

which is incident to such conditions, there is no excuse on the part of civic authorities for not taking up this problem, which means the abolition of mediæval systems of sanitation and substitution of modern methods for systems which no modern city should allow to exist.

On page XVI. of the advertising section of this Journal is the copy of a circular which has been issued by the Division of Entomology. It is printed on a card and will be sent to anyone making application to me for the same. Health officers might have similar cards printed for distribution.

MASTICATING

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Masticating is generally considered to be merely the grinding of food into small particles, in order to facilitate swallowing and subsequent digestion.

There are other considerations involved, however:—the partial digestion of the food in the mouth; the development of the muscles of the face, thus affecting the expression; the development of the teeth and jaw bones; the development and nutrition of the throat and nasal passages. Mastication is accomplished by the action of the teeth of the lower jaw against those of the upper. In the carnivorous or flesh-eating animals, the movement of the lower jaw is limited to that of up and down and the food is crushed between the very uneven surfaces of the upper and lower teeth: while in the herbivorous or grass and grain-eating animals, the movement is almost wholly sideways, grinding the food between the comparatively smooth surfaces of the teeth. As man's diet consists of a large variety of foods, we find a modification of these two forms in a somewhat uneven surface of the teeth and a very free movement of the lower jaw, forwards and backwards, and from side to side. When food has been taken into the mouth, the tongue moves it back between the posterior teeth, where it is ground into small particles. The movements of the tongue, lips and cheek serve to retain the food in the proper relation to the teeth until it is sufficiently comminuted and mixed with saliva, when it passes backwards and is swallowed. This should not be done until the food is thoroughly masticated and insalivated.

The value of thorough mastication is threefold:

(1) *Mechanical*—The subdividing of the

food into fine pieces is of the greatest value to subsequent digestion. The indigestibility of many articles of food is due very largely to the facility with which they may be swallowed without being very finely divided. While meat, eggs, etc., are very readily digested by the fluids of the stomach when in small particles, a lump of either will resist their action for a considerable time.

(2) *Chemical*—During mastication the flow of saliva into the mouth is very largely increased by the reflex action of taste and also by the pressure on the salivary glands, of the bones and muscles involved; the flow of the juices of the stomach is also induced. The object of mastication, the trituration and insalivation of the food, is more perfectly accomplished by this action being prolonged and this, "the first process of digestion being thorough, the succeeding ones in stomach and intestines would proceed with greater ease, with a saving of energy and vitality."*

(3) *Physiological*, or the effect on the jaws and surrounding structures—The muscles of mastication are very large in relation to the bony structures in connection with them. The exercise of these muscles largely influences the nutrition and development, not only of the muscles themselves, but also of the important structures near them, such as the jaw bones, the salivary glands, the soft palate, the tonsils and the posterior portion of the throat and nasal passages. The development of a bone depends considerably on the amount of exercise given the muscles which are attached to it. Hence in a person accustomed from childhood to thoroughly masticate, we generally find the jaws large and

* H. Campbell, M.D., F.R.C.P., (Lond.), in "The A.B-Z of Our Own Nutrition."