THE BOTOCUDOS. — Dr. P. Ehrenreich has published the results of his study of the Botocudos of the Rio Doce in the *Zeitschrift für Ethnologie*. He discusses the observations of former travellers, and compares them with his own experience, thus giving the best sketch of this interesting nation which can be obtained at the present time. Dr. Ehrenreich has collected a considerable amount of anthropological, ethnological, and linguistic material. He gives a number of craniological and anthropometrical measurements, sketches the life of the tribes, who live in a remarkably low state of civilization, and gives a vocabulary — which he has compared with the older ones of Martius — and brief grammatical notes. His researches lead him to the conclusion that the Botocudos formerly occupied a more extensive territory than they do at the present time, inhabiting a tract of land which extended from the coast far westward. They are related to the Ges nations, who inhabit the central parts of Brazil, and a member of whom was discovered by Von Steinen on the upper Xingu. It is of importance to know that the Ges and the Botocudos wear labrets and ear ornaments, that their ceramic art and methods of navigation are very primitive, and that they do not use the hammock. Ehrenreich is of the opinion that the Botocudos remained in an earlier stage of development than the Ges nations, who migrated west and came into contact with other peoples, while the former remained isolated. He believes that the remains found in the caves of the province of Minas Geraes belonged to the ancestors of the Botocudos.

ORIGIN OF THE ESKIMO.—In the *American Naturalist* of August, 1887, Mr. Lucien M. Turner criticises Dr. H. Rink's theory. The latter supposes that the Eskimo were originally an inland people, living somewhere in the north-western part of North America, whence they descended to the seacoast along the rivers. In several articles, Dr. Rink tries to prove this theory by comparing the languages and customs of the different tribes. Though convincing proofs cannot be given, it seems very probable that the Eskimo have come from the rivers and lakes in the interior of America. This theory is open to criticism, but Turner's objections fail to convince us, and do not meet Rink's arguments. The latter is right in laying stress upon the fact that the Eskimo are not so exclusively a coast people as is generally supposed. The most difficult problem of the study is the difference of the tribes west and east of the Mackenzie. Rink emphasizes the fact that the former have certain inventions which the latter have not, while other implements are more developed the farther east we come. From this fact he concludes that the Eskimo first reached the sea and came into their present environment west of the Mackenzie, near the mouth of the Alaskan rivers. This theory, though not improbable, ought to be scrutinized by a study of the anthropology of Alaskan and eastern Eskimo tribes. It seems to us that much of the difference may be due to foreign influence. An interesting paper on the anthropology of the Eskimo, more particularly of those of East Greenland, is contained in the Bulletin de la Société d'Anthropologie (ix. p. 608). While the population of western Greenland is mixed with Danish elements to such a degree that there is probably nobody of pure Eskimo descent in South Greenland, this tribe has never mixed with Europeans. They are less dolichocephalic and slightly taller than the West Greenlanders and other eastern tribes. Their noses are described as being aquiline, but this also occurs among other tribes. The researches in East Greenland which were carried out by Lieutenant Holm show definitely that the tribes of the east coast never came into contact with the ancient Normans.

BOOK-REVIEWS.

The Treatment and Utilization of Sewage. By W. H. CORFIELD and LOUIS C. PARKER. London, Macmillan. 8°.

THE fact that this work has reached a third edition is evidence of its value and usefulness. Since the second edition was published, sixteen years have elapsed, during which time great progress has been made in the methods of treatment of sewage, so that it has been necessary, in order to bring the book up to date, to incorporate much material which will not be found in the earlier editions. The historical portions have been retained in their entirety, as being not only interesting in themselves, but also, on the one hand, descriptive of a state of things still to be found in many places, and, on the other, important as a record of methods and processes which have been adopted at various times, for methods and processes which have been tried and abandoned as useless are liable to be brought forward again as new at some future time unless such a record is kept. Special attention has been given in this edition to the important investigation of the British Association Sewage Committee, more especially as regards the determination of the percentage of the manurial ingredients of sewage actually utilized by irrigation on land, and recovered in the form of crops, and the accurate method devised by that committee for taking samples of sewage and effluent-water for analysis. The practical inquiry originated by the suggestion of the late Dr. Cobbold that entozoic disease might be spread through the agency of sewage farming, and the quantitative examination, with a view to its manurial value, of the compost resulting from the use of earth-closets, are described in detail. The table of contents is a very extensive one, occupying twenty-two pages, and includes many subjects of great interest and importance of which the title of the book gives no suggestion.

In the opening chapter reference is made to the early systems for the collection and removal of excreta, the midden heaps, the stagnant ditches, and the open cesspools. In some of the English towns, in 1845, the privies were in the cellars, and often overflowed. This condition of things could not but be detrimental to health, and must of necessity favor to an alarming extent the spread of many epidemic diseases. Those who question the relation between filth and disease will do well to read that chapter in Dr. Corfield's book in which he treats of this subject. He succeeds in demonstrating that the opinion that the pollution of drinking-water by excreta, and of the air by emanations from cesspools and so forth, on the one hand, and on the other the amount of general sickness, and, in many cases, of special epidemics, stand in the relation of cause and effect, is a true one. Instances are given of fever, cholera, and other forms of disease, breaking out in English towns, which are directly traceable to the filth which had been allowed to accumulate.

In the reports of the Health of Towns Commissioners it is continually pointed out that sickness is the chief cause of the non-payment of rent. One witness says: "Three out of five of the losses of rent that I now have are losses from the sickness of the tenants, who are working men. Rent is the best got from healthy houses." Another says: "Sickness at all forms an excuse for the poorer part not paying their rent, and a reasonable excuse," so that filth causes sickness, sickness inability to work, inability to work poverty and non-payment of rent, to say nothing of starvation. We not infrequently hear in this country, the statement that the State has no right to interfere, that a man's house is his castle, and that he can do what he likes within it. It is this sentiment which for so many years prevented legislation for the protection of tenants in our large and dilapidated tenement-houses, a sentiment which is, we are glad to say, being done away with, more, however, we fear, because the laboring men are beginning to realize and exercise their power than because of any general awakening of landlords to the duty which they owe to their fellow-men. Writing on this subject in 1844, with reference to the then state of Liverpool, Mr. Howe said: "The man who, in a crowded street, is living in filth and breathing a putrid atmosphere, or who makes that street a receptacle for the offal which he casts from his dwelling, becomes the instrument of danger to his neighbors by spreading infection, and he not only hazards his own life, but endangers that of others. The man who erects a flimsy edifice in a crowded thoroughfare, which by its falling may destroy life, should be prevented doing so; and he who constructs a house to let for profit and pays no attention to those matters which are essential to comfort, but, on the contrary, so constructs it as to engender fever and endanger the lives of his tenants, — all these are cases where, with propriety and in justice the legislature ought to interfere, and to insist upon such a mode of construction as will not endanger human life." The earth and ash closets are fully described and their advantages and disadvantages discussed. In speaking of this system, Dr. Corfield says that there can be no doubt that a well-managed dry-earth conservancy system, or midden and ash-pit system, is better than no system at all, but it by no means follows that they are free from danger. They both go upon a wrong principle: we do not want conservancy at all; our first object must be

to get rid of refuse-matters, and not to see how long we can keep them about our houses in a *presumed* harmless condition. The Rivers Pollution Commissioners in their first report, 1868, have no hesitation in pronouncing the dry-earth system, however suitable for institutions, villages, and camps, where personal or official regulations can be enforced, entirely unfitted to the circumstances of large towns.

The subject of sewerage is very fully treated. In the consideration of the separate system, that at Memphis, Tenn., and Pullman, Ill., are mentioned and described. The best method of sewer-ventilation is still undetermined in this country, and the sanitary journals are at the present time discussing the subject with a good deal of earnestness. On this point Dr. Corfield says that the very common plan of ventilating sewers by means of untrapped rain-water pipes from the roofs of houses is extremely dangerous. These pipes are often very loosely jointed, and the air rising from the sewer will escape through every such joint, possibly into bedrooms; and in many cases the open head of the pipe is just beneath a dormer or attic window. During heavy rain the rush of water down these pipes will force the air of the drain into the interior of the house through trapped or untrapped openings. He also condemns the practice of ventilating the sewers by means of the soil-pipes of houses, as there is constant risk of the escape of sewer-air through defective joints into the interior of the house. The house-drain should pass through a disconnecting chamber with an air inlet, and be trapped before entering the sewer. Connecting the sewers with furnace chimneys is also condemned. The Shone, Liernur, and Berlier systems of sewerage are described in a concise but thoroughly intelligible manner.

Among other interesting topics discussed, and which we are compelled to pass over for want of space, are the sanitary aspects of the water-carriage system, the value of sewage, the injury which it works to rivers, the pollution of drinking-water, the discharge of sewage into tidal waters, the straining and precipitation of town-sewage, filtration, irrigation, and the treatment and utilization of manufacturing-refuse. In speaking of the influence of sewage-farming on the public health, the author states, that, as far as nuisance is concerned, there is no doubt that if irrigation farms are badly managed they may be made a nuisance to the neighborhoods. Ordinary sewage is only in a very slight degree offensive when fresh. What is really the most offensive part of sewage farms is the black slimy mud which collects along the sides of the carriers when the sewage is not filtered before being sent to the fields. It is advisable that sewage should be filtered and strained in the manner practised at several places. There is no reason to spread a layer of comparatively worthless and necessarily offensive filth over the surface of the soil. There is good reason to expect that the utilization of the sewage of towns on the land near them, while preventing the pollution of drinking-water, and the spread thereby of cholera and typhoid fever, will at the same time maintain the purity of the atmosphere around and about the towns, and that the result will be, especially when combined with that produced by the increased demand for labor and the more plentiful supply of food, a diminution of the general death-rate.

The late Dr. Cobbold had great fear that entozoic diseases would be spread by means of sewage irrigation. Although this possibility has been borne in mind ever since Dr. Cobbold drew attention to it in 1865, there are no facts reported which connect entozoic diseases with sewage irrigation. Dr. Corfield summarizes his views on the question by saying that it has not yet been shown that sewage irrigation has ever increased the amount of entozoic disease in men or cattle. Still less that it is likely to do so to a greater extent than any other method of utilizing human excrement; and were this shown to be the case, the danger would be to a great extent obviated by some preliminary treatment, with a view to the separation of the suspended matters.

The Treatment of Sewage. By Dr. C. M. TIDY. New York, Van Nostrand. 24°.

THIS little book, which is one of Van Nostrand's 'Science Series,' contains in a very concise form a great deal of valuable information on the subject of which it treats. It goes over necessarily much of the same ground as Corfield's 'Treatment and Utilization of Sewage,' a review of which we have already given, but in a much more condensed form.

Dr. Tidy, in marked contrast with Dr. Corfield, thinks that there is danger that entozoic diseases may be communicated to both man and beast by means of the products of sewage farms. He says that the fact has always been recognized that entozoic diseases have an external origin; i.e., that the ova or parasites come from without, and are not generated within, the human body. Millions of ova are voided with every segment discharged by the person afflicted with tapeworm, each ovum being capable of producing a measle in the flesh of an animal, and each measle a tapeworm in the body of the man. He has seen watercresses and celery grown on sewage ground, having a quantity of dried sewage matter deposited on the stems, and he has, with more than a cook's patience, tried to wash this matter off, but the tenacity with which it sticks upon the surface of the vegetable when once dry is perfectly astounding. It should be remembered in this connection that these vegetables are eaten in an uncooked state. The grass covered with sewage, eaten as it is with rapacity by the cattle, infects their bodies with the larval parasite. Thus the meat is measly, and measly meat, except for efficient cooking, means tapeworm to the human subject. Perhaps a similar story might be told of trichina, with its ten times greater danger. The farm, therefore, that receives sewage must be more liable to produce measly meat than the farm that does not receive it.

In opposition to these views of Dr. Tidy we have the opinion of Dr. Corfield, already referred to, and also that of the British Association Committee. This committee made experiments to determine this very question of the distribution of entozoic disease by means of sewage irrigation. Dr. Cobbold, at the request of this committee, examined the carcass of an ox which had been fed for two years on sewage-grown grass, and reported the perfect freedom of that animal from internal parasites of any kind, but explained this freedom in a manner which to his mind did not affect the main question. The committee did not accept this explanation, but in their report say that it appears as far as this one case goes (and it is certainly as conclusive as a single case could possibly be), there is no evidence that entozoal forms of life are to be found upon the farm at all, in any stage of their existence, or in the flesh of an animal fed exclusively for twenty-two months on sewaged produce grown on the farm. This report was made in 1871, but we have Dr. Corfield's statement that since the date of that report no facts have been recorded connecting entozoic disease with sewage irrigation.

It would be interesting to know whether Dr. Tidy or others have any evidence to the contrary. It would seem as though the system had certainly been in practical operation long enough to have settled this question.

It is a matter of regret that the publisher of Dr. Tidy's book has not given the reader a table of contents or an index. In order to ascertain what it contains it must be read through from title-page to colaphon, and as a book of reference its value is greatly diminished from this omission.

NOTES AND NEWS.

A SANITARY Convention was held at Traverse City, Mich., Aug. 24 and 25, under the auspices of the State Board of Health. The objects of the convention were the presentation of facts, the comparison of views, and the discussion of methods relating to the prevention of sickness and deaths, and the improvement of the conditions of living. It was not a doctors' convention, but for the people generally. Among the many subjects which were presented and discussed were the following: disposal of waste in Traverse City by sewerage and otherwise, the present and future water-supply of Traverse City, the best methods of warming and ventilation, the work of the village health-officer, the money value of sanitary work, the prevention of contagious diseases, school hygiene, foods and their adulterations, the drink problem, and the prevention of insanity.

— In the letter on 'Chrome considered as a Poison,' by Charles Harrington, in last week's *Science*, centimetre (p. 105, col. 2, 4th line) and centigram (p. 106, col. 2, 21st line) should read 'gram.'