Case Report

FREDERICK B. NOYES, B.A., D.D.S., LL.D.
Chicago, Illinois

THE PATIENT Muriel S., age 10 years and 1 month, came for examination the 10th day of January, 1935. Her height was about a year below the Brush standards and weight approximately a year above. The father, a physician, gave nothing in the history of apparent importance or significance. Muriel's temperament was decidedly on the nervous side. Her face showed distinct lack of development in the lower third, the upper lip prominent, the lower lip back. Within the month the incisors had the appearance of Class II, Division 1, except that the lower lip had caught the upper right central incisor holding it back and was drawn in under the other incisors pushing them labially. The cusps of the first permanent molars were end to end on the left side and in Class II relation on the right. On the lower right side the second temporary molar had its mesial surface in contact with the distal surface of the erupting permanent cuspid. There was no history of extraction of any teeth.

The X-rays revealed the lower first temporary molar on the right side entirely submerged and covered by soft tissue and the first bicuspid held down beneath it almost in a horizontal position. The case was handled in four periods of treatment.

First period of treatment, January 1935 to January 1936, the principal objectives were:

1. To open the space where the first permanent molar and the second temporary molar had drifted mesially so as to allow the removal of the submerged first temporary molar, and
2. To secure alignment and relation of the incisors so as to allow normal lip function.

Second period of treatment from September 11, 1936 to December 12, 1937: objective to regain lost space in the lower right side.

Third period of treatment from January 23, 1938 to October 8, 1938: objective to erupt lower first bicuspid.

Fourth period of treatment from December 27, 1938 to May 27, 1940: objective–

1. Correction of mesio-distal relation
2. Symmetry in arches.

The ribbon arch appliance was used at first with 22/1000th round arch in the upper and in the lower, 22/1000th round in the anterior section with threaded arch segments in the lateral portion. After about six months a rectangular arch was substituted for the round arch in the upper.

In December after twelve months of treatment, the space was opened sufficiently for the removal of the submerged temporary molar. The operation was made on the 21st day of January. The second temporary molar was extracted in the ordinary way, but the first temporary molar was deeply imbedded and covered with bone as well as soft tissue. After it was re-

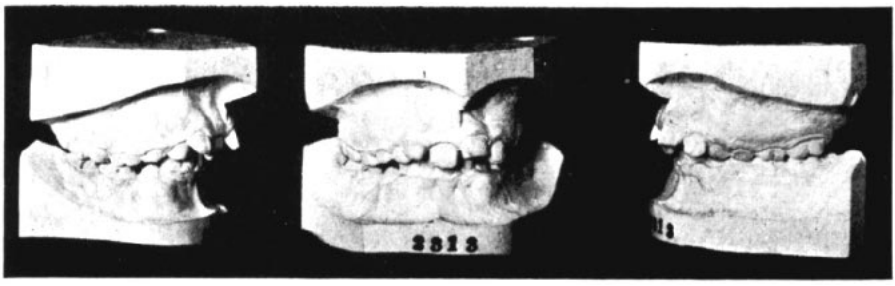

Fig. 1.—The models at the beginning of treatment, January 1935.

Fig. 2.—The models at the end of the first period of treatment and after the first operation, February 1936.

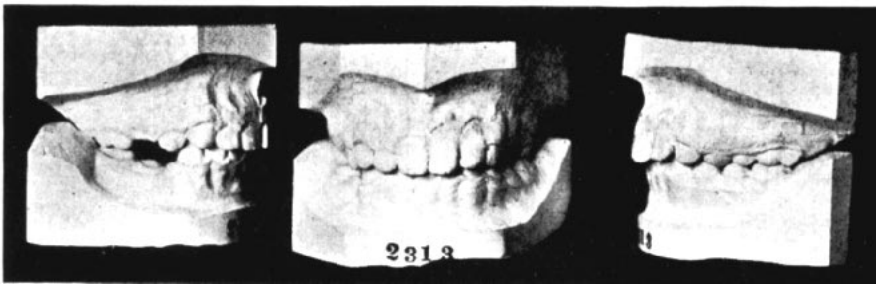

Fig. 3.—The models in August 1936 showing the lower left second bicuspid beginning to erupt.

moved, the bone was cut away from around the crown of the bicuspid in order to free it as much as possible. The patient had a very bad nervous reaction to the operation. On the 28th of February all bands were removed and it seemed best to give the patient a complete rest for several months.

In April the tips of the cusps of the second bicuspid were just in sight and the space from the mesial of the first permanent molar to the distal of the cuspid had closed 2 mm. The incisor relation had remained and the lips were closing normally.

The second period of treatment was started September 11, 1936. The previously used bands were replaced. The father was given a wrench and

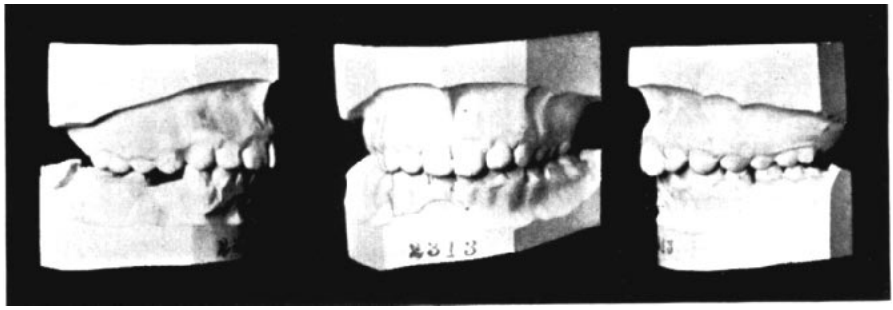

Fig. 4.—The models showing condition at the end of the second period of treatment and the time of the second operation.

Fig. 5.—The models at the end of the third period of treatment showing the lower right first bicuspids partly erupted.

Fig. 6.—The models at the end of the fourth period of treatment.

directed to advance the nut on the lower right side one full turn every five days. On the 12th of February, 1937, sufficient space had been obtained, all bands were removed, and a vulcanized space maintainer made. For about a year this was the only appliance worn. After a year's wait, it was apparent from the X-ray that the first bicuspid had moved very little, and it was decided to return to treatment. The ribbon arch appliance was again placed. The placing of appliances was completed on the 23rd of January 1938 and on the 26th a surgeon again uncovered the first bicuspid. A little cap of pure gold had been made by fitting it to the corresponding tooth on the opposite side which was in position. A piece of the McClain chain was soldered to the

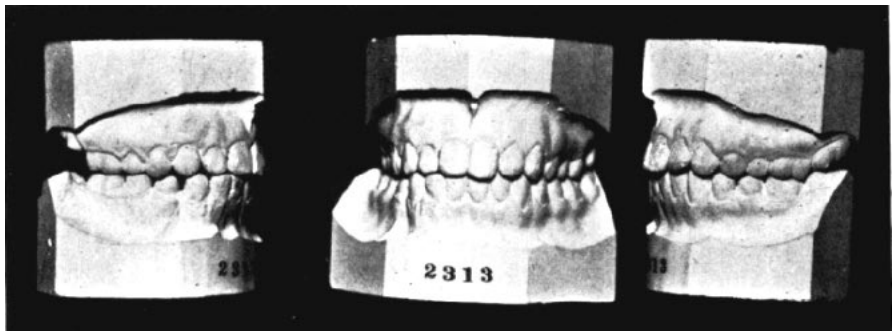

Fig. 7.—The models three years after the completion of treatment.

Fig. 8.—X-ray at the beginning of treatment showing the completely submerged first temporary molar and the crown of the first bicuspid below it.

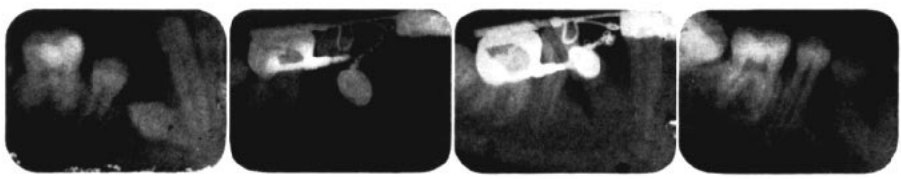

Fig. 9.—Four X-rays showing the progress in the eruption of the lower right first bicuspid.

cap, and the cap cemented to the imbedded tooth with phosphate of copper when it was uncovered. A 22/1000th gold finger spring had been soldered to the arch and the chain was fastened to it. The patient was not seen again until the 4th of March, approximately six weeks later. The spring had exhausted its tension and the chain was hanging loosely in a loop, showing that the tooth had moved occlusally almost as much after the tension of the spring had been exhausted as it did during the period in which the spring was acting.

Fig. 10.—Photographs at the beginning of treatment.

Fig. 11.—Photographs, January 1939, at the beginning of the fourth period of treatment.

Fig. 12.—Photographs, June 1940, after all appliances were removed.

This was a very striking example of a principle that has been stated again and again, namely, that in orthodontic treatment teeth are moved not by mechanical force but that mechanical forces act as a stimulation upon the cells of the tissues producing tissue reaction by which the teeth are moved, and these activities when once set up continue to act after the force

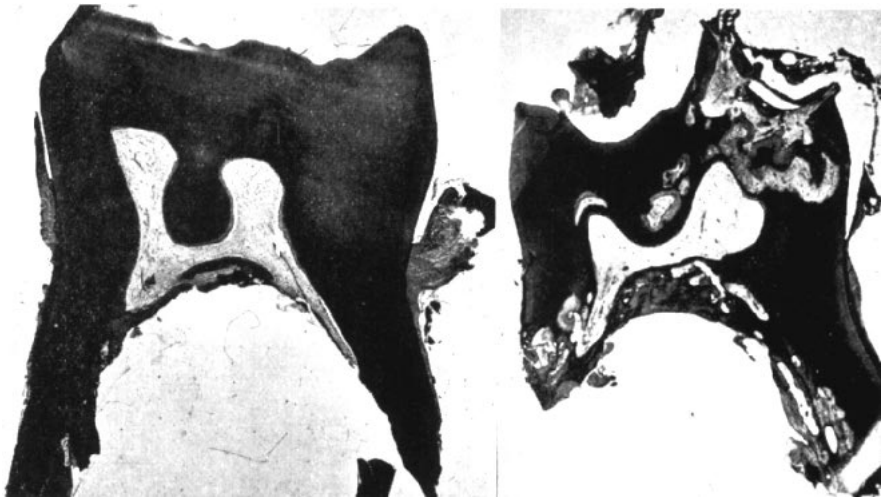

Fig. 13.—A section of the lower right second temporary molar showing the area of ankylosis.

Fig. 14.—A section of the lower right first temporary molar showing something of the extent of the ankylosis.

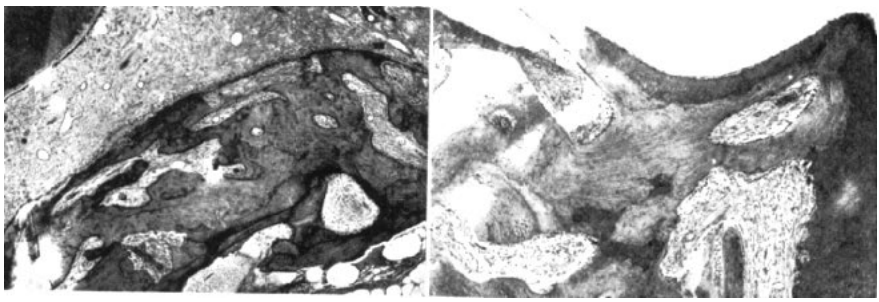

Fig. 15.—Higher magnification of Fig. 14 showing the structure in the bifurcation of the root.

Fig. 16.—Higher magnification of Fig. 14 showing the structural conditon in the occlusal portion of the crown.

that had activated them has ceased to act. We have heard elaborate methods described for measuring exactly the modification made in an appliance during adjustment so as to know exactly how far and in what direction the teeth were to be moved. The instance which has just been described shows clearly the fallacy in this kind of reasoning.

On the 8th of April 1938, the bicuspid was erupting, and the gold cap was out of the gum. October 8th, the crown of the first bicuspid was well out of the gum, and it was decided to give the patient a rest and allow the tooth to move occlusally.

The fourth period of treatment was started the 27th of December, 1938. At this time the molars and bicuspids on the left side were in normal mesiodistal relation. The upper first molar and second bicuspid on the right side were in full Class II relation. The median line of the lower was displaced to the right about the width of the lower incisor. For this period of treatment the edgewise arch mechanism was employed. Considerable time was required to correct the asymmetry that had developed in the arch. This was accomplished by carefully forming ideal arches and being very careful in the way in which they were tied in position. May 11, 1940 all the upper bands were removed and an acrylic palate placed. May 27, 1940 all the lower bands were removed and an impression taken for a lower removable acrylic retainer. These were worn for about a year and a half. The case has been seen at intervals and to the present (1944). There is no tendency to relapse.

The models show the case at the beginning and end of each period of treatment and the final, about three years after completion. The photographs show the development of the face. The X-rays show the development of conditions in the area of the submerged tooth.

One of the very interesting features of this case was the ankylosis of the first and second temporary molars on the lower right side. The second temporary molar was only slightly ankylosed, being united with the bone only in a small area in the bifurcation of the roots. This seems to be the first and most common position for this condition to occur. The occlusal growth of this tooth had been only moderately interfered with as it was only slightly below the occlusal level. The first temporary molar was completely ankylosed and entirely submerged. It was covered not only by the soft tissues of the gum but by the bone of the alveolar process, which had grown occlusally around it. The absorption of the dentin and replacing of it by bone had extended through a large portion of the crown of the tooth. At one point it had passed the dento-enamel junction and extended slightly into the enamel.

One is forced to think of the foreign body reaction and the formation of giant cells. Certainly it looks as if the tooth would have finally been entirely destroyed and replaced by bone, if it had not been removed. It is also interesting to note that the surface of the enamel of the first bicuspid had suffered considerably from resorption. In THE ANGLE ORTHODONTIST, April 1932, there appeared an article on this subject, describing the histologic characteristics.[1] The persistence of the pulp tissue and its characteristic structure is especially marked.

The odontoblasts remain active and apparently are stimulated to the formation of dentin by the approach of absorption. The condition deserves further and more careful histologic study.

55 E. Washington St.

[1] NOYES, F. B. ANGLE ORTHODONT., 2:77, Apr. 1932.