

Ludwig; the former of whom by his chemical investigations has enabled us to differentiate the various products of albuminous decomposition, while the latter, with his pupils, Schmidt-Muhlheim and Wooldridge, discovered the poisonous action of albumoses and peptones, and of the juices of various tissues when injected directly into the blood.

Before the proteid constituents of our food can be absorbed they must be split up during digestion into albumoses and peptones; yet these researches show that the very substances which are necessary to repair waste, and are indispensable for the continuance of life, prove fatal when introduced into the body in a wrong way or in too great quantity. But the products of the digestion of albumen do not normally enter the circulation as albumoses and peptones. During absorption they undergo changes of a synthetic nature in the walls of the intestine, and probably to a certain extent also in the liver, so that they again form harmless substances, and their poisonous properties are destroyed before they enter the general blood stream.

But how is it that the ferments which decompose albuminous food and form poisons from it in the intestine, do not pass into the blood and kill the animal by digesting the tissues and forming poisons from them? Of course pepsin cannot do so, as it acts only in an acid medium, but there is no such hindrance to the action of trypsin, and and yet it does not destroy the tissues composing the body itself. In all probability the reason why digestive ferments do not digest the tissues is not that they are destroyed in the digestive canal, nor yet that they are not absorbed, but that they are altered from active enzymes into inert zymogens which can be stored up without risk, and can again liberate active enzymes when these are required to digest a subsequent meal. In this respect they may be compared to the knives used by wandering peoples to cut up their meat, and which are not thrown away after each meal, but are simply put into sheaths which cover their edges and deprive them for a time of their cutting power.

But it is not in the intestine only that enzymes are found; they are also poured into the blood by the pancreas, and probably by the thyroid and other glands. As our acquaintance with the processes of cell life increases it seems more and more likely that the tissue change on which functional activity depends is effected by the enzymes, and the truer do the speculations of Van Helmont appear—that life is a process of fermentation.

There can be little doubt that if enzymes in a free state were to circulate through the body they would do much harm, and