Hyperborean, Abaris, "the air-walker," to whom Pythagoras, the Miss Kilmansegg of antiquity, displayed his precious leg. In fact here, as elsewhere, Mr. Tylor has acted on the principle that the half is greater than the whole. He selects enough for his purpose, and resolutely declines to overburden himself with superfluous testimony. Fortunately there are two sides to the theory of survival. If on the one hand we have survivals of the type of modern spiritualism, we have on the other survivals of ideas, which, first broached in a stage of civilisation when they are considered foolish or mischievous, become in a higher stage the dominant influences which direct human opinion. To take a single case:—It is now near upon two centuries since Balthazar Bekker, a D.D. of Amsterdam, corrupted, may be, by certain impious notions propounded by the arch-infidel Descartes, published his "*Monde Enchanté*," a crime for which he was at once deprived of his benefice; since, as a learned Englishman remarked in reference to the case:—

Dæmonas ex mundo quisquis proscripterit audax,
Esse brevi nullum dicet in orbe Deum.

If the English reader of to-day will take the trouble to read this work—and it is worth the trouble—he can scarcely fail to be struck with the remarkable survival of the ideas contained in it, expanded, corrected, developed as they are in these chapters by Mr. Tylor. Not that Mr. Tylor has borrowed anything from Bekker, but simply that Bekker was the first, as Mr. Tylor is the last, to apply science systematically to the phenomena of sorcery, witchcraft, and spiritualism of his age. Survivals of this kind are indeed proofs as decisive of the vitality of civilisation as survivals of the other kind are of the vitality of barbarism.

In the following chapters on Language, emotional and imitative, Mr. Tylor makes out a strong case in favour of what Prof. Max Müller, with a felicity worthy of a better cause, has nicknamed the "pooh-pooh" and "bow-wow" theories. "It may be shown," he says, "within the limits of the most strict and sober argument, that the theory of the origin of language, in natural and directly expressive sounds, does account for a considerable fraction of the existing *copia verborum*, while it raises a presumption that, could we trace the history of words more fully, it would account for far more." Among other matters touched on in this inquiry, Mr. Tylor refers to the language employed in addressing beasts, particularly dogs and horses. Some curious samples of dog-language are to be found in the Book of St. Alban's, and, indeed, in almost every old treatise on hunting. Sir Tristram, however, the hero of the Arthurian cycle, who is generally considered the *rédacteur en chef* of this particular dialect, appears to have thought plain Norman French best adapted to the intelligence of greyhounds, and is very sparing in his use of mere "brutish interjections." Of horse-language one of the best examples is to be found in "The Enterlude of John Bon and Mast Person," a tract belonging to the middle of the sixteenth century. This is how John Bon addresses his team:—

Ha, browne done! forth that horson crabbe!
Ree, comomyne, garde, with haight blake hab!
Have agayne, bald-before, hayght ree who!
Cherly boy, cum of, that whomwarde we may goo!

One branch of inquiry into which Mr. Tylor partly

enters in these chapters and the following one on the Art of Numbers, appears to deserve closer attention than it has yet received. Considering the important part which gesture plays in all the lower languages, it is a fair hypothetical inference that, as language gradually became more and more developed, a number of words and phrases would creep into it, formed on the principle of translating gesture into phonetics. Thus, for instance, the universal gesture for "likeness" or "sameness" is to hold out both hands together. If, in several different languages, the words meaning "likeness" or "sameness" have an etymological connection with the word meaning "together," a strong presumption would be raised that they were translated from the gesture; and if any large number of correspondences of the same kind were detected, the presumption would be raised into a theoretical certainty. Whether such evidence exists of the translation of action into sound in general language, none could determine better than Mr. Tylor himself, whose essay on the gesture-language in one of his earlier works, forms really almost a complete handbook on the subject. That it does exist in language, as applied to numbers, is clearly shown in his chapter on the art of counting, where he traces the quinary, decimal, and vigesimal systems to their origin in the fact that the average man possesses five fingers on each hand, and as many toes on each foot. He perhaps, however, has not sufficiently noticed the further strong probability that the duodecimal system owes its origin to the circumstance that, in addition to his fingers and toes, a man possesses two hands and two feet—a consideration not without its bearing on the obscurity attending the numerals eleven and twelve in certain languages.

LEA'S UNIONIDÆ

A Synopsis of the Family Unionidæ. By Isaac Lea, LL.D.
4th edition. 4to. (Philadelphia, 1870.)

THIS work, by a veteran American conchologist, contains 184 pages, and is a memorial of his labour and zeal during a period of more than forty years. The *Unionidæ* are generally known as "fresh-water mussels." Their variability is notorious; for almost every river, lake, and pond yields different forms, which some writers call species and others call varieties.

Non nostrum est tantas componere lites.

But while giving Dr. Lea ample discretion to make as many species as he pleases, and full credit for his honest wish to keep down the number, it certainly strikes one as somewhat singular that he admits only "seven or eight species of the family *Unionidæ* living in Europe," when he enumerates 720 species as North American, of which latter number he has himself described no fewer than 582! According to Kreglinger's catalogue, which is the newest on the land and fresh-water shells of Europe, fifteen species of this family inhabit Germany. We have but five, including one debateable species of *Anodonta*. The total number of living species recognised by Dr. Lea is 1,069, besides 224 unknown to him or doubtful. To distinguish varieties from species is one of the great difficulties which perplex the naturalist; but the rule which I have adopted may serve the purpose to a considerable extent, viz., "that all distinct groups of individuals living together and having a common feeding-ground, and which are not connected

or blended with each other by insensible gradations, are *prima facie* entitled to the rank of species." (British Conchology, vol. i., Introduction, p. xix). Now we may see several species of *Rissoa* living under the same stone between tide-marks, several species of *Limnaea* in the same stream or ditch, and more than one species of *Helix* feeding together on the same leaf. In such cases there is no fusion or confusion of species; each has its own definite limits, and retains its own peculiar characters. I say nothing of genera and more comprehensive groups which form communities in a still more diversified fashion, but are equally free from intermixture.

J. GWYN JEFFREYS

OUR BOOK SHELF

Echinides du Département de la Sarthe, considérés au point de vue zoologique et stratigraphique. Par Cotteau et Triger. (Paris: Baillière, 1855-1869. London: Williams and Norgate.)

WE fear that some time must elapse before science will resume its place in unhappy France; but in the meantime its professors, who are innocent of the mischievous and insane acts which have caused so much ruin, demand our heartfelt sympathy. M. Cotteau, of Auxerre, whose work we are about to notice, is well known to English geologists, and is highly esteemed by them for his long and conscientious labours in the field of Mesozoic echinology. His coadjutor, M. Triger, died during the progress of the work. It consists of two royal octavo volumes, one containing an account of Echinoderms found in the Jurassic and Cretaceous formations in the Department of the Sarthe, the other having sixty-five well-executed plates of species, besides several charts to show their geological and stratigraphical distribution. It appears from the preface that this most creditable production of French palæontology was commenced in 1857, and finished in 1869. We therefore regret to observe that M. Cotteau was not aware of Dr. Wright's admirable monograph on British fossil Echinodermata, which was published by our Palæontographical Society in 1856, and which goes over a great deal of the same ground as M. Cotteau. Had the latter author consulted it, he would probably have avoided some mistakes, e.g. in attributing the specific name of *Pseudodiadema hemisphericum* to Desor instead of to Agassiz. A comparison of the figures of this and other species given in both works is decidedly favourable to the British artist (Mr. Bone) as regards accuracy and completeness, although MM. Levasseur and Humbert are deservedly eminent in their style of lithography.

The Echinoderms found in the Jurassic and Cretaceous formations must have inhabited a soft bottom in seas of considerable depth, judging from the present habits of allied species; and their variability was not less in those remote periods of the world's history than it was in the epochs which preceded and followed.

J. G. J.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his Correspondents. No notice is taken of anonymous communications.]

The Paris Observatory

HAVING read only yesterday the agonising account written by M. Marie-Davy and countersigned by M. Delaunay, descriptive of the Communists having made the Paris Observatory one of their chief strategical points, of the domes of the observatory having five hundred bullet-holes through them, and of the rabid attempts made by the citizens in arms, before retiring on the ap-

proach of the Versailles, to burn or blow up the whole building, I am not a little surprised to find in NATURE of June 8, received here this morning, a statement to the effect "that the Paris Observatory had suffered scarcely any injury up to the end of the second siege. No delegate of the Commune had presented himself either to take possession of it or to blow it up."

I presume that you wrote in ignorance of the real facts, and perhaps not without some intention of whitewashing the poor Communists from the exaggerated denunciations which have been poured on them since their fall; yet neither they nor you should object to true accounts of what they actually did while in power appearing before the world without menace and without favour.

The mere showing of the Commune during this second siege, and still more its international organisation, seems to have surprised most persons; yet the character of the association, and its imminence under the feet of all the Governments of Europe, was duly noted in the section on Metrological Legislation of my report presented to the Board of Visitors of the Royal Observatory, Edinburgh, in June 1870; the association, though political, having obtained mention there on account of its having adopted the scientific metrical system of weights and measures, and professing to find it a most efficient agent for assisting in breaking down the barriers between nations, and rooting up traditional customs and beliefs. I must confess, however, that I was not prepared for these revolutionaries taking up so very early in their outward career, as this their first and just-concluded essay in Paris, the chronological department of the metrical system, thereby repudiating, as the order found on General Delescluze indubitably shows, both the Christian Era and the accustomed months, for decimal periods of days and the era of the first French Revolution. In my book, "Our Inheritance in the Great Pyramid," published in 1864, I did indeed remind that that most revolutionary method in chronology was originally a part of the metrical system, and though deposed under Napoleon Bonaparte, might be expected to reappear when the present promoters of French metrology in this country had acquired more boldness; but here is the accomplished fact upon us at this very moment, and it would be well for all those metrical agitators who were so loud at the British Association last summer in Liverpool in their outcries to Government to make the metrical system compulsory throughout this country, now to declare honestly whether they are inwardly with the Communists in desiring ultimately the abolition of the Christian era and the destruction of the week of seven days.

C. PIAZZI SMYTH
15, Royal Terrace, Edinburgh, June 9

Science Lectures for the People

IT is all very well to say, Let our children be taught science in the schools; but that does not meet the need of a large section of the nation, the product of the schools of a former generation. Many hard-worked men who had no scientific teaching whilst at school, have now acquired the wish to know more of nature's mysteries, but know not whither to turn for aid. Books are plentiful, but it is very tiresome to wade through dry pages, scientifically dried of their sap by the use of terms which are not commonly understood—especially after the wearying labours of the day. Experimental lectures, like those at the Royal Institution, but a little more specialised, are wanted for popular use; the question is, How are we to get them? Are we to go to Government for aid, or shall we bestir ourselves and voluntarily endow these lectures?

Surely Huxley or Tyndall would be quite as much sought after as Spurgeon if they came forward and announced a series of lectures; St. James's Hall would be as crowded as the Tabernacle if they held a weekly lecture; pew-rents would be as certain of collection from scientific as from religious devotees. Those busily engaged professors can indeed hardly be asked to undertake such a task as this; but any competent man of science, able to explain the facts of science in popular language, might reckon on public support if he made such a venture as this. Let him, for example, give a series of twelve lectures on Biology, as it affects our daily existence; not wandering into the remote regions of extraordinary phenomena, but simply expounding ordinary life laws. Here would be a subject refreshingly new and interesting to thousands of City-born and bred toilers.

The lectures, if on week days, must be after office hours—from nine o'clock to ten, say; and in some hall easily accessible, as St. James's.

GEORGE FRASER
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