

## Odontological Section.

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Mr. P. SIDNEY SPOKES, President of the Section, in the Chair.

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### The Cure of Mouth-breathing.

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THE ill-effects produced by nasal obstruction and mouth-breathing are so significant that in all branches of medical science the establishment of normal respiration is regarded as of the utmost importance. At the present time the procedure for the establishment of nasal respiration consists of operative measures followed by breathing exercises and, of course, voluntary effort by the patient. In many cases this may suffice, but in a large number mouth-breathing continues. The majority of failures are due to the persistence of a habit which, although controlled during the day, recurs at night when voluntary effort is impossible.

Those of us who are responsible for the care of the mouth have little difficulty in detecting a mouth-breather. The effect on the mucous membrane in the front part of the mouth is characteristic; in children gingivitis is present where the tissues are exposed to the air, later pyorrhœa alveolaris becomes established as is seen in adults who are mouth-breathers. Imperfect development and deformity of the bone of the face is well known in mouth-breathers; the maxillæ are chiefly affected, one of the most frequent characteristics being protrusion of the incisor teeth.

The difficulty of dealing with patients who were able to breathe through the nose, but whose mouths clearly indicated that they continued to breathe through the mouth, led me to attempt breaking the

habit of mouth-breathing at night which was the cause of the trouble. For a considerable time I used strips of strapping which were placed across the mouth, the position of the strapping being varied from night to night. In one or two cases bandaging was also used. This method was successful in many cases, although trying and irksome to the patient. The apparatus about to be shown was tried and has been used in a number of cases; the success in the majority of instances has been so marked that it seemed to be of sufficient interest to bring it to your notice.

The apparatus consists of a wire frame, over which thin sheet rubber (dental rubber-dam) is stretched; it is placed inside the lips and cheeks, resting upon the outer surfaces of the teeth and gums. The frame is

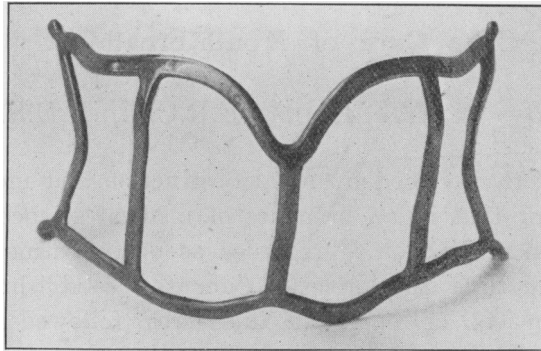


FIG. 1.

Frame of apparatus to prevent mouth-breathing.

made to a model. An impression is taken in composition, which should not be made too soft, as a sharp impression is not required. It is better not to use a special tray except for small children, when the taking of the impression may have to be carried out quickly; a tray would have to be so uncomfortably large for the patient in order to obtain a satisfactory impression; in children one may have to be satisfied with what one can get.

The following method is given in detail, as an accurate model is essential for success. The teeth are occluded, the impression composition is rolled into a sausage-like shape and is inserted inside the lips and cheeks, it is then pressed against the teeth and upwards and downwards into the sulci; the lips are closed over the impression material. The operator standing behind the patient places a hand upon each

cheek with the fingers over the lips ; uniform pressure is made over the impression material. Cold water is then syringed inside the cheeks until the composition is quite hard ; the water is allowed to escape into a bowl, the head being tipped forwards. The removal of the composition may cause the ends to be bent inwards ; this is the reason why a special tray may be necessary in children. The impression should extend as far back as the first molars and to the full depth of the sulcus of each jaw. The composition can be replaced after being hardened in cold water if there be any doubt of its accuracy ; on this account too sharp an impression is undesirable. The model is poured, a zinc cast

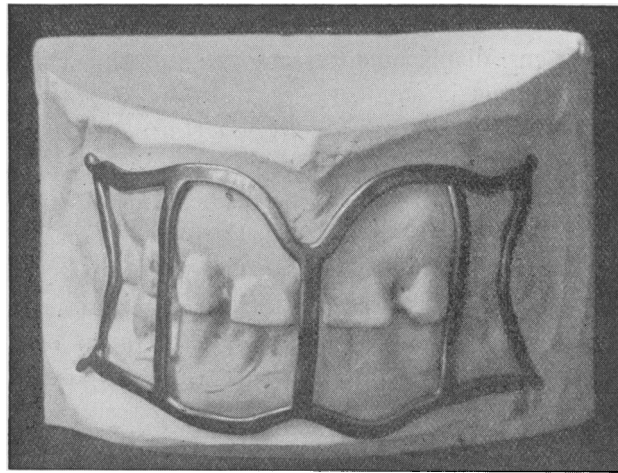


FIG. 2.

Frame in position on model. (The downward bend for the frænum can with advantage be carried lower.)

and a lead die prepared. The shape of the frame is marked out on the model ; the outer wires are fitted, soldered, and struck, the vertical supporting wires (usually three in number) are also fitted, but soldered at one end only, the other end being slightly longer than is required, it is then struck ; finally, the other ends of the wires are soldered and the whole frame struck up. The exact shape of the apparatus and the position of the wires are shown in the illustrations. The upper horizontal wire is placed near the top of the sulcus, but slightly lower at the ends, in the middle line a depression corresponding with the frænum labii must be made. The frame is chiefly supported by resting upon

the projecting teeth and alveolar mucous membrane of the maxillæ. The lower horizontal wire should not be carried to the lowest part of the sulcus, for although it should fit it cannot do more than rest against the tissues of the mandible as they are more or less vertical.

The chief discomfort is from rubbing; this is prevented by making the frame large enough to be steady and by avoiding bony eminences, the horizontal wires being carried either above or below them. The frame should reach almost as far back as the first molars and the horizontal wires approximate slightly to one another, in order to allow the angles to have rounded projections over which the rubber can be stretched. On no account should the frame extend beyond the area of accurate impression, as otherwise the tissues are almost certain to be rubbed. The frame should be large, chiefly to keep it steady when worn, but also to prevent displacement from the mouth, which can easily occur if the apparatus is small.

The wire used in most cases has been German silver, gilded after completion. Fine wire makes a lighter frame, which is less noticed, but it is very easily bent and is then uncomfortable. Dental alloy wire has been used, also gold. An attempt to make a vulcanite apparatus was not successful, as the parts were so easily chafed by it. At present the size of wire used is thicker than formerly. The wire was drawn down between rollers in order to give an oval contour; a draw plate would probably be better for this purpose. When used the rubber is stretched over the frame and the surplus trimmed off with scissors. A supply of rubber is given to the patient, who has directions to change it frequently. If the rubber is stretched too tightly it is apt to tear and may press upon the teeth, causing them to become tender.

The apparatus may be worn during the day if it is thought desirable, as in one of my patients who was a thumb-sucker no rubber was put on during the day, but the frame alone effected the purpose of preventing the thumb being inserted. Ordinarily the apparatus should be used at night as has been stated. When the apparatus is in position mouth-breathing is absolutely impossible and the patient is compelled to use the nose for respiration.

The patient may find it impossible to use the apparatus if nasal obstruction exists, in which case a surgeon should be consulted. Some discomfort is usually felt for one or two nights and then the inconvenience should be very slight; several patients were able to sleep comfortably on the first night. The comfort of keeping the mouth

and throat moist made so great a difference to some individuals that they slept better, and in consequence prefer to have the apparatus. One patient says he is so attached to his that he can hardly sleep without it; he suffered from a chronic sore throat which has improved in a remarkable manner. Besides improvement in the condition of the mouth and throat, the nose also benefits; chronic nasal catarrh is markedly diminished; one patient has been more or less free for nine months. With the use of the apparatus the improvement of the nasal condition should be progressive. An adult who had used strapping and later an apparatus was able, for the first time in her recollection, to take a full deep breath through the nose.

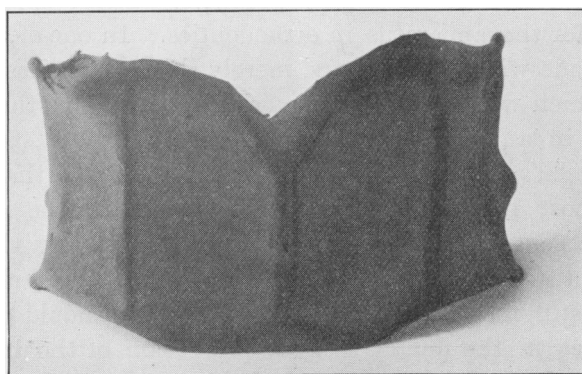


FIG. 3.

Frame with rubber stretched over it.

The length of time that the apparatus must be worn varies. It should be continued until normal respiration is quite established. The patient is then allowed to omit it for a night, then alternate nights followed by its use on one night in three, then one in four and so on. The apparatus should certainly be continued where the conditions of gingivitis and pyorrhœa alveolaris are still unsatisfactory, for every possible effort is necessary for their correction and a return of the mouth-breathing for a short time may be most harmful. The improvement of these conditions is quite remarkable in some patients.

By preventing mouth-breathing in children who have some nasal obstruction but insufficient to demand an operation the nasal respiration may be so improved that surgical interference becomes unnecessary.

This certainly appears to be the case in two or three of my patients. In one of these children, after wearing the apparatus for two nights it was not used on the third night as the mucous membrane had been injured by rubbing. On the night it was omitted the mother said the child's mouth was closed and she was breathing through the nose, but the mouth-breathing occurred on the night following.

This apparatus can also be used to correct conditions which result from mouth-breathing; it is possible to arrange the rubber in such a way that pressure can be brought to bear upon the incisor teeth to correct protrusion. My experience has so far been limited to correction of cases where premolars have been removed, but the possibilities of exercising the function which is normal for the lips in moulding the dental arches seems to be highly probable. There appears to be a valuable use for the apparatus in orthodontics. In one of my cases the frame was made without crossbars, merely the outer wires; studs held the rubber which was put on with very little tension; the teeth were carried back in a most satisfactory manner. At the same time the gingivitis, which was quite marked, was so improved that the mouth appeared almost normal. In another case where the incisors were separated the central vertical bar was divided, allowing the rubber to press on the tips of the teeth; the bar has been shortened gradually. The case is still under treatment. Its early use should prevent some of the changes in the dental arches; protrusion of the incisors might certainly be checked and very probably contraction of the arch prevented.

The uses to which the apparatus can be applied would suggest the name of "artificial lip," for some of the functions of the lips are represented to a considerable degree by it; for instance, the closing of the mouth and the moulding of the dental arches in front. The apparatus may undergo modifications or be replaced, but the principle applied should, I think, be of value.