971, Figs. 877-879.

Fig. 1889. Roentgenograms of the mouth of a 53-year-old man. These were taken in 1932 (Figs. 1889 to 1907 are of the same case.)

In May, 1961, the lower ten-unit splint that had been in position for ten years was removed. Another ten-unit fixed splint supported by six teeth was constructed. The old vertical dimension was retained, and a simple articulator was used in the construction. The actual work was rendered as nontraumatic as possible owing to the lowered tolerance of elderly people. It was inserted in June, 1961, when the patient was 82 years old. His oral hygiene was totally inadequate. He realized this and was willing to come as often as requested for the necessary dental care. In July, 1962, the patient died. His wish not to have to wear full dentures had been fulfilled. (Figs. 1889 to 1907.)

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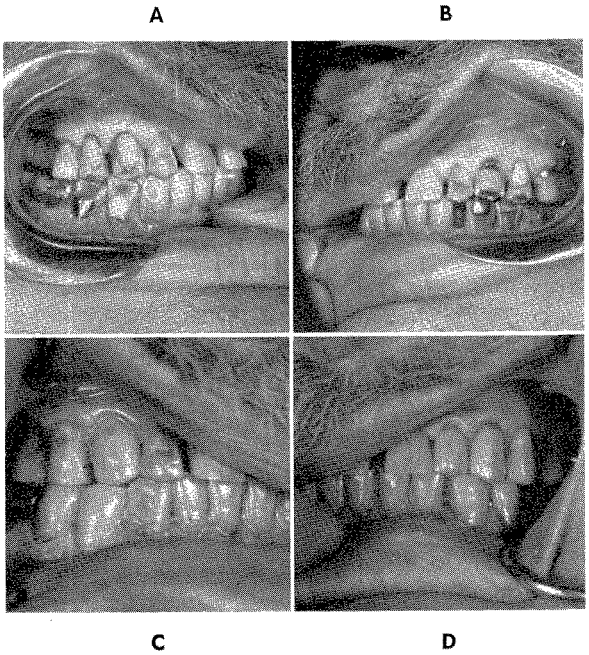

Fig. 1890. A and **B,** Right and left views of the mouth taken in 1936. The patient was then 57 years old. The teeth were unsightly, eroded, and abraded. **C** and **D,** Porcelain jacket crowns were inserted to cover the unsightly teeth.

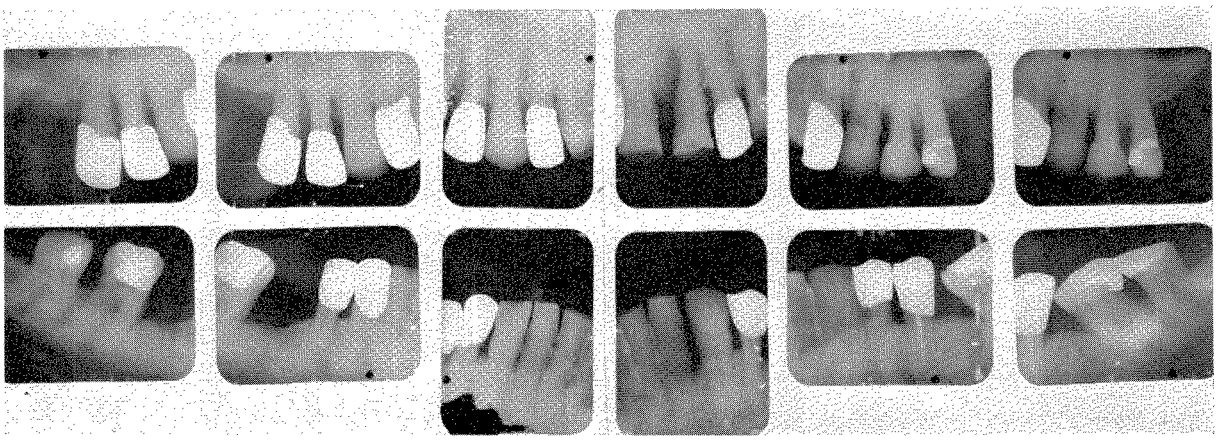

Fig. 1891. Roentgenograms taken in 1949. The patient was then 70 years old.

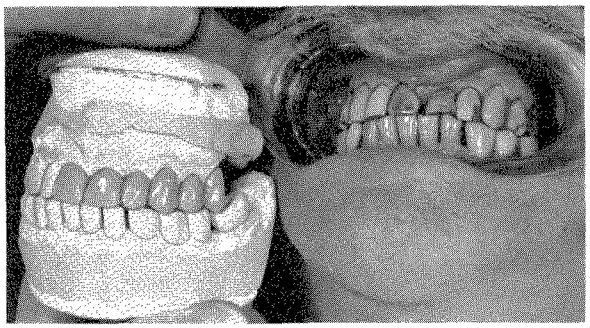

Fig. 1892. The upper teeth were reconstructed in 1949. The upper right photograph was taken just before the work was started. The vertical dimension was maintained by using the right side for the reference, whereas the temporary acrylic splint was constructed for the left side, as shown in this illustration on the left. Then the acrylic splint was used as the reference when making the right temporary work.

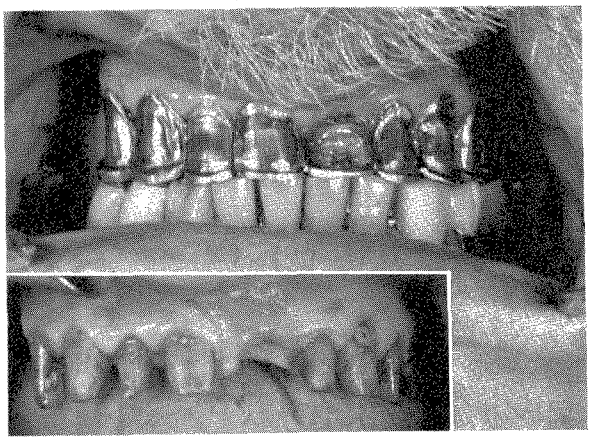

Fig. 1893. Two views of the upper construction are shown here. **Above,** The individual cast crowns are being tried in the mouth. **Below,** The teeth are shown completely prepared.

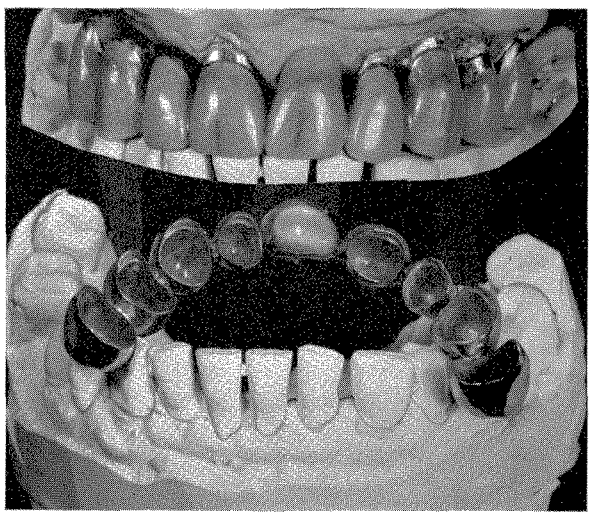

Fig. 1894. Two views of the completed upper nine-unit splint are shown here. There are eight abutment teeth and a missing upper left central incisor. The splint is rigid.

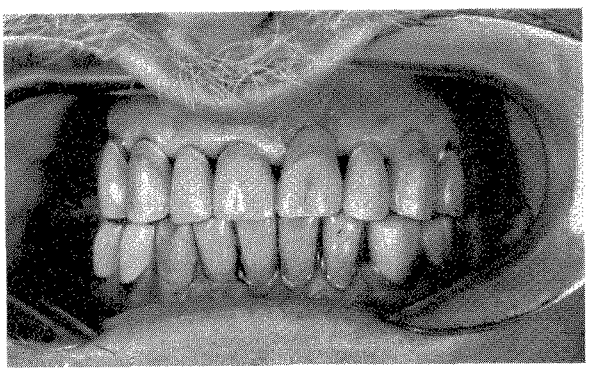

Fig. 1895. Front view of the mouth taken in 1949 at the completion of the upper nine-unit splint.

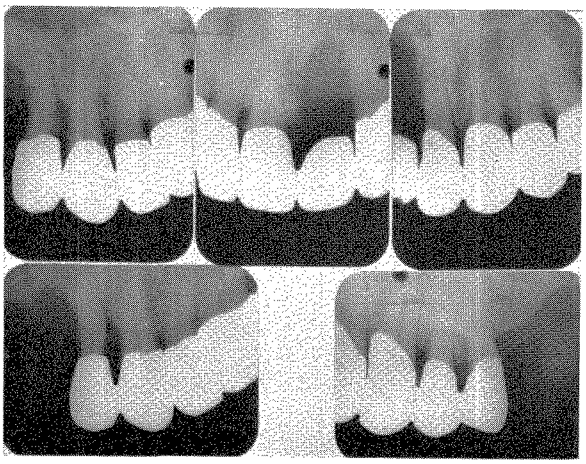

Fig. 1896. Roentgenograms of the completed splint taken in 1949.

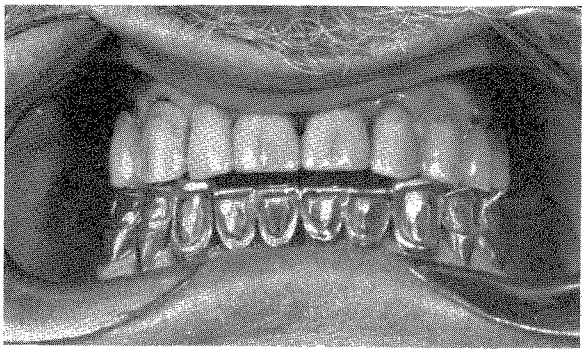

Fig. 1897. In November, 1951, a ten-unit lower splint was constructed. The try-in of the frame is shown in this photograph. The tips of the lower incisors were finally restored in acrylic resin to obtain a pleasing esthetic result.

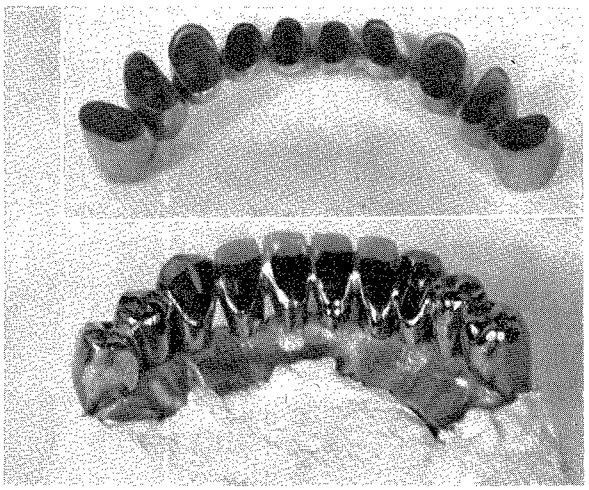

Fig. 1898. Two views of the completed lower ten-unit splint. The crowns are all soldered together.

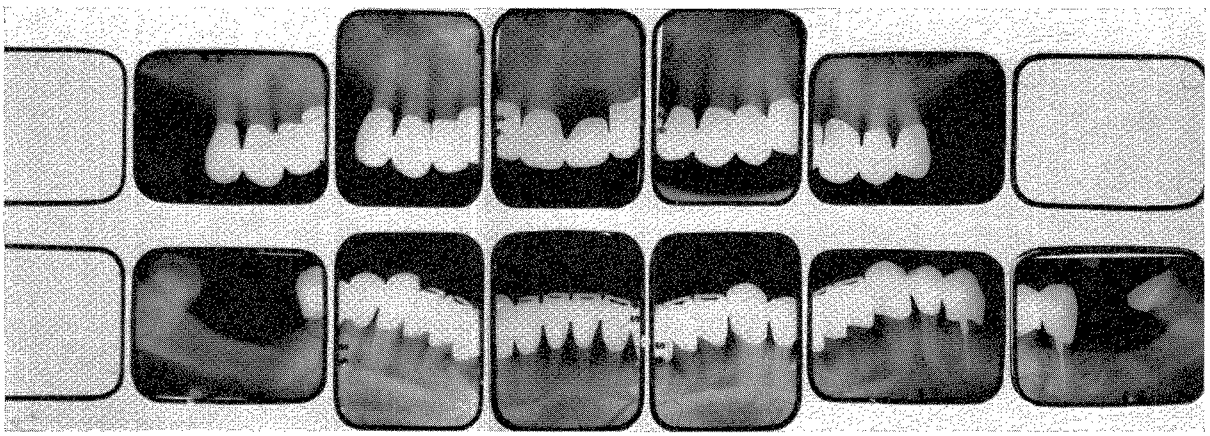

Fig. 1899. Roentgenograms of the completed upper and lower splints, taken in October, 1952. The upper splint is three years postinsertion, and the lower one is one year postinsertion.

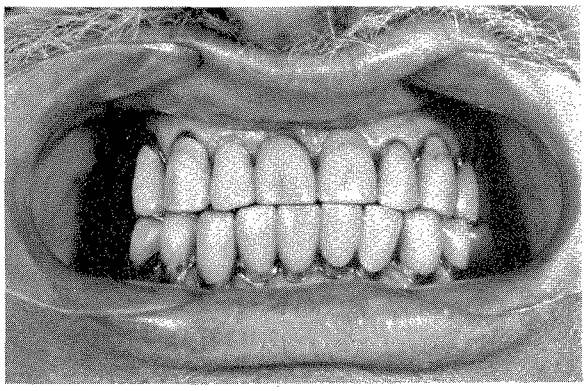

Fig. 1900. The mouth as it looked in 1954.

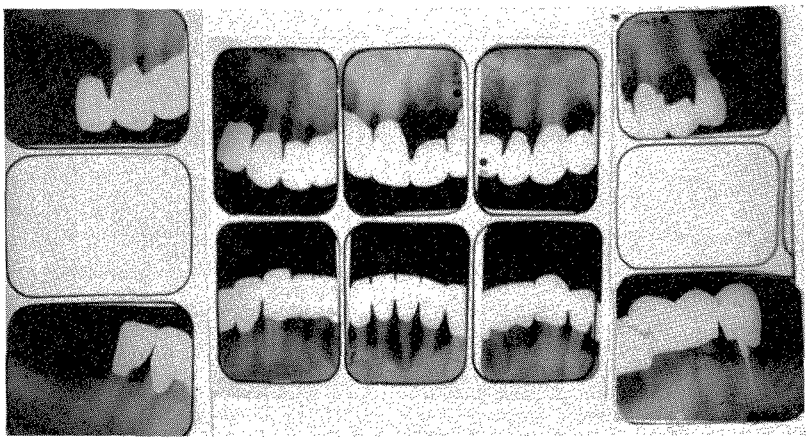

Fig. 1901. In 1958 the roentgenograms disclosed deep caries and infection. The patient was then 79 years old. The decision was made to redo the upper splint. The present one had served ten years. Five teeth could still be retained. The lower left central incisor was also infected.

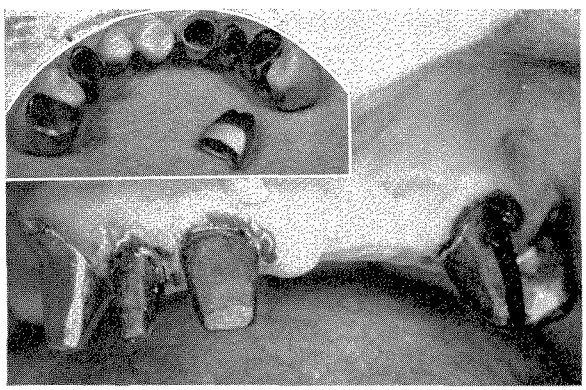

Fig. 1902. The five teeth were treated. The right cuspid and left bicuspid were built up with gold cores. The bridge is shown in the inset. It was cemented in January, 1959.

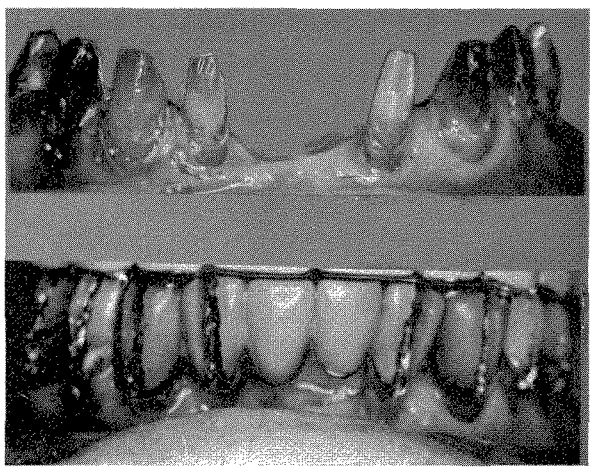

Fig. 1903. In May, 1961, the old lower bridge was removed. It had served for ten years. The method of cutting the castings is shown in the lower photograph. The exposed teeth are shown in the upper photograph after the cement had been removed. The silver nitrate was applied before the splint was inserted ten years previously.

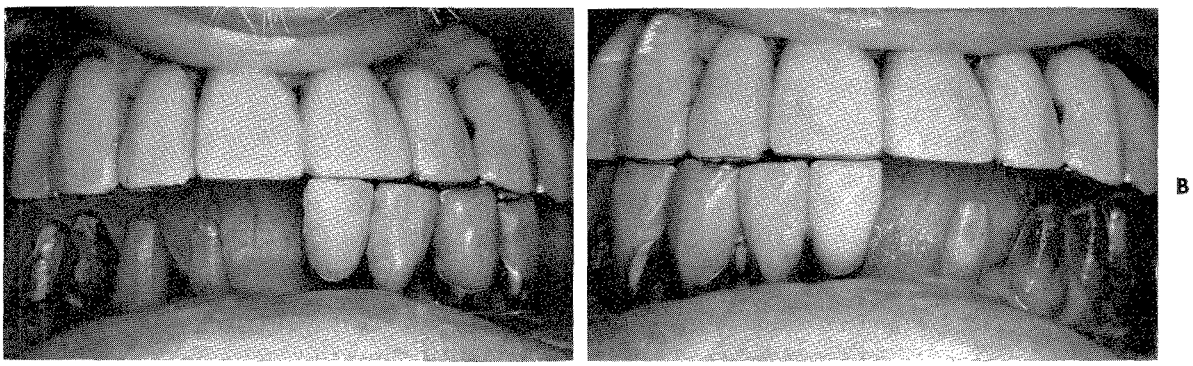

Fig. 1904. The old vertical height was retained by using two sections of the old bridge as the references for constructing the new veneer crowns. **A,** First the right-side cast crowns were constructed using the old lower left splint as the control. **B,** Then the left side was constructed using the lower right old splint as the control. In this way the old vertical dimension was retained as well as the centric occlusion.

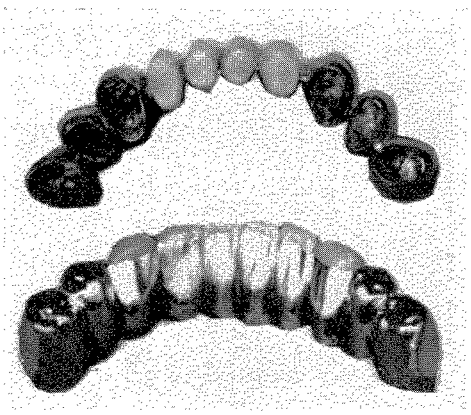

Fig. 1905. Two views of the completed lower bridge.

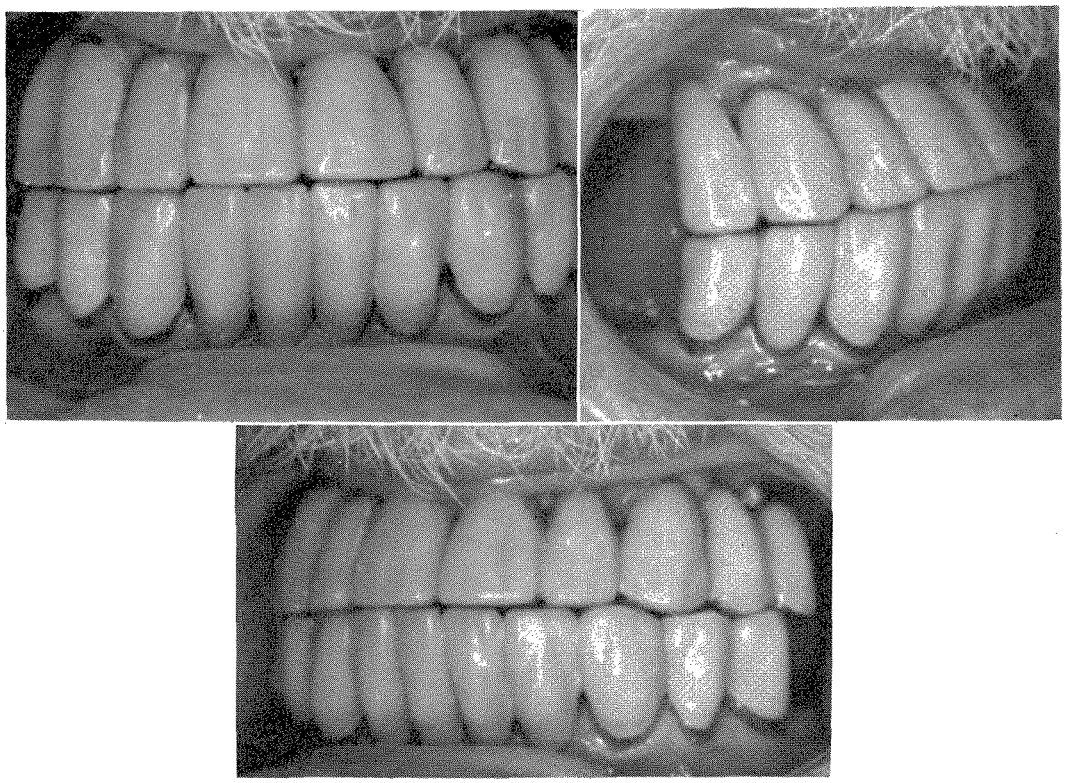

Fig. 1906. Three views of the mouth taken in 1961. The patient was 82 years old.

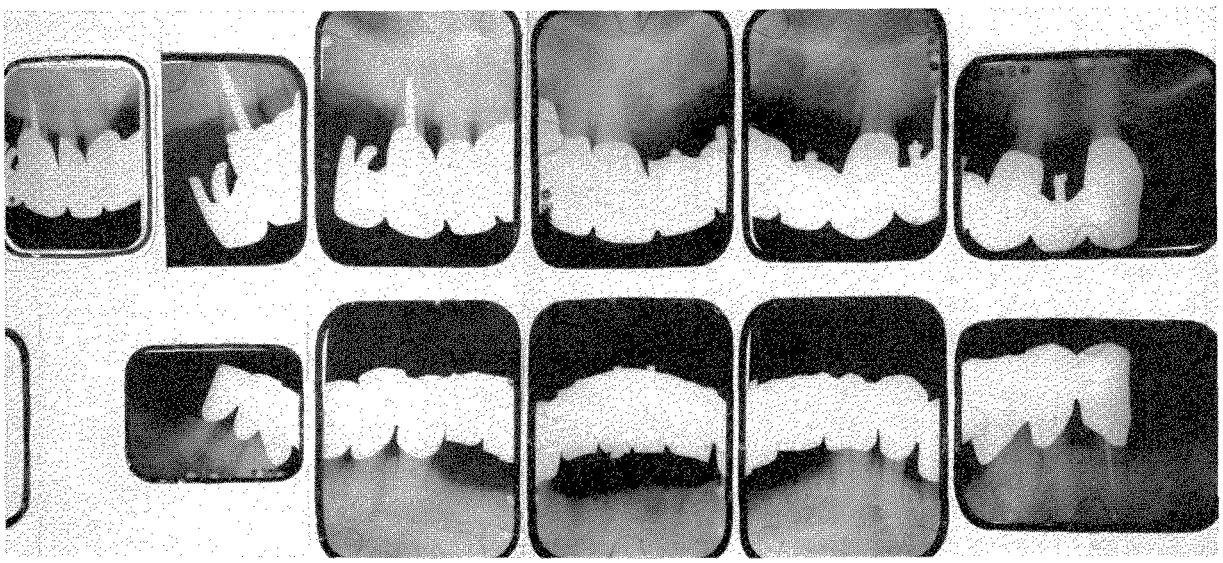

Fig. 1907. Final roentgenograms taken in 1962. This patient died in 1962 at the age of 83. The upper right cuspid and lateral incisors were attacked by caries. The smaller single illustration to the extreme upper left shows the amalgam fillings that were inserted.

Possible cause of rampant caries

For the previous fifteen years, this patient had been subject to gout. He had difficulty with his legs due to their swelling. This condition grew more acute as he grew older. He received medication to reduce the water content and thereby the swelling. The medication was probably in the nature of a diuretic. This could decrease the amount of saliva and reduce its anticariogenic action, which would account for the excessive degree of caries found in his mouth. Toward the end, drugs were constantly administered to diminish the body fluids that caused the swelling of his tissues. (Refer to pp. 643 to 644 and 1012.)

Case 15

Past history

In April, 1942, the mouth of a 59-year-old man was reconstructed. He was first examined in February, 1940. His teeth were badly broken down, and the esthetics were extremely poor. There were twelve teeth missing, including all of the lower molars. The periodontal tissues were in good condition. The plane of occlusion was very irregular, with several downward and upward curves. This uneven occlusal plane was corrected by first reconstructing the lower teeth to a regular symmetrical plane of occlusion. Part of the lower prosthesis consisted of a lingual bar with right and left free-end saddles. The upper maxillary posterior castings were then constructed using the lower occlusal plane as the pattern. The vertical dimension was increased.

The upper anterior teeth were the last to be reconstructed. The entire work was completed in July, 1942.

Postinsertion events

For the following five years, the patient came for periodical dental checkups, after which he decided that it would be more convenient to visit his local dentist. About once every two years, he would send his roentgenograms for advice. From 1947 to 1960, although his dental attention was entirely inadequate, his structures remained normal. In November, 1960, he voluntarily asked for an examination. At that time he was 77 years old, and the rehabilitation had been completed eighteen years previously.

The oral examination revealed acute extensive multiple caries with a generalized food impaction and extremely poor hygiene. His roentgenograms failed to reveal the extent of the deterioration. In addition, his delayed mental reactions were particularly noticeable. He was no longer able to maintain the hygiene necessary to keep his teeth from deteriorating. Neither was he impressed by the diagnosis of his oral condition. Although we can be sympathetic with these patients, it is impossible to restore their ability to prevent the rapid destruction of their teeth once old age and mental feebleness sets in. This patient died in October, 1962, at the age of 79 years.

Irregularity of occlusal plane

Another interesting observation in this case concerns the irregular occlusal plane that his teeth presented before the oral reconstruction. Some observers

maintain that this pattern of occlusion is due to individual characteristics and should be copied in the restored occlusion. Although there may be some individuals whose neuromuscular patterns have been responsible for the irregular wear observed in various sections of their occlusal planes, the irregularities seen in the majority of occlusal planes are caused by the loss of teeth and failure to replace them or by the avoidance of certain areas because of pain. When these mouths are rehabilitated and the irregularities in the occlusal planes removed, they remain so unless some accident or neglect again predisposes this occlusion to the same noxious influences that orginally caused the irregularity. This patient's occlusal plane irregularities were only partly corrected, as shown in Figs. 1908 and 1915. In 1960, eighteen years after the reintegration had been completed, the occlusal plane irregularities remained slightly more pronounced than when completed in 1942, but not nearly as severe as those that the patient presented at the start of the work.

Another area that invites discussion is the reason for the rampant decay that affected these teeth. Although it cannot be denied that poor hygiene and the inability to coordinate because of age were important factors in causing the deep-seated caries, it seems as though some other more important cause was operating. This could come from the blood itself were its contents to be altered. Careful questioning disclosed that during the last two years the patient had been on antibiotic

Text continued on p. 956.

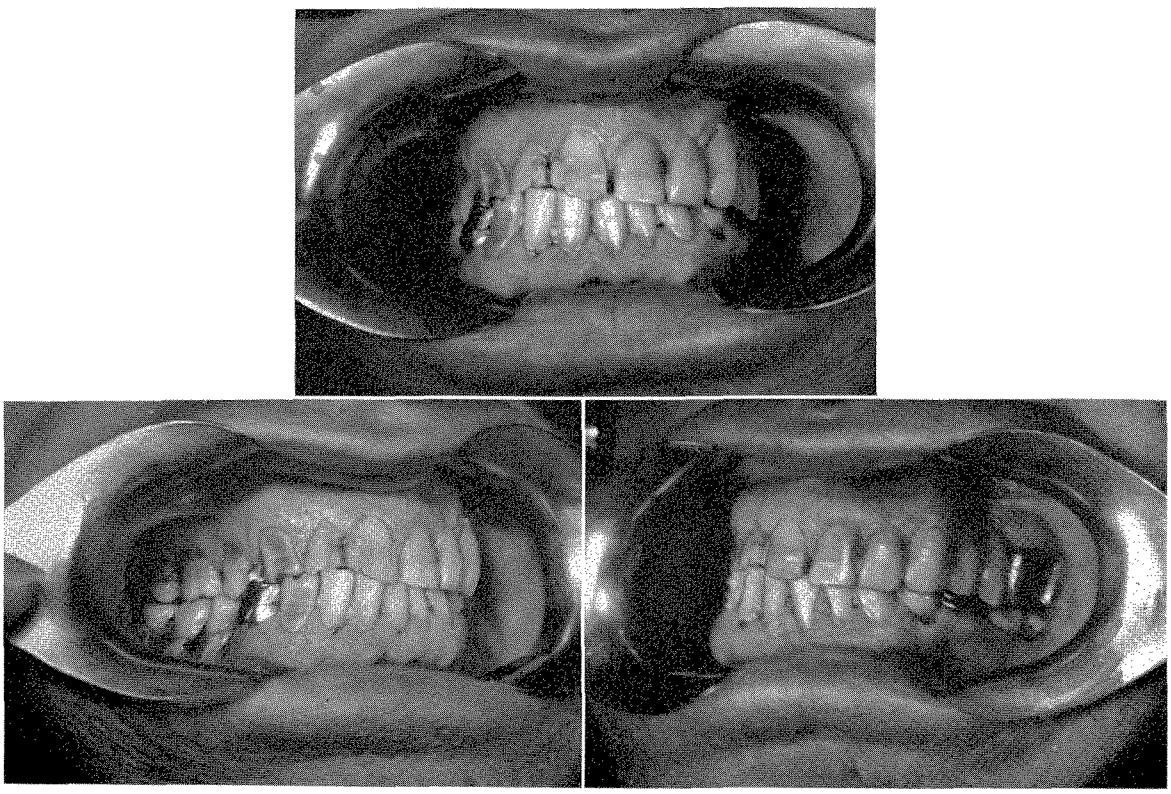

Fig. 1908. Three views of the mouth of a 59-year-old man. These were taken in April, 1942, just prior to rehabilitation of his mouth. Observe the irregular curves of Wilson and Spee. (Figs. 1908 to 1920 are of the same case.)

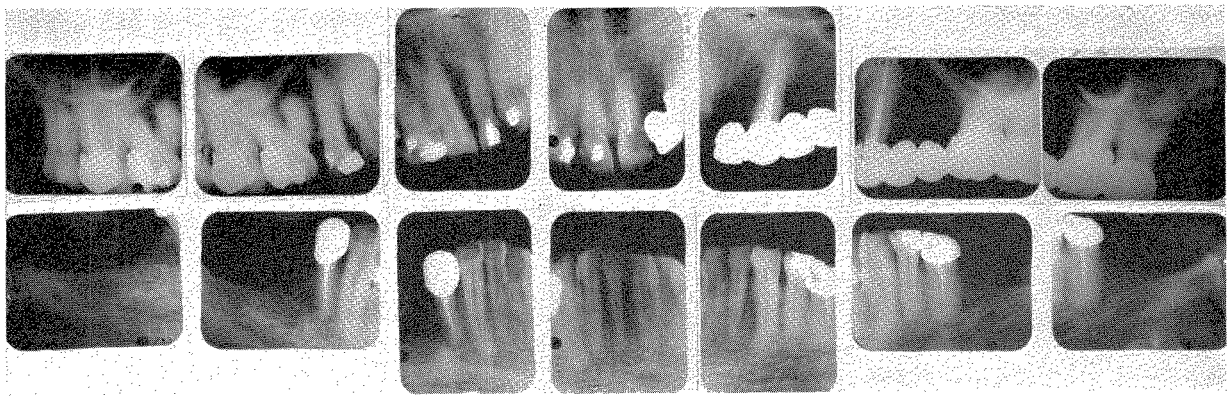

Fig. 1909. Roentgenograms taken in February, 1940.

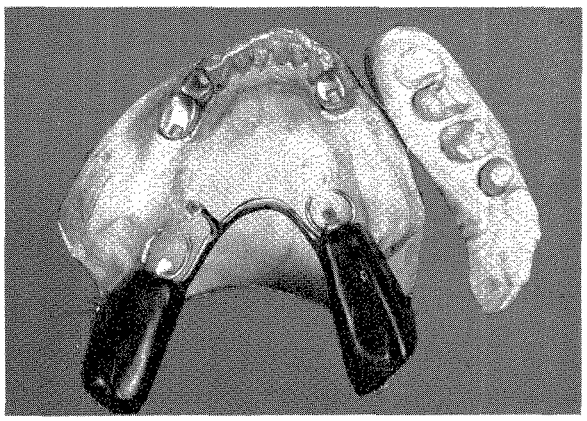

Fig. 1910. The lower working model is shown here with the three cast crowns in position on the bicuspid dies. The completed frame of the lower lingual bar was used to register the centric relation. It was not finished until the work was ready for completion in order to adjust the interocclusal relationship properly. The upper right side was also being prepared. The three amalgam dies were ready for the castings to be made.

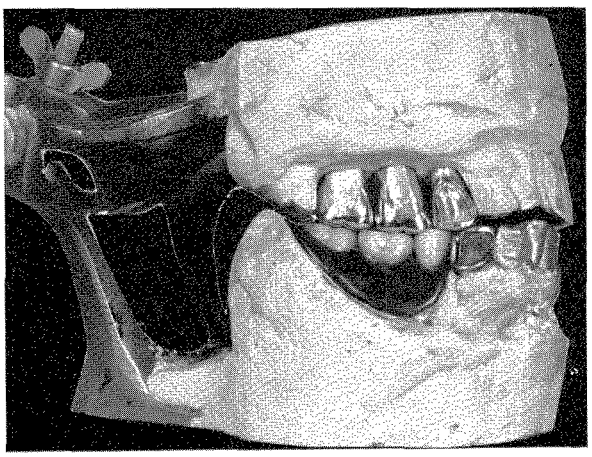

Fig. 1911. The upper right castings were completed, and the teeth were added to the lingual bar. The amount that the vertical dimension was restored (or increased) is clearly visible. It was just sufficient to permit for the restoration of the upper right anterior teeth.

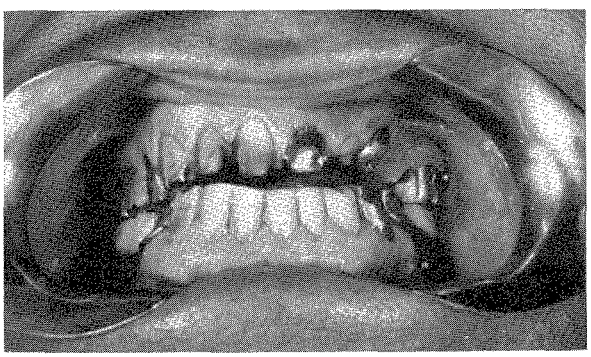

Fig. 1912. All the upper castings were completed and assembled in the mouth. The left central incisor was nonvital. A coping had been prepared for it. This will be covered by a porcelain jacket crown.

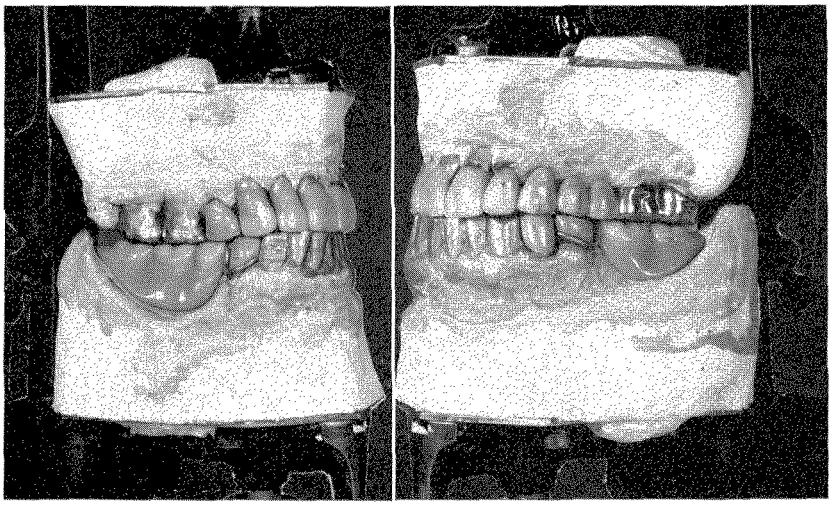

Fig. 1913. The completed work is shown in these two photographs. The reconstruction was done on a Hagman balancer.

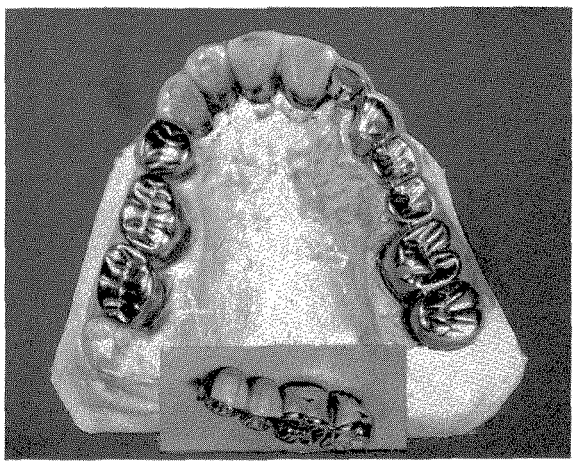

Fig. 1914. Two views of the completed work. In the upper teeth, the left fixed partial denture ran from the upper left central incisor to the upper left molar. A lug and lug rest were placed in the distal surface of the cuspid. The inset shows the posterior section of the bridge.

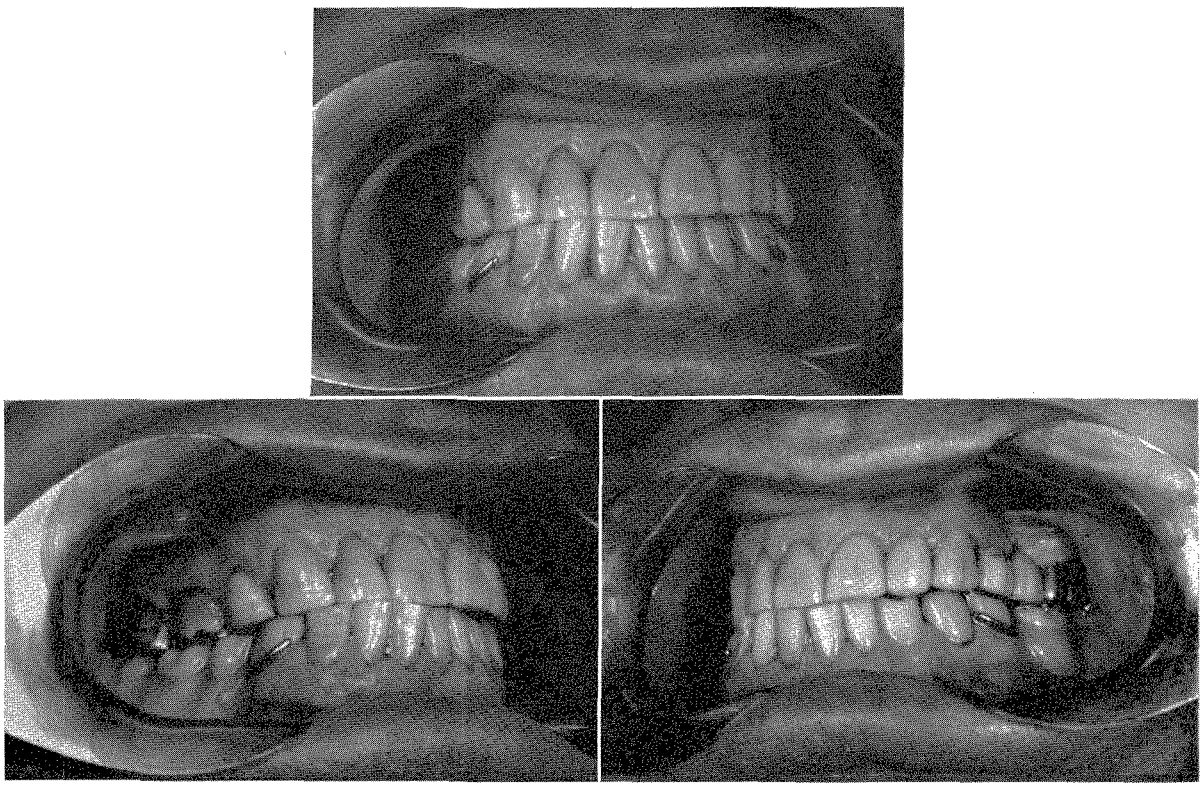

Fig. 1915. The work was inserted in November, 1942. Three views of the completed work are shown here. Compare these illustrations with Figs. 1908 and 1913 to see the attempt that was made to correct the irregular occlusal plane. It had not been entirely corrected.

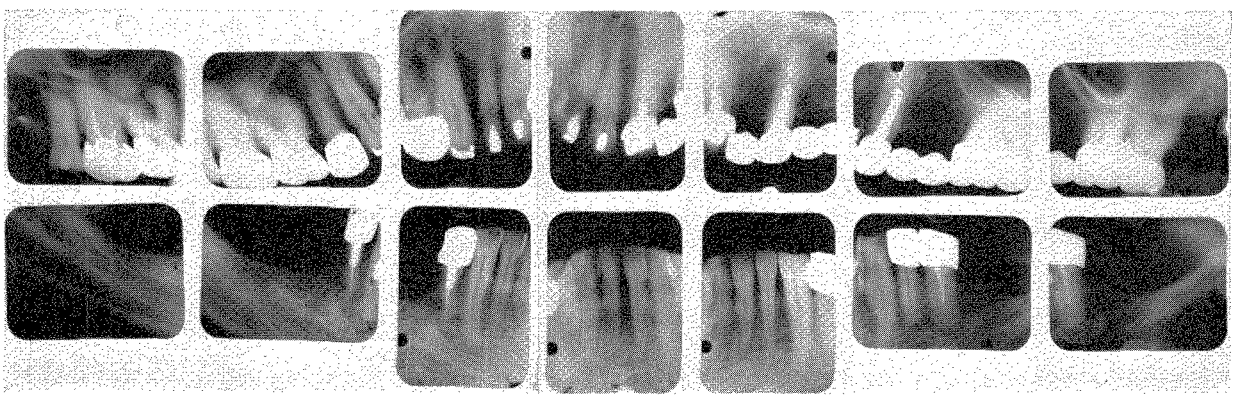

Fig. 1916. Roentgenograms taken in June, 1942, of the completed work.

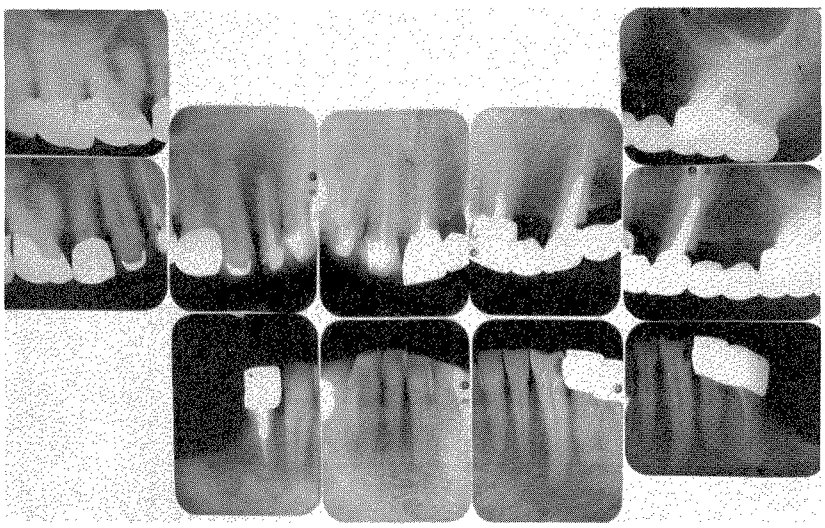

Fig. 1917. Roentgenograms taken in 1953. This was eleven years postinsertion. I had not seen the patient in two years. The patient was 70 years old in 1953.

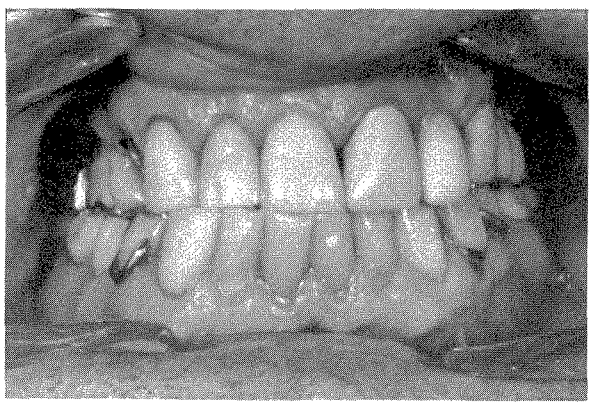

Fig. 1918. The front view of the mouth in 1953.

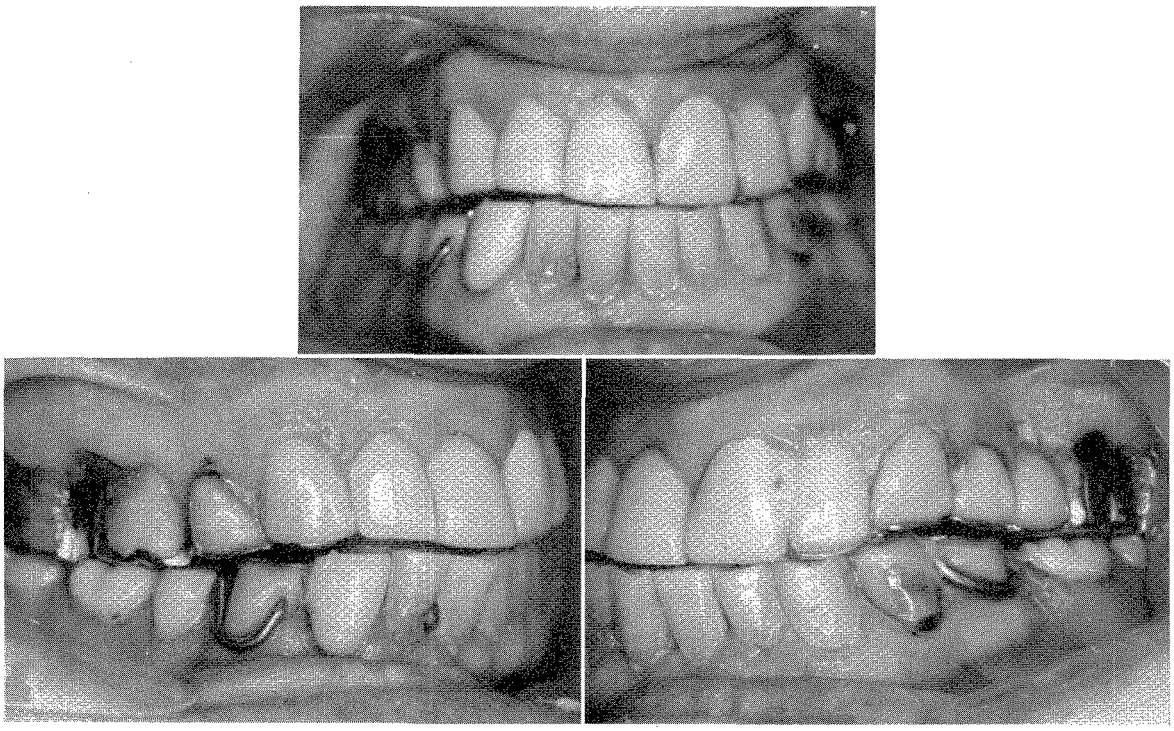

Fig. 1919. Three views of the mouth that were taken in November, 1960. The patient was 77 years old at that time. Food impaction is general. Deep-seated caries and alteration of the interocclusal relationship are apparent. The starting irregular occlusal curve was present to a slightly greater degree than shown in Fig. 1915.

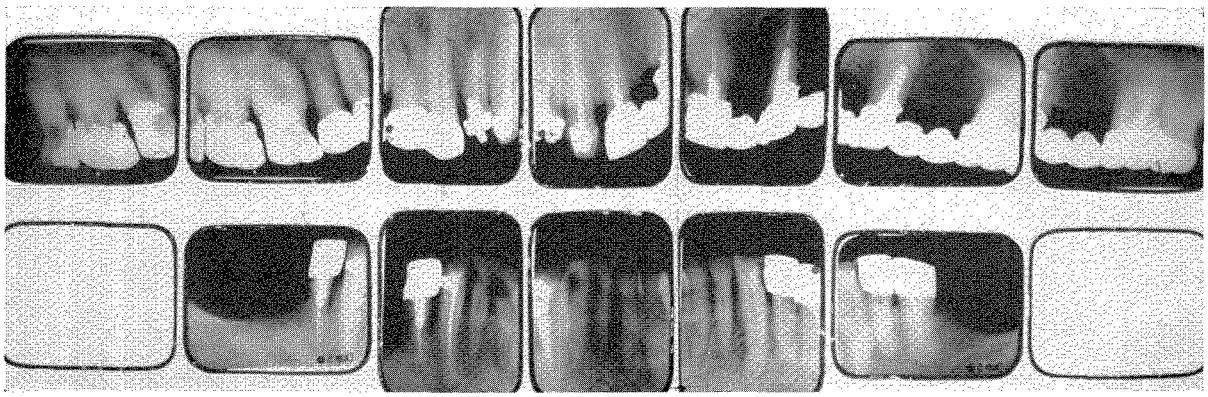

Fig. 1920. Roentgenograms taken in December, 1960. At that time the mouth was in an advanced state of deterioration. (Read text.) These were taken eighteen years after the rehabilitation was completed.

therapy for a physical ailment. Is it possible that this had been able to cause a softening of the enamel and dentin? The type of decay that was found differs from that which is ordinarily seen, especially in adults. The miracle drugs have been mentioned many times previously in this text (pp. 643 to 644 and 1012). So have the diuretics and the refined sugars taken in tablet form and slowly dissolved in the mouth. It is high time that controlled research is undertaken to prove or disprove what clinical examinations have been revealing. (Figs. 1908 to 1920.)

Case 16

Irregularity of occlusal plane

Another patient will now be considered who had an irregular occlusal plane. The teeth on one side were severely worn. However, in this case, the face was shorter on one side than on the other. The patient stated that as far as he could remember this was always so. It is possible that his neuromuscular pattern at birth exerted more pressure on one side than on the other. As his teeth erupted, they were exposed to uneven pressures that had been responsible for the uneven wear. If this mouth were ever reconstructed, the uneven pressures of the masticatory muscles would have to be considered. Otherwise the same irregular occlusal patterns might return and destroy the completed work. (Figs. 1921 to 1925.)

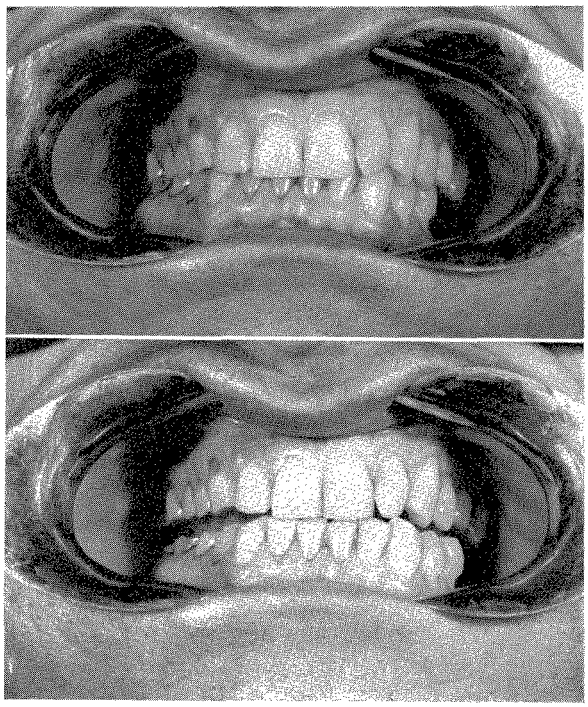

Fig. 1921. Two views of the mouth of a man in his late forties. These photographs were taken in 1952. The uneven occlusal plane is readily discernible. (Figs. 1921 to 1925 are of the same case.)

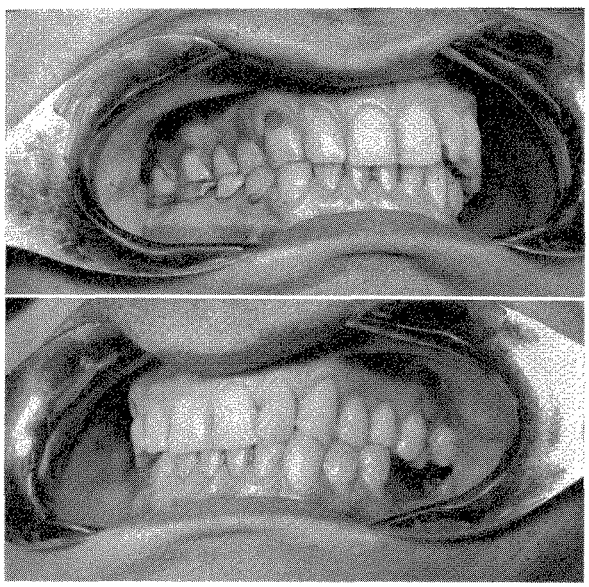

Fig. 1922. Right and left lateral views.

Fig. 1923. Photograph of the face showing the asymmetry of the right and left sides. The left side had been underdeveloped from birth and may account for the uneven wear of the dentition.

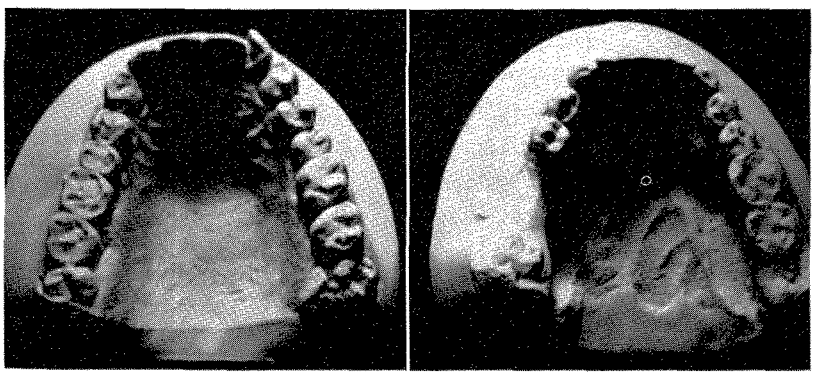

Fig. 1924. Occlusal view of the casts showing the extensive abrasion on the right side and the apparent lack of normal function on the left side. Of course, we must consider that the left side lacks the lower molars, and hence function must of necessity be diminished.

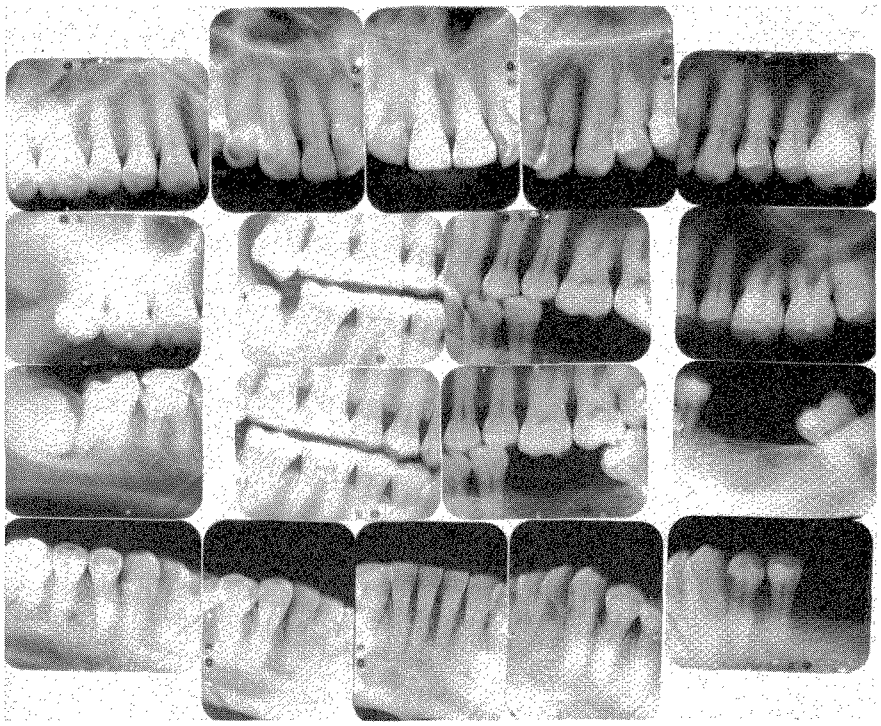

Fig. 1925. Roentgenograms taken in 1952.

REHABILITATION FOR AGED PATIENT

There is no valid reason why some elderly patient requiring complete oral reintegration should not have this work performed. Although in many of these individuals chronic disease and disability are present, still a reasonable proportion of them are able to undergo the mental and physical energy necessary for the performance of this task. There seems to be considerable variation in individuals between their physiological and chronological ages, and for those who are able, the dentist should provide the same service he is able to render to the young and middle-aged groups. The difference in the approach is important. Emphasis should not be placed on the mechanical procedures but rather on the physiological requirements. Complicated techniques have no place in the treatment of the aged. With them, the learning process is more difficult. Therefore, they should not be compelled to wear full dentures if some of their natural teeth are able to be retained. These can support fixed and removable partial dentures that require fewer adjustments. The responses of this group are slower, and they often become frustrated.

Case 17

The following case report is that of a 75-year-old man whose mouth was rehabilitated in 1954. The teeth had been discolored by the constant use of tobacco, and the periodontal tissues were inflamed. The reconstruction was accomplished in easy stages over a period of several months. Incisal guidance was established first, followed by the posterior occlusion. The vertical dimension was not altered, nor were steep cusps used. In the construction of the work a simple laboratory

Text continued on p. 962.

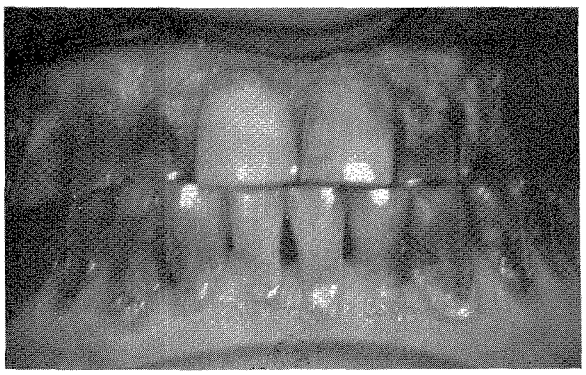

Fig. 1926. Front view of the mouth of a 75-year-old man. This photograph was taken in May, 1954. The teeth were almost black and were extremely unsightly. (Figs. 1926 to 1936 are of the same case.)

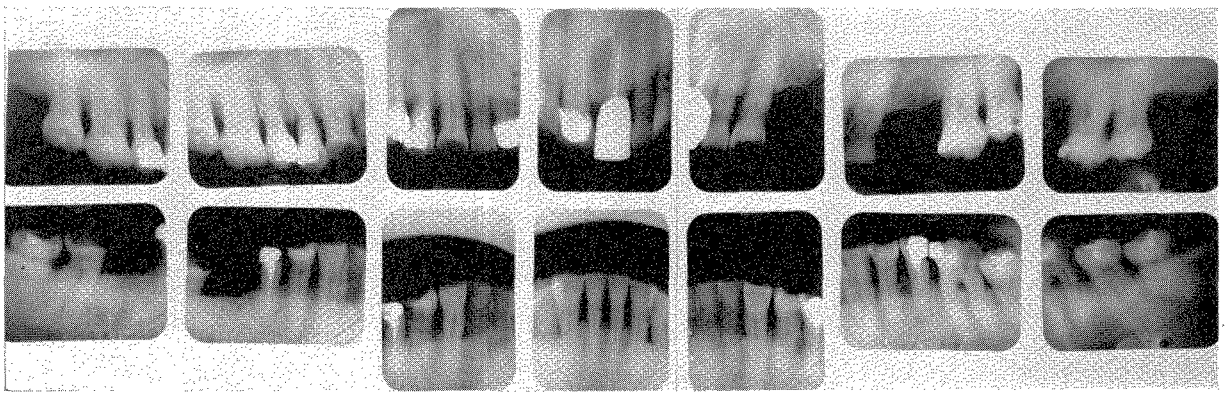

Fig. 1927. Roentgenograms that were taken in June, 1953.

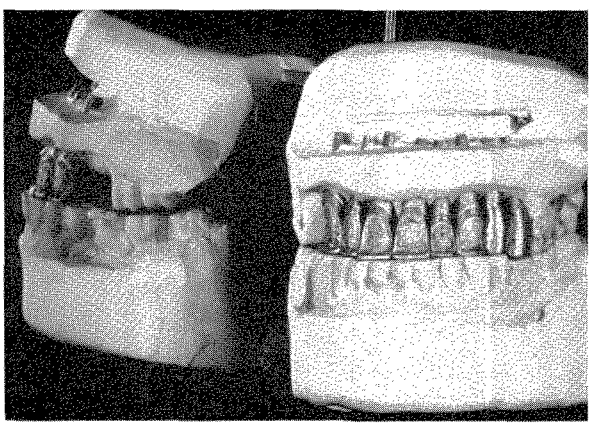

Fig. 1928. First, the upper incisors were rebuilt on a simple articulator. This permitted the establishing of the centric relation and the vertical dimension.

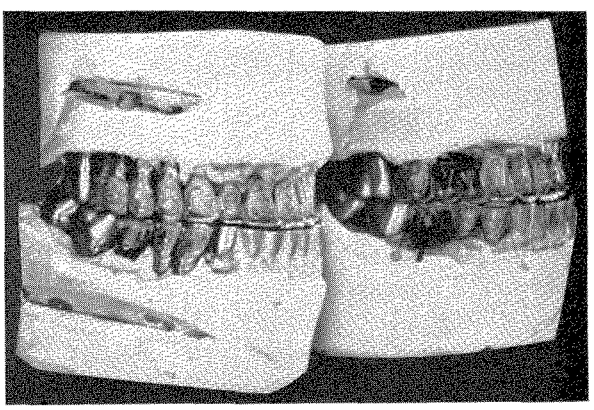

Fig. 1929. Then the establishment of posterior occlusion was done, also using a simple articulator and uncomplicated recordings of the mandibular position.

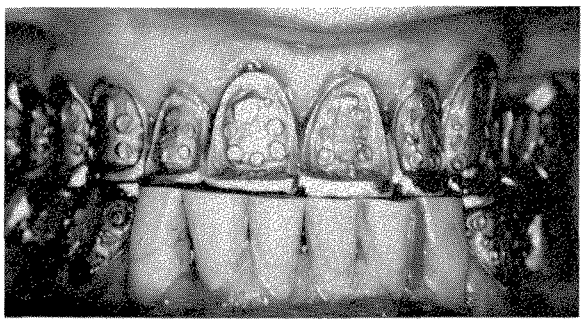

Fig. 1930. The final try-in just prior to completion. This can be quite an ordeal for a 75-year-old man.

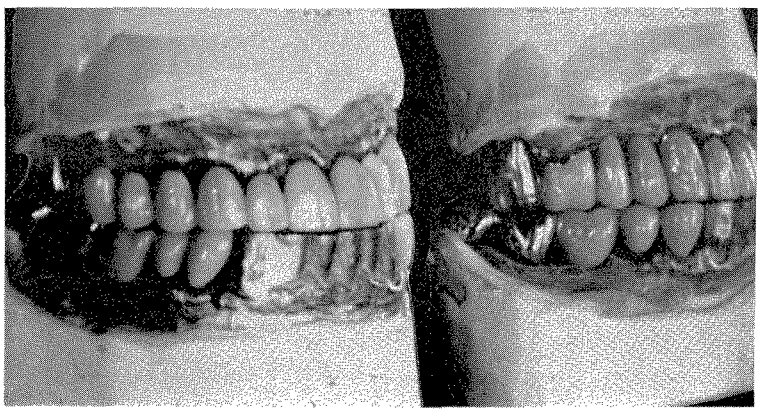

Fig. 1931. The work was completed on a plain-line simple laboratory articulator.

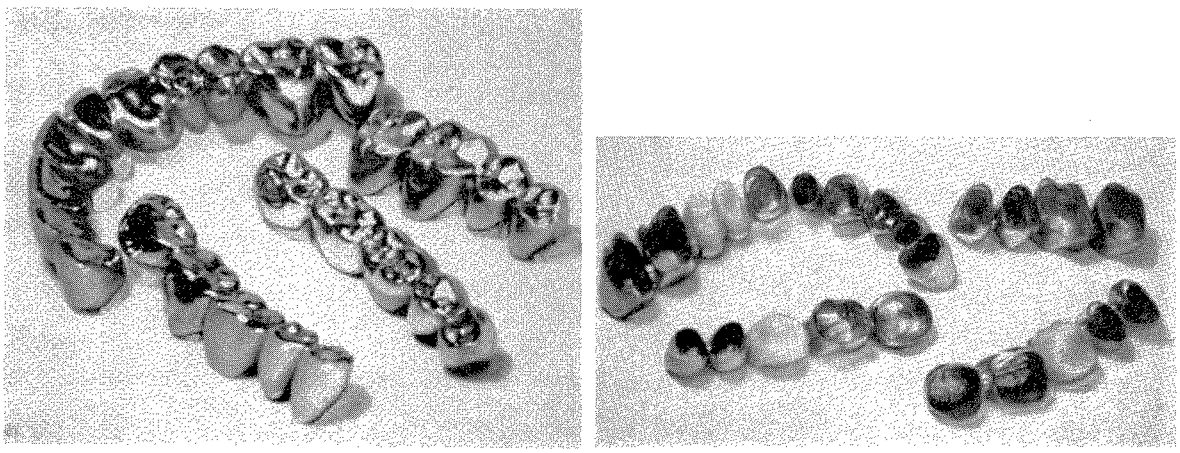

Fig. 1932. Two views of the completed fixed partial dentures.

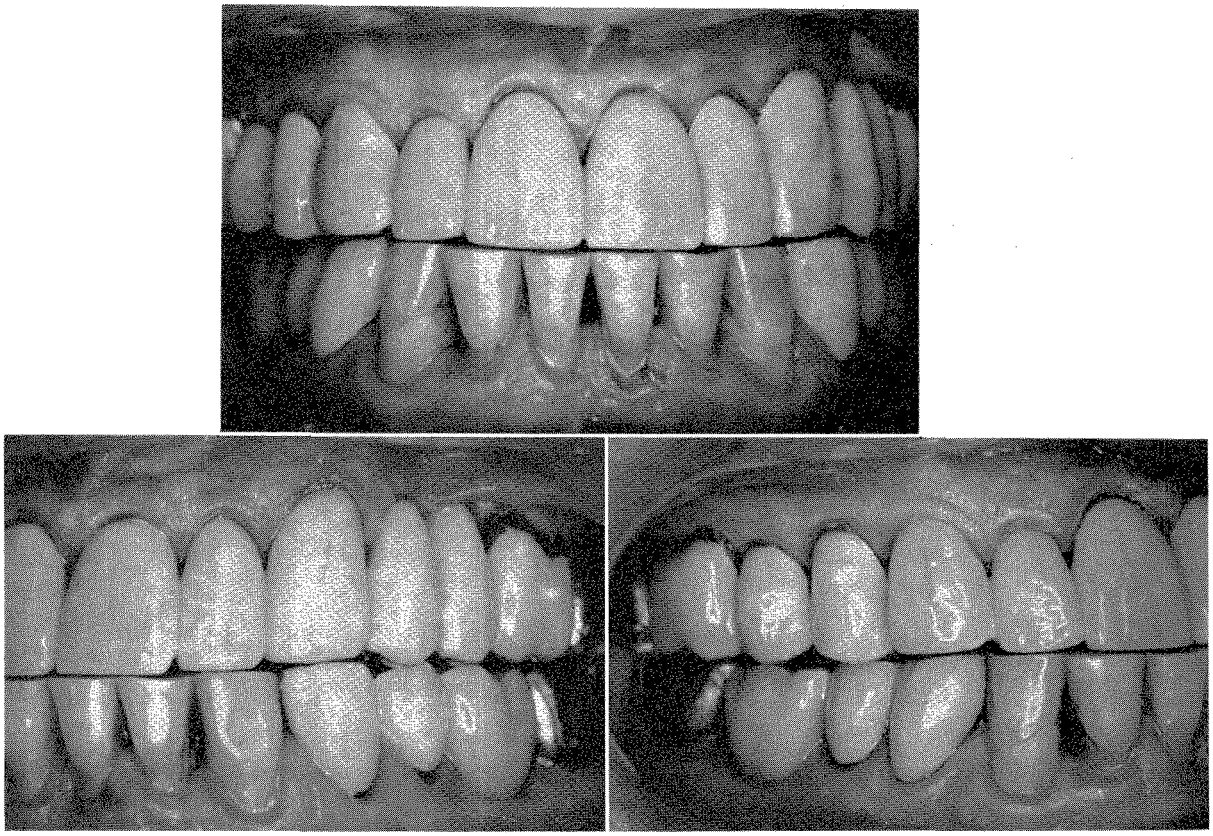

Fig. 1933. Three views of the completed work. This was inserted in January, 1955. The patient was then 76 years old.

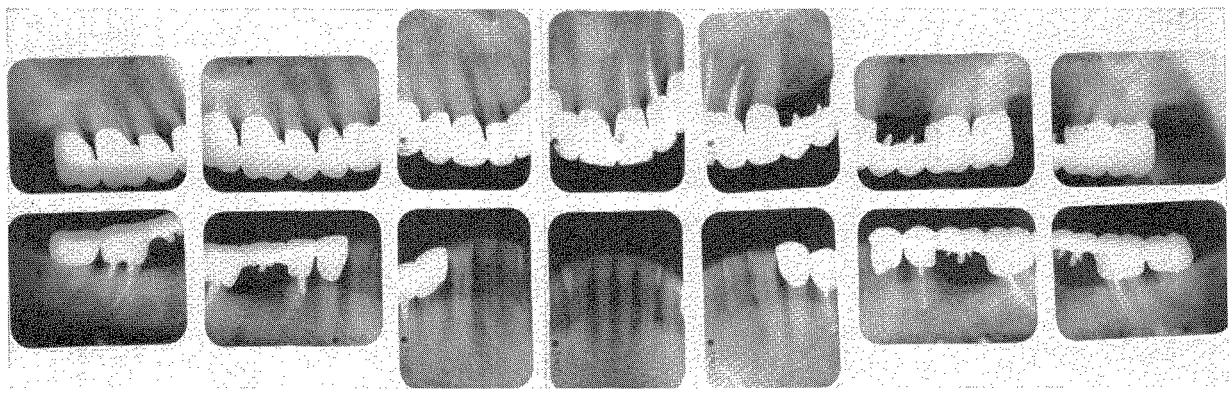

Fig. 1934. The roentgenograms that were taken at the completion of the work in January, 1955.

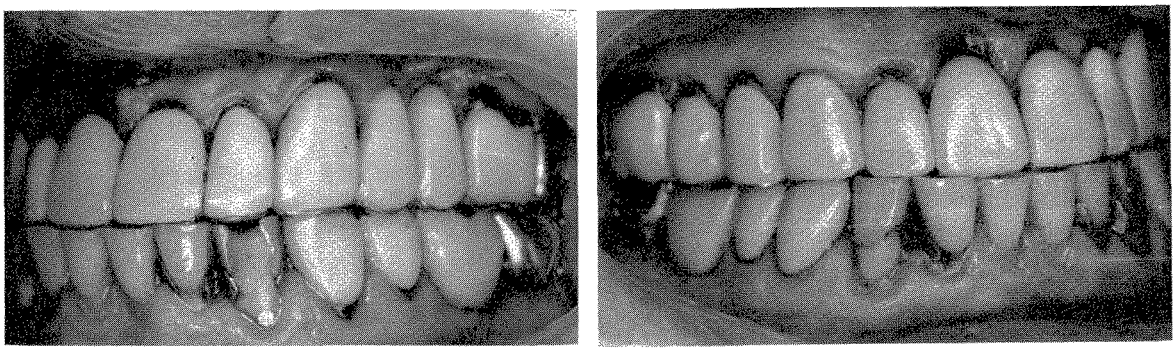

Fig. 1935. Two views of the mouth taken in 1962. The patient was then 83 years old.

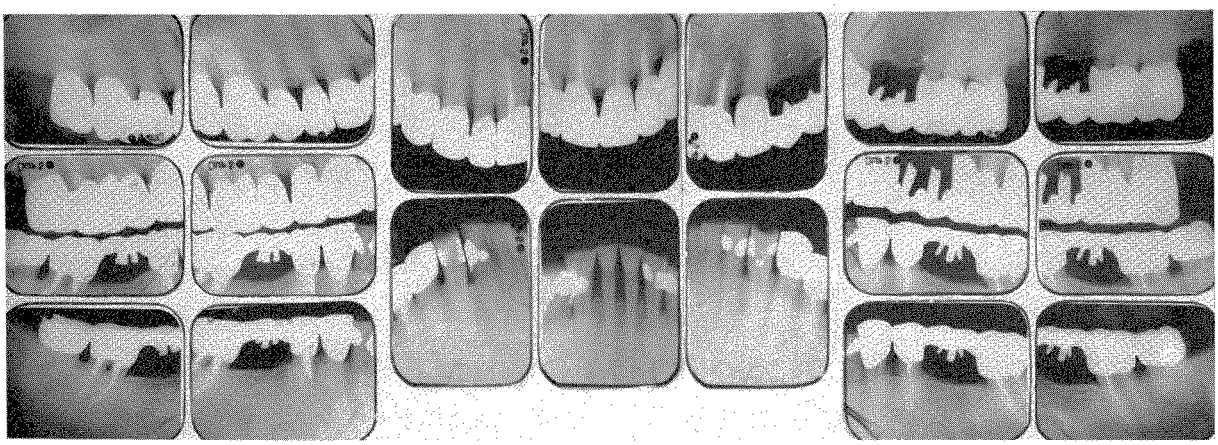

Fig. 1936. Roentgenograms taken in 1962.

articulator was used. Two lower five-unit and two upper four- and ten-unit posterior fixed bridge splints were used. The prosthesis was inserted in January, 1955. The finished interocclusal contact was tip to tip. Seven nonvital teeth were treated and retained. This patient at the time of writing was 84 years old. Dentistry had made a worthwhile contribution to his health and happiness. (Figs. 1926 to 1936.)

Case 18

In 1961 a 73-year-old man was treated. He presented an anterior open bite that extended from the upper right to the upper left first bicuspids. When he was first examined clinically, it was not easy to determine his correct mandibular position. He was able to place his mandible into several convenience positions.

Discussion

If structure and function are normal, the presented occlusal pattern should be maintained. When dealing with a patient like this, what must be considered seriously is whether or not the oral structures are in good condition when the patient is first examined and also whether or not function is normal for him. Questioning will soon reveal any abnormalities. If function is normal and if the structures are

good, no attempt should be made to change them. Any necessary restorative dentistry should be done within the limitations of the interocclusal relationship which the patient presents. It is wise to accept individual normal instead of group normals for these patients in order to avoid future complications. This is especially so in the old age group.

A similar case of a younger patient was described on pp. 590 to 594, Figs. 1249 to 1258. The reconstruction in her case also followed her individual relational and functional patterns.

In the treatment of the patient whose case is being described, it was necessary to do three fixed partial dentures and several gold inlays for the four posterior sections of this patient's mouth. The restorative work was completed in single sections, one at a time. Every effort was made to maintain the same interocclusal relationship, although there was a great temptation to improve upon it.

At the completion of the work, the patient was just as comfortable as at the start. Although the construction was done at the normal amount of patient inconvenience, it was not necessary for the patient to go through a period of adaptation to new oral environments that sometimes prove so disastrous. (Figs. 1937 to 1943.)

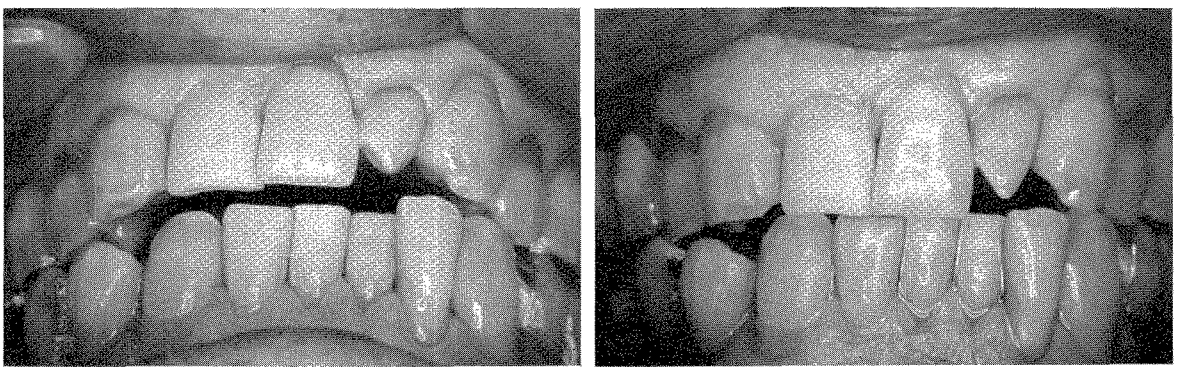

Fig. 1937. Anterior and posterior positions of the mandible in the mouth of a 73-year-old man with a malocclusion in the form of an anterior open bite from the first upper right bicuspid to the first upper left bicuspid. Both anterior and posterior positions were acceptable to him. (Figs. 1937 to 1943 are of the same case.)

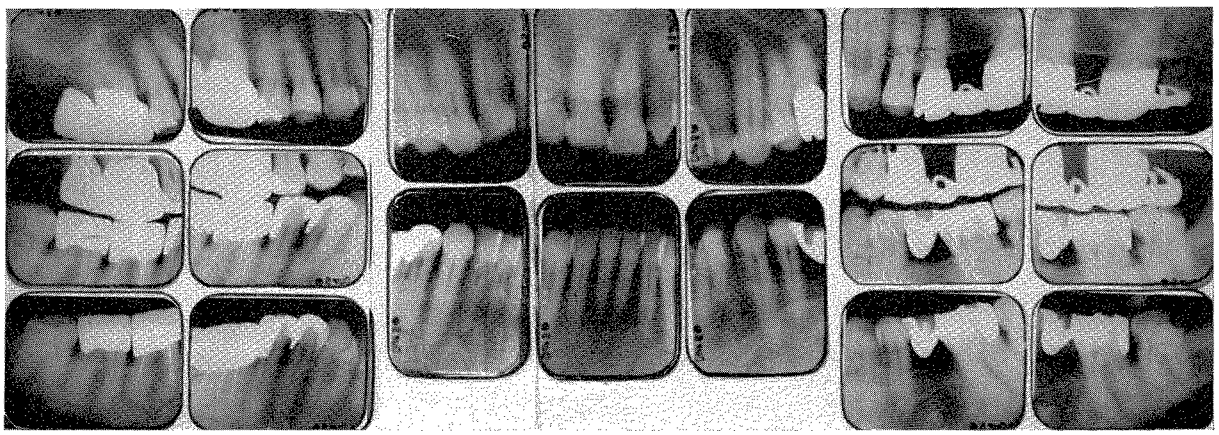

Fig. 1938. Roentgenograms taken at the start of treatment in 1961. The structure was good.

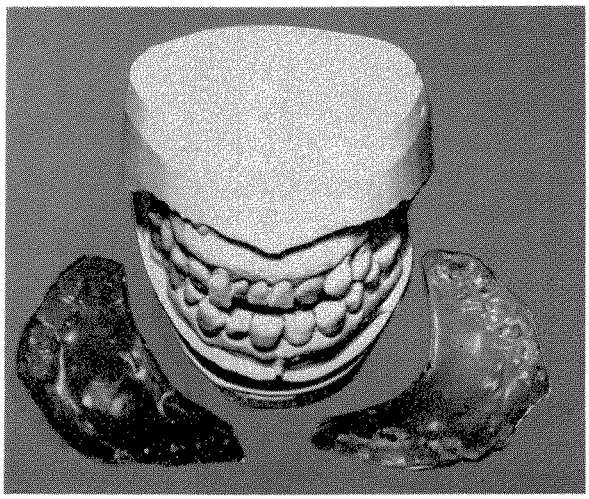

Fig. 1939. A careful study was made of his interocclusal relationship. He gave several different bites. At his age, with the excellent condition of his structures, it was extremely important that his old interocclusal relationship be maintained and that no pronounced changes be attempted. The casts are inverted. The open bite is shown here with the mandibular cast in its posterior or retruded position.

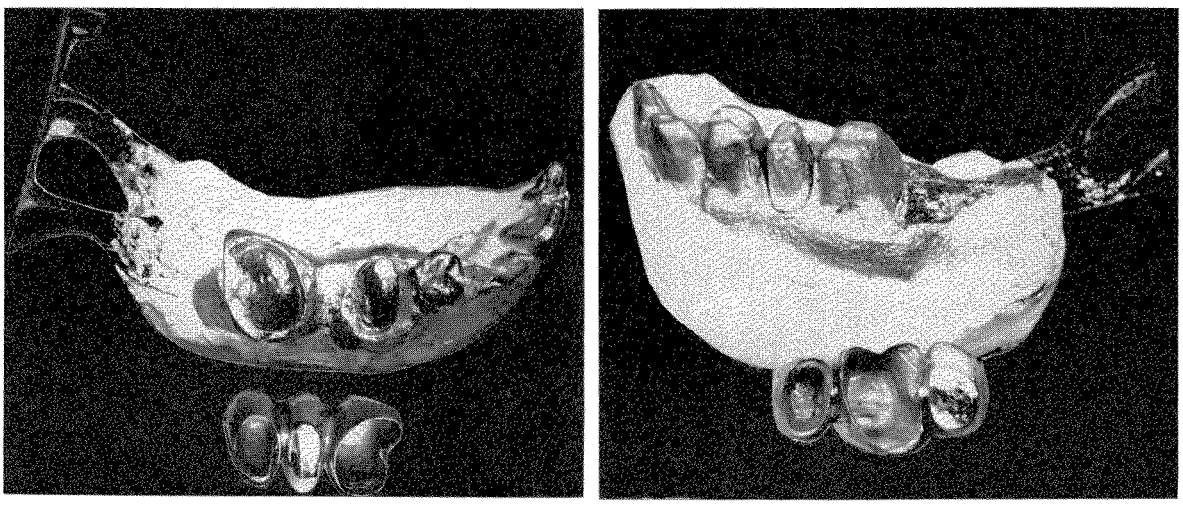

Fig. 1940. Although the posterior four quadrants of his mouth were redone with fixed prosthesis (all except the lower right molars), his interocclusal relationship was maintained and not altered in any direction or dimension. The fixed bridges were made first for the lower left quadrant, then for the upper left, the upper right, and, finally, the lower right quadrants. They were constructed on unilateral articulators. The upper right and left bridges are shown here.

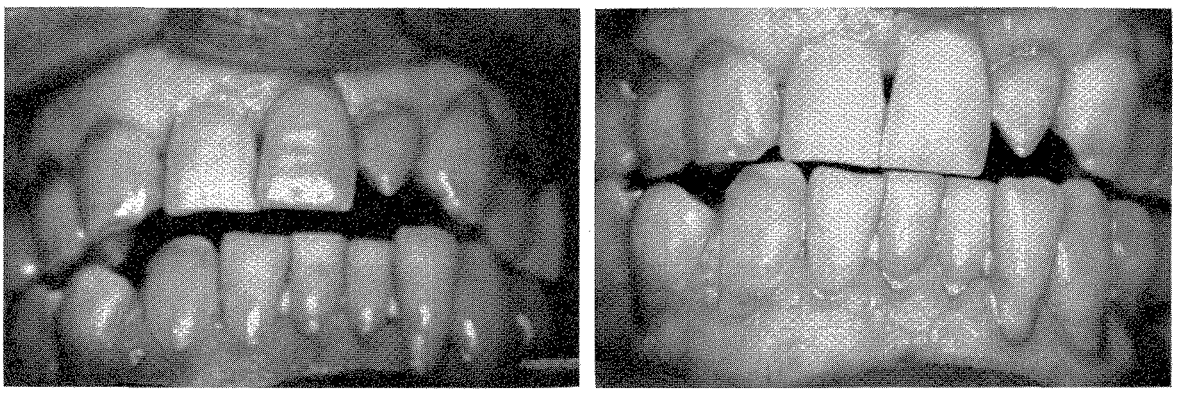

Fig. 1941. Two views of the completed work taken in May, 1962. Compare these illustrations with Fig. 1937 to see how closely the original bite was retained.

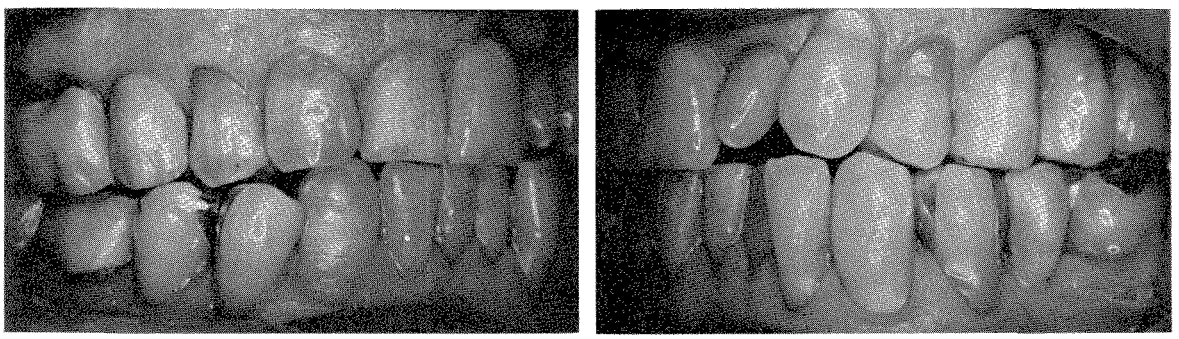

Fig. 1942. Right and left views of the completed work.

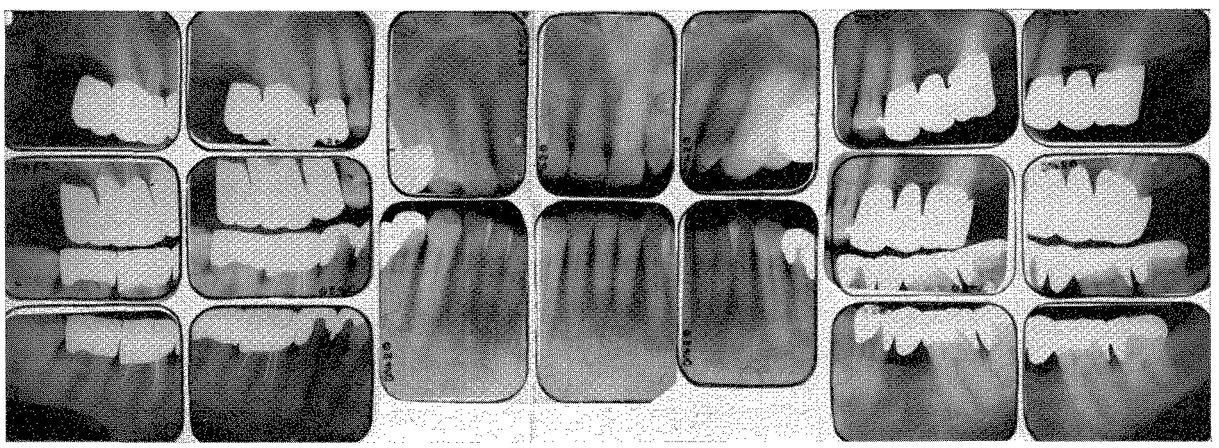

Fig. 1943. Final roentgenograms taken in May, 1962.

Patients are not always fortunate enough to retain their natural teeth throughout their entire lives no matter what amount of care and attention they give them. But if we, as their dentists, see to it that sincere, conscientious services are rendered and that our efforts have been directed in protecting their dentitions for as long as possible, then we have contributed our part to their total health service.

Case 19

Past history and first reconstruction

In February, 1941, a 55-year-old woman came for dental treatment. All the maxillary molars, one bicuspid, and five lower posterior teeth were missing. A deep vertical overbite was present which was augmented by the missing posterior teeth. In March, 1943, her teeth were reconstructed, and the vertical dimension was restored. The work was constructed on a Hanau Model H articulator.

By May, 1948, the bite had shifted, and the occlusion was again traumatic. Her hygiene had always been very poor. In June, 1948, central-bearing plates were attached to the removable partial dentures, and the occlusion was equilibrated by grinding. By 1950, two of her remaining natural teeth were subject to deep caries and had to be removed.

Second reconstruction

In 1952 it was decided again to rehabilitate her mouth. Her hygiene habits remained totally inadequate in spite of her regular visits and repeated warnings. She was then 66 years old. The second reconstruction was completed in June, 1952. Extensive splinting was used. The articulator upon which the work was constructed was the kinoscope (Hanau Engineering Co.). Mucostatic impressions were taken in special trays. The removable and fixed parts were related by means of a separate impression. The maxillary fixed splint contained nine units with one throw-off. The mandibular fixed splint contained eight units with one throw-off. Upper and lower removable partial dentures completed the prosthesis.

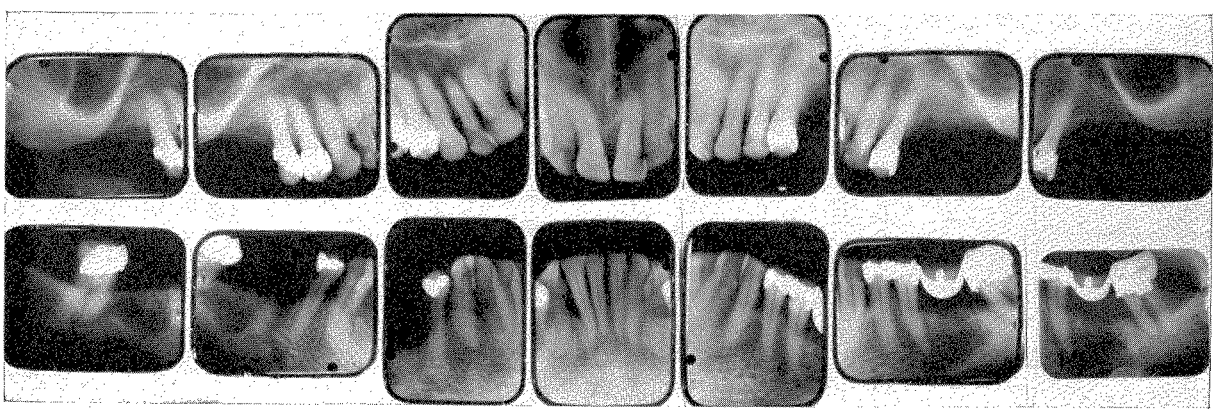

Fig. 1944. Roentgenograms of the mouth of a 55-year-old woman. These were taken in 1941. (Figs. 1944 to 1976 are of the same case.)

Postinsertion events

Five years after the completion of the second reconstruction, three natural teeth had to be removed because of recurrent caries and pulp involvements. The partial dentures were repaired. This took place in 1957 when the patient was 71 years old. Physical deterioration had set in at a more rapid pace than before. The patient had become corpulent. An operation had been performed for cataracts, and her coordination had become very poor. In spite of all this, her mentality was

Text continued on p. 977.

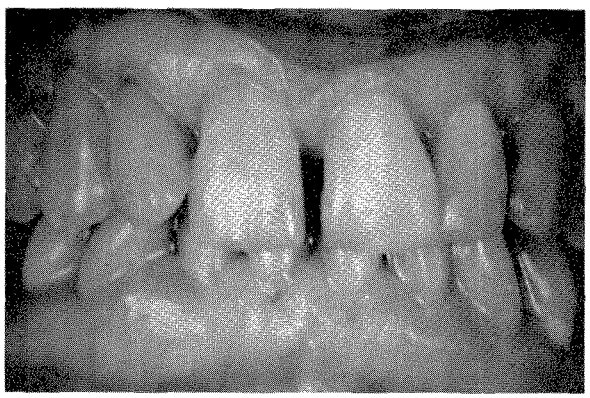

Fig. 1945. The oral rehabilitation was started in March, 1943. This is a front view of the mouth. Observe the vertical overbite.

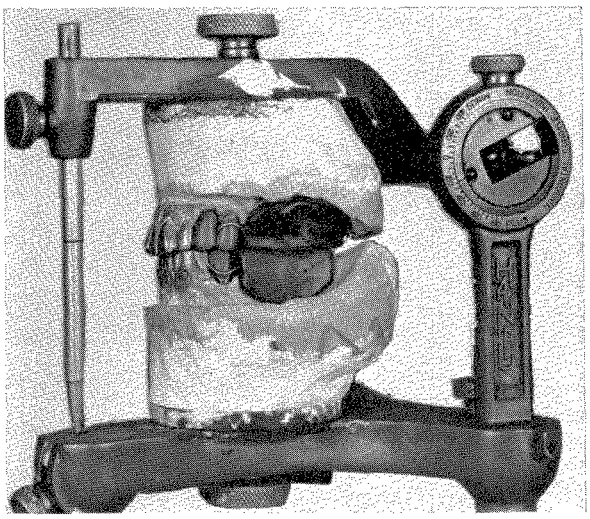

Fig. 1946. A Hanau Model H articulator was used. Conventional records were taken. In this illustration, bite plates are being used to register the centric relation and the vertical dimension.

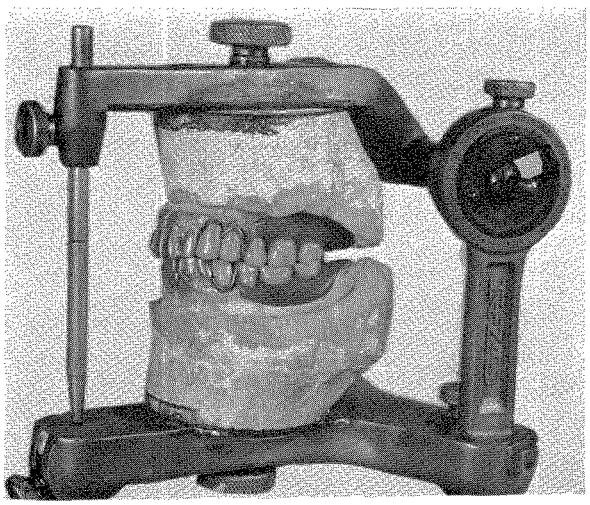

Fig. 1947. The teeth were set up as shown here. Several try-ins were made, and the occlusion was finally coordinated. This illustration was taken just before the final work was completed.

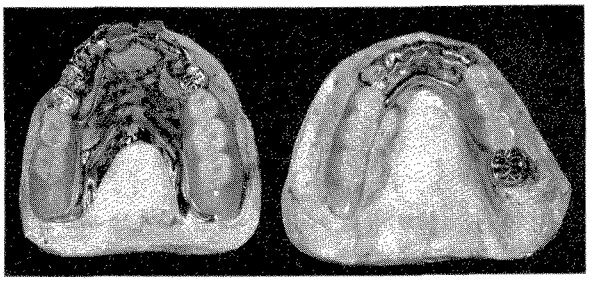

Fig. 1948. The final upper and lower prostheses. An occlusal view.

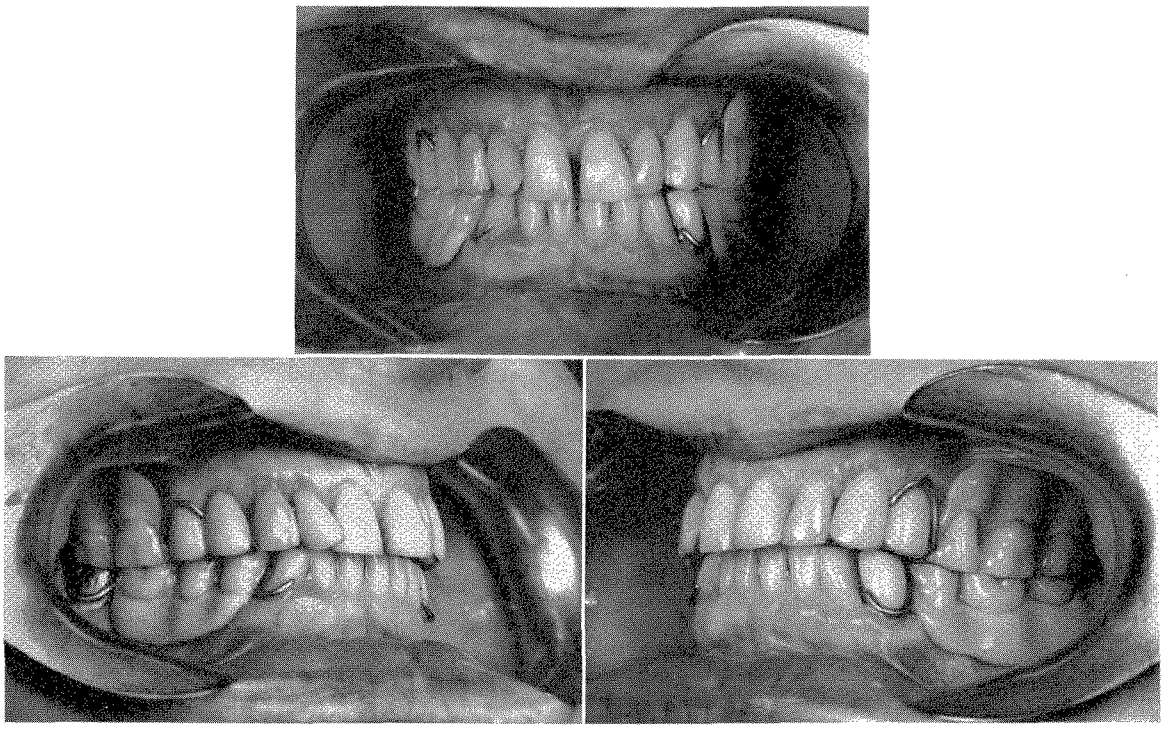

Fig. 1949. Three views of the completed work. This was inserted in May, 1943.

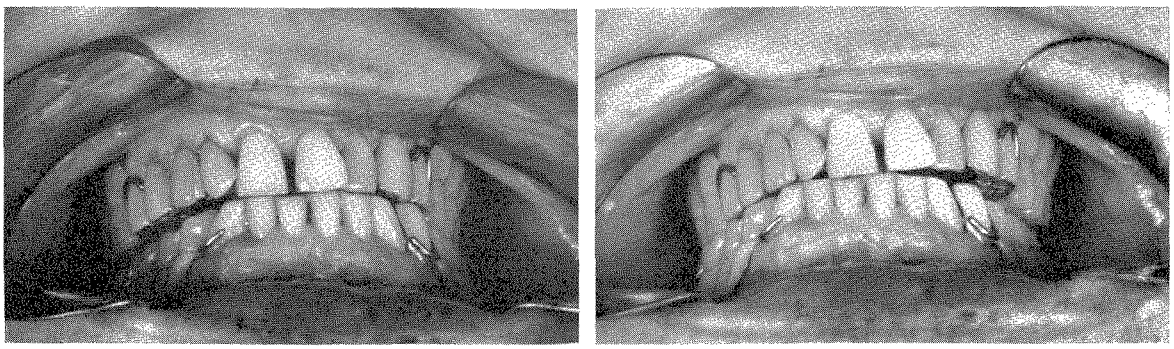

Fig. 1950. The complete work showing the right and left working and balancing bites.

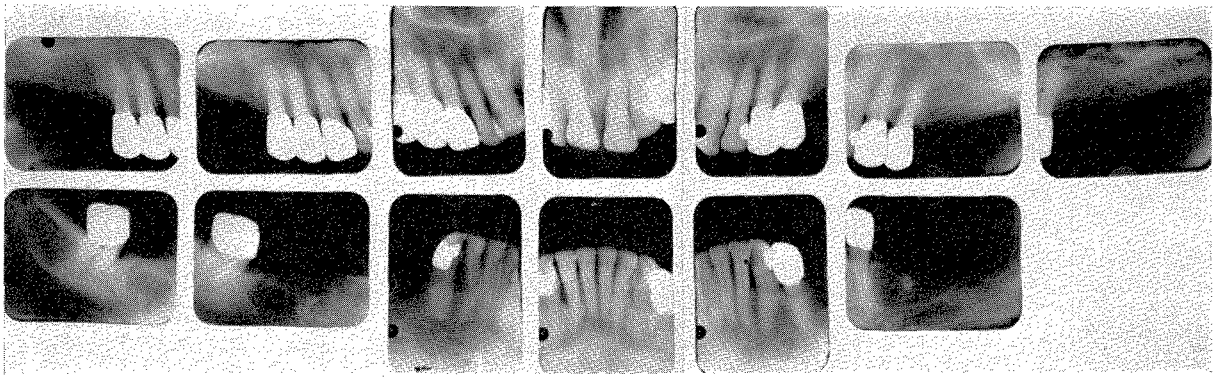

Fig. 1951. Roentgenograms taken in March, 1944. This is nearly one year after completion.

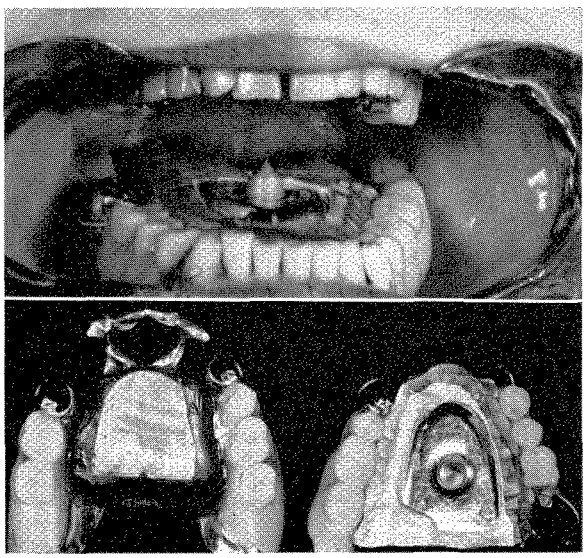

Fig. 1952. In 1948 intraoral bearing plates were constructed in an effort to equilibrate the occlusion that had shifted since the completion of the work in 1943. In the lower photograph the bearing plates have been attached to the upper and lower removable partial dentures, whereas in the upper photograph they have been inserted in the mouth.

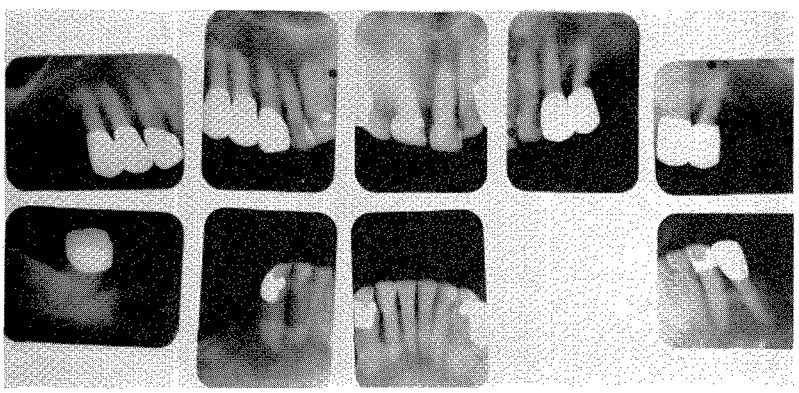

Fig. 1953. Roentgenograms taken in November, 1948.

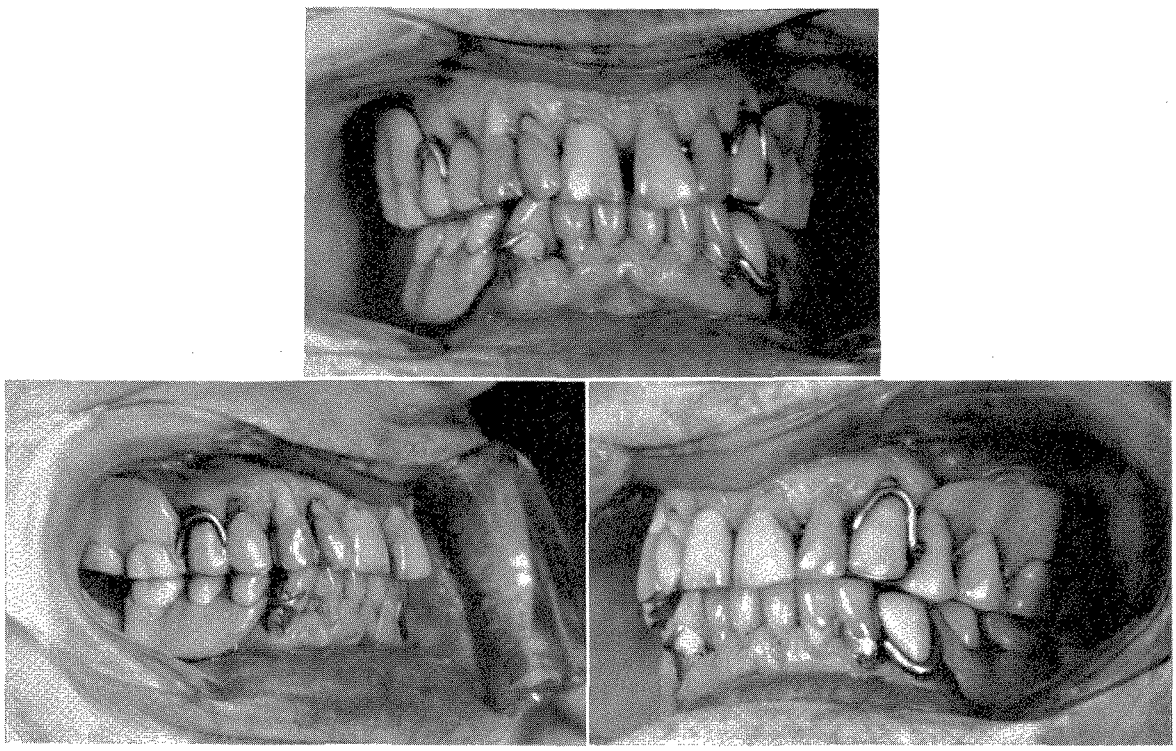

Fig. 1954. Three views of the mouth taken in February, 1952. The former reconstruction was then nine years old. The patient was 66 years old.

Fig. 1955. Roentgenograms taken in February, 1952, just before the start of the second reconstruction.

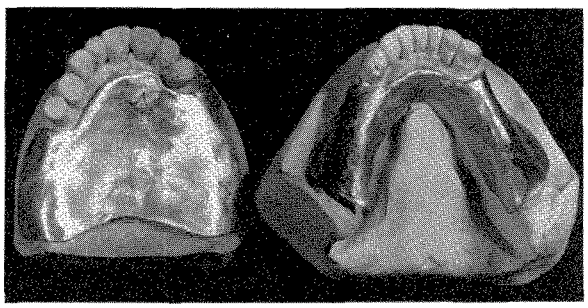

Fig. 1956. Cast metal individual trays with which to take the mucostatic impressions for the removable partial dentures.

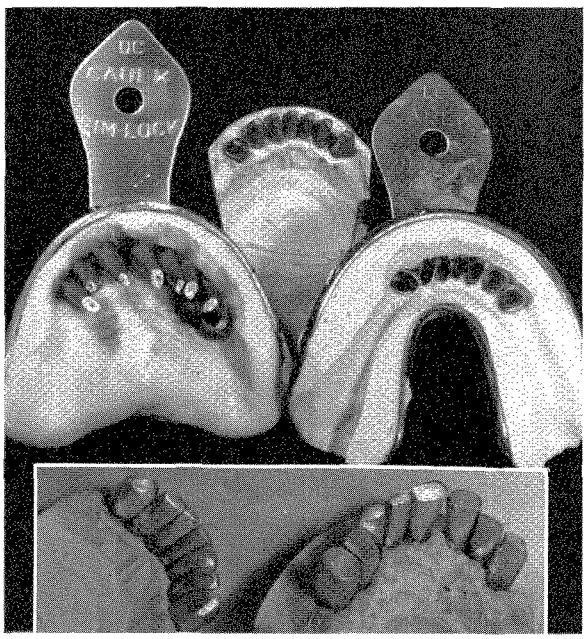

Fig. 1957. Base metal transfers were made on copper-plated dies and a squash bite. These were tried in the mouth one by one, and the centric relation and vertical dimension were established. Then these transfers were soldered together in the mouth with a hot spatula and additional Melotte's metal. Upper and lower alginate impressions were then taken, and the copper-plated dies were placed in their respective positions. Work casts were then poured.

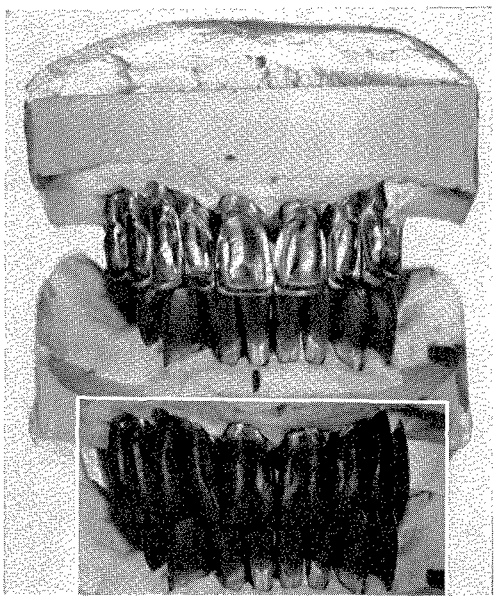

Fig. 1958. The low-fusing transfers were removed from the dies, and the completed wax-up is shown in the lower foreground. The upper crowns were cast first and returned to the cast. Any necessary correction was then made. Finally, the lower crowns were cast.

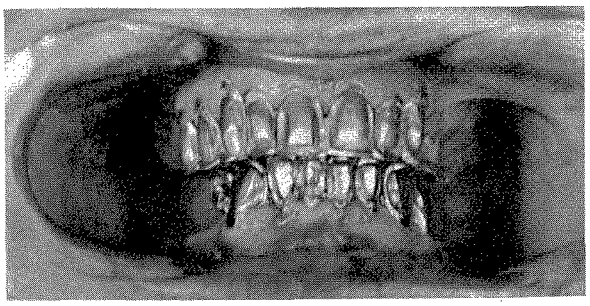

Fig. 1959. The castings were inserted in the mouth. Centric relation and vertical dimension were checked. Radiographs were taken to check the fit of the crowns.

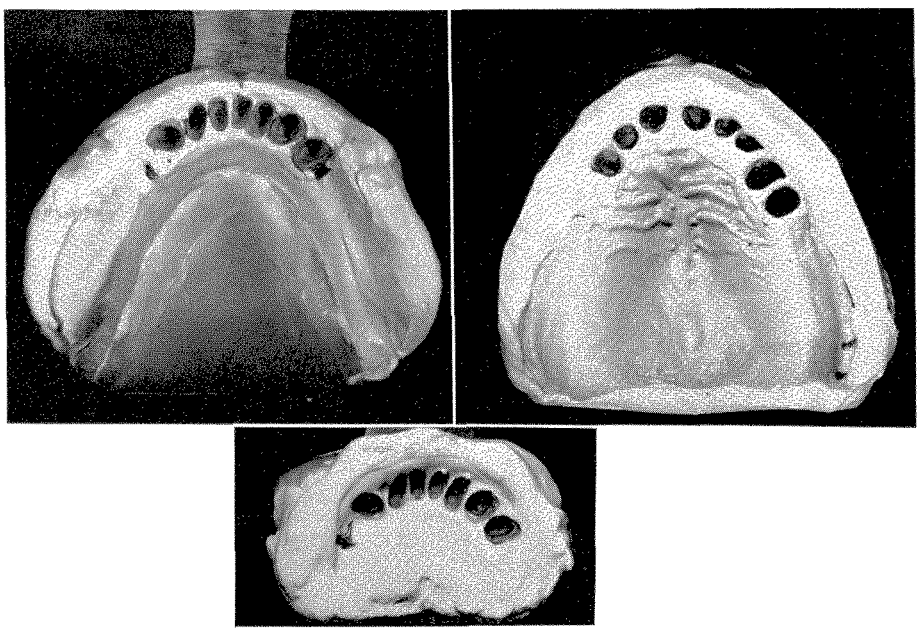

Fig. 1960. Upper and lower muccstatic impressions were taken with the gold cast crowns in place. The first impression was taken of the tissue areas. The second part was taken over the first in order to relate the tissues and the teeth together. The smaller impression in the foreground is taken in order to solder the castings together to construct the splints.

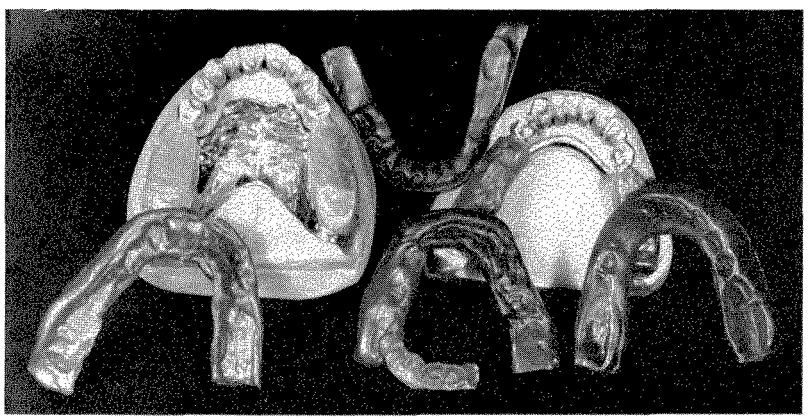

Fig. 1961. The removable partial denture castings have been completed. Centric relation will now be established by the oral wax records that have been taken and are shown here.

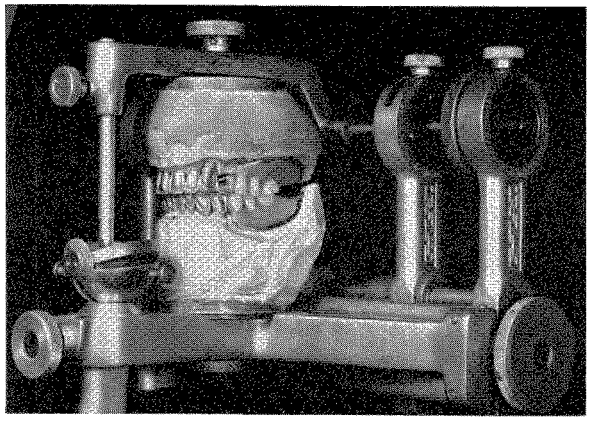

Fig. 1962. The work was completed on the Hanau kinoscope. This is ready for try-in. Several try-ins are necessary as the work proceeds.

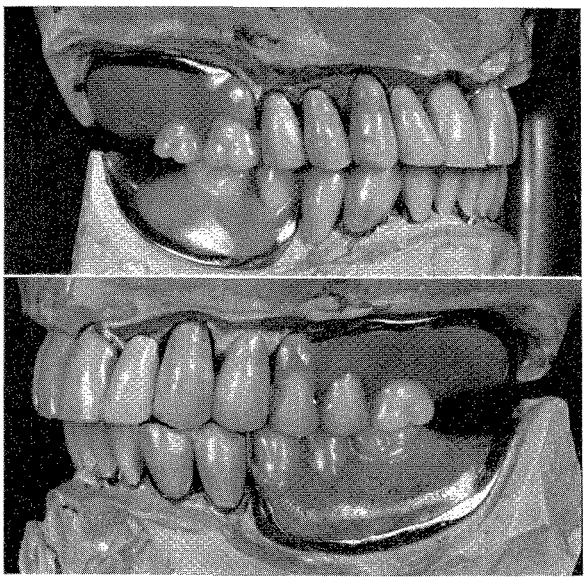

Fig. 1963. Two close-up views of the completed work. A checkbite is taken and a remount is made, if necessary, to do any final correction.

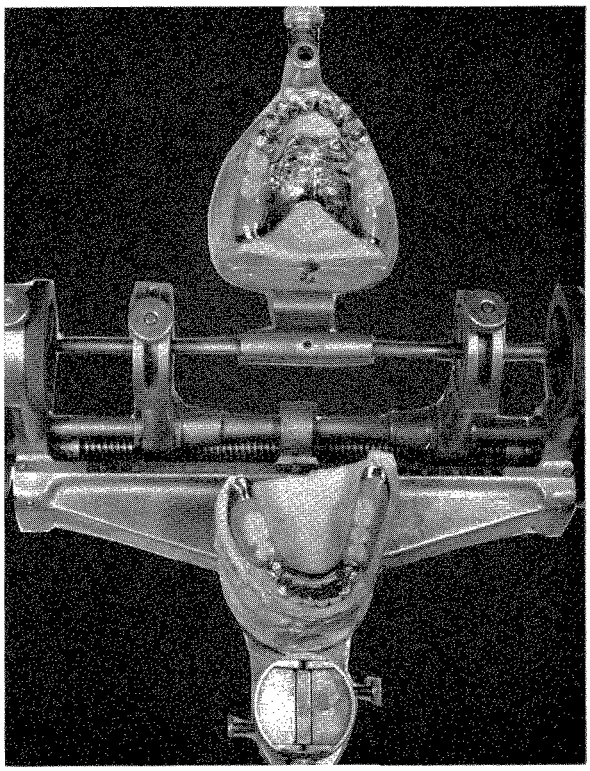

Fig. 1964. An occlusal view of the completed work.

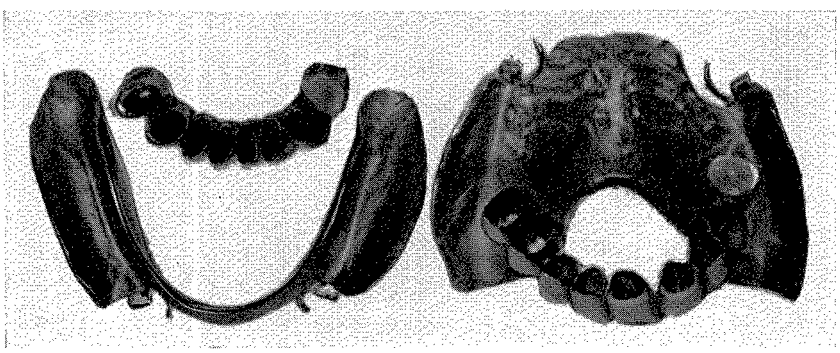

Fig. 1965. The tissue sides of the removable partial dentures are not highly polished. This is done to obtain better adaptation to the tissues.

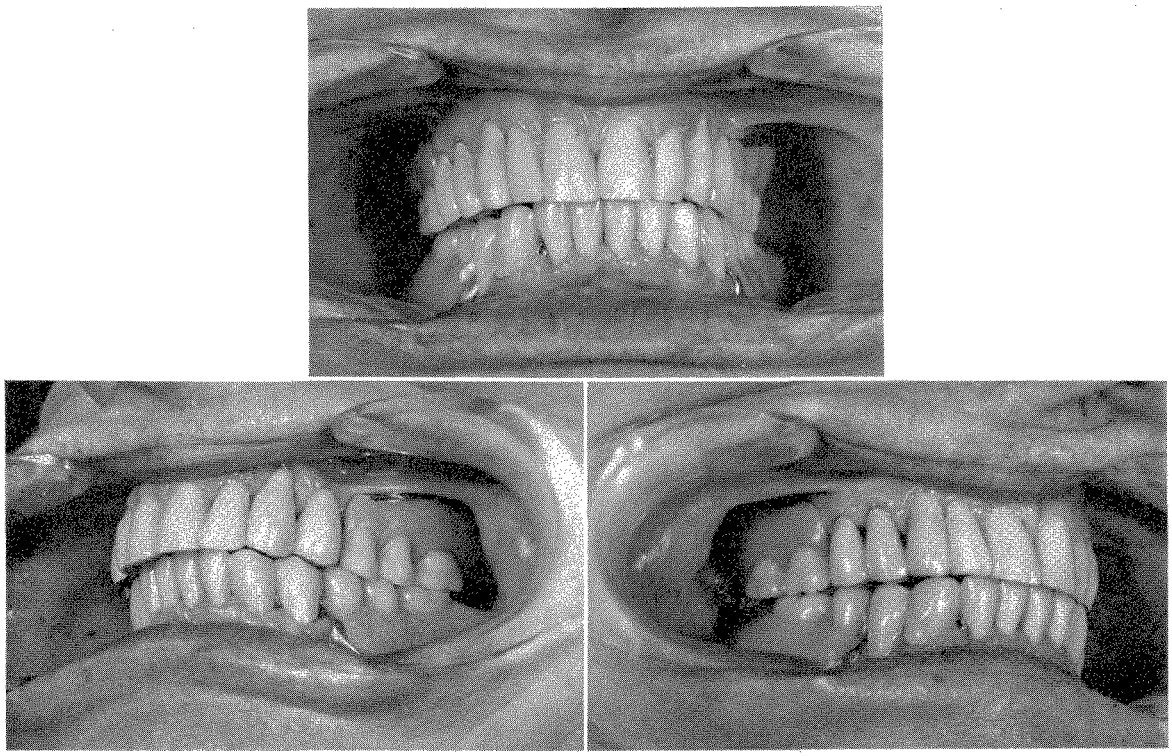

Fig. 1966. Three views of the completed work. This was inserted on June 7, 1952.

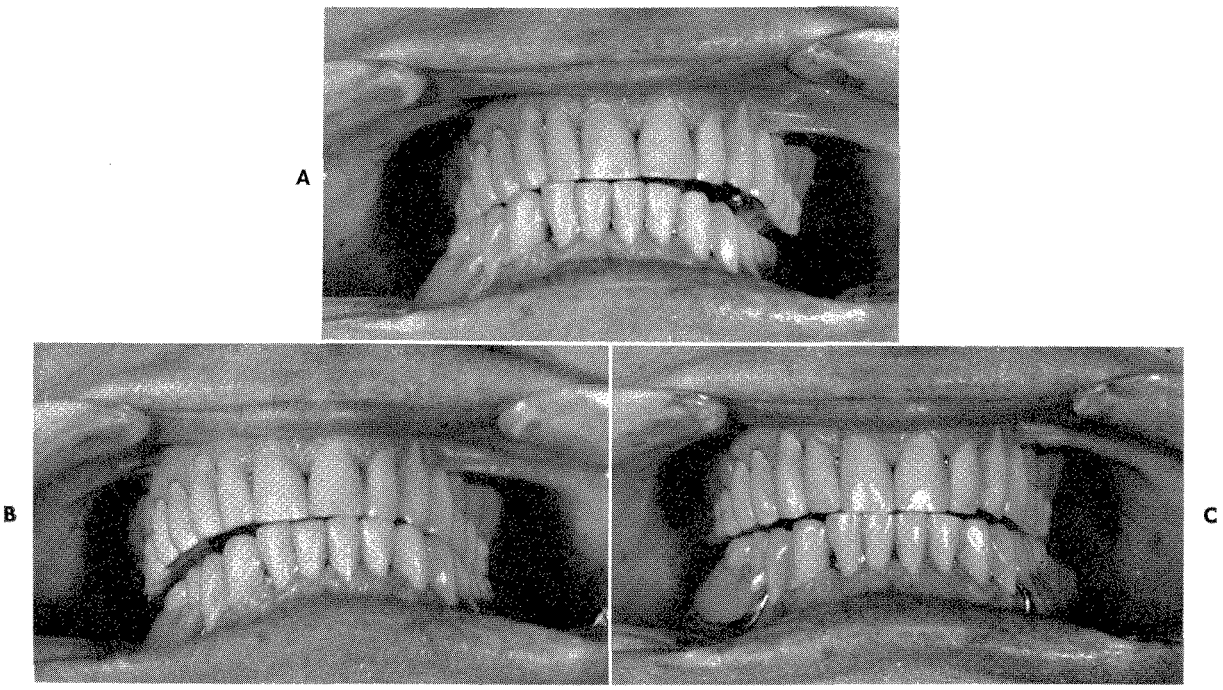

Fig. 1967. A, Right working, left balancing bites. **B,** Left working, right balancing bites. **C,** Protrusive bite.

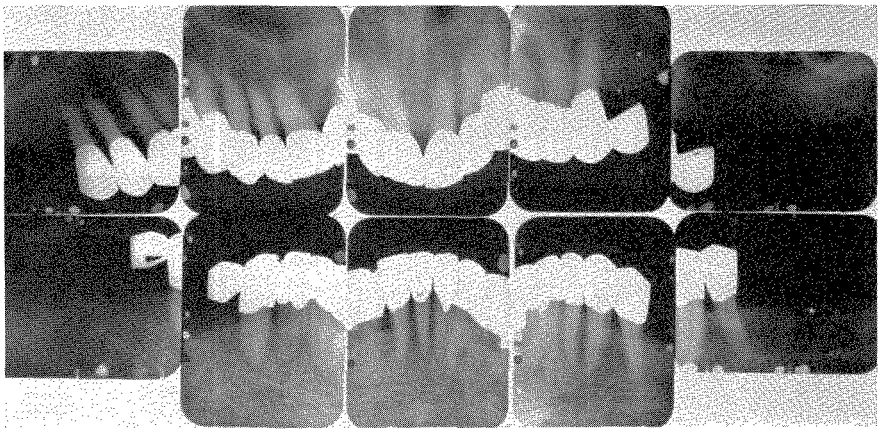

Fig. 1968. Roentgenograms at the completion in June, 1952.

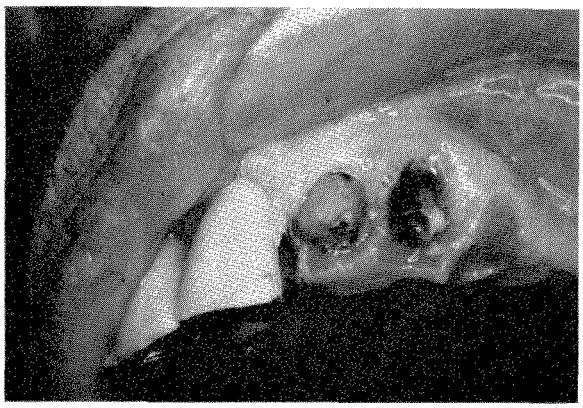

Fig. 1969. In 1956, the upper left lateral incisor and cuspids fractured. The anterior splint was cut free at the distal surface of the left central incisor, and the roots were removed. The upper denture was repaired.

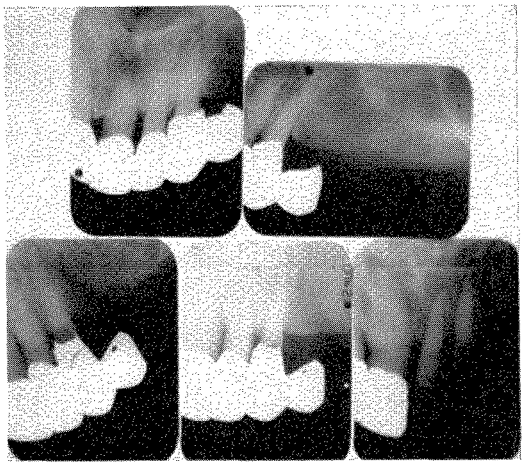

Fig. 1970. In January, 1956, the roentgenograms (upper two) showed no pathology. In December, 1956, the roentgenograms (lower three) revealed the fracture.

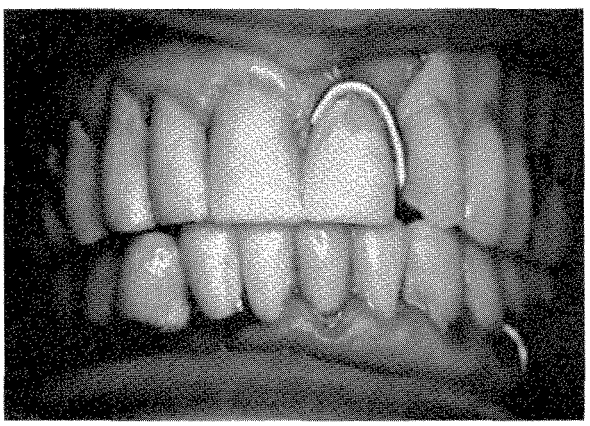

Fig. 1971. In December, 1958, a new upper temporary partial denture was made with full palatal coverage. The lower right cuspid became infected and was removed with the right lateral incisor. In this photograph the lower roots were extracted while the crowns were not yet cut free from the splint. This was done later, as Fig. 1972 shows.

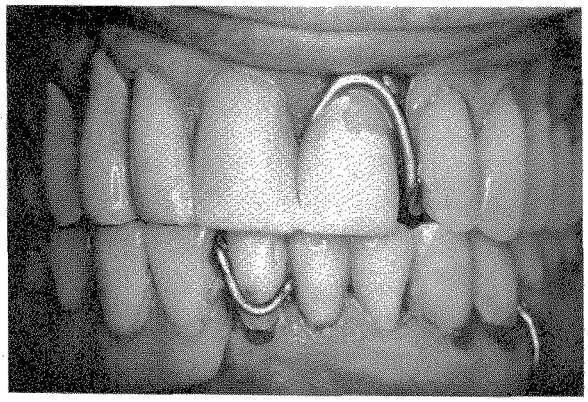

Fig. 1972. A front view of the mouth in 1959. The insertion of full dentures was not too far off.

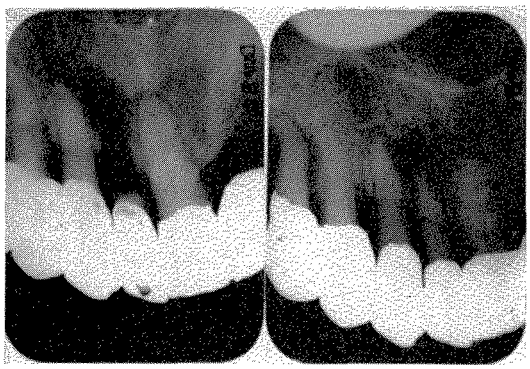

Fig. 1973. In February, 1961, the upper right lateral incisor became infected, and its root was removed from the splint.

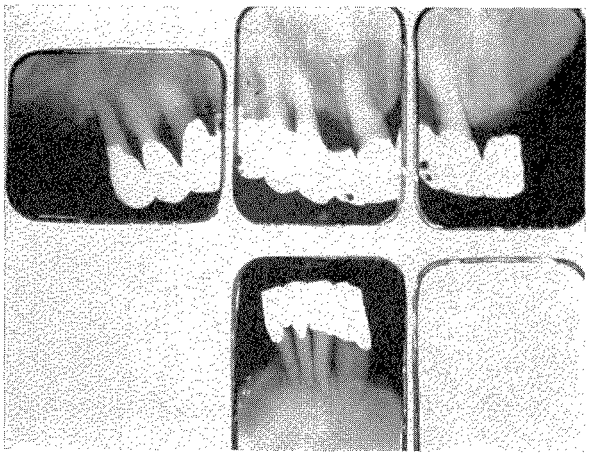

Fig. 1974. In September, 1961, the decision was finally made to insert full dentures. The roentgenograms indicated further caries and infection.

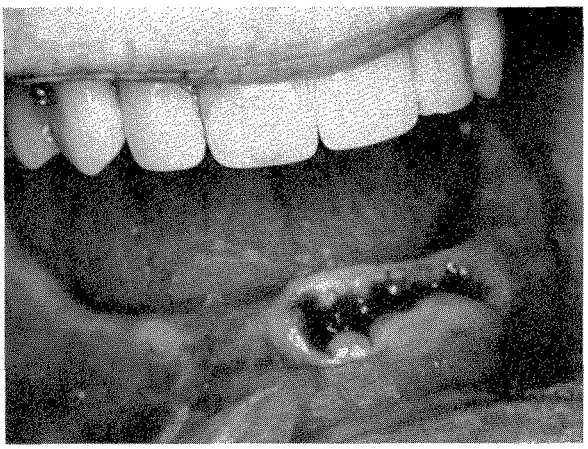

Fig. 1975. The upper and lower remaining teeth were finally removed in October and November, 1961. In this photograph, the immediate full upper denture is in place, and the lower anterior teeth have just been removed.

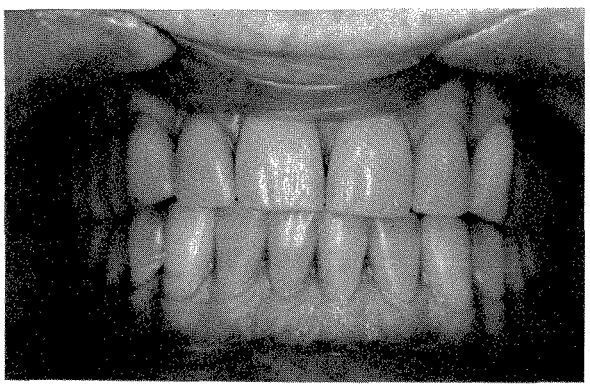

Fig. 1976. Full dentures were inserted. This photograph was taken in May, 1962. The patient was then 76 years old.

still keen. The decision was made to continue to repair the prosthesis until full dentures were required. In the meantime, she had no difficulty with oral function.

In 1962 she was 76 years old, and the reconstruction was ten years old. Only five upper and four lower natural teeth remained. These were not all healthy. The time had arrived for the insertion of full dentures. The patient had been well prepared, and the adjustment was, therefore, simple. The final dentures were inserted in April, 1962. (Figs. 1944 to 1976.)

UNSATISFACTORY CASES

There are a group of cases that are unsatisfactory for reasons beyond our comprehension. Some of these have already been discussed in previous chapters. Good judgment and utmost skill are exercised, yet somehow the breakdown continues. These cases, although completed, are in constant need of postinsertion care. For a case to be a complete success, the causes of the breakdown must cease to operate, and healthy tissue must continually be rebuilt. For a case to be a partial success, the causes of the breakdown must be arrested. Problem cases and compromise results are usually an admission, above other things, that all the causes of the breakdown have neither been totally discovered nor have they been arrested. We all have our share of patients in this category, even though we are reluctant to admit it. They require skillful treatment and sympathetic understanding, and in return they must place great confidence in the ability and conscientiousness of the dentist.

Case 20

Past history

In November, 1950, a woman in her early sixties came for dental treatment. Nine teeth had already been removed. Four additional ones required removal. A total of nineteen teeth remained. She was unable to maintain good oral hygiene. The fact that she was wearing removable partial dentures only served to increase the destructive forces. Occlusal reconstruction was prescribed. The work began in March, 1951, and was completed in April, 1951. A nine-unit upper anterior splint, together with a removable partial denture, were inserted. Posterior fixed partial dentures were inserted to replace the missing mandibular teeth.

Postinsertion events

In spite of the combined efforts of the patient, the dental hygienist, and the dentist, the home care was deficient, and the tissues were in a constant state of inflammation. These people are often unaware of their oral pathology and are in a satisfied mental state regarding their oral health. The patient-doctor relationship is usually excellent. This woman came regularly for treatment and for whatever was necessary to be done to safeguard the tissues and the restorative work.

Second upper reconstruction

In January, 1960, nine years after her reconstruction had been completed, a decision was made to remake the upper work. Two upper natural teeth requried

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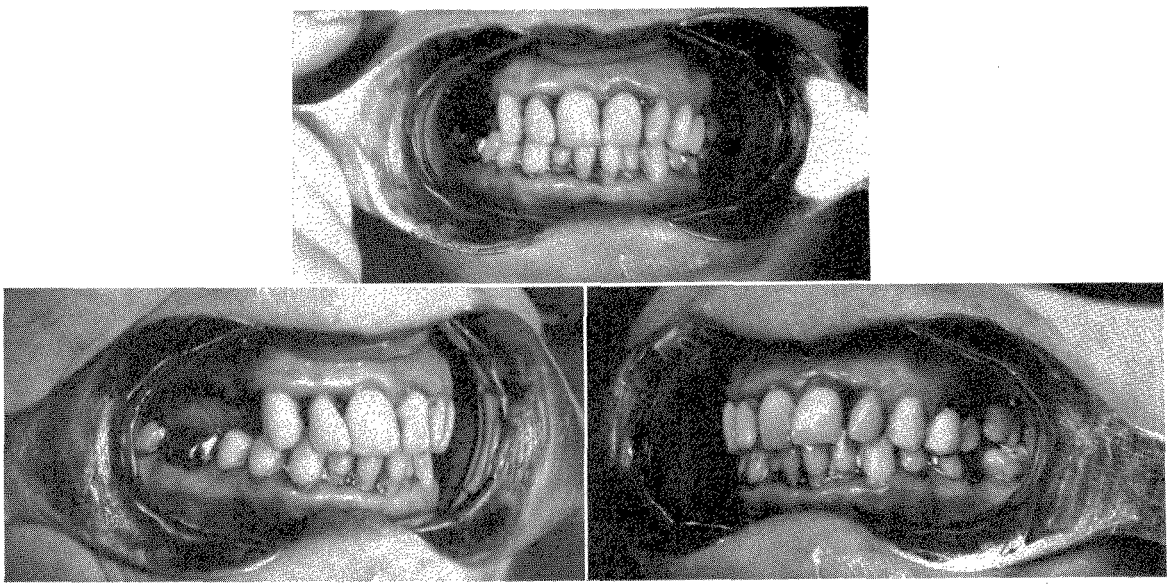


Fig. 1977. Three views of the mouth of a 62-year-old woman. These photographs were taken in November, 1950. (Figs. 1977 to 1997 are of the same case.)

Fig. 1978. Roentgenograms taken in August, 1950, before treatment was started.

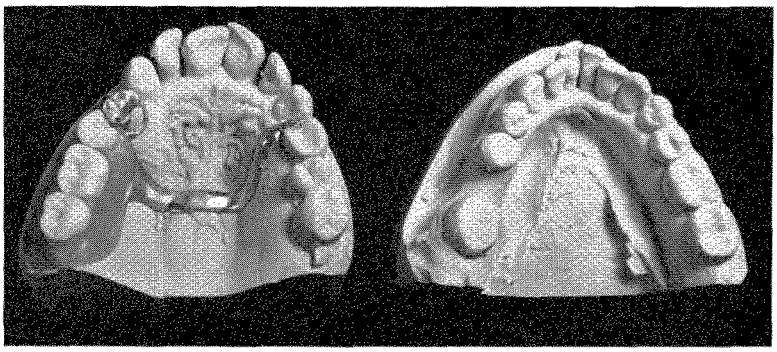


Fig. 1979. Study casts at the start of treatment.

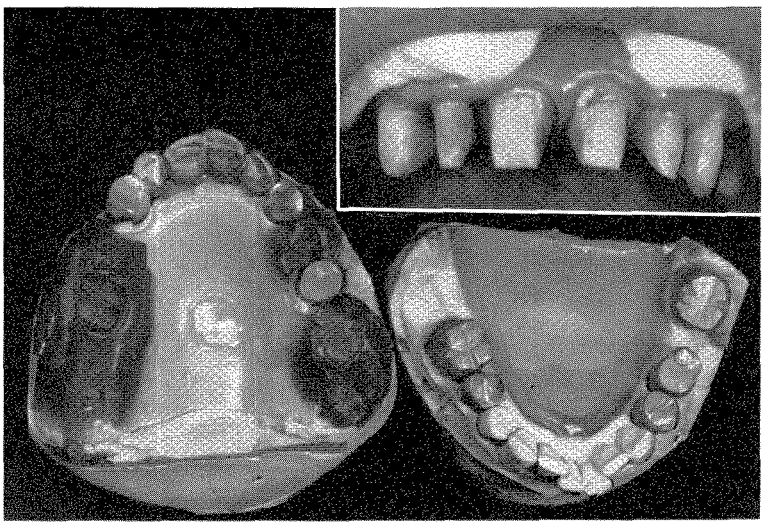


Fig. 1980. The centric relation and the vertical dimension were registered by means of an acrylic bite plate and red wax. The upper and lower prepared teeth were covered by transfers made of low-fusing metal.

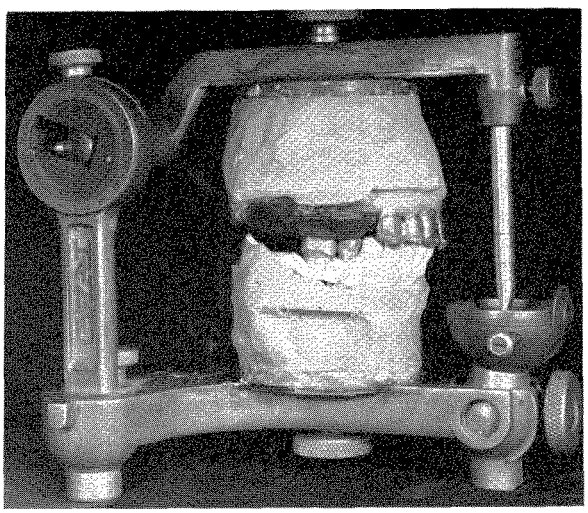


Fig. 1981. The final cast crowns were tried in the mouth, and an incisal guidance was established. Then the bite plate was used to register mandibular positions. The work was transferred to a Hanau Model H articulator using the bite plate and a face-bow as the guides.

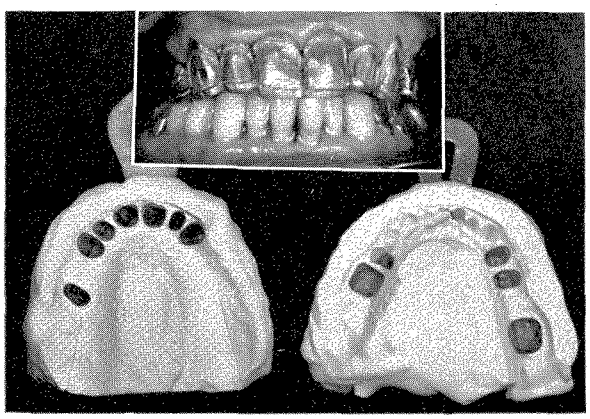


Fig. 1982. Several try-ins were necessary as the work progressed. After each stage, upper and lower plaster impressions and additional wax records were taken. New work casts and a new mounting were made in order to proceed.

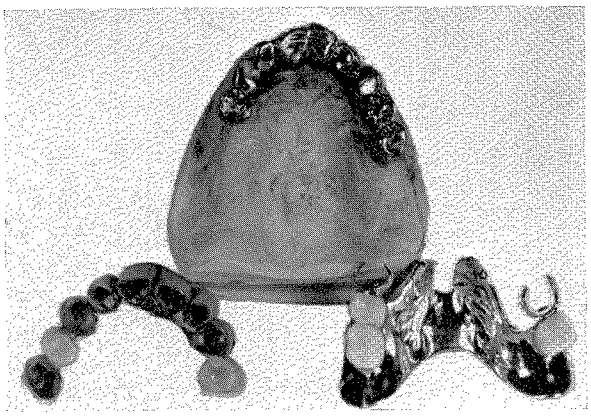


Fig. 1983. The completed upper fixed and removable partial dentures. The fixed splint contains nine units with one throw-off. The clasps contain one rigid lingual arm, a precision lug, and a flexible labial arm.

A

B

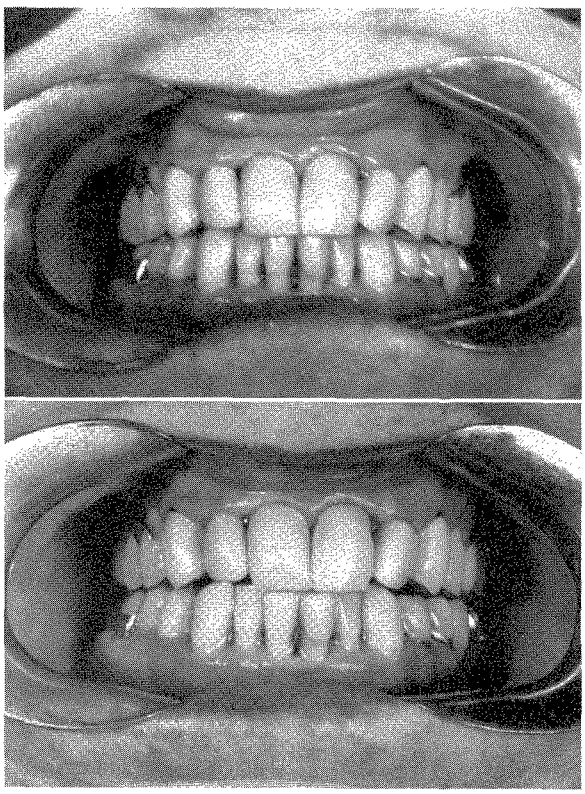


Fig. 1984. The completed work. **A,** Centric occlusion. **B,** Protrusive occlusion. These photographs were taken in April, 1951.

A

B

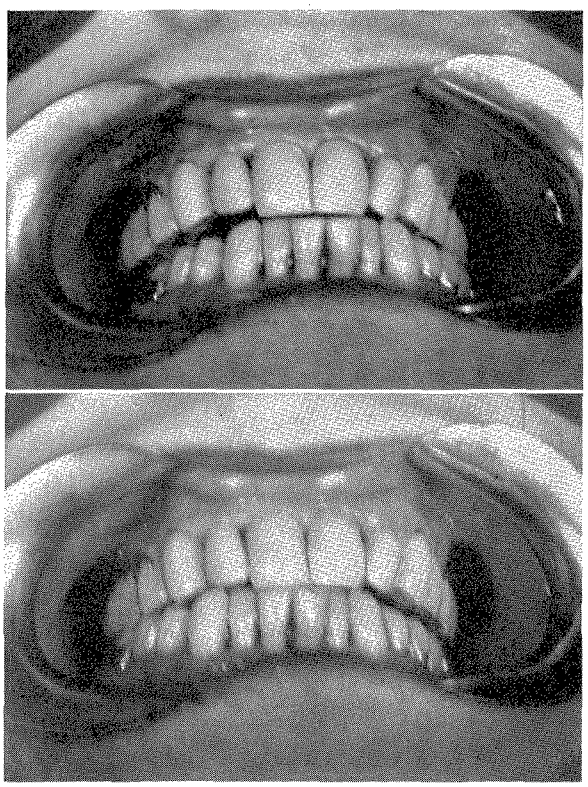


Fig. 1985. A, Right balancing, left working bites. **B,** Right working, left balancing bites. The work was completed in April, 1951.

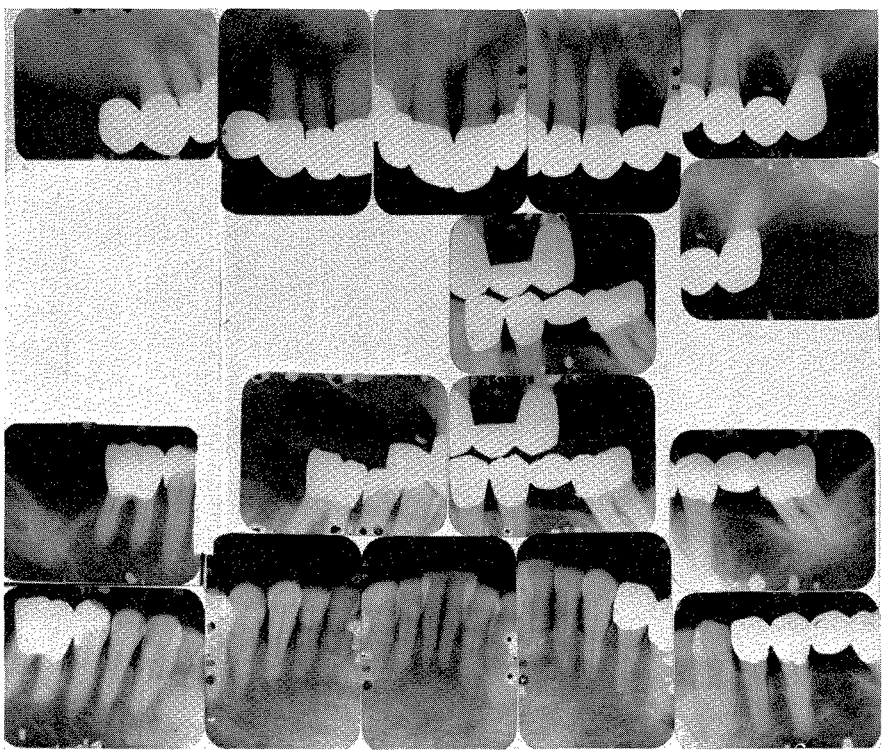


Fig. 1986. The roentgenograms that were taken in April, 1951, after the completion of the work.

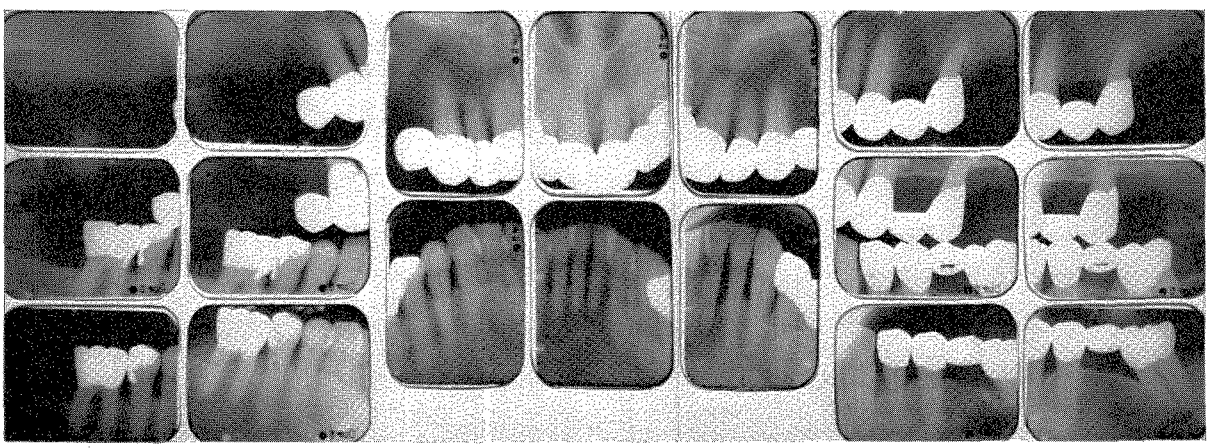


Fig. 1987. The roentgenograms that were taken in October, 1959.

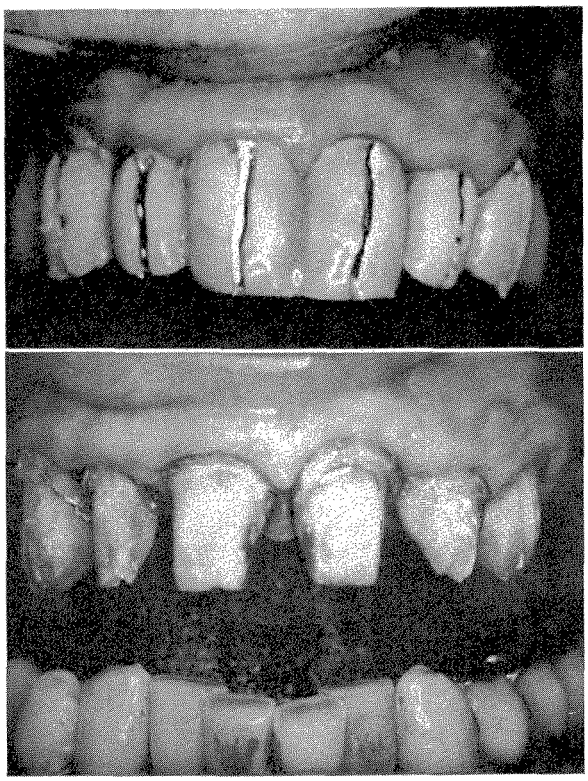


Fig. 1988. In January, 1960, the upper splint was removed. This was nine years after it was inserted.

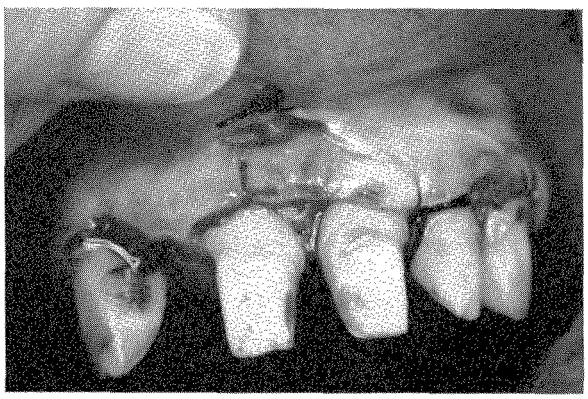


Fig. 1989. The labial and lingual gums were resected. A frenectomy was performed. The right lateral incisor was removed.

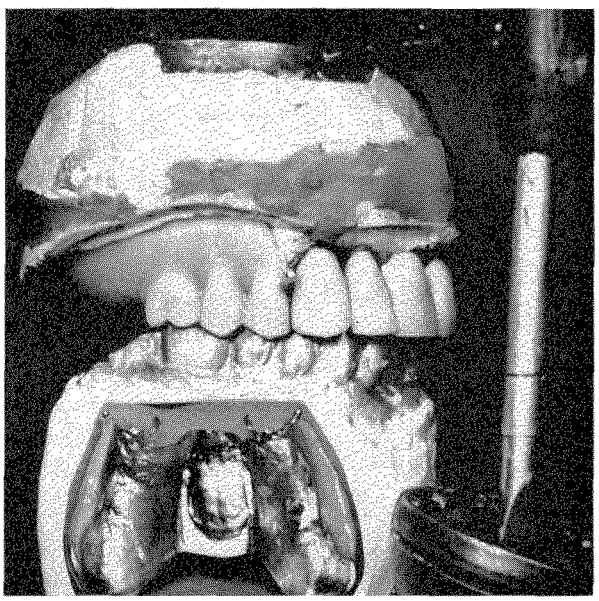


Fig. 1990. The upper teeth were again reconstructed. This photograph shows the right side of the completed work. In the inset in the foreground the upper removable partial denture is shown. It is retained by means of precision attachments with lingual arms.

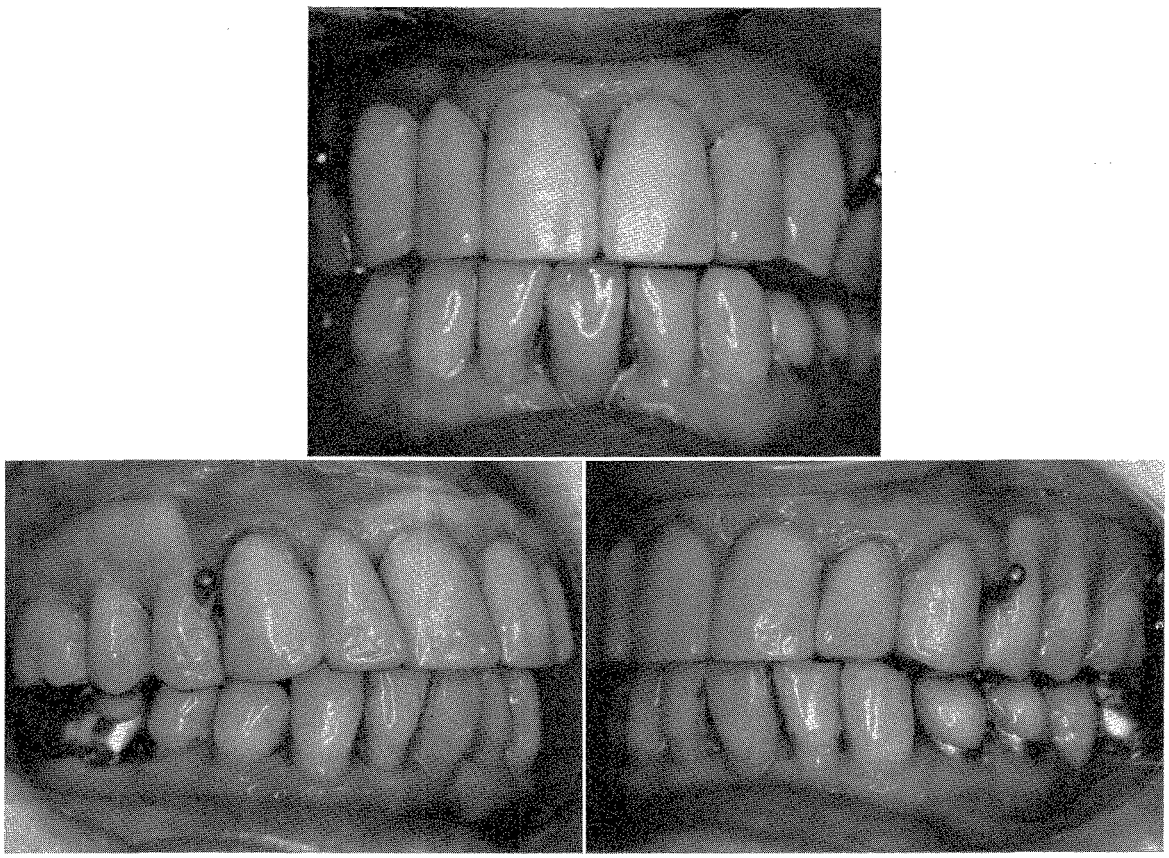


Fig. 1991. Three views of the completed work. This was finished in June, 1960. The patient was 72 years old.

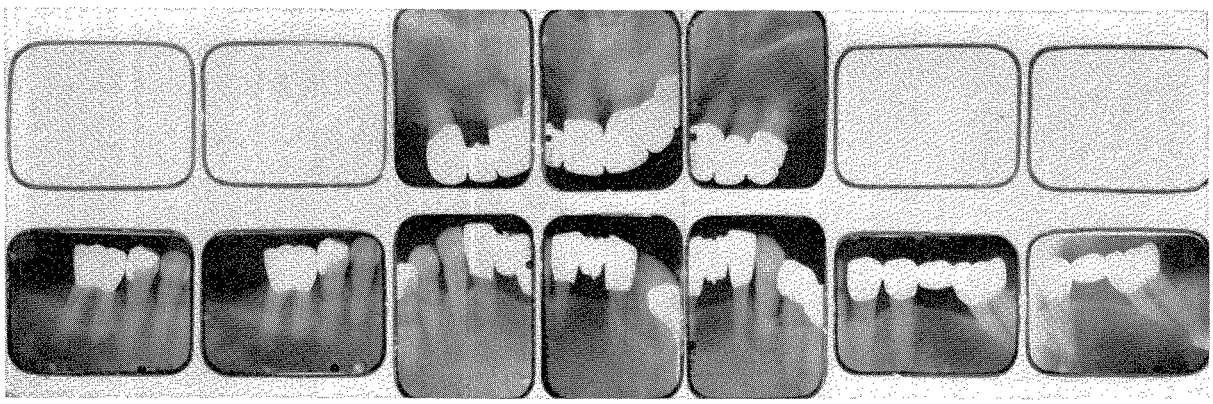


Fig. 1992. Roentgenograms of the teeth taken in November, 1961. The lower left central incisor had been removed and replaced by a fixed bridge.

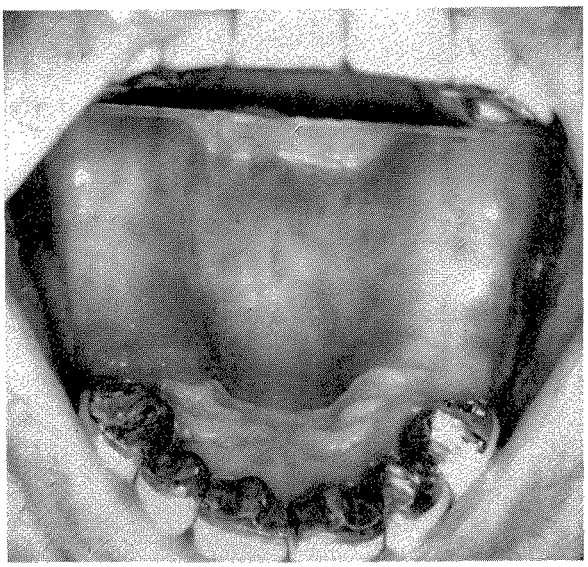
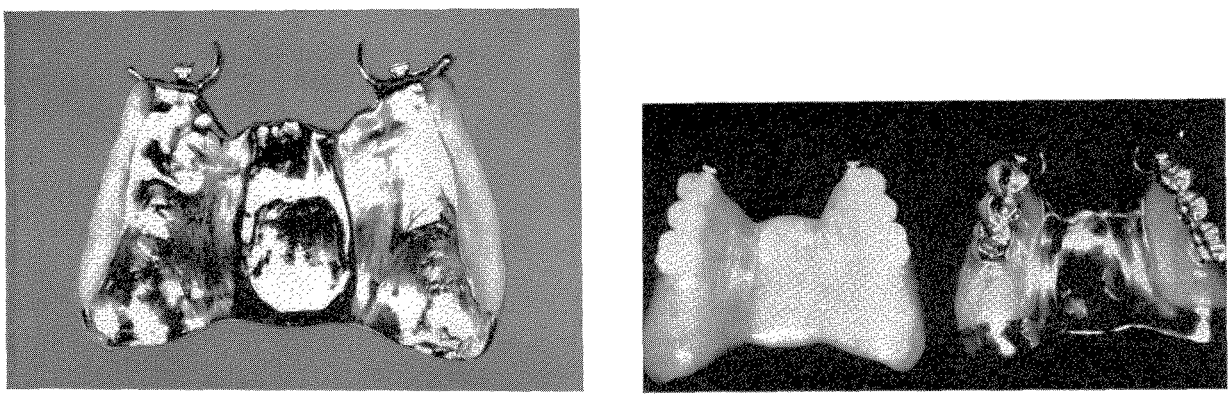


Fig. 1993. The palate is continually inflamed in spite of many admonitions regarding oral hygiene. The inflammation is shown in this illustration that was taken in January, 1962.



A B

Fig. 1994. **A**, The tissue side of the removable partial denture was repeatedly polished whenever the opportunity presented itself. **B**, In November, 1962, a new experimental upper partial denture with a plastic saddle was inserted in an attempt to control the palatal pressures by means of treatment with disclosing paste, etc. This had only limited success, but the tissues tolerated it better than the metal one. It is shown on the left side of the illustration.

Fig. 1995. The oral hygiene was very poor. Food and all kinds of debris were continually present. This photograph was taken in January, 1962, to demonstrate the large amount of debris which was always present.

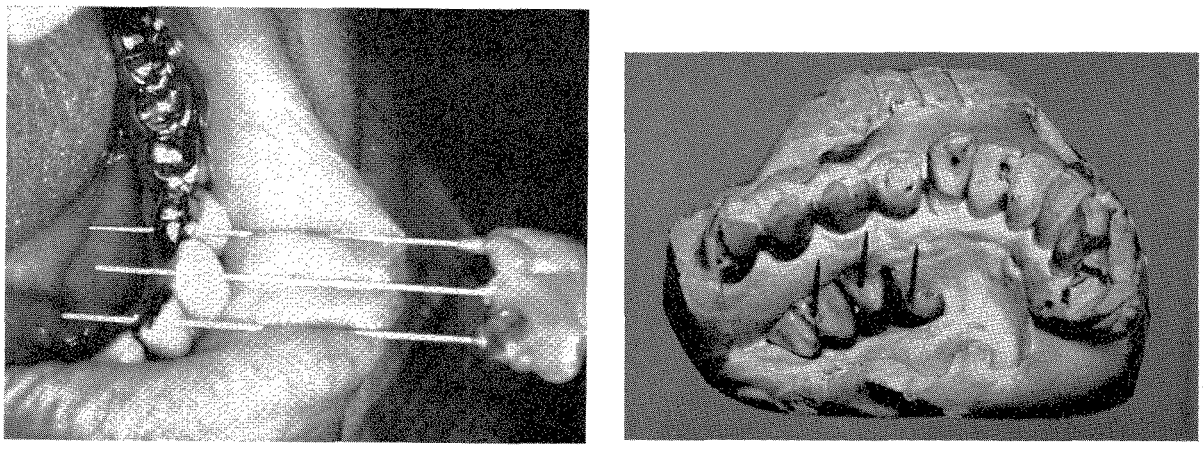


Fig. 1996. The lower left fixed bridge had been inserted in 1951. In 1961 the lower left cuspid began to separate from the lower left first bicuspid. It was decided to join this cuspid by means of a horizontal pin ledge to both anterior and posterior fixed bridges. In February, 1962, the old lower left fixed bridge was united to the new anterior bridge by means of a horizontal pin ledge splint shown in this illustration. The technique for this type of pin ledge is shown elsewhere in the text. In this instance, the lower left cuspid was joined to the left lateral incisor and to the left first bicuspid so that the final splinting ran from the left second molar to the right central incisor and joined two fixed bridges together. The method of paralleling the three pins is shown on the left. The completed pin ledge and the cast are shown on the right.

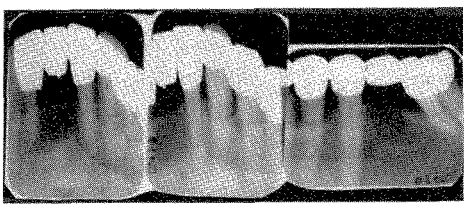


Fig. 1997. Roentgenogram of the lower anterior and left fixed partial dentures joined by horizontal pin ledges in the canine.

removal. The periodontal tissues were surgically resected. In June, 1960, the new upper restorative work was inserted. This patient was satisfied and grateful. Recently she had cataracts removed from both eyes. She has always been affected with chronic acne. Her skin was red and irritated. Her eyes were usually bloodshot. Although the previous reconstruction had lasted nearly a decade, still the results had been unsatisfactory because of the inability to return the oral tissues to a state of health. Considering the fact that the other organs of her body were in a state of deterioration, perhaps the unfavorable results of the oral treatment were to be expected. With the knowledge presently available, cures for this type of oral disintegration seemed unlikely. (Figs. 1977 to 1997.)

ON ETIOLOGY OF PERIODONTAL DISEASE

In March, 1960, a Conference on Research in Periodontal Disease was held in which participants were invited who were likely to develop some original concepts. The contributors were asked to project their own research into conceptual approaches to this serious problem. In summarizing the results of the conference, Greep stated, "This conference has dealt with the nature of the periodontal membrane and the etiological factors concerned in periodontal disease. Certainly the nature of the periodontal membrane has been clarified considerably, but little has been added to our knowledge of the etiology of periodontal disease. At least it still remains obscure to me.

"It has always seemed to me that the periodontist has been quite sure of his knowledge, and the writings in this field seemed almost to be so assured as to be dogmatic. By contrast, I was impressed that, in the considerations here today, there seemed to be little but doubt and incredulity.

"This afternoon session dealt with nutrition, environmental, and occlusal factors. There is suggestive evidence that each of these may play a part in periodontal disease, but the ignorance of how they act is simply abysmal. I did not get a single suggestion from any of the papers as to how any of these factors act. No one would call them primary factors—only contributory factors.

"This evening's sketch of the effects of systemic factors on periodontal disease left me with just this one item: that, while the periodontal membrane can reflect the impact of any or all systemic diseases, it is not possible to attribute periodontal disease to any known systemic factor."*

CARIES CAN CREATE PROBLEMS

Caries can create difficult problems for the patient and for the dentist, yet by careful continuous care in childhood, many unnecessary extractions can be avoided and the teeth retained during these important years of youth and adolescence. Needless sacrifice of pulps can also be avoided by the application of recognized operative procedures. As time goes on, it can mean the difference between normal uncomplicated dental care and the possibility of either oral rehabilitation or full dentures.

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*Greep, Roy O.: Proceedings of the Conference on Research in Periodontal Disease, J. D. Res. **41**:331-333, 1962.

Case 21—report of a family

As an example, only one family history will be presented. In 1925, the father was 34 years old. He had undoubtedly suffered from rampant caries as a youth. At the age of 37 there were fifteen nonvital teeth present. This was the period when the Mayo Brothers had called attention to "focal infection."* Nonvital teeth were being removed for the cure of every systemic infection. By 1934 this patient had had all his nonvital teeth removed. Only fourteen natural teeth remained.

Over the past thirty-six years his mouth had been reconstructed twice. At the time of writing, at 72 years of age, because of complete apathy on his part, his mouth has been entirely neglected, and it had completely disintegrated. Although intelligent, he refused all but emergency treatment.

The other consideration is "focal infection." The original sacrifice of sixteen nonvital teeth was unwarranted and disastrous in its effect upon the stomatological system of the father. It was not justified in the light of the knowledge that was known. It hastened the destruction of what remained. Where there is some doubt as to the ill effects of nonvital suspicious teeth, a conservative attitude should be maintained because the effects of hasty judgments and wholesale extractions often cause irreparable injury to the entire system. The evils caused by lack of proper

*Mayo, Charles H.: Focal infection of dental origin, D. Cosmos **64**:1206-1208; disc., 1233-1238, 1922.

Text continued on p. 994.

Fig. 1998. A, Roentgenograms taken in 1925. The patient was then 34 years old. There were fifteen nonvital teeth. This patient suffered from rampant caries as a youth. **B,** Roentgenograms taken in 1930. There were only three nonvital teeth remaining. (Figs. 1998 to 2015 are of the same case.)

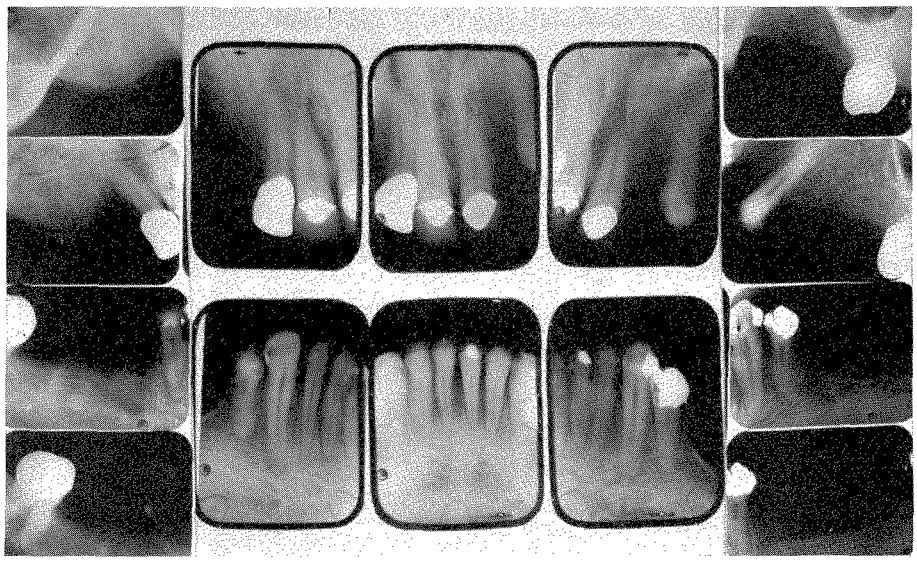


Fig. 1999. Roentgenograms taken in 1934. The nonvital teeth had all been removed. The patient was then 43 years old.

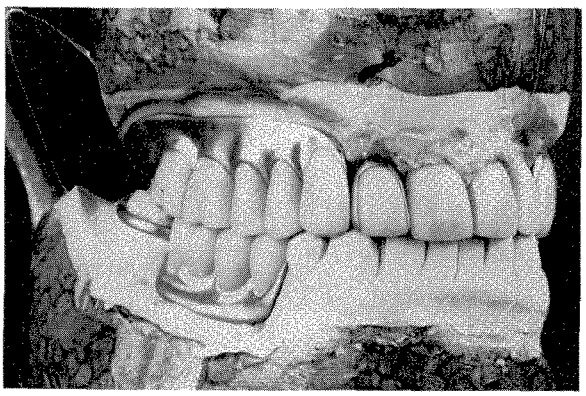


Fig. 2000. The mouth was reconstructed in 1936. A lower lingual bar and an upper precision attachment palatal bar removable partial denture were used.

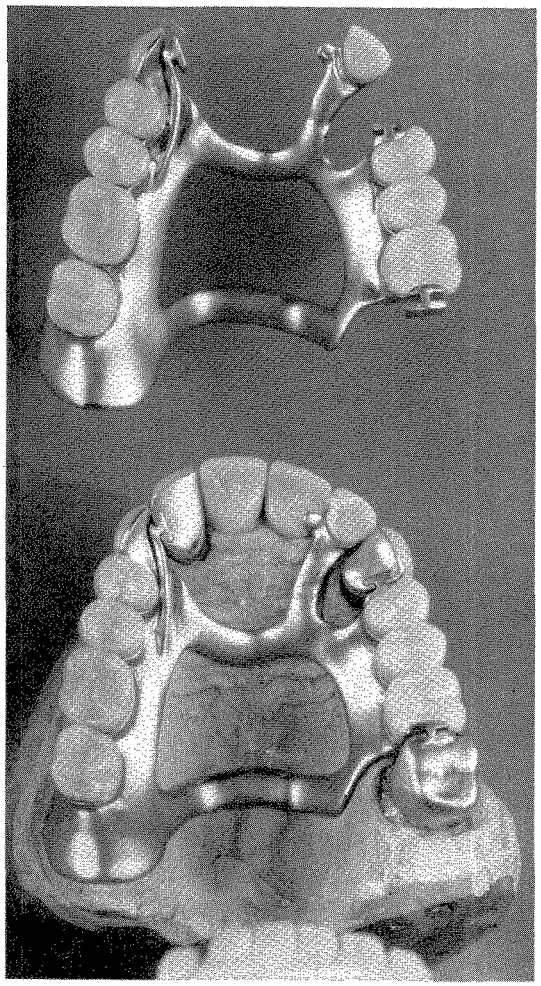


Fig. 2001. The upper bridge was retained by precision attachments and contained a heavy-gauge gold wire that acted as a breakstress. This was the type of design that was employed nearly thirty years ago. It was incorrect in principle because it allowed for too much uncontrolled movement.

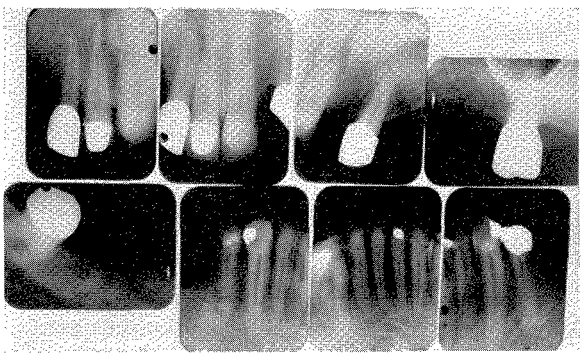


Fig. 2002. Roentgenograms taken in June, 1936. The patient was 45 years old.

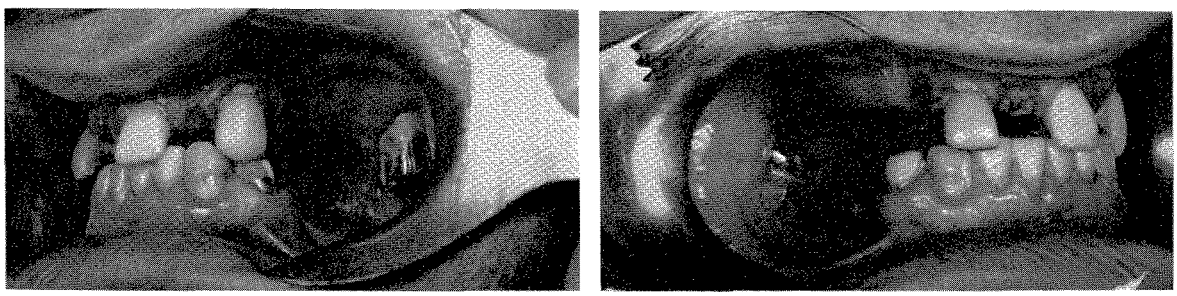


Fig. 2003. Two views of the mouth as it looked in 1939. Observe the poor hygiene.

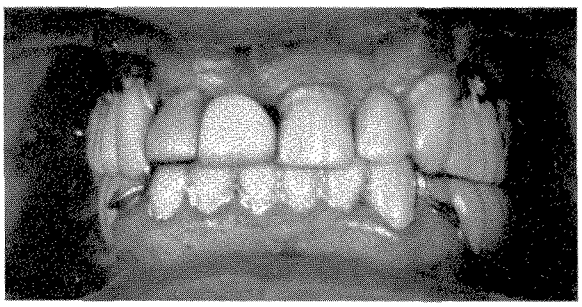


Fig. 2004. His mouth was reconstructed in 1946. A Hanau Model H articulator was used, together with a conventional technique. This is a front view of the mouth as it looked in May, 1946. Observe the poor hygiene.

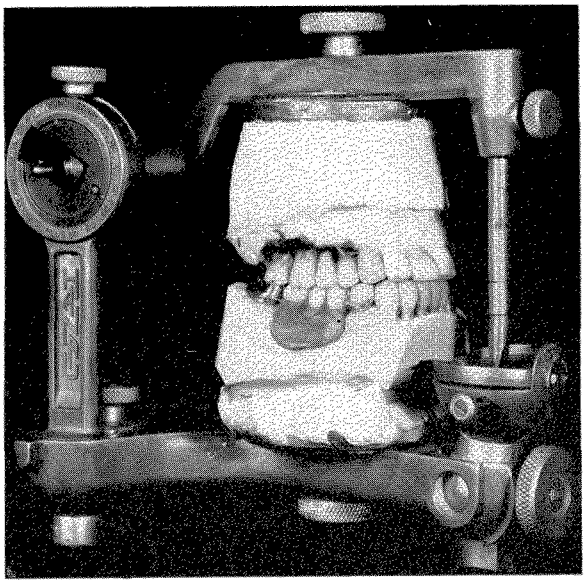


Fig. 2005. One stage during the second rehabilitation in 1946.

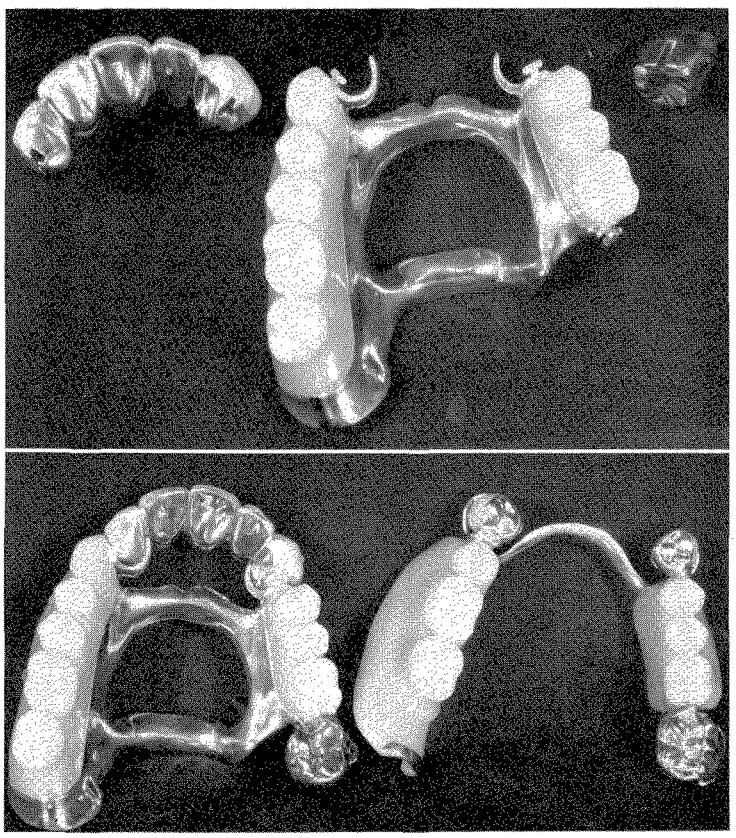


Fig. 2006. Two views of the completed work. This was completed in 1946.

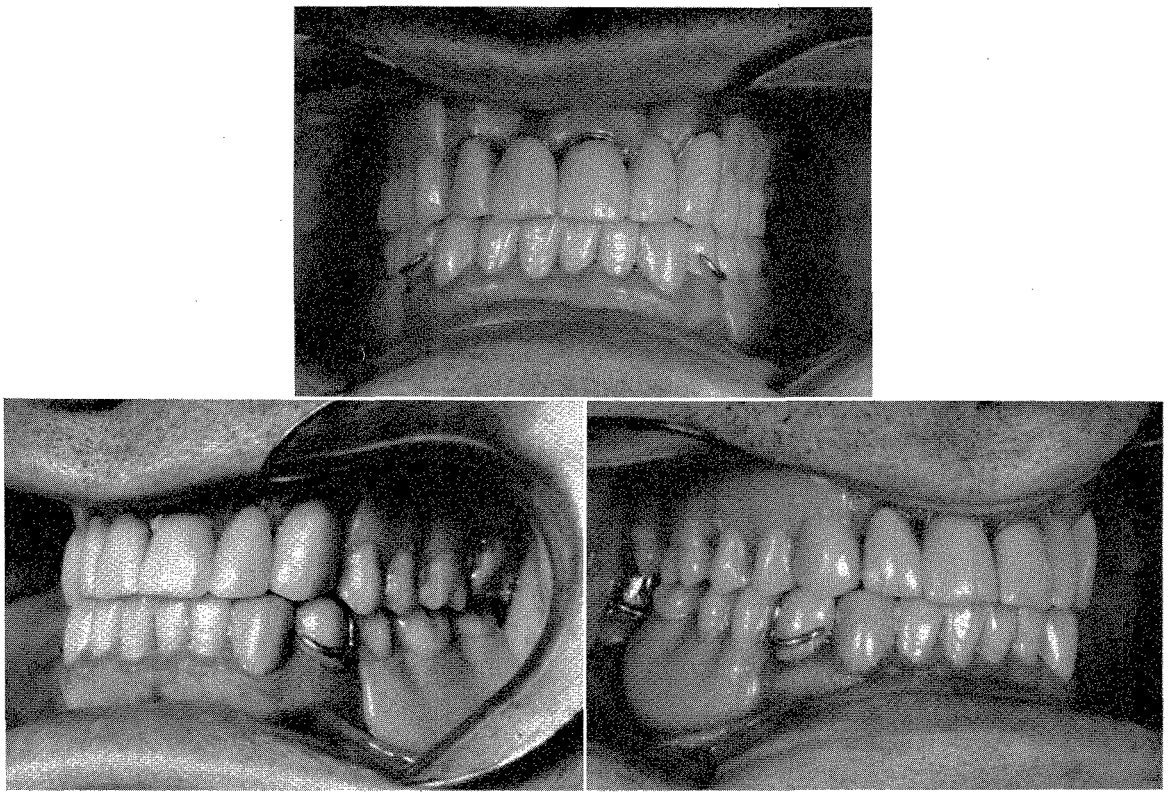


Fig. 2007. Three views of the completed work in the mouth. The prostheses were inserted in June, 1946. The patient was then 55 years old.

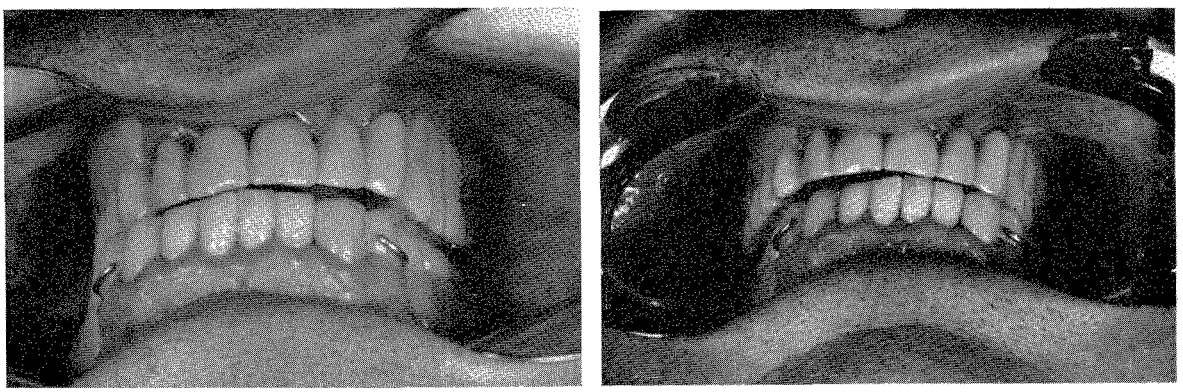


Fig. 2008. Two views of the right and left balancing and working bites.

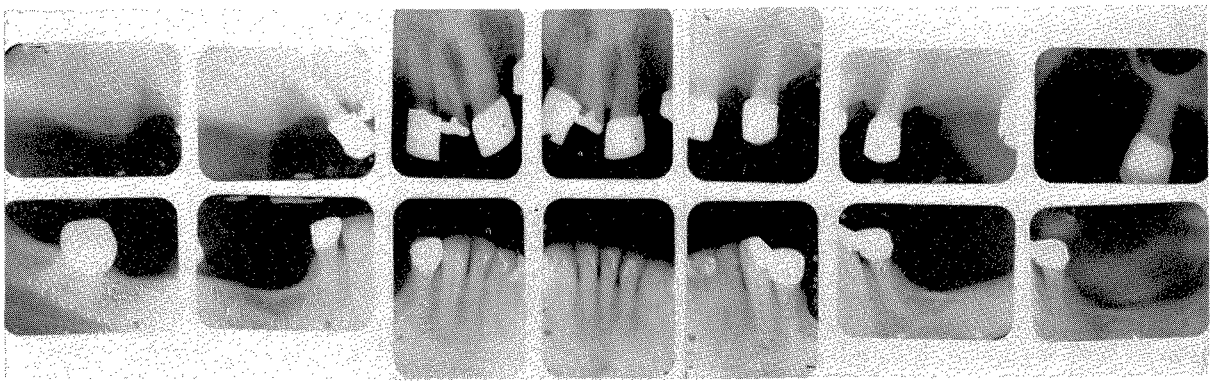


Fig. 2009. Roentgenograms taken in 1946 before the reconstruction.

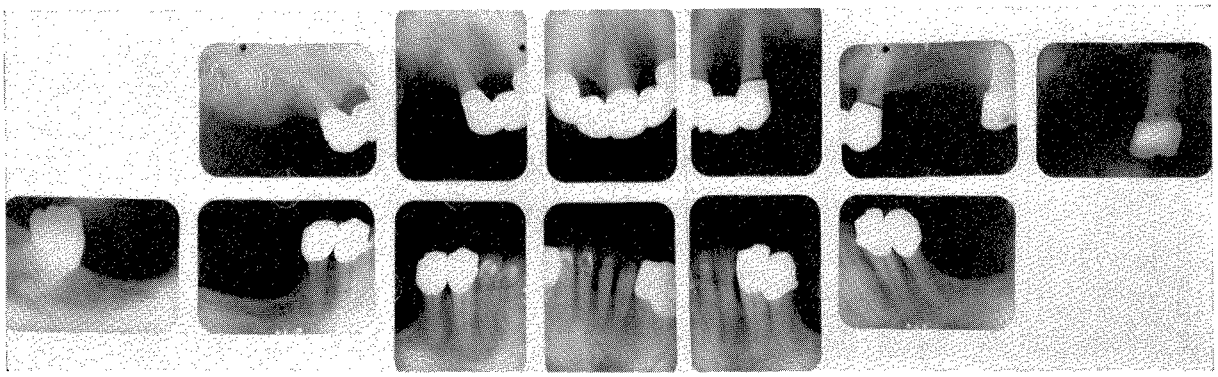


Fig. 2010. Roentgenograms taken in 1949. This was three years after the reconstruction. Neglect had already claimed the upper left cuspid.

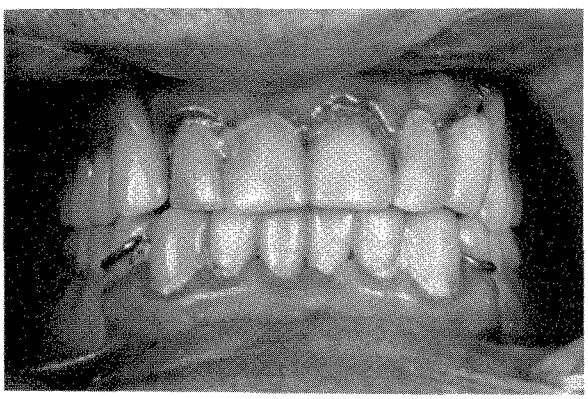


Fig. 2011. Front view of the mouth taken in 1953 showing the very poor mouth hygiene. The patient was then 62 years old.

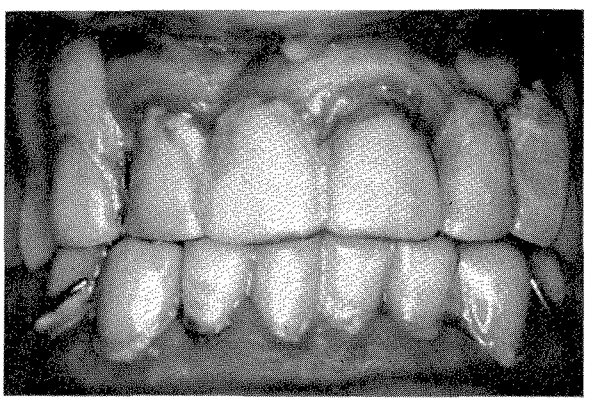


Fig. 2012. By 1955 the oral hygiene was so poor that it finally became necessary to remove the upper teeth and insert an upper denture.

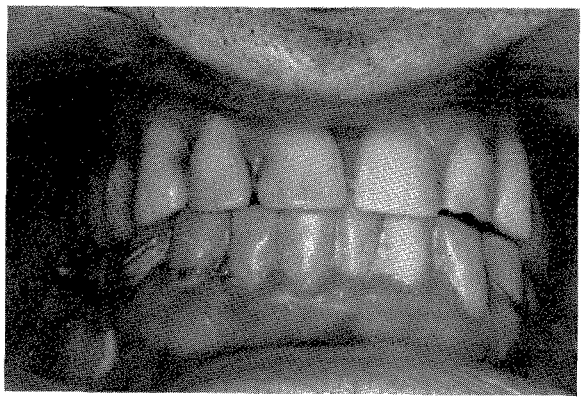


Fig. 2013. A full upper denture was inserted in 1955.

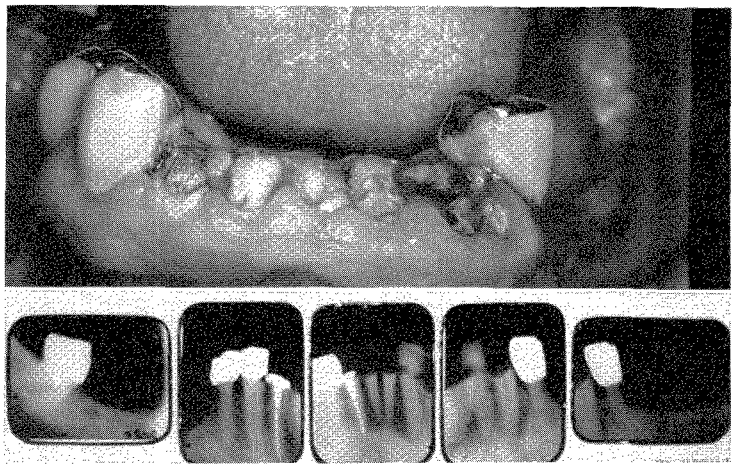


Fig. 2014. This photograph was taken in September, 1960. The lower teeth are completely disintegrating. Acute caries of a soft type has penetrated all the anterior teeth. The roentgenograms are shown in the foreground.

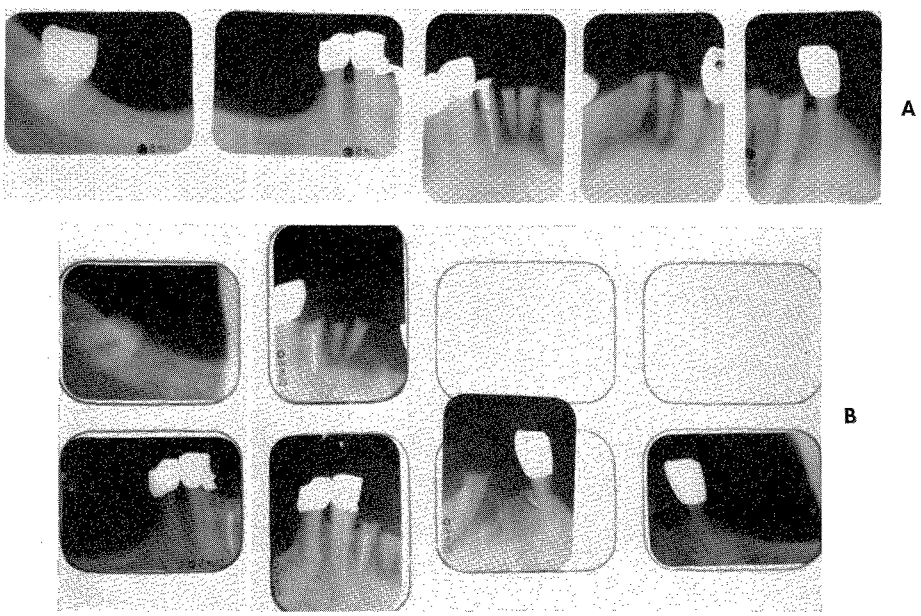


Fig. 2015. **A**, Roentgenograms taken in 1962. The patient was then 71 years old. He no longer seemed to care what happened to his mouth. **B**, Roentgenograms taken in June, 1963. No dental treatment had been given in several years except emergency treatment to relieve pain or to extract an infected tooth.

function of the masticatory system can far surpass the possibility of evil that may be caused by focal infection. Where the issue is clear-cut and the infections are definite, there is no doubt of the wisdom of their removal. Otherwise, all other possible causes should first be eliminated.

This man had been taking various kinds of the miracle drugs to relieve emotional tensions. Five years previously he began taking one of the newer miracle drugs and took it daily to the time when last seen. Whereas formerly for many years his teeth had been affected infrequently by caries, during the previous five years they became soft, and rampant decay had destroyed many of them. The type of decay and the quickness with which it progresses were most unusual. It is possible that the drugs which he was taking were responsible for the caries. Many instances of this have been presented previously in this text. Refined sugars, which are concentrated and kept in the mouth for periods of time, such as lozenges, must also be considered. This patient sucked these tablets every evening while watching television. (Figs. 1998 to 2015.)

Case 22

His wife's roentgenograms extend over a thirty-year period from 1933 to 1962. In 1933 she was missing three third molars, and since then lost only the remaining

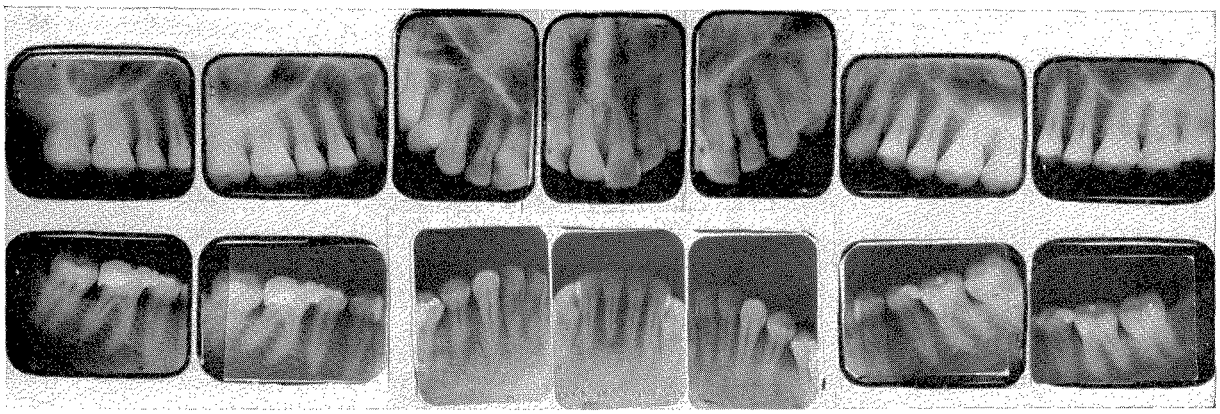


Fig. 2016. Roentgenograms taken in 1933 of a woman in her early thirties. (Figs. 2016 to 2019 are of the same case.)

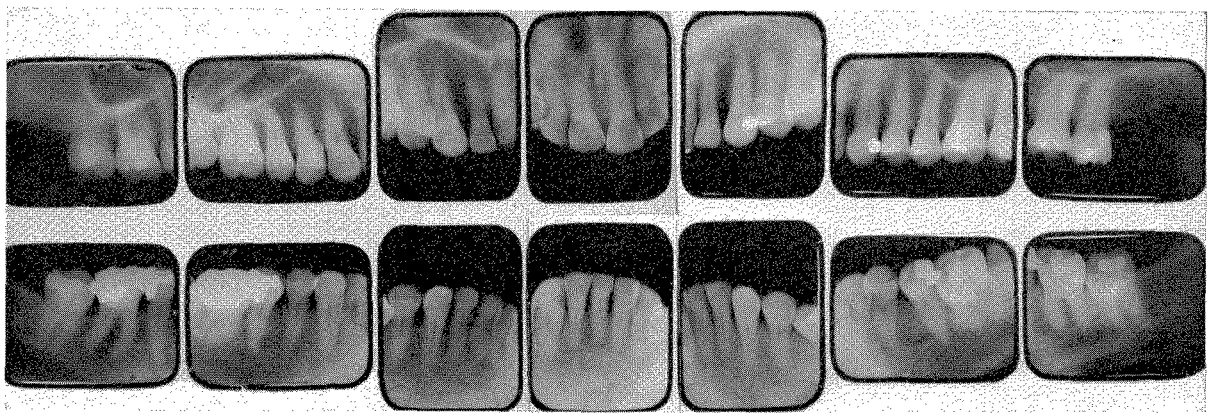


Fig. 2017. Roentgenograms taken in 1949.

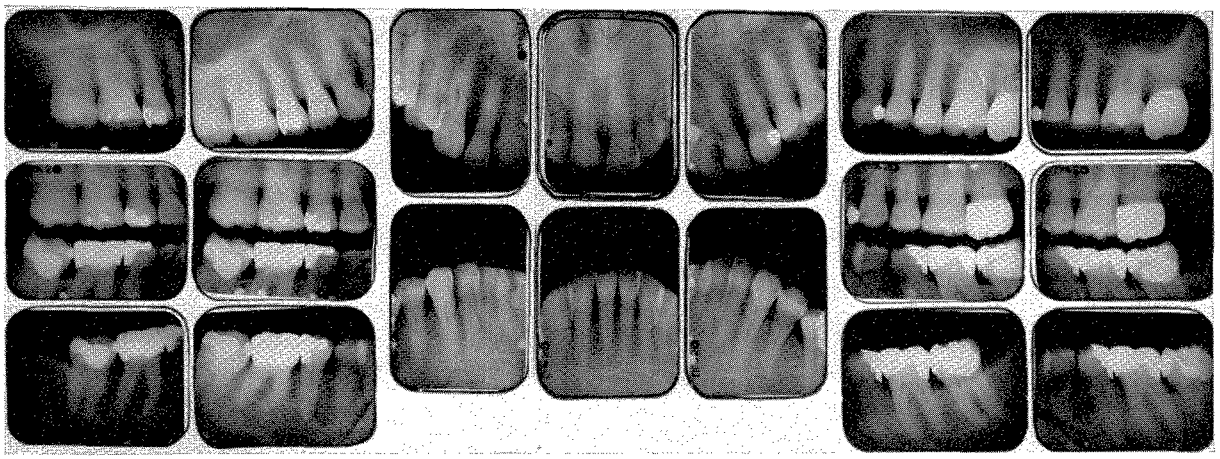


Fig. 2018. Roentgenograms taken in September, 1963. The patient is now in her early sixties. The oral structures are good.

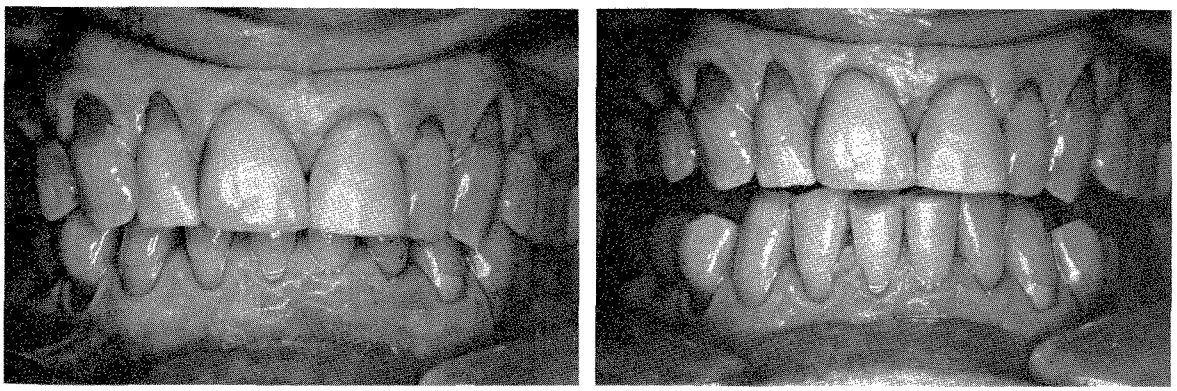


Fig. 2019. Two views of the mouth taken in 1963. The vertical overbite was deep. Observe the deep drop of the occlusal plane posterior to the lower cuspids.

third molar. Other than that, her oral structures were in excellent condition. In 1962 she was in her sixties. (Figs. 2016 to 2019.)

Cases 23 to 25

This couple had three sons. Two of them had rampant caries during their youth and adolescence similar to their father. By exercising patience and careful operative treatment, both of these young men were carried through the dangerous dental period of their lives with a minimum of tooth or pulp losses. At the time of writing both of them had excellent functional occlusions. The treatment was difficult and time consuming, but the results had been gratifying. The third son did not have rampant caries but inherited his mother's dental structures. He also had a full complement of healthy teeth. These young men were between 30 and 40 years old. Although it is not always within our power to accomplish these results, it is possible in more cases than are actually accomplished. (Figs. 2020 to 2026.)

Cases 26 and 27

Many future problem cases can be avoided by the meticulous and diligent care given to these youthful patients. (Figs. 2027 to 2029.)

Many of these problem cases cannot really be considered failures in the true sense of the word. Failure in these cases rather indicates a deterioration, a sort of decay. The body becomes weak and with it the organs give way. No grave mistakes

Text continued on p. 999.

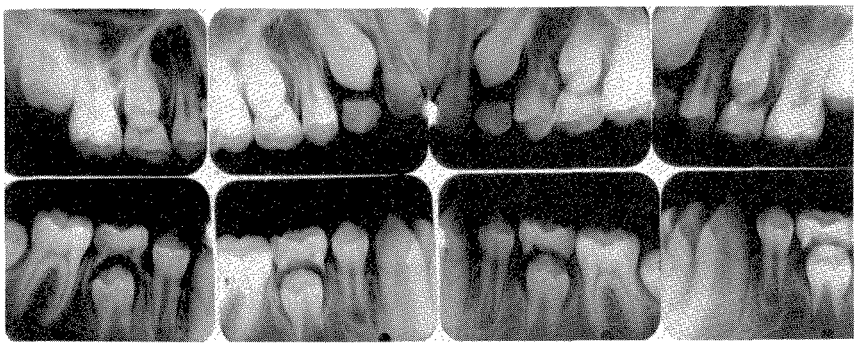


Fig. 2020. Roentgenograms of one son taken in 1938 at the age of 11 years. This was one son of the parents whose photographs are shown in Figs. 1998 to 2019. (Figs. 2020 to 2022 are of the same case.)

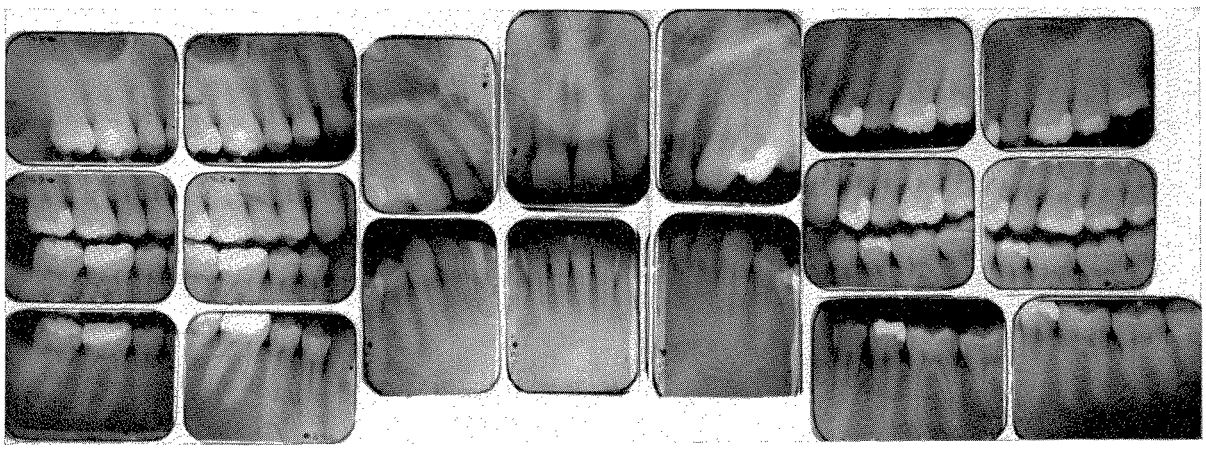


Fig. 2021. Roentgenograms taken in 1962 at the age of 35 years. The structures were good. This is the same patient whose roentgenograms are shown in Fig. 2020.

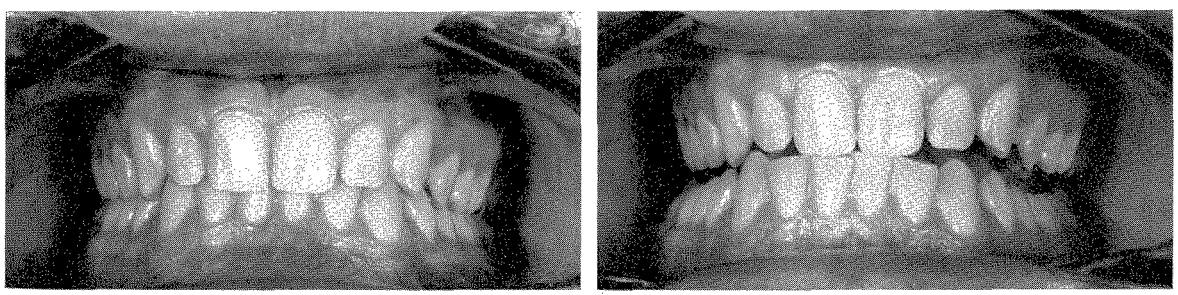


Fig. 2022. Two views of the mouth of the patient whose radiographs are shown in Figs. 2020 and 2021. These were taken at the age of 26 years.

Fig. 2023. Roentgenograms taken in 1942 of another son of the parents whose photographs are shown in Figs. 1998 to 2019. The young man was 12 years old when these were taken. (Figs. 2023 and 2024 are of the same case.)

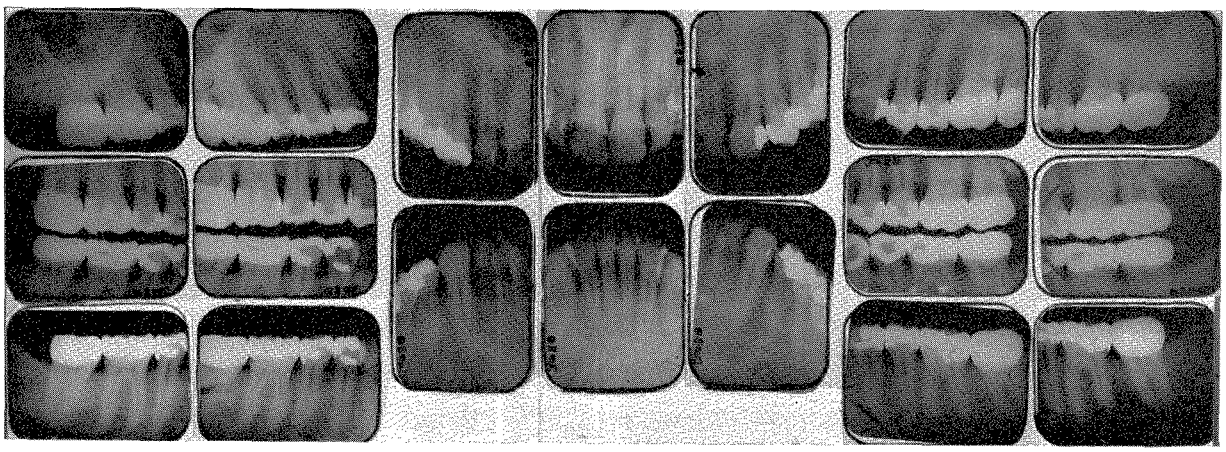


Fig. 2024. Roentgenograms taken in 1962. This patient was 32 years old. The caries were rampant, but effective dental care saved his teeth.

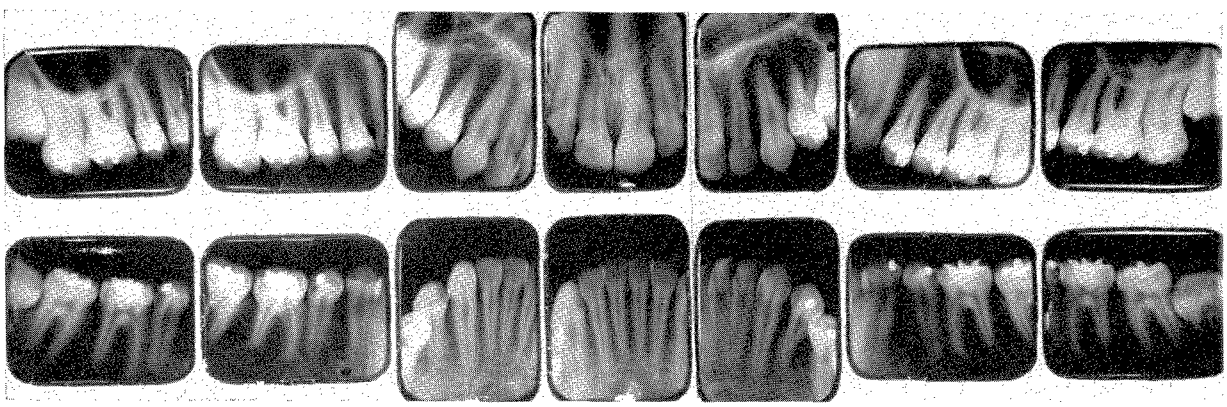


Fig. 2025. Roentgenograms of a third son of the parents whose photographs are shown in Figs. 1998 to 2019. These were taken in 1936 at the age of 14 years. (Figs. 2025 and 2026 are of the same case.)

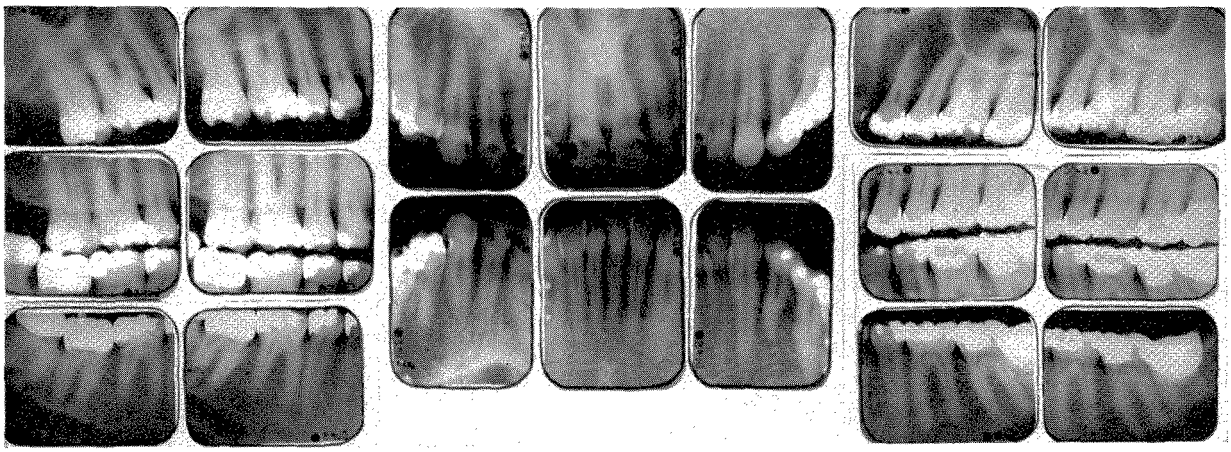
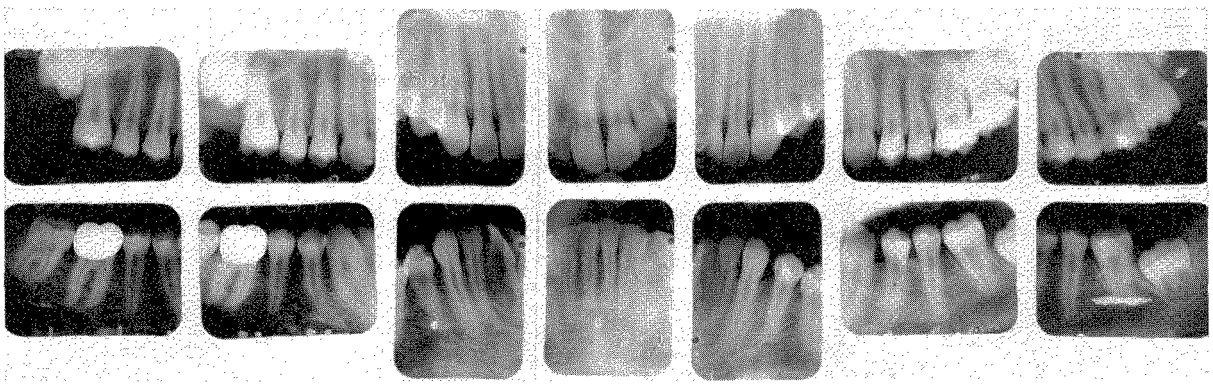


Fig. 2026. Roentgenograms taken in 1961. The patient was 40 years old. He also suffered from rampant caries, but not quite so severely as his brother whose radiographs are shown in Figs. 2023 and 2024. Conscientious dental care saved this patient's teeth.

A



B

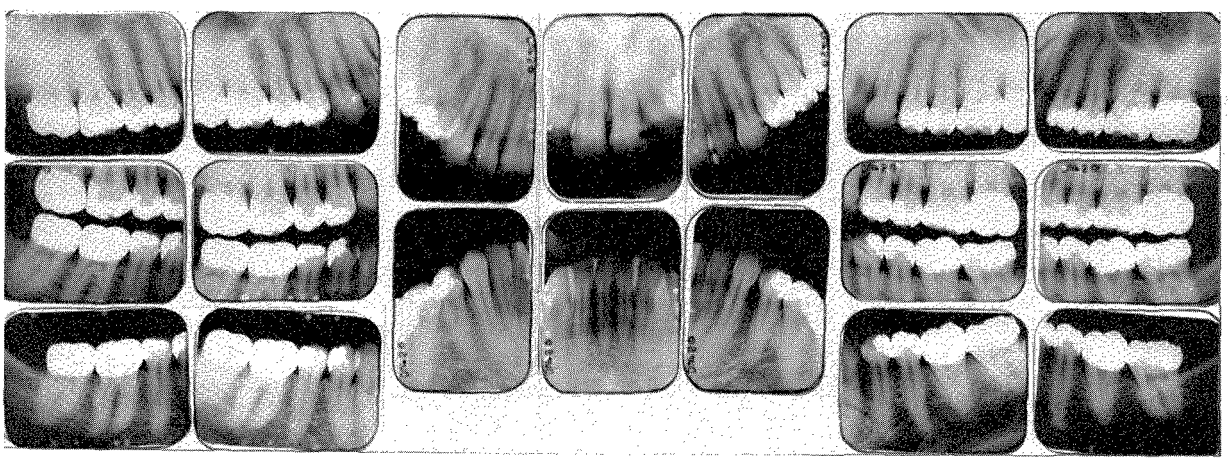


Fig. 2027. Another patient who is now in her early twenties (1963) suffered from rampant caries when in her teens. Diligent dental care and excellent parental supervision saved her teeth. **A,** These roentgenograms were taken in April, 1950. **B,** These roentgenograms were taken in November, 1962.

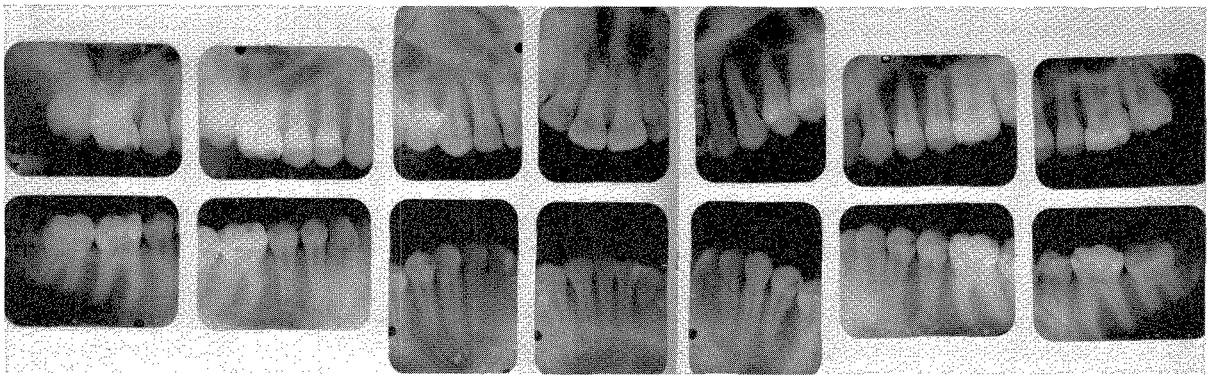


Fig. 2028. Roentgenograms of the teeth of a 13-year-old female patient. These were taken in February, 1949. (Figs. 2028 and 2029 are of the same case.)

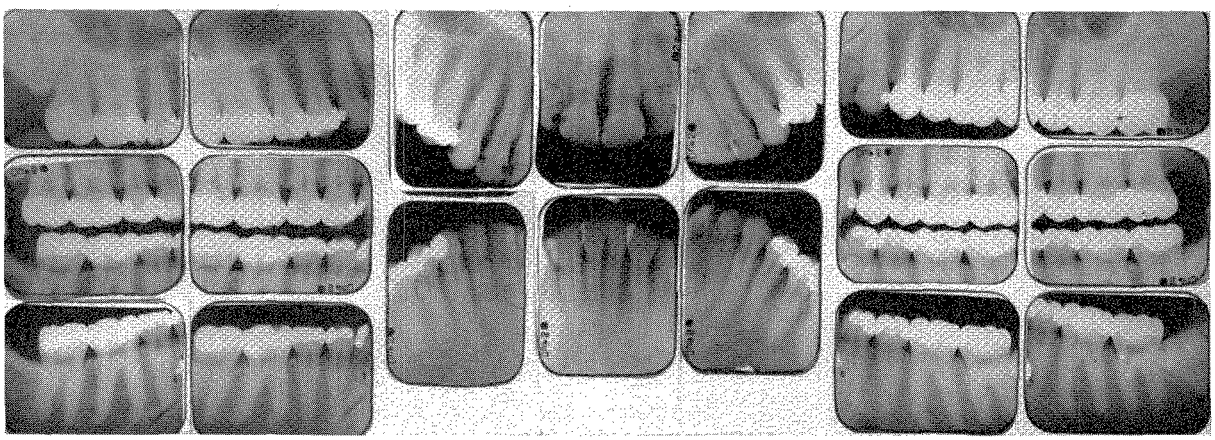


Fig. 2029. Roentgenograms of the teeth of the patient shown in Fig. 2028. These were taken twelve years later, in November, 1961. They indicate that rampant caries had invaded her teeth, but by good dental care the teeth have been well protected. In cases such as these, which are not too infrequent, without this meticulous dental attention the teeth are subject to rapid disintegration.

have been made in judgment or in evaluation. The dentist has not been found wanting in either his actions or in his duties.

There are some patients who are determined to save their teeth regardless of what the effort requires in time, money, and energy. They are even willing to gamble with the possibility of retaining some teeth that are questionable from the point of view of focal infection.

Case 28

In 1934 a 30-year-old woman was examined. Five teeth were already missing. Of the remaining, ten were nonvital and either infected or suspicious for infection. Several others were carious. From the roentgenograms that were taken at that time, it was easy to read the past history. Rampant caries had taken a great toll during her teens. Constant vigilance on the part of her parents and her dentist had succeeded in retaining what was found in 1934.

Her medical advisor was consulted relative to her general health. He disadvised

the extraction of her questionable nonvital teeth in view of her excellent general health. He was perfectly willing to assume the responsibility for their retention.

The time spent with the patient at this time is very important. The dentist must act as an interpreter and evaluate the pros and cons of what remains. Then the patient must make his decision. If the patient elects to retain his teeth and to accept the responsibilities which this decision entails, the dentist must also be sincere in his efforts to help the patient toward this goal, but both the patient and the dentist must have an objective insofar as the oral scheme is concerned. (See pp. 925 and 926, Figs. 1856 and 1857.) The alveolar bone and the soft tissues were always in excellent condition in the case of the patient just being described. Over the years her teeth were protected carefully in whatever manner was necessary. In the fall of 1962 the lower right bicuspid fractured. At that time the nonvital incisor was also removed, and the lower teeth were reconstructed as shown in Fig. 2034. The patient was in her late fifties and had twenty of the twenty-seven natural teeth which she had in 1934. The dentist had made the necessary effort, and the patient has given her full cooperation. No one knows what the future holds in store for her, but if more extensive work is required, she is better prepared to accept it. (Figs. 2030 to 2034.)

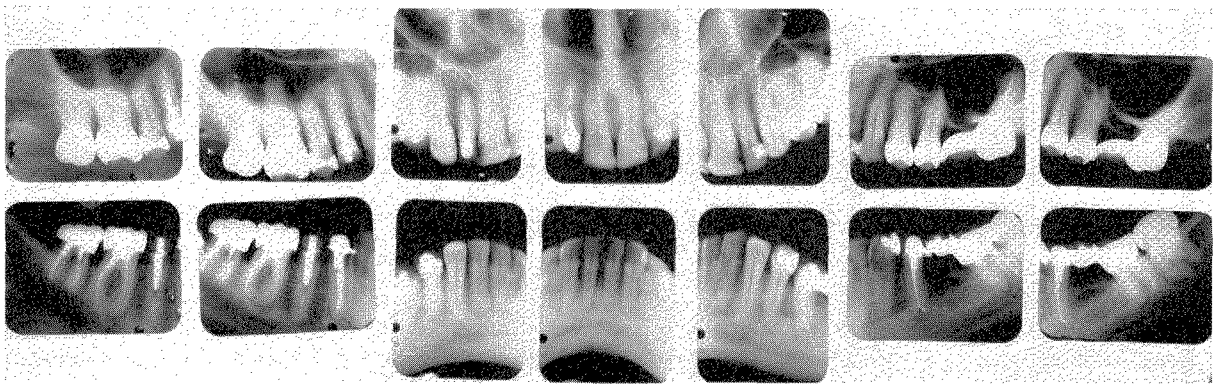


Fig. 2030. Roentgenograms of the teeth of a 30-year-old woman. These were taken in 1934. They indicate that rampant caries invaded her teeth at an early age. (Read text.) (Figs. 2030 to 2034 are of the same case.)

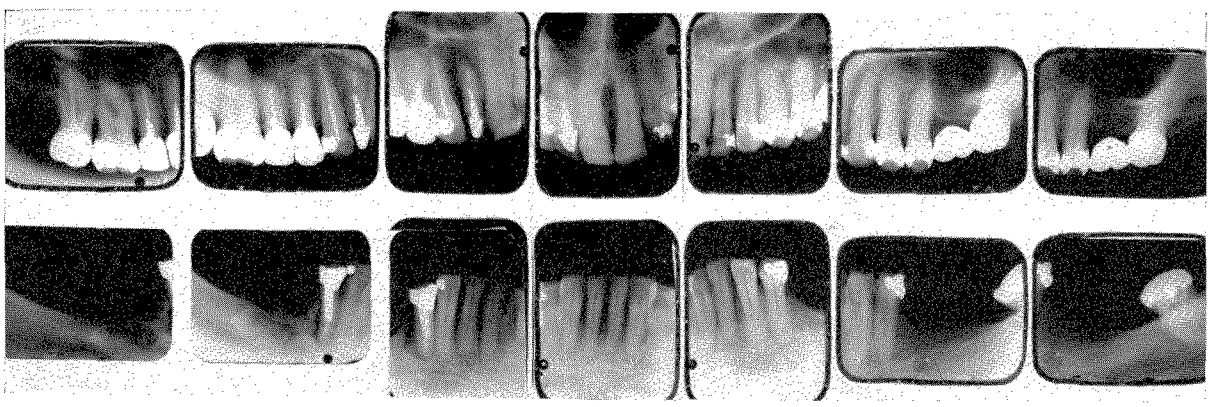


Fig. 2031. Roentgenograms of the teeth taken in 1944.

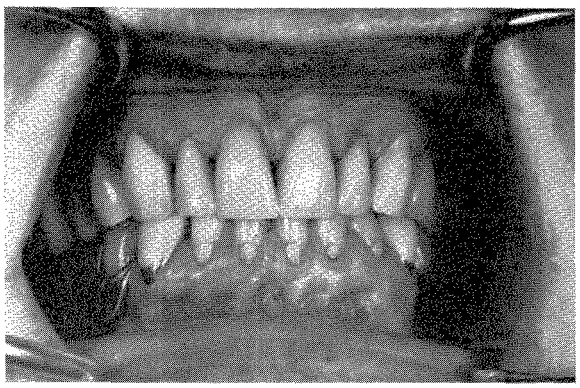


Fig. 2032. Front view of the mouth taken in 1951 at the age of 47 years.

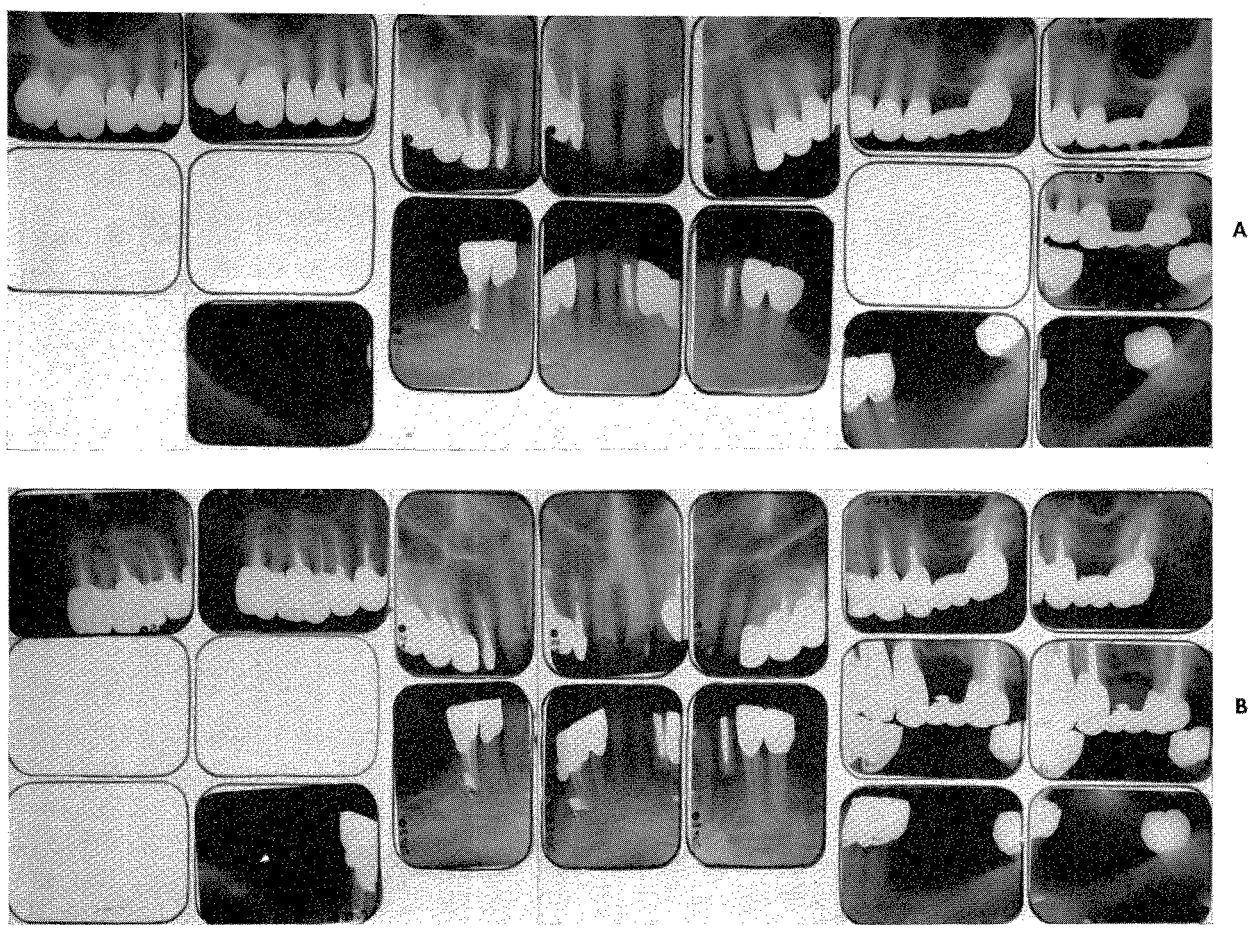


Fig. 2033. A, Roentgenograms of the teeth taken in 1958. **B,** Roentgenograms of the teeth taken in 1962. The patient was in her late fifties.

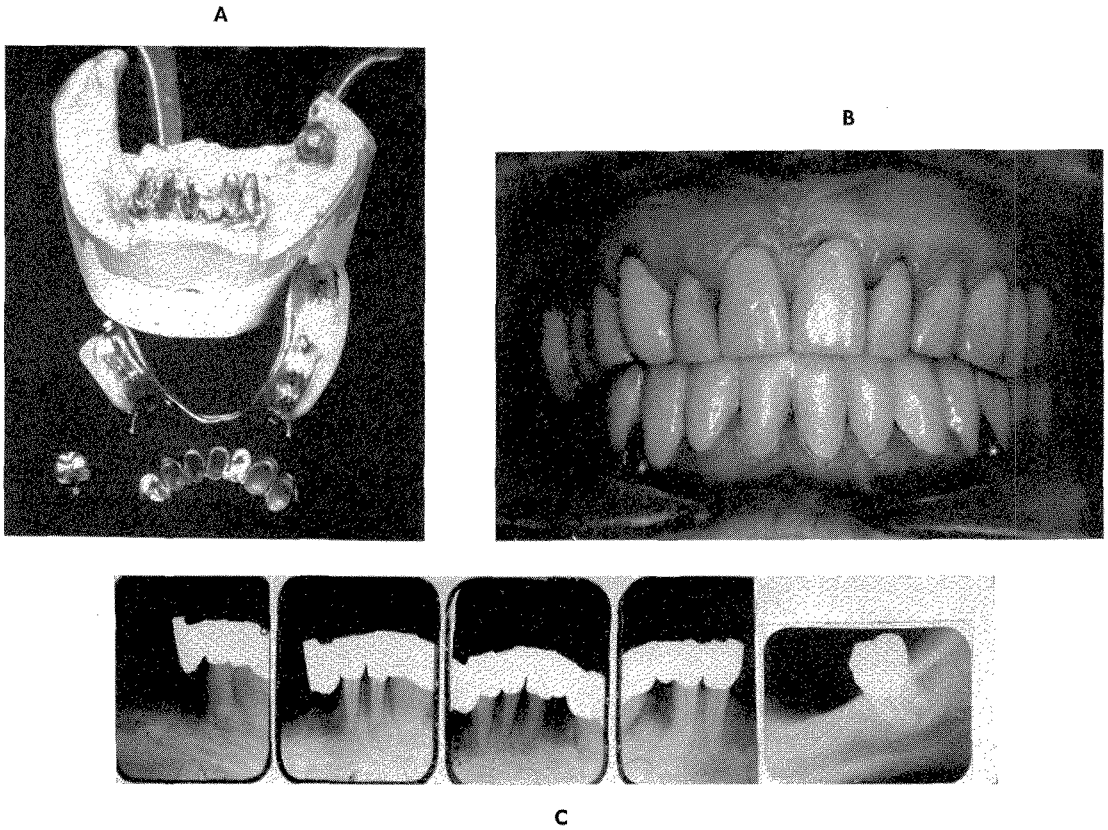


Fig. 2034. A, In September, 1962, the lower right first biscuspid fractured. It was removed, together with the nonvital incisor, and the lower teeth were reconstructed. The new fixed anterior splint contained seven units. The fixed and removable parts are shown in this illustration. Precision attachments were employed for the retaining devices. **B,** This photograph was taken in May, 1963. The new lower prosthesis is in place. **C,** Roentgenograms of the final lower reconstruction taken in May, 1963.

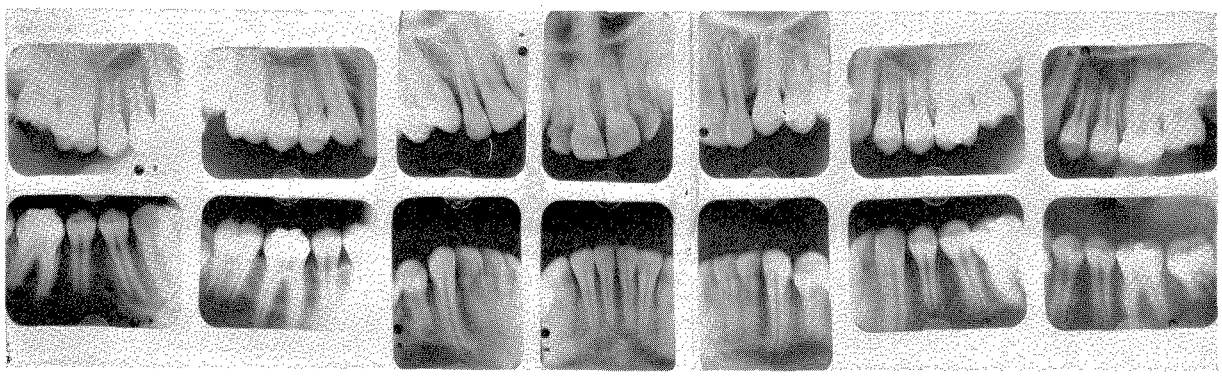


Fig. 2035. Roentgenograms of the teeth of a 12-year-old boy taken in 1938. This was the son of the patient whose teeth are shown in Figs. 2030 to 2034. (Figs. 2035 and 2036 are of the same case.)

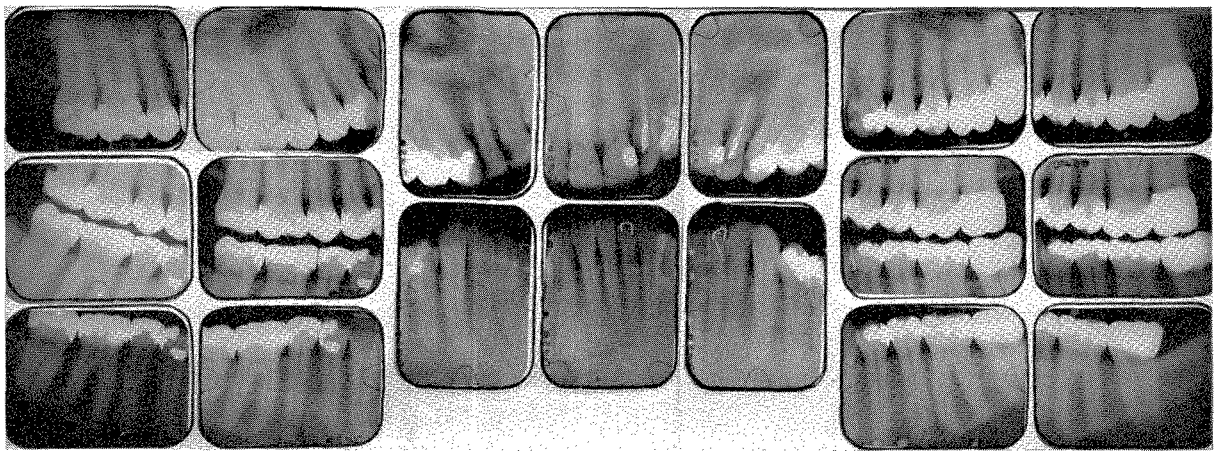


Fig. 2036. Roentgenograms of the teeth taken in 1962. The patient was 36 years old.

Case 29

The son of the patient whose mouth was just described has been treated since he was 12 years old. He also suffered from rampant caries at a very young age. Only excellent parental guidance and conscientious dental treatment brought him through this dangerous period of his dental life with minor injuries. Without this care his oral structures would have disintegrated long ago. As it is, he still had twenty-eight teeth with only one nonvital lateral incisor. The care and vigilance are not easy, but they are well worthwhile and as a rule are very much appreciated. (Figs. 2035 and 2036.)

Chapter 15

SUMMARY AND CONCLUSIONS

In the preceding chapters about two hundred cases were reported, some in great detail, whereas others just briefly. In each instance some problem was present, and it was for this reason that they were selected from a much larger group of average cases in which success was attained and maintained with much greater ease. Every patient who desires treatment has some problem, if any form of restorative dentistry is necessary, but in selected instances the problem requires a deeper understanding of the physiological and biological forces that tend to establish health as we know it. In many cases the ability to understand the causes of health and disease are still unknown. For this reason complete success in the solution of these problems continues to evade us.

It is not often that a reader is given the opportunity to review the histories of so many patients who have been documented for such great lengths of time in one textbook. In retrospect, I would have probably approached some of these problems differently. However, if one considers how many intangibles, other than actual concepts and techniques, are involved, the results may not have been very different even if these cases were attempted at this time when our knowledge is more extensive.

VARIATION OF RESPONSE

In the treatment of these patients, variation stood out as an important factor. No two cases were alike or responded in the same manner, yet, in spite of this, there were quite a few predictable cause and effect relationships. For example, in most cases involving closed bites that were restored or raised in the process of treatment, the original relationship usually returned. It was necessary, however, in most instances to inject the fourth dimension, namely, time, in these studies. However, when given the time factor, the evidence was unmistakable. Although this does not mean that these bites were not to be restored by increasing the vertical dimension in order to permit the insertion of prosthesis that otherwise seemed

impossible, still the increasing of the vertical dimension is a complex procedure. The origin and insertion length of the muscles that are responsible for the operation of the stomatological system more often than not cannot be changed to any degree from the dimension that the patients presented when they were first examined. What happens in the greatest majority of the cases in which the vertical dimension has been increased in order to obtain sufficient space to insert prostheses is a return to the original vertical dimension after a lapse of time, but the inserted prosthesis is usually accommodated by the process of intrusion of the teeth and the recession or atrophy of the bone and soft tissues and/or both.

PROSTHODONTIST SHOULD BE GIVEN CREDIT FOR CALLING ATTENTION TO IMPORTANCE OF OCCLUSION

The importance of correct interocclusal relationships has been a major concern of prosthodontists for over half a century. They have written an imposing amount of literature and have advanced many theories in support of correct interocclusal relationships. It would be easy to name the many prosthodontists who not only have stressed the importance of correct maxillomandibular positions but also have invented articulators to carry out their ideas. An enormous amount of this work was done long before any of the other specialties were even recognized. If correct maxillomandibular relationships and proper intercuspal coordination are responsible for healthy supporting tissues, then the prosthodontists should be given full credit for their multitudinous past and present efforts in this direction.

ARTICULATORS

Although articulators are to be recommended in coordinating the interocclusal relationship, they are difficult to rely upon because, for one thing, the records and the settings are the work of the operator. Inaccuracies are injected consciously or unconsciously that upset the entire theory upon which the articulator depends. The correctness of any particular concept of occlusion and articulation is largely based upon the background and the ideas of the human mind behind it. This, in turn, depends upon man's idea of how a person performs functional and empty chewing. My experiences teach caution in promoting any specific school of thought. On the other hand, since articulators must be used, especially when oral rehabilitation is undertaken, the dentist should strive to become proficient in the theory and operation of one or another of the several that are now available. All concepts of occlusion are open to discussion. Within the past decade, the principles of gnathology, as interpreted by the present adherents of this theory, have been challenged. In my opinion, no suitable answers to the criticisms leveled at it have yet been given. Good results have been obtained even in complex cases involving complete oral rehabilitation by skillful, experienced operators using diversified techniques with dissimilar articulators. However, all of these operators were meticulous in carrying out all details and were aided by skillful technicians.

ORAL HEALTH IN SPITE OF MALOCCLUSION

Too often the examination of the mouths of elderly patients has revealed that not only have a large proportion of their natural teeth been retained but also their investing tissues were in excellent condition, and this in spite of many so-called malocclusions. In others of this old age group, teeth that had been extracted in youth and had not been replaced have caused no serious interference either with structure or with function. Examples of these cases have been reported in this book with documentation extending over long periods of time. Although it would be presumptuous of me to draw any definite conclusions as to the cause of the longevity in these individuals, I cannot help but consider the systemic factor, rather than the interocclusal relationship, as the main cause of the good health and normal function.

IMPORTANCE OF SYSTEMIC FACTOR

Given a good systemic factor, then the interocclusal relationship seems to be of secondary importance. On the contrary, with an excellent interocclusal relationship but a subnormal systemic factor, deterioration will take place regardless of our efforts. The difficulty in finding a correct solution to our oral problems is that we have not yet discovered what constitutes a good systemic factor other than to agree that it is not the local environment. We do suspect that the small amount of time that is used daily in functional chewing cannot be responsible for the great amount of damage for which it has been accused. Idle grinding, clenching, and the gritting of the natural teeth during a large portion of day and night seem to be the chief offenders in those dentitions whose deterioration is suspected of being caused by a traumatic interocclusal relationship.

DIFFERENT CONCEPTS OF WHAT CONSTITUTES NONTRAUMATIC INTERCUSPAL RELATIONSHIP

For the individuals just mentioned, it is important that the interocclusal relationship and the jaw position be coordinated to whatever our particular idea of what constitutes a nontraumatic intercuspal relationship. Many ideas have been advanced for this, among which are the following:

1. Functional contact of only individual groupings of teeth at one time. This can be designated as segmental occlusion.
2. Multitudinous simultaneous contact of all teeth during centric and functional movements, namely, on or near the horizontal plane.
3. Contact of all the teeth only when they engage in the final 1 or 2 mm. of closure. This had been called the "terminal functional orbit."
4. Contact of the posterior teeth from the cuspid backward only on the working side with the balancing side removed from contact.
5. Cuspid protection. In this concept, the upper cuspids act to protect the posterior teeth from wearing out. The cuspids are so arranged in the final inter-

occlusal relationship that they cause the posterior teeth to separate as the individual engages in lateral gliding movement.

6. Action of the cuspids as a pattern for forming the entire posterior interocclusal relationships. In this theory, the cuspids act as guides and direct the formation of the posterior cusp carvings for the final work. Contrary to the previous theory of "cuspid protection," the cuspids and the posterior teeth have simultaneous contact in lateral excursions on the working side. This concept is based upon the old theory of the functional chew-in.

BRUXISM AND CLENCHING CAN CAUSE ORAL DISINTEGRATION

Thus we see that coordination of the occlusion depends upon one's ideas of what he believes to be normal. For those patients who possess good function and structure, in spite of missing teeth and apparent malocclusion, one may conjecture that they do not engage in bruxing, clenching, or idle grinding during the hours between their meals. These noxious influences probably account for a large percentage of occlusal breakdown. It can also be deduced that in elderly people, who present unworn cusps, the method of functional chewing is predominantly vertical with underemphasis of the lateral sliding movements on the horizontal plane.

CARIES VS. PERIODONTAL DISEASE AS CAUSE OF TOOTH MORTALITY

It is often claimed that periodontal disease is the greatest cause of tooth mortality. However, several recent research reports, in which the causes of tooth loss were documented, attribute the responsibility equally to dental caries. Documentation is more realistic and much more scientific than mere assumption. If the causes for the loss of the final teeth are to be considered in their proper order, and if the time or age factors are included, then dental caries must contend with periodontal disease. The former takes the far greater role in the younger group, whereas the latter takes the lead with age. Even in this older group, an impressive number of cases of periodontal disease may be traced to the premature loss of teeth as a result of caries in the younger group and the failure to replace these missing teeth. This, then, becomes an indirect cause of tooth loss during aging.

DOES FAULTY OCCLUSION CAUSE PERIODONTAL PATHOLOGY?

Those who, without adequate documentation, would ascribe tooth loss mainly to periodontal disease, maintain that faulty occlusion is largely responsible for this periodontal pathology. Quite naturally, they prescribe the correction of faulty occlusion as the "major aim of dentistry." Although I do not wish to deny that correct occlusion is desirable, many of my documented cases do not substantiate

the contention that periodontal disease is caused by an incorrect interocclusal relationship. The etiology of many types of periodontal disease is still unknown. It is often referred to as the "systemic factor" because of its general rather than its local background. Only in selected cases has periodontal pathology been eliminated by correcting the interocclusal relationship and/or the maxillomandibular relationship. It has been stated that "the problem of articulation is without a doubt the basis of all of our dental problems" and that "evidence is ever mounting that most of our periodontal problems are strictly those of occlusion."*

Neither clinical nor laboratory investigation substantiates the above statements. Periodontists and orthodontists are still seeking the causes of the diseases and malocclusions encountered by their specialties, and, in so far as prosthodontists are concerned, there is still considerable disagreement as to what constitutes the ideal static and dynamic interocclusal relationship. Until more valid answers can be advanced, we must conclude that, at least for the present, "the articulation of teeth is not the basis of all of our dental problems." Dentistry has many aims. It strives to maintain optimal health in the stomatological system. This includes longevity and adequate function without premature deterioration and also includes good esthetics. To attain these goals many services are required, such as efficient periodontics, orthodontics, oral surgery, prosthodontics, pedodontics, endodontics, and operative dentistry. Dentistry does not distinguish one area as being more important than another.

CONSERVATIVE OPERATIVE AND PROSTHETIC TECHNIQUES RECOMMENDED

If the observations mentioned are considered, then fewer cases of full oral rehabilitation should be undertaken. Instead, the mouths of more patients should be cared for carefully during youth and middle age by efficient but more conservative operative and prosthetic procedures. Segmental occlusion provides a more rational concept of an adequate functional relationship for the majority of people. It provides an intimate interocclusal contact of certain sections of the arches at a given time. Although this may be contrary to the simultaneous multitudinous contact theory, this latter concept has insufficient scientific documentation to prove its superiority over the segmental theory. There are a sufficient number of cases, some of which have been reported in this text, in which recognized conventional conservative operative and prosthetic procedures have maintained the integrity of the stomatological system that otherwise would have deteriorated rapidly. What should be stressed in graduate and undergraduate teaching is the conservation of the natural teeth at the given vertical dimension and interocclusal relationship which the patient presents, rather than the teaching of radical techniques, the majority of which have proved disastrous to the health and longevity of the stomatological system.

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*Lucia, Victor O.: The fundamentals of oral physiology and their practical application in the securing and reproducing of records to be used in restorative dentistry, J. Pros. Dent. **3**:213, 1953.

TOTAL REHABILITATION INDICATED FOR SOME CASES

This does not infer that there are not exceptions which must be treated by total reconstruction utilizing complex techniques and for whom the maxillomandibular relational position and the vertical dimension must be changed. These are, however, the exceptions and not the rule and should be evaluated carefully in order to be sure that such radical changes are called for. Far too many mouths that might have been allowed great longevity and normal function by simple techniques have been subjected to the paradox of destructive reconstructions.

REGARDING OPEN BITE

Regarding the open bite, it has generally been true that the majority of the cases encountered resulted from tongue thrusting and false swallowing patterns. These habits are difficult to break. In the treatment of adults, it seems intelligent to be guided by our hindsight and deliberately to allow sufficient open spaces for the tongue as part of the treatment procedure, rather than to have the spaces invariably opened up again as the tongue squeezes outward on all fronts. Another lesson to be heeded is that old habits are the most difficult to change. If the anterior teeth in an adult who is over 30 years of age present an open bite with a large horizontal overjet, an effort should be made to include this same interocclusal relationship in the completed work. The older the patient, the more important this becomes, especially in cases in which the supporting structures are still in good condition but in which it becomes necessary to restore the teeth.

PSYCHOLOGICAL IMPLICATIONS

Past experiences with many patients who were either never able to be completed successfully, or, if completed, were unsuccessful without any reasonable explanation, point to the psyche as another large factor in creating dental problems. The dentist's responsibility in the care of these cases must be clarified. Although he cannot be expected to become the psychiatrist, the extent and limit of his duties to these unfortunate people should be more clearly defined. In addition, either the American Dental Association or the dental colleges or both should provide a reasonable background for the student and the practitioner in the recognition and handling of this type of problem.

In accepting a patient whose mouth is to be rehabilitated, the dentist realizes that considerable energy must be spent to bring the undertaking to a successful conclusion. This energy is expended upon solving the mechanical and physiological problems of the reconstruction. There are times, however, when a case is undertaken which involves psychological problems of an unexpected and unwarranted nature. These neurotic patients can tax the most able dentist and create emotional traumas that definitely shorten his professional life. We have all had them. In extensive restorative procedures, the dentist who is in charge often has a difficult and enervating task without the additional burden of deep-seated emotional factors.

If these are recognized before the work is undertaken, the dentist has three choices: (1) not to accept the case; (2) to accept the case with a provision in the

contract that will permit him to withdraw if he comes to an impasse in the treatment which he feels is due to emotional factors beyond his control, in which case he is to be fairly compensated for his services to the date of his withdrawal; (3) to accept the case but to insist upon psychiatric consultation and treatment along with his dental treatment.

If the emotional factors are recognized only after treatment is undertaken, then additional burdens are imposed upon the dentist. It seems intelligent to be straightforward in discussing these problems with the patient or a close relative and to advise professional psychiatric help. If that is refused and there seems to be no way of finishing the work because of the emotional impacts, then the dentist should withdraw his further services. Certainly he is justified under those circumstances, because further treatment will be ineffective and is both harmful to the patient and unfair to himself. Among the many types of problem cases, these can create obstacles that have proved insurmountable to the younger and less initiated, nonetheless to the older and more able and experienced among us.

Oral disintegration can be caused by psychological disturbances which probably affect the glands of internal secretion and the various hormones. Although the cause and effects cannot be pinpointed accurately, still sufficient evidence is present which leads to this conclusion.

ORAL EFFECTS OF SYSTEMIC DISEASE

In cases in which local manifestations of pathology cannot be cleared up by modern conventional dental techniques, systemic disease must be considered. The open-minded dentist who considers the welfare of his patient should consult with the patient's medical advisor if systemic complications are suspected. Often the dentist and the medical advisor are able to clarify an otherwise confused picture and to succeed in helping the patient. The dentist must not forget that systemic disease frequently has oral manifestations. Greater knowledge along these lines will aid the dentist and the patient in dealing with this type of problem.

PROBLEMS ASSOCIATED WITH AGING

Adequate oral hygiene must be carried out in order to preserve the health of the oral structures. This is even more important in cases in which disease is present. With elderly patients, the neuromuscular coordination necessary to carry out this hygiene is lacking. Experience has shown that deterioration takes place rapidly with these patients. The dentist must adopt a sympathetic attitude and must give them extra help. This requires patience and includes more-frequent visits. Even then, problems associated with aging are most difficult to solve.

RETENTION OF A FEW REMAINING TEETH

Experience has shown that where only a few teeth remain to support some form of dental prosthesis, it becomes the duty of the dentist to evaluate not only the mechanical and physiological aspects of their retention but also the financial and psychological impacts. If, in spite of all the dentist's admonitions, the patient still wishes to retain these few remaining teeth, he should be permitted to do so.

In a reasonable percentage of these cases, experience has demonstrated that the teeth are able to give excellent service for a sufficient period of time to warrant their saving. In addition, they have provided a cushion for the psychological needs of some patients, which otherwise would be lacking. With some patients, the loss of their teeth creates a psychological shock that can be compared only to the loss of their youth. This may be equally as traumatic to the total organism as the damage sustained from an apical or a periodontal infection. The dentist should consider the retention of a few remaining teeth not only as a mechanical advantage for a proposed partial removable or fixed denture but also as of considerable benefit to the patient's psyche. It permits the patient to become mentally adjusted over a longer period of time, instead of being suddenly projected into a full denture.

SPLINTING OF TEETH

The splinting of natural teeth in order to distribute the occlusal forces better has become an acceptable procedure in prosthodontics and in other phases of dentistry. This is not to be interpreted as saying that splinting is the answer to all the occlusal problems. The interocclusal relationship should be coordinated to the best of one's ability regardless of whether or not the teeth are to be splinted. Splinting should be used only in cases in which a mechanical advantage is desirable. It can be used advantageously in cases in which the supporting structures have been partially destroyed by periodontal disease and/or in which missing teeth are to be replaced and the load is to be distributed over a larger number of the remaining teeth. Where splinting has been resorted to, good oral hygiene must be stressed. Although many types of internal castings have been used successfully as retainers for splints, the full crown is most effective. This is especially true in the middle and older age groups in which the crowns of the abutment teeth have already been weakened by a number of fillings.

POSTINSERTION CARE

Postinsertion care of all prosthesis is essential. Breakage and deterioration take place in proportion to the use and abuse the prosthesis is subjected to. The skill employed in the construction of the work, as well as the health of the patient, are also factors that control the necessity and the extent of the postinsertion care that will be required. Patients should be told that their prosthesis must be inspected regularly and serviced where necessary. Experience has shown that the greatest majority of patients are grateful for this information. Radiographs often disclose caries and other degenerative processes in connection with all forms of prosthetic restorations. These vary in degree but are found in the majority of patients. The life of innumerable restorations can be prolonged by constant vigilance. No dentist's work is immune from these attacks, and all of us will serve our patients better if we remember this. The conscientious dentist need not feel guilty if his prosthesis should fail because of continued caries or periodontal disease, providing his efforts at construction, insertion, and maintenance have been performed to the best of his ability and according to recognized standards.

RETENTION OF NONVITAL TEETH

The retention of nonvital teeth should be considered on the basis of individual requirements rather than on the basis of a group average. When used as an abutment, a nonvital tooth, which gives no radiographic evidence of periapical disease, may provide greater stabilization and longevity to the prosthetic restoration. The indiscriminate extraction of nonvital teeth on the basis of their acting as possible foci of infection should be reconsidered. This is especially so if their removal will cause an impairment of function.

ORAL EFFECTS OF MIRACLE DRUGS

Acute caries has been observed in a sufficient number of elderly patients to consider it more than accidental. A large proportion of these patients are being treated with the newer drugs. Among them are the antibiotics, the tranquilizers, the anticoagulants, the diuretics, and cortisone and its related drugs. Although no definite proof is available that these drugs can cause the acute decay that has been observed, they should be placed under suspicion and more data obtained. Some of them are used to treat various types of vascular diseases and neuroses.

With the elimination of water and some of the essential salts, their is a lack of saliva and a dryness of the mouth. This causes some of these patients to resort to hard candies and various forms of mouth lozenges in an effort to counteract this discomfort. The result is that concentrated sugar is brought into direct contact with the tooth surfaces for long periods of time. In addition, when drugs that inhibit the flow of saliva are being used, the saliva is not effective against those oral bacteria that are capable of producing caries. As a further result of a dry mouth, the food that is ingested is not moistened with a sufficient amount of liquid, and swallowing becomes difficult. The food clings to the teeth, and the carbohydrates are concentrated upon the enamel surfaces. Under these unfavorable conditions, caries becomes excessive and forms rapidly. Patients who have been subject to irradiation for some systemic ailment may have the salivary glands affected. This can produce a dry mouth and a softening of the tooth structure. Both dentin and enamel are affected, and the type of decay produced is difficult to treat. The prolonged use of cortisone and its related drugs can produce osteoporosis. This can result in a porosity of the jawbone and can render periodontal treatment ineffective. In all probability this is responsible for the rapid soft caries that destroy teeth relatively quickly. In cases in which rampant caries is observed in a mouth that was formerly in good health, the patient should be questioned as to what drugs are being consumed and, of equal importance, whether he sucks hard candies or any form of tablets that contain concentrated refined sugar. It is abnormal to encounter rapid soft decay in the mouths of adults past 40 who, other than the diseases that have just been discussed, have undergone no physical change. If the dentist will take the necessary time to question these patients carefully and report his findings, the newer so-called "miracle drugs" may be brought under closer scrutiny, and their direct, as well as their indirect, effect in causing the absence of saliva and a dry mouth may be more readily controlled.

PERNICIOUS HABITS

Pernicious habits were responsible for the deterioration seen in several of the cases reported previously. These habits were often accidentally discovered. Pipe smokers clench the stems of their pipes between the teeth for long periods of time. The pressure is sustained rather than intermittent. This has caused the breakdown of the periodontal tissues. Where evidence of trauma is observed, the patients should be questioned carefully in an effort to find the cause. Acid erosion caused by lemon juice, acute caries caused by sucking throat lozenges, and acid erosion caused by the intake of hydrochloric acid for a systemic ailment are three examples that were all destructive to tooth structure. These habits can be discovered only by careful questioning. Dentists should be alerted in the presence of oral evidence.

RETENTION OF INFECTED TEETH

No dentist should subscribe to the retention of teeth that are obviously infected and will not respond to treatment. Regardless of what the patient may say relative to his willingness to assume the responsibility, the dentist's reputation is at stake, and this can prove too costly. In addition, clear-cut infections are potential health destroyers so that neither party benefits from such an arrangement. When teeth that are even suspicious of infection are retained, this should be put down in writing and the signature of the patient obtained. A patient's memory can be short-lived when the restorative work fails, and the dentist should not permit himself to be placed in an embarrassing position.

POSTSCRIPT

Dentistry is a very rewarding profession, and the contributions that its members have made as promoters of good health are significant. On the other hand, it imposes long hours and hard work upon those who are engaged in its practice. One of the severest handicaps to maximum efficiency has been the time factor, yet all of us, with very few exceptions, labor under this pressure. One solution is to engage in fewer extracurricular activities, but it can become stultifying to live purely vocationally. To accept fewer patients is another solution, but if one wishes to maintain an active practice, this can be dangerous. Perhaps group practice may be the ultimate solution. I have always been subjected to constant pressure, both as a result of the regular curricular and the extracurricular activities.

At the conclusion of this book, I am reminded of a quotation that will be written as remembered:

"Man, of all creatures, either for knowledge or for personal gain or for reknown, having been led to the brink of the great unknown and being aware that his days are numbered, measures his time by the tick of the clock and continues to pursue tasks which are forever beyond his reach. But the journey itself is wondrous beyond all imagination."

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