pressure on the lower surface of the hard palate, while ingenious, cannot be regarded as a complete explanation.

It seems very probable that each of these theories is to some extent correct, but that no single one is sufficient to fully explain the mode of production of these deformities. It is, however, quite certain that interference with nasal respiration is capable of producing serious and extensive deformity of the teeth and jaws, and that by the restoration of nasal breathing this disfigurement of the maxilla can be prevented, and if seen at an early stage considerably alleviated, the constant stream of air expanding and developing the upper jaw. There are many cases of V-shaped deformity of the maxilla with anterior protrusion due to other causes, but interference with nasal respiration is so common a cause that the condition of the nose and nasopharynx should be investigated in all these cases.

Breathing exercises as advised by Mr. Arbuthnot Lane are undoubtedly valuable in some cases of naso-pharyngeal obstruction produced by the presence of an abnormal quantity of adenoid tissue, especially if the obstruction to nasal respiration is a first attack or the repetition of a previous one with a history of free nasal breathing in the interval. But when the obstruction is chronic, especially if acute exacerbations also occur, when secondary aural affections exist, and more especially when the deformities in the teeth and palate above described are present, it will be found that breathing exercises, unless preceded by operative measures, will be almost invariably ineffective, and valuable time will have been irretrievably lost.

REFERENCES.

¹ Medical Press, 1900. ² Laryngoscope, 1898. ³ Journal Amer. Med. Assoc., 1900. ⁴ Mouth Breathing, 1901.

FOREIGN BODY IN OESOPHAGUS.

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CASE.

J. W., a girl aged 12, was admitted into one of Mr. Paget's wards in the West London Hospital on December 13th, 1901.

History.—She stated that about 1 p.m., on coming home from school, she seized and swallowed hurriedly a piece of cake which was lying on the counter in her mother's shop. She felt something hard pass over the throat, and found that she was unable to swallow anything more. Neither the child nor her mother having any idea of the nature of the obstruction, various domestic remedies were employed to "get it down." All attempts to swallow pieces of crust, etc., were followed by their prompt return, and about 5 p.m. the child was brought to hospital.

Condition on Examination.—With the *x* rays a dark-coloured disc about the size of a penny was seen lying, as it were, in the episternal notch, the lower edge of the disc being just behind the upper edge of the manubrium. On looking from the side, a dark line was seen lying almost vertically just in front of the vertebral column. The case was obviously one of a coin impacted in the oesophagus.

Treatment.—All attempts to remove it with coin-catchers and probangs failed, although a small oesophageal bougie was passed into the stomach, and gave a grating sensation on withdrawal. It was decided to attempt its removal under an anaesthetic by means of a laryngeal forceps, and with the help of the *x* rays. The child was placed on a table lying on her back, and with the vacuum tube close to the left side of the neck. Chloroform was given, and a crocodile-bladed laryngeal forceps was passed into the oesophagus. With the screen placed close to the right side of the neck the blades of the forceps were passed down until they were seen to touch the upper end of the black line; they were then opened slightly and passed down so as to get a firm hold. On putting on light traction the coin refused to move, and I imagined for a moment that the wall of the oesophagus must have got caught in the blades; but with the employment of a considerable amount of force (less has been used in extracting a tooth) the resistance was overcome; and the interesting picture was visible of the coin enclosed in the blades of the forceps moving up towards the mouth and being finally removed. After the

first pull no more force was necessary, and the coin was removed with great ease. It turned out to be a penny.

After-History.—The patient was discharged from the hospital on the following day. Two days after the operation all that remained was a little discomfort on swallowing.

REMARKS.

It appears likely, from all the circumstances of the case, that it would have been impossible to remove the coin by any other means than those employed. Without the *x* rays it might have been possible to lay hold of the coin, but the force employed was so great that one would have hesitated to employ it without actual demonstration that the coin, and nothing but the coin, was within the blades of the forceps, again, it was so tightly impacted that coin-catchers and probangs must have utterly failed to dislodge it, even with the help of the screen.

THE CAUSATION OF DEATH DURING THE ADMINISTRATION OF CHLOROFORM.

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(Continued from page 893.)

III.—THE CAUSE OF THE FALL OF BLOOD PRESSURE FROM THE ADMINISTRATION OF CHLOROFORM.

ALL previous investigators agree in finding that chloroform causes a gradual fall of blood pressure, but they mostly disagree in their conclusions as to the cause.

Some of these conclusions are summarized in the following scheme:

The Hyderabad Commission maintains that the fall of blood pressure is due to vasomotor paresis alone.

Wood,⁶ Hill,¹ Hare and Thornton,⁹ MacWilliam,¹⁶ Duplay and Hallion,¹⁷ conclude that it is due to vasomotor and heart paralysis combined.

Gaskell and Shore,¹² Richet,¹³ conclude that the fall of blood pressure is due to impairment of cardiac muscle alone.

The possible causes of this gradual fall of blood pressure are:

1. Diminution in the heart's output per second.
2. Increase in the outflow from the arterioles, either from:
 - a. Loss of central vasomotor control, spinal and medullary.
 - b. Diminished efficacy of the muscular fibres of the arterioles themselves.
3. Increase in the bed of the circulation by relaxation of arteries and veins.

Excepting Gaskell and Shore, the other investigators do not appear to have sufficiently considered the possibility of chloroform directly influencing the muscle tissue in the walls of the vessels themselves, as it does cardiac muscle.

Lister,¹² experimenting upon the web of a frog's foot, found that the application of chloroform or of chloroform vapour caused hyperaemia of the part. This suggested a local paralytic effect upon the muscle of the arterioles.

1. Changes in the Force of Cardiac Contractions.

It has been shown above that paralysis of the heart occurs from chloroform in the blood circulating through it, corresponding in vapour tension with small percentages of chloroform vapour in the inspired air. When the circulating blood reaches a vapour tension of chloroform the same as that of 0.3 per cent. vapour in the inspired air, the heart steadily becomes paralysed, and the blood pressure falls.

2. Changes in the Rate of Cardiac Contractions.

That vagus slowing of the heart may be a factor of considerable importance in depressing the circulation is readily seen in those blood-pressure tracings of morphinized dogs in which the percentage strength of chloroform vapour in the air inhaled has been enough to raise the irritability of vagi to the stage of slowing the heart, but not to that of stopping it.