

kind he had worked on at home. Fortunately, however, it was found that the mice at Athens were even more susceptible to inoculation and also to infection through the alimentary canal than those in Germany. This fact was established in a few days by inoculating and feeding the mice in the laboratory with cultures of the organism. Preparations for experiment on a large scale were at once made, and Loeffler, Dr. Abel, and Dr. Pampoukis, director of the bacteriological laboratory in Athens, set sail on April 16 for Volo, and went by rail from thence to Larissa, the capital of Thessaly.

Loeffler had found that the micro-organism, *Bacillus typhi murium*,<sup>1</sup> grows very well in a decoction of oat and barley straw to which 1 per cent of peptone and  $\frac{1}{2}$  per cent of grape sugar have been added. So a large amount of this liquid was prepared and inoculated. Pieces of bread about the size of a finger were soaked in these cultures after abundant growth was secured, and the bread was then distributed in the openings of the burrows of the mice. A number of mice were also inoculated and turned loose; this was done because the mice eat the bodies of those that die, and spread contagion in this way. It had been amply proved by experiment that the bread soaked in the culture could be eaten by man and various domestic animals with perfect impunity.

In a few days after the holes had been baited, news came from all sides that the infected bread had disappeared from the holes. This news was very satisfactory, as it could by no means be certainly counted upon beforehand that the mice would eat the bread, surrounded as they were with abundance of fresh food. A visit to Bakrena, about nine days after the experiment had been started at that place, showed that the mice had ceased their activity entirely. In two other places, Nochali and Amarlar, a similar result was obtained. Several burrows at these places were opened and found to be empty or to contain sick, dead, or half-eaten mice. There were sick and dying mice sticking in many of the openings. A number of sick and dead mice were carried to Larissa, and examined. They were found to present all the characteristic lesions of the typhoid fever of mice, and to contain the organism in their internal organs.

Reports from other places which Loeffler subsequently received, were all satisfactory. So Loeffler is justified in closing his very interesting account of his expedition with the following words: "The science of bacteriology has thus again proved its great practical significance, and hence also its right to be specially cultivated and advanced."

#### LETTERS TO THE EDITOR.

\*\*\* Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.

On request in advance, one hundred copies of the number containing his communication will be furnished free to any correspondent.

The editor will be glad to publish any queries consonant with the character of the journal.

#### The Ancient Libyan Alphabet.

IN *Science*, Aug. 12, Professor Keane offers some inquiries and statements relating to a note of mine on the Libyan alphabet.

The note referred to was partly based on an article by Dr. Collignon, as was indicated. Dr. Collignon is one of the highest authorities living on north African ethnography and archæology, as Professor Keane doubtless knows. He would not make the following statement unless he had good grounds for it: "Quant à la forme même des caractères libyques, on ne peut nier qu'elle ne remonte à une haute antiquité; elle est, en tout cas, antérieure à Carthage." Of course, Dr. Collignon is aware of the common theory that the letters were of Punic origin; but considers it time to discard it.

<sup>1</sup> Centralblatt f. Bacteriologie und Parasitenkunde Bd. IX., No. 5.

As to Professor Keane's suggestion of the origin of the name *tifinar*, from *Finagh* = Phœnician, it is purely fanciful, and his assertion that the stress "still falls on the root *fin*," is utterly incorrect, as it falls on the last syllable, and not on the penult (see Hanoteau, "Grammaire Tamachek," p. 5).

It is true that in loose language the whole alphabet, or any alphabet, is called *tifinar*; and it is not quite correct to say that all the *tiddebakin* are vowels. The proper distinction is thus given: "Les signes exclusivement tracés en traits sont nommés *tifinar*; ceux tracés avec des points sont nommés *tiddebakin*."

How Professor Keane, quoting Hanoteau's "Grammaire Tamachek," can deliberately write that in the Libyan alphabet "curves occur quite as frequently as straight lines," can only be explained by the supposition that he never saw the book he quotes. It is before me now, and out of the thirty-five simple and compound letters only three are curvilinear, and all of these are recognized as mere variants, and placed after the true rectilinear forms. I refuse to think that this is a fair example of the accuracy of Professor Keane's quotations.

Whether they were derived from a rectangle or not, has something more than theoretical importance in relation to their possible derivation from Egyptian forms; but it need not be insisted on. That all the original forms were composed of right lines is a point of considerable interest, which has not been disproved.

As to what writers may be considered specialists in the study, there is room for legitimate difference of opinion. When Professor Keane rejects Duveyrier, he rejects the author who beyond all others has a practical acquaintance with the written speech of the Touaregs — the only tribe who still use the *tifinar*. Professor Newman's works have been laid aside as substantially useless, on account of their phonetic system, by the best French scholars — notably René Basset; and Dr. Oudney never claimed to be an adept in the tongue.

D. G. BRINTON.

Media, Pa., Aug. 15.

#### Remarks on the Migration of Coleopters.

ONE might suppose, on simply looking at the map of the earth, that the animals of the northern hemisphere would exhibit a greater structural uniformity than those south of the equator.

In the north the continents on one side are separated only by the narrow Behring's Strait, on the other the Gulf Stream, and the prevailing west-east storms connect both continents, making migration of insects a possibility.

The similarity of climates of the northern half of the continents is less favorable to the production of generic varieties than are the southern lands, isolated by wide troughs of the ocean, with a variety of climes and altitudes; and, indeed, as we go northwards the varieties decrease in number.

If we abstract from the coleopterous groups genera which are most likely to migrate from one continent to the other by commerce, such as the Staphilinidæ, the Silphidæ, or the phytophagous insects, transportable in their food-plants, the rest of the forms will represent the aboriginal masses of 400 years ago.

In the far north above latitude 50°, and where Asia approaches so near to the American shores, the indigenous genera of both continents differ comparatively little; the genera are common, and some species are identical in both continents. Commerce in these regions was slight, even up to our days, and an uninterrupted natural development manifests itself everywhere.

True northern genera, such as the *Carabus*, *Calosoma*, and *Cychrus*, have species of strict similarity, such as *Calosoma sycophanta*, *inagator*, etc., extending from the Atlantic to the Pacific in the eastern continent, and *Cal. scrutator*, *calidum*, and *wilcoxii* in America; *Carabus cancellatus*, *clathratus*, and *monilis* on one side, *Car. serratus*, *limbatus*, and *vinctus* on the other, and *Car. truncaticollis* on both sides of Behring Sea.

If we assume that the land holding the greater number of species of one genus constitutes a centre of development, that is the birth-place of that genus. Accordingly, the genera *Cychrus* and *Calosoma* are to be taken as of American origin; the first being represented in Europe and Asia by four and in America by thirty species, the