

Aryan dialects which preceded the Sanskrit in India. It has no inflections proper, but uses prepositions for the expression of case-relations, and forms tenses very much in the same way as the English. It is noteworthy that this language, though a slightly developed one, has a clear distinction of gender; but the value of gender-distinction as a linguistic differentia is not yet well made out. In common with most of the languages of eastern Asia, the Khasi has a system of tones. The same thing is true of the Siamese, on which Mr. George presented a paper, illustrating the tonic distinctions by a short Siamese reading.

The paper of the most general interest was one on the origin of the Phoenician alphabet, read by Mr. J. P. Peters of New York. For some years past, most students of the subject, accepting for the present the conclusions of the late Vicomte E. de Rougé, have been inclined to derive the Phoenician from the Egyptian. This conclusion is based on the close relations existing between Egypt and Phoenicia in historical times, and on the similarity between certain letters in the two alphabets. But recently the Babylonian-Assyrian alphabet has begun to press its claims to be considered the parent of the Phoenician. It is almost certain that Phoenicia was closely connected with the Tigris-Euphrates valley at a time earlier than the oldest known historical monument. As long ago as 1877, a German scholar, Deecke, came forward as the champion of the Babylonian alphabet; but he committed the anachronism of deriving the old Semitic or Phoenician from the more modern 'cursive' cuneiform. Mr. Peters took the most ancient cuneiform signs, and compared them with the oldest Phoenician, finding in several instances striking resemblances. He urged besides, against the Egyptian origin, the fact that the Phoenician alphabet contains no vowels, while the hieroglyphics have distinct vowel-signs [though this is true of the Babylonian also]; and, further, the fact that the Egyptian had a large number of different signs for the same sound, and would present greater difficulties in the way of deriving an alphabet than the Babylonian, which had fewer homophones. The question is yet far from being settled, one serious obstacle in the way of the Assyriologists being the difficulty of determining the oldest forms of the cuneiform writing; but all such sober investigations as that of Mr. Peters must advance the desired solution. Meantime the Egyptologists, on their part, are bringing forward new material.

The edition of Manu, which was undertaken by the eminent English Sanskritist, Mr. Burnell, has been committed by the publishers, since his death, to Mr. E. W. Hopkins of New-York City, who sent on two papers, — one on the Nandini commentary on Manu, the other on the quotations from Manu in the Mahabharata. The former was a defence of the commentary in question: the latter was a contribution to the criticism of the Manu text. Mr. Hopkins took those passages in the Mahabharata which are introduced by the phrase, 'Thus said Manu,' and, finding that they do not always agree with the existing text of the laws, concluded that both texts rest on an older tradition; that Manu was an ancient sage, with whom tradition

connected a number of laws, whence grew the collection called by his name.

Professor Whitney read on the variants of the Sama-Veda, coming to the conclusion (against the position of Benfey and Weber, hitherto generally accepted), that, in most cases in which the Sama text differs from that of the Rig, the latter is entitled to the preference. Professor Bloomfield of Johns Hopkins university, who is engaged in editing the Kauçika-Sutra to the Atharva-Veda, sent an account of the manuscripts of the Sutra in his hands, most of which he had obtained through the kindness of English officials. Mr. Brown made a short report of the recent Oriental congress in Leiden, at which he was present.

The next meeting of the society will be held in Boston, May 7, 1884.

LETTERS TO THE EDITOR.

Geology of Philadelphia.

DR. PERSIFOR FRAZER'S explanations of his use of the term 'hydromica slate,' in his Lancaster-county report, as either 'not an equivalent for hydromica schist,' or as a 'misprint,' renders it evident that he has changed his opinions since the writing of his report on York and Adams counties. In that volume the term 'hydromica slate' is employed ten times or more to designate 'hydromica schists,' and in several instances the terms are used synonymously. In two instances, localities marked in his printed section as hydromica schist are referred to in the accompanying descriptive text as hydromica slate (v. sections 2 b, 4, and p. 94, 101). As is evident from the context in a number of places, his 'hydromica slate' does not mean 'chlorite slate,' but 'hydromica schist' as it is elsewhere called (v. p. 83, 142, etc.).

There is, however, equal objection to his use of the term 'chlorite slate,' frequently employed in his different reports to distinguish greenish portions in the hydromica series. These are no more slates than are portions of the adjacent hydromicas, which are of identical structure. Nor, indeed, are they true chlorites, having but a low percentage of magnesia. (A recent analysis of some of the greenest of this so-called 'chlorite slate,' made for the writer by Prof. S. P. Sharples, gave only 4.28% of magnesia.)

Hydromica slate, as meaning hydromica schist, is also used several times in the report on Chester county, and the synonymous terms 'talc slate,' 'mica slate,' 'talc-mica slate,' 'talc-mica schist,' 'micaceous talcose slate,' and 'South Valley Hill slates,' are employed more than fifty times in the same report without distinction between slate and schist. Professor Rogers, as is well known, used most frequently the expression 'talc-mica slate.'

That the term 'slate' has been used synonymously with 'schist' in the region of the South Valley Hill, is not only shown by the indiscriminate use of those terms by Rogers, Lesley, and Hall, but is apparent in a remark by Dr. Frazer himself in the Chester-county report, p. 279, where he says:—

"South of the Valley limestone, which only touches the extreme angle of the township, are hydromicas and mica-schists, dipping about south 35°, east -62°. The southern contact of limestone and *slate* occurs in this corner. . . . The hydromica schists and mica-schists to the south, which enclose this, are principally vertical," etc.

Now, as the only slates which occur at this locality are hydromica slates belonging to the hydromica

series of rocks of the South Valley Hill, these must be the slates referred to, even if 'hydromica slates' is a contradiction in terms.'

While the undersigned certainly does not intend to be a champion for the term 'slate' instead of 'schist' for these rocks, good reason for the use of that term lies in the slaty character of many of these hydromicas as distinguished from the contorted and schistose character of the micaceous rocks of other regions.

The writer's use of the expression 'hydromica slate' in describing the Edge Hill and Barren Hill rocks (the 'altered primal slates' of Rogers), is thought preferable to the term 'hydromica schist,' since large portions of that formation are slaty rather than schistose. The greater part of the formation is a slaty sandstone or quartz slate, and, where outcropping in Chester county, is so designated by Dr. Frazer. It might naturally be taken for granted that the writer believes, with Dr. Frazer, that the hydromica schists and slates of the South Valley Hill of Chester county are about contemporaneous with this quartz slate or Edge Hill rock.

In order to prevent future misapprehension, it may here be stated, that the writer has been led to the conclusion that the two formations are distinct, and that both Professors Rogers and Frazer have confounded two rock series belonging to different geological horizons,—the one, Cambrian; the other, Silurian. The analogue of the Edge Hill rock is believed to occur in Chester county, on the south side of the hydromicas of the South Valley Hill. The facts leading to this conclusion have been gathered during some extended field-work in Chester county, and will shortly be published. Meanwhile, the remarks upon the primal slates made in the Franklin institute lecture should be understood as referring solely to the Edge Hill rocks proper, and not to the South Valley Hill schists or slates, which are but poorly defined in the vicinity of Philadelphia.

H. CARVILL LEWIS.

The specific distinctness of the American and European brine shrimps.

In Professor Smith's notice of our 'Monograph of phyllopod Crustacea,' he states, that, in the portion relating to the above subject, 'there is certainly confusion,' and quotes two paragraphs relating to the females alone, and finally remarks, "but differences like these in statements of observation betray inexplicable carelessness."

After quoting the two paragraphs relating to the females alone, it seems to us a careful critic would have also taken pains to have quoted the longer paragraph relating to the males, which directly follows the first paragraph quoted by our critic. To allow the two paragraphs relating to the females to be so widely separated was an oversight on the part of the author, who, however, thought that he had taken a good deal of pains to show the specific distinctness of the American and European species. Two sets of females from different localities, named by different persons, were examined at different times; and this explains how the two paragraphs became placed too far apart in the author's copy. It would have been better, of course, if the author had added a few words, and dogmatically stated that the two species were undoubtedly distinct. He preferred not to do, or omitted to do, this, but gave in considerable detail, and in as judicial a way as possible, the facts of the case. At first it was 'difficult to find good differential characters' between the females, and those found are but slight ones. The females of any of the species of *Artemia*, *Branchinecta*, or *Branchipus*, do not exhibit

good specific characters; but the males do, as the author attempted to show. If the author failed in directness of statement on this subject, or led to any confusion in any one's mind, he sincerely regrets it: on the other hand, he doubts whether there were, in the case, reasons for the charge of 'inexplicable carelessness.'

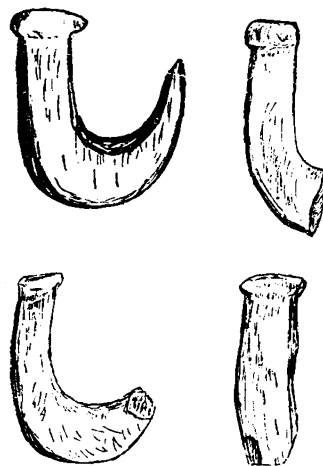
The paragraph which Professor Smith would have done well to have quoted is the following one:—

"Upon comparing a good many males from Great Salt Lake with several, both stained with carmine and unstained, received from Cagliari, Sardinia, through Prof. J. McLeod of Ghent, the European *A. salina* is seen to be considerably stouter, the head wider, the eye-stalks longer and larger, and the eyes larger. The frontal button-like processes of the first joint of the claspers are nearly twice as large as in the American species, and a little more pointed, while the claspers themselves are larger and stouter. The legs and sixth endites are of about the same form. The most apparent difference is in the caudal appendages, or cercopods, which in *A. salina* are several times larger than in *A. gracilis*, being in the Sardinian specimens nearly three times as long and much larger than in our species. In this respect, the genus shows a close affinity to *Branchinecta*. However, in a lot of *A. salina* ♀ from Trieste, the cercopods are very much shorter than in the Sardinian females, and only a little longer than in our American specimens. These appendages do not differ in the two sexes."

A. S. PACKARD, JUN.

Bone fish-hooks.

Recently, while digging in a shell-heap near Narragansett Pier, Rhode Island, I found among broken arrow-points, and fragments of bone, pottery, and shells, a nicely worked bone-hook, and also the shanks of three other apparently similar hooks; while in a neighboring shell-heap two more fragments were found.



The perfect hook measures a little more than one inch in length, and a little less than one inch across from the shank to the point, the latter being nearly as long as the former. The shank is flattened and notched at the end, forming a sort of head, somewhat similar to the fish-hooks of the present day. This hook, although much shorter, resembles a hook from Long Island described and figured by Mr. Charles C. Abbott on p. 208 of his work on Primitive Industry. Of this he says, "Objects of this character are exceedingly rare, either as found on the surface, or in shell-heaps. While of so simple a form, bone fish-hooks of this pattern do not appear to be common in any locality in eastern North America."

Figures are here given of the perfect hook, and the