

AN
INAUGURAL DISSERTATION
ON

Digestion.

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Digestion.

The word digestion, is derived from the Latin word, *Digeo*, which means to dissolve, and by digestion is meant the changes which alimentary substances undergo, when taken into the digestive canal. The object of this is to convert the alimentary substances, into two parts: one of which is to renew the waste caused by the decomposition of the animal tissues: the other when deprived of its nutritious properties, ^{is} carried through the alimentary canal, and rejected from the body. This function is composed of a series of organic actions, differing according to the particular organization of the animal. In Man they are eight in number. viz. 1. Prehension, 2. Mastication, 3. Insalivation, 4. Deglutition,

5. Action of the stomach, 6, action of the large Intestines, 7. action of the small intestines 8. Expulsion of the faeces. By prehension is meant, the act of carrying the food to the mouth, and placing it within its cavity. Mastication is the act of chewing up, or grinding the food; when taken into the mouth. Mastication is executed by the tongue, cheeks, and lips, which place the food between the teeth, and by the actions of the muscles of mastication, and the lower jaw, it is cut and ground into fine particles, by the teeth. During the whole of this process, the food is being continually moistened by saliva which softens it and partially

digests it: preparing it for deglu-
-tation. Insalivation is the Parotid,
Submaxillary, and Sublingual,
glands pouring out their secretions,
through the ducts of Steno,
Wharton, and Rivinus, upon what-
ever is taken into the mouth
to be masticated. It is believed
by some Physiologists that insal-
-ivation, and proper mastication,
is as essential to digestion as the
proper performance of any other
function, relating to digestion.
It is owing to improper mastication,
and insalivation, that there are
so many dyspepticks. Food hastily
swallowed, without thorough mas-
-tication, and insalivation is very
hard to decompose, when taken
into the stomach: and thus weakens

the performances of the stomach, with its great exertions to digestion.

Deglutition is the act, by which substances are passed from the mouth, into the stomach, through the pharynx, and oesophagus.

Deglutition is very complicated in its character; requiring the action of a great many muscles: some of which are called into action voluntarily and some involuntarily.

When the food has been sufficiently reduced, by the mouth, it is carried back, until it has passed the anterior palatine arch. This is done by entire voluntary movement.

By the approximation of the tongue and hard palate. In the second stage of deglutition, the tongue is carried still farther back

-wards, and the larynx is drawn upwards and forwards under the root of the tongue: so that the epiglottis is passed over the rima glottidis. The muscles of the anterior palatine arch contract, after the morsel has passed it; and push the bolus backwards. Then the muscles of the posterior arch contract in such a manner, as to force the food down to the pharynx, which is raised to receive it. The most of these acts are voluntary; but some are automatic. The third stage of deglutition, is after the food has reached the pharynx. The morsel after it has passed into the pharynx, is forced downwards by the constrictors of the pharynx: and is carried through the oesoph-

-agus in the same manner. The act of deglutition is wholly involuntary, in the third stage. At the cardiac extremity of the oesophagus, there is a sort of a sphincter, which keeps the food from passing back, when passed into the stomach. To describe the actions of the stomach; it is necessary to give the anatomy of the stomach to some extent. When the stomach is in a normal state, the inner coat of the stomach is of a deep pink color; but becomes pale as it is distended. The mucous coat of the stomach is also composed of very small tubules, which are called villi. These villi are very vascular, and are very easily excited; enlarging or diminishing as they are the more or less excited. These villi

are for the purpose, of pouring out
a pure, colorless, and slightly viscid
fluid. This fluid is very acid: (But
to the anatomy of the stomach.)

The stomach is composed of a
muscular coat which is very essential
to digestion. The fasciculi of the
muscular coat of the stomach, are
so arranged, as to contract or relax,
according to the necessity of their proper
duties. After the food has passed
into the stomach by continued waves,
through the oesophagus; it passes
from right to left, around the
splenic end of the stomach; then
from left to right, around the
larger curvature of the stomach,
to the pyloric end: then from
right to left around the smaller

curvature, thus keeping up a con-
-tinued revolution, as long as
any particles of food remain.
These fasciculi of muscles (before
spoken of) cause these revolutions,
or agitations, of the bolus, by
their contractions and relaxations.
The stomach has been frequently
compared to an hour glass, in
form: and the pyloric end
designed for the deposit of the
partially digested food, As the
bolus is thus revolving in the
stomach, the little villi are
excited and begin to pour out
their contents, called Gastric juice;
This fluid coming in contact
with the outer surface of the
bolus, penetrates and moistens it,

also decomposing it as it were, and changing it into chyme. This chyme or decomposed food is deposited in the pylorus, by being scraped off, as the bolus makes its turnings. Then the undigested part, is again saturated with this fluid, and is also changed into chyme. Thus this chemical operation goes on until the whole of the contents of the stomach is changed into chyme, except that which cannot be changed by any means. Some articles of food are harder of digestion than others: and requires more of the gastric fluid to dissolve it. Thus this fluid is increased or diminished, as necessity may require.

After the pulpy matter, or chyme begins to make its exit from the pylorus into the duodenum, the stomach begins to contract; and thus forces out the entire contents into the duodenum. The chyme passes much more rapidly at last, than at first, into the duodenum, or second stomach, as it is sometimes called. Much could be said in regard to the nervous system connected with digestion, as it is wholly governed by the nervous power. But as simple digestion is the subject, it must be strictly adhered to. The next thing looked to is the action of the intestinal tube. And the small intestines are the

first to be noticed. After the chyme has passed into the duodenum, the pancreatic, and the biliary ducts, pour out their contents, upon this chyme, causing it to undergo another change, similar to the change on entering the stomach. After the chemical process goes on in the duodenum, the chyme is changed into another different fluid; called chyle. This chyle is so diluted that it is very easily absorbed. And the lacteals of which the duodenum is composed, are continually drinking, in this chyle as it were: and depositing it in the receptaculum chyli; and it is then conducted to the circulation, by the thoracic duct: the thoracic duct emptying itself,

into the left subclavian vein.

The chyle is not entirely digested, until it has passed into the lungs and there deprived of its carbon and other impurities.

The contents of the duodenum, is not entirely taken up by the lacteals; but a great deal of matter remains. The most of this substance, is excrementitious matter, which passes down the intestinal canal. As this substance traverses the intestinal canal, after leaving the duodenum, the most or all of the nutritious particles are absorbed, by the absorbents, or lacteals, of the small and large intestines: leaving nothing but the excrementitious matter which is passed

out, by the rectum. To describe the
the actions of the small and large
intestines, after the duodenum
has performed its functions, would
be one and the same thing, as
~~they~~ do very little towards digestion,
when the food is taken into the
digestive canal by the mouth.
But frequently food is taken into
the system, per anum. Then
digestion is compelled to be, some-
-what different. In fact the process
which substances undergo when cast
into the rectum, cannot be called
digestion properly. For it is only
fluids and mucilaginous substances,
that can give nutriment to the
system, when taken into the
rectum. And this is done by the

laetals absorbing the nutritious particles, and distributing them to the system. It may be in place here to mention that there are nutritious substances, taken by the mouth, which undergo no digestion: but are immediately absorbed. These substances are mostly of the oleaginous class, requiring only to be mixed with the different fluids, for the separation of their particles, for easy absorption. Much has been ^{left} ~~said~~ which is connected with digestion: but the alimentary canal, and its actions, have been the discussion, which are the chief principles to digestion.