

peripheric part of the iris. 10. Perhaps in diseases of the ciliary body.]

E. Hert recommends a solution of the extract of such a concentration that one drop shall contain the extractive matter of three grains of the crude drug. He furthermore says that the alcoholic extract is soluble in glycerine, and that this solution is more durable than the watery one, which after a few days becomes decomposed.—*Geissler. Am. Jour. Ophthalmology.*

TRICHINA SPIRALIS

TRICHINIASIS.—We published in our last number an extract from the *British Med. Journal* relating to the whole-sale poisoning of a large assembly at Hettstadt, Germany. The fatal agent used was *Trichina Spiralis*, served in hog's flesh at a feast. Disregarding the injunction in Leviticus concerning swine, "Of their flesh shall ye not eat, and their carcase shall ye not touch; they are unclean to you," eighty-three persons ate and died, and there can be no doubt that many instances of death attributed to poison or mysterious disease are due to the same cause. It would really seem as if the pig were created to serve as a foul nursery for the most loathsome parasites which infest man, and as an aversion to him, which long ago amounted to complete abstinence from pork in every form, is now increased tenfold by the recent information that the encysted trichinae, which are occasionally found in the muscle of man on dissection and which we knew were derived from the muscles of swine, instead of being the harmless parasites we have theretofore considered them, produce one of the most deadly diseases known. Unfortunately there are no symptoms of trichiniasis in the pig after the encysted stage; and the presence of the capsules which contain the worms would hardly be noticed in its flesh on account of their near resemblance in colour, and the amount of fat with which the latter is saturated. The disease has never yet been met with in any herbivorous animal, and, according to Langenbeck, trichinae have been found in great numbers in earth-worms (as many as 500 or 600 in a single worm), which form part of the food of swine when at liberty. A committee, consisting of Virchow, Romak, Gurlt, and others, has been appointed by the Berlin Medical Society to investigate the whole subject. We add for the further information of our readers an interesting account by M. Davaine, from the same journal, of the symptoms produced in man by this disease.

When trichinae exist in great numbers, their presence in the muscles or intestines produces severe and sometimes fatal symptoms. These symptoms may, in animals experimented on, present three successive, more or less distinct phases. The first phase is characterized by intestinal disorder, produced by the development of the larvae in large numbers, and their adhesion to the mucous membrane of the intestine. In this stage, M. Davaine has seen rabbits die with intense diarrhoea; and two cats, which he fed with trichinized meat, had diarrhoea for at least a fortnight, but survived. Five or six rats fed on a similar diet, one only, which was pregnant, died of diarrhoea, after abortion, on the eighth day. According to Mr. Leuckart, the passage of the embryos of the trichinae through the intestinal walls sometimes produces peritonitis. This intestinal phase often becomes blended with the next; it may be relieved by the

expulsion of the worms by means of the diarrhoea, or may cease with the natural death of the worms.

The second stage presents general symptoms—muscular pains, &c. These phenomena are dependent on the introduction of the trichinae into the muscles; they rapidly acquire their maximum intensity, and have not a long duration. The appearance and duration of this stage are in complete relation with the development and length of sojourn of the trichinae in the intestines; in fact, in this entozoon oviposition is not slow and of long duration as in many nematoid worms; the genital tube is rapidly formed, and the ova in its whole length are developed almost simultaneously, so that the embryos, arriving soon at maturity, are at once thrown out in large numbers into the intestine, and the mother trichina dies exhausted. If it be remembered that the embryos do not escape before the eighth day, that a certain number of days are required for their arrival in the muscles, and that new ones are not produced after six or seven weeks, it will be understood that the first symptoms of this stage can scarcely appear until the end of a fortnight after ingestion of the diseased food, that they must continue four or five weeks, and that after this they may disappear. This course of events is observed in animals; and in man, the symptoms of this stage have shown themselves and become aggravated from the third to the sixth week after infection. Most animals die during this stage; rabbits rarely survive; rats, on the contrary, generally resist it.

If the animals do not die of the general symptoms or local disturbances proper to these two stages, the inflammatory symptoms cease, respiration becomes natural, and order is re-established. But, in some cases, the number of cysts formed in the muscles are sufficiently great to impede the proper exercise of their functions, and hence arise general debility, a kind of consumption which persists or becomes aggravated, and the animal dies of marasmus. M. Davaine has noticed this in rabbits, but especially in a rat.

Recovery from these phases of trichinal infection may be apparently perfect. A rabbit, which M. Davaine kept during five months, became large and fat, although it had a large number of trichinae in its muscles; a rat which had had these entozoa in considerable numbers during six months was to all appearance in good health. Hence he concludes that the trichinae produce symptoms only when they are in the intestinal canal and when they are entering the muscles. Having become lodged in their cysts among the muscular fibres, they may remain harmless for an indefinite time. In every case, except one, down to 1853, trichinae have been found in the bodies of persons who have died of disease (generally chronic) or by accident, or in the dissecting room in bodies regarding which the previous history could not be obtained. In most cases, the cysts contained a cretaceous or fatty deposit, showing that they had probably existed for several years.

The observations which have been made on the human subject in regard to the symptoms caused by trichinae show that they belong, as in animals, to the initial period of infection. They consist in intestinal and muscular lesions: the latter coincide with the entrance of the parasite into the muscles, and are truly traumatic. In Zenker's case, the intestinal symptoms present were swelling and pain: