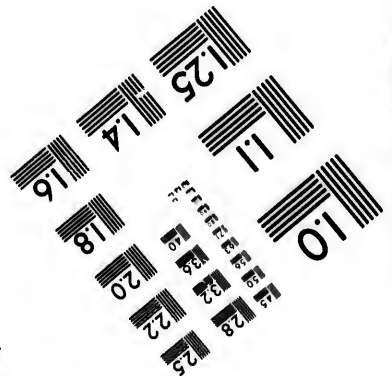
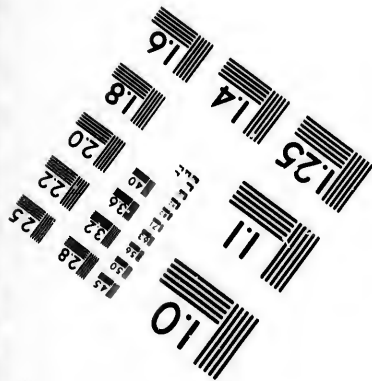
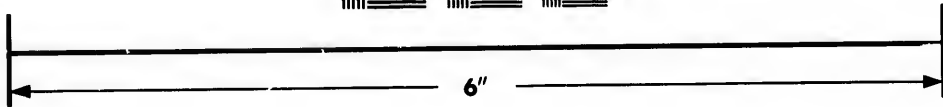
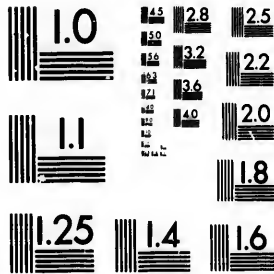


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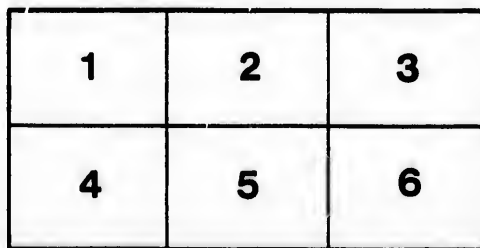
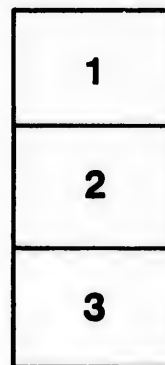
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JUNE, 1898.

BY

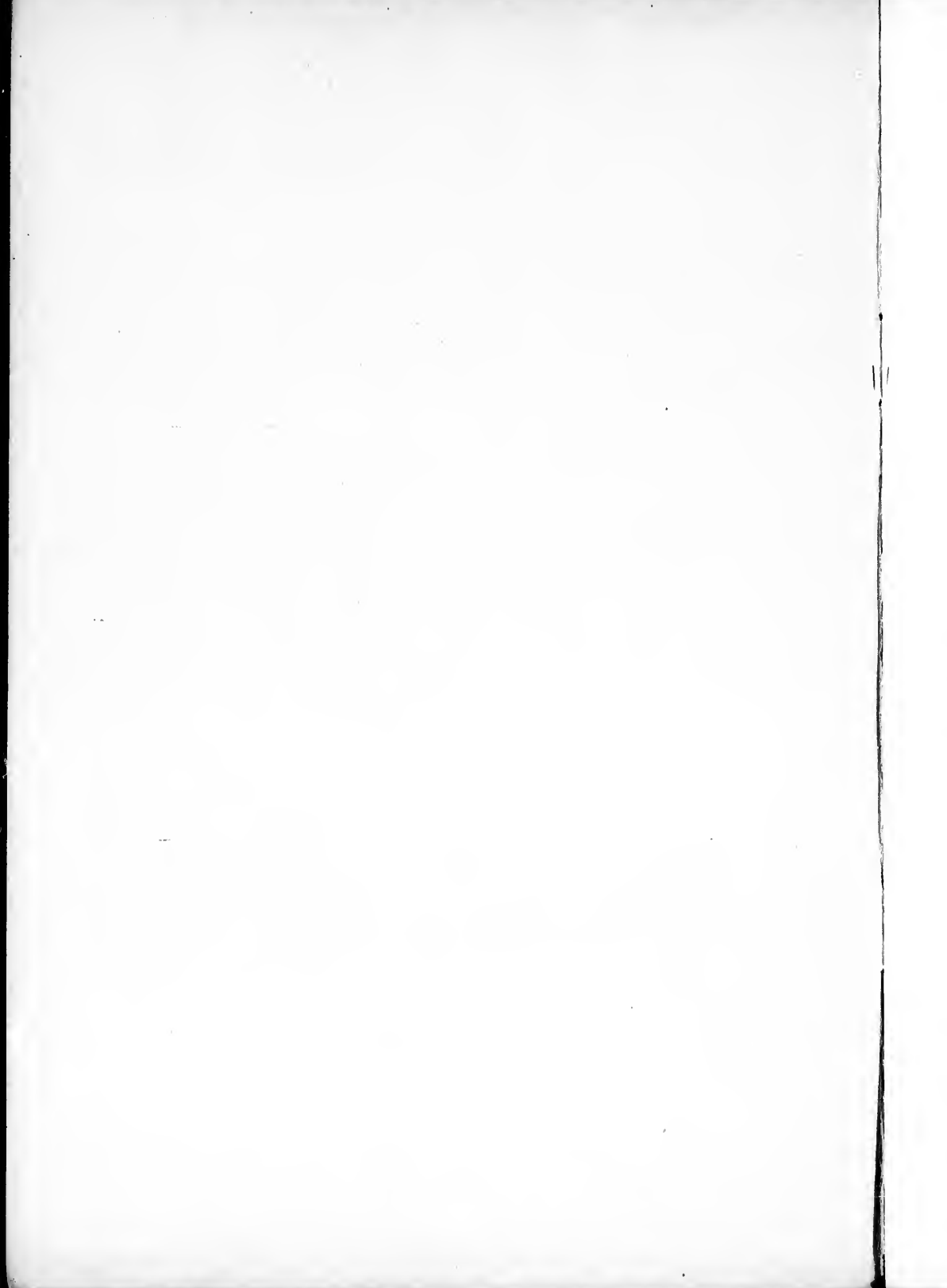
FRANCIS J. SHEPHERD, M.D., C.M.,

Professor of Anatomy, McGill University; Surgeon to the Montreal General  
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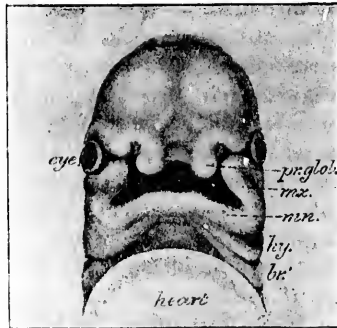


A LECTURE ON THE CAUSES AND TREATMENT OF HARE-  
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FRANCIS J. SHEPHERD, M.D., C.M.,  
Professor of Anatomy, McGill University; Surgeon to the Montreal General  
Hospital.

GENTLEMEN:—Before describing the treatment of the deformity which I am to speak of to-night, I should like to give you a short account of the development of the face, for all the congenital deformities met with are due to an arrest of this development at an early period of foetal life. A study of embryology is of great assistance to the surgeon in enabling him to account for many of the congenital conditions he not infrequently meets with.



- Pr. Glob.*—Globular extremity of the mesial nasal process.  
*Mx.*—Maxillary arch.  
*Mn.*—Mandibular arch.  
*Hy.*—Hyoid arch.  
*Br.*—First branchial arch.

*Development.*—At a very early period of foetal life a series of clefts (branchial) appear on the side of the cephalic extremity, separated by rods of tissue called *branchial* or *gill arches*. The clefts communicate with the alimentary canal. The first branchial cleft is between the mandibular and hyoid arches. The mandibular arch which is afterwards developed largely into bone is divided into the superior and inferior maxillary portions. The two sides of the inferior maxillary portion early unite to form the lower jaw, but interposed between the two superior maxillary portions is the fronto-nasal pro-

cess. The space between the superior and inferior maxillary portions is called the buccal cleft. This is closed early except where the aperture remains for the mouth which is larger or smaller according as the cleft is more (macrostoma) or less (microstoma) closed. Sometimes the buccal cleft remains open from ear to ear. Now as to the nasal processes, these are divided into *mesial* and *lateral*; the mesial processes are united at their base by a depressed median part the *fronto-nasal process*, but below they are separated and each ends in a globular process (diagram and slides exhibited). These nasal processes, as development proceeds, extend backwards and along the embryonic roof of the mouth forming the nasal laminae. Eventually, the nasal processes coalesce in the middle line and form the intermaxillary process and the middle part of the upper lip, the depression between forms the septum of the nose and by a coalescence of the nasal laminae the rest of the nasal septum is formed. In rodents the notch between the globular processes persists and there is a fissure leading through the upper lip to the mouth. Above the depression is a triangular space forming an angle with it, this forms the tip of the nose and the triangular surface above it, the bridge. The lateral nasal processes form the *alae nasi*, these are not so prominent as the mesial. Between the lateral nasal processes and the maxillary process the lachrymal groove passes from the eye to the nose. Where the maxillary process of one side does not coalesce with the globular process then single hare-lip results, and if the union fails in the bony part as well, cleft palate is then seen. When both maxillary processes fail to unite with the globular processes, double hare-lip results, in this case the cleft usually goes through the line of union between the intermaxillary and superior maxillary bones. The middle part of the lip thus floats free and has attached to it the two intermaxillary bones, and is itself hanging from the septum of the nose. A failure of the two globular processes to unite is very rare though from time to time cases are reported. The mesial or septal part of the nose is developed from the junction of the globular processes. The septum is at first broad and depressed and the nostrils are widely separated, as seen in the lower races of mankind and monkeys.

The median union of the palate is completed about the 10th week of foetal life and the globular processes unite with the maxillary also very early, the incisor foramen only remains to mark the junction of these structures. The fact that the arrest of union of these processes results in hare-lip and that the union takes place so early, rather discredits the many stories one hears of hare-lip and other deformities being produced by maternal impressions. In many cases the tenden-



cies to such deformities runs in families and it is not uncommon for two children in one family to suffer from hare-lip and cleft palate.

Hare-lip then is a congenital affection and often is due to heredity. There are various forms of this deformity :

1. Simplest, merely a notch in the red edge of the lip.
2. Through the soft parts only and not going through to the nostril.
3. The cleft through the lip and nostril and accompanied by cleft palate.

4. Double hare-lip, with a floating intermaxillary bone and cleft palate, occurs in  $\frac{1}{10}$  of all cases.

There are other forms of deformity connected with arrest of development of face, such as enlargement of mouth, a persistence of the lacrymal groove, &c. (Slides shown of these deformities.)

Single hare-lip is usually on the left side, and is always to one side in the line of the junction of the intermaxillary with the maxillary bone. The child who suffers from this deformity, as a rule, cannot suck and has to be fed with a spoon. The mother's milk should be drawn and used as food for the child. Some advocate injecting the milk into the pharynx with a glass syringe, to which is attached a piece of rubber tubing. Sometimes a stoppered bottle with a large teat, having the aperture below, is useful. Rubbing the child with codliver oil or olive oil if it is puny, may help to keep it in condition until old enough for operation. Artificial foods should not be given unless under dire necessity. The child should be kept warm in flannel.

*Best Age for Operation.*—This depends on the condition of the child and the character of the deformity ; should the deformity involve only the soft parts and the child be healthy, operate at once for the mother's sake and in order that the child may suckle. In simple cases the earlier the operation the better. The only danger in early operations is from hæmorrhage, young children do not stand the loss of blood well. On the other hand they soon make up lost blood. Should the child be weakly, or the fissure be double and extend through the hard parts, then the operation ought to be postponed some weeks or even months. From six weeks to three months is probably the proper time for operating. I prefer the age of six weeks, this is well before dentition has commenced. Some advise waiting in the difficult cases until the child is weaned, but this is keeping a deformity before the family too long, and furthermore it renders the success of the operation more difficult.

*Operation.*—The number of operations devised for the relief of this deformity are many and varied. The ingenuity of surgeons is taxed

more by these plastic operations than by any others, and the number of methods is only equalled by the great variety of procedures advocated by the gynæcologist in sewing up the abdominal wound. Chloroform is the best anæsthetic in these cases. The child should be wrapped in a sheet or large towel, so that the arms may be confined, and then held in the arms of a strong nurse. A good light is essential. Sitting in front of the patient, the operator should first cut through the mucous membrane attaching the lip to the gum, and freely separate it so that the lips hang loosely; the edges of the cleft are now freely pared by using a narrow-bladed knife and transfixing the edge of the cleft well up to the nostril, the flap is cut free above but below it is left on each side attached to the edge. As the two edges of the cleft are seldom the same length, one being usually distinctly longer than the other, on the longer side the soft parts should be more freely freshened; both flaps should be cut as far as the red line of the lips. Some advise cutting the flap of the shorter side quite away and only leaving the long one, and then bringing this flap across the middle line to fill the deficiency of the shorter side. Any redundancy can be cut off without trouble. It is my custom not to separate the flaps from the edges of the cleft below until several sutures have been placed in the lip above and the fastened edges of the cleft accurately adjusted near the nose. Now the paring from the shorter side is cut away and more or less, as occasion requires, of the tissue at the red portion of the lip removed, the flap of the long side is brought over as before and adjusted as accurately as possible. By this means there is less hæmorrhage and no mistake of taking too much or too little away is made. Of course, during the operation an assistant compresses the sides of the cleft with his fingers, and thus loss of blood is prevented. Should any blood get into the mouth it must be at once removed with sponges on handles. Now as to sutures: formerly wire and hare-lip pins were always used. At present we employ nothing but silk-worm gut and horse hair. For years I have used nothing else and with the best results. Care should be taken not to go through the lip whilst suturing, but to dip down to the mucous membrane only; the stitches should range on each side at least one-eighth of an inch from the edge. It has always been my custom, if the sutures have not been satisfactorily placed or seem to pull too much, or if perhaps there is a slight unevenness, to immediately take them out and re-introduce them. A little painstaking at this step of the operation is worth a good deal. After the main sutures of silkworm gut are placed, intermediate ones of horse hair may be employed, and afterwards the lip everted and the mucous membrane

sutured in the mouth, by this means the continuity of the surface is preserved and septic matter is prevented from entering the wound from the mouth. To recapitulate then. The most important points to be observed in the operation are :

1. Freeing the lip from the gum.
2. A free sacrifice of the edge of the cleft.
3. Accurate apposition of the parts.

The dressing should be simple. I usually apply an antiseptic paint (made of iodoform, resin, oil and alcohol) put on a piece of lint or cotton and nothing more. If the usual cheek straps are applied to preserve tension, they should be made of diachylon plaster, which is less irritating than the rubber adhesive, and the cheek parts cut broader than the part running across the lip, they should interlace in the middle line, the cheeks being well pulled forward. Before operation it is very important to know that the child has not been exposed to any fevers, as measles, or scarlatina. This is one cause of failure. Another is the inordinate crying of the child, and also the too early removal of the stitches. Sepsis, of course, is the great cause of failure and this is most likely to occur in badly nourished infants with poor resisting powers.

It is very important that sutures should not be removed too soon. In the old days of hare-lip pins they were removed in from 24 to 48 hours, because if left longer they would cut through the soft tissues of the infant's lip. Now we commonly leave silkworm gut in from 6 to 10 days. Should primary union not occur, wait until the inflammatory action has subsided and then freshen the edges and bring them together. Union now almost always occurs, because the parts have become, so to speak, immune. After the operation the child should be closely looked after. There is often great difficulty in breathing through the nostrils owing to tension on the upper lip and compression of the nostrils, and rubber tubes introduced are often a great aid and prevents collapse of the nostrils. After a time the parts get eased and the child will breathe easily through its nostrils.

The operation I have already described is that for single hare-lip. Double hare-lip is less common and must be somewhat differently dealt with.

Where there is no projecting intermaxillary process, the operation is not difficult, for then all the mucous membrane from the central portion is cut away and the flaps taken from the sides of the cleft as in single hare-lip. The central portion is sutured on each side to the lateral clefts and the lateral flaps run across to meet each other below the central portion, the lower part of which is freshened. What is in

excess is cut away. Sometimes the central portion may be cut into the shape of a V and the lateral flaps adjusted to it.

In those cases, however, where the intermaxillary bone projects the case is rendered much more difficult. In some cases, such as where the bone grows from the tip of the nose it must be sacrificed, but usually it can be broken back and forced into the cleft. Sometimes it is necessary to pare the edges of the gums, and I have been obliged in some cases to keep the bone in position with wire or silk sutures. It has been objected that the incisor teeth which belong to this premaxillary portion grow in crooked, if so they can be afterwards straightened by a dentist, or the teeth may be pulled out. It is also objected that the retention of the intermaxillary keeps open the palatal cleft. Always try and save the intermaxillary bone and so prevent a gap in the solid jaw. In cases where I have had to remove this bone, however, there was remarkably little deformity. Sometimes there is a double hare-lip and only a single cleft in the bone. In such cases the bony cleft of one side projects and has to be forced back with the thumb. In severe cases of operation in very weak infants where much paring has to be done, and the bleeding is excessive, the final stages of the operation may have to be postponed until recovery from shock takes place. In very young children bleeding is a factor which must be considered. (The different methods of operating were then described, such as Malgaigne's, Nelaton's, Mirault's, Giraldé's, Rose's and many others. All were illustrated by lantern slides.)

