

they can be studied as individuals. Of these, however, many are albumoses or of proteid nature and are destroyed, according to Nencki, by various digestive juices.*

As the first three classes of these substances differ from what we commonly have in mind when we speak of poisons, so do the symptoms which they are supposed to produce in the so-called autointoxications differ from the toxic picture we see in a case of ileus or acute intestinal obstruction.

We know that the chief symptoms of ileus, such as pain, vomiting, cold clammy sweat, pallid and shrunken features, with possibly sub-normal temperature and ultimate complete muscular relaxation, all of which often result in death within one or two days, can be simulated by poisons formed by bacterial activity, and that, too, within a comparatively few hours, as, for instance, by the tyrotoxin of Vaughan,† Lepine and Molière‡ have occasionally observed in cases of intestinal occlusion symptoms like those seen in atropin poisoning, namely, dilated pupils and marked redness of the skin and these authors surmise that death in these instances may be in some degree due to autointoxication from absorption of ptomaines from the intestine.

It is not my purpose to offer a chemical theory in explanation of any of these various symptoms that arise in the course of an acute and complete obstruction of the intestinal canal at different points in its course. It is my object rather to present a chemical study of the intestinal contents in cases of complete obstruction of the small intestines in order to learn whether other or more powerful poisons than the putrefactive products already isolated can be found under such circumstances. Such poisons if present must exert their action and play their part, be it great or small, in the symptomatology of ileus; certainly the substances so far observed in the intestinal canal are not sufficiently toxic to account for any of the symptoms observed in intestinal obstruction. On the other hand, "shock," and similar expressions, are far from giving a rational explanation of the condition described.

When we consider the chemical and physical conditions which exist in a case of this kind we find, first, a closure of the bowel, it may be by hernia, volvulus, intussusception or pressure, but the effect is to convert as much of the digestive tract as may be above the constricted portion into a closed thermostatic tube containing culture materials in the shape of proteids, carbohydrates, etc., kept at body temperature and infected by a varied bacterial

* Ransom (*Deutsche med. Wochenschr.*, 1898, p. 117), however, finds that tetanus toxin passes in large part unchanged through the alimentary canal, its harmlessness when administered by the stomach being due to incapacity of the stomach and intestine to absorb it. Behring (*ibid.*, page 662) considers that other proteid-like bacterial toxins behave in the same way.

† *Zeitschr. f. physiol. Chem.*, x, 146.

‡ Cited from Eichhorst, *Darmstenose*, *Real-Encyclop. d. gesamm. Heilk.*, iii, edit., v, 430.