

fact, something of a Nauplius-like appearance to the animal; and, inasmuch as the Nauplius is the larval stage of certain Crustacea, Pedalion may be said to offer some resemblance to an arthropod. It must be remembered that arthropod limbs are always symmetrically disposed, and never occupy a position in the median line, except as a secondary modification resulting from the fusion of two originally distinct limbs into one median structure; as occurs, for example, in the Labium. Moreover, arthropod limbs are the appendages of segments, and are arranged in serial order lengthwise of the body and by segments. In the Rotifera, on the contrary, there is and can be no such arrangement, because there are no segments. In fact, we must interpret the similarity—which, after all, is imperfect—of the limbs of Pedalion to those of the Nauplius as an analogy, and not as an homology.

So, much may be said to indicate the limit beyond which the special merits of the work do not extend; but within those limits we find a great deal of the best excellence, which abundantly justifies our congratulating the authors upon the completion of their capital and thorough treatise.

LETTERS TO THE EDITOR.

[Continued from p. 592.]

The cause of consumption.

THIS subject is of such great importance not only in the prevention but also in the treatment of the disease, that I feel sure you will permit me to reply to the important objection raised by 'Medicus' to my theory of consumption. In science we proceed from the known to the unknown. Now, we know that the constant inhalation of small particles produces consumption, and that they evidently reduce the breathing capacity; and we have produced experimentally the disease in animals by simple confinement, which also reduces that capacity. Further, I have produced consumption by reducing the breathing surface of the lungs below a certain point, and I have searched the records in vain to find a case of consumption in which such conditions were not present. The tribes that are absolutely free from this disease are known to live under conditions that tend to develop the lungs; and we see the introduction of civilization amongst them—that is, of conditions that tend to reduce the breathing surface—is followed by the introduction of that disease. But, says 'Medicus,'—and I have had the same objection here,—that is because the bacillus has been introduced. I reply, apply the same process of examination to the bacillian theory, and it fails at the very beginning. Koch's important experiments—they mark an epoch in the knowledge of life—resulted in an apparent affirmative and an absolute negative. In some animals he induced consumption, in others he did not. What is the difference between the two classes of animals? The former evidently had been, and were, subjected to conditions that tend to reduce the breathing capacity; while the

latter had not been, and were not, subjected to such conditions to the same extent. What followed the stoppage of the ventilating shafts of several wards at Brompton, an outbreak of consumption? No. Erysipelas. In civilization we do not know where the bacillus, so called, tuberculosis is not, and I am curious to see who will prove their absence amongst the tribes that are yet free from consumption. And while the germicide treatment of the disease has admittedly failed, that based upon this theory has, both in the experiments and in the four cases to which it has been applied, proved completely successful.

G. W. HAMBLETON.

London, May 25.

Scandinavian studies in the United States.

THE readers of *Science* had their attention directed to this subject in a recent article written by Daniel Kilham Dodge; but the writer of that article, unwittingly I suppose, does injustice to the Scandinavians in this country as well as to the work that is so nobly being carried on by them. He also omits a prominent university in the north-west which is trying to do what he thinks ought to be done by many American colleges. As to the success of such efforts, his historical account has important lessons.

He states that there is "a population of 107,768 Scandinavians in Minnesota, and there is not a college in which the parent tongues of this great mass of people can be studied."

This might convey a wrong impression about the Scandinavians, if the readers of *Science* were not informed that during the year 1886 between seven and eight hundred students attended the Scandinavian institutions of Minnesota. True, these institutions are not as yet complete colleges in the American sense of the term, but the day is not far distant when some will be an equivalent. Their object is not degrees, but qualifications. These people have been nurtured by European university principles, and with university men in their midst: they are not slow in fathoming the shallowness of a great deal of the American college-training.

Gustavus Adolphus college, situated at St. Peter, Minn., is a flourishing institution with two hundred students, that is lacking only one year of having a four-years' collegiate course. One-half of the professorships are held by men who are not Scandinavians, but Americans educated in eastern American colleges. Latin, English, German, mathematics, and natural sciences are taught by these professors. Augustana college, Rock Island, Ill., is another and older institution, supported by the Swedes, which has been graduating class after class for a period of ten years. Persons holding a diploma from this latter institution are admitted into the University of Upsala without examination. A goodly number of the professors are also American college-bred men. Within recent years a most promising educational work was begun by the Swedes at Lindsborg, Kan. During the past year, over three hundred students attended the different departments of Bethany college and Normal institute, and at the coming commencement they will dedicate an elegant and large college-building.

The Swedes and the Norwegians are alive on educational matters, and their influence is and will continue to be felt in this country. They are Swedes

and Norwegians, and no one can blame them if they desire their children to be educated in a way that they can appreciate it; and, if the Americans cannot and will not do it, they will and must do it. As a rule, they are not opposed but glad to have their youth learn English; but they also wish them to know something more, especially the language, literature, and history of the fatherland. The complaint made against them often comes from denominational headquarters, because they cannot proselyte them fast enough. The Scandinavians are Lutherans, and they will resist any and every attempt that is made to rob them of the faith for which Gustavus Adolphus

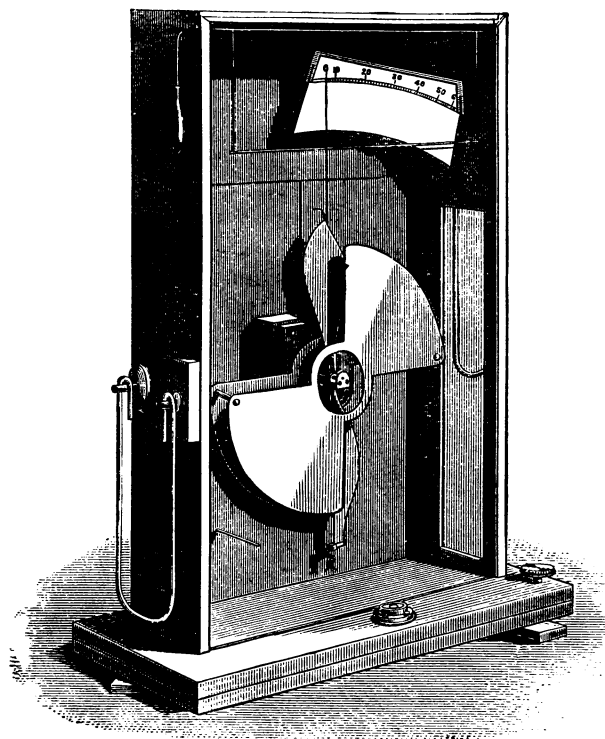
markedly well, evidence of which I have recently had, in which I have used a large battery of Leyden jars as a source of electricity.

The instrument measures between four hundred and ten thousand volts, and is exceedingly useful in connection with the Holtz machine and other high-tension sources.

F. E. NIPHER.

St. Louis, June 3.

THE report recently issued by the geological survey of Kentucky, on the geology of Elliott county, discusses the coal-measures of that region, and especially the massive conglomerate, which,



THOMSON'S ELECTROSTATIC VOLTMETER.

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fought and died. Allow them the religious liberty of which we boast as Americans, and they will be Americans too.

J. P. ÜHLER.

St. Peter, Minn., June 2.

Thomson's electrostatic voltmeter.

Respecting your inquiry as to the merits of the Thomson electrostatic voltmeter, I must say that I have made great use of it during the last year, and am very much pleased with its performance. It has the disadvantage of not being very portable, and I fear that the wood of which the enclosing box is formed will go the way of all European woods in our climate. I begin to see evidence of warping now, which will make it necessary to re-examine the scale of the instrument.

The instrument will, however, hold its charge re-

along certain uplifts, has been deeply trenched by the streams, the vertical walls of the narrow and exceedingly picturesque gorges ranging from 75 to 175 feet in height. We also find here full accounts by Messrs. Crandall and Diller of the trap dike of Elliott county, which is noteworthy as being the only mass of eruptive rock yet discovered in Kentucky, and of the 'interesting possibilities' in the way of diamonds suggested by Professor Lewis. But, although this peridotite is similar to that so closely associated with the diamonds in South Africa, Mr. Diller finds no facts which would warrant a persistent search for the gems in Kentucky.