

OUR BOOK SHELF

Handbuch der Systematischen Anatomie des Menschen. Von Dr. J. Henle, 1 Band, 1 Abtheilung, Knochenlehre, 3 Auflage, pp. 310. (Braunschweig, 1871. London: Williams & Norgate.)

IT is unnecessary to commend the work of Prof. Henle, which is on the whole the most full and exact yet published. It shares the richness and accuracy of its illustrations with the last edition (the fourth) of Cruveilhier's great work, and shares with it the serious disadvantage of being incomplete. Indeed, while in the latter the part relating to "Angéiologie" which includes the description of the heart, blood-vessels and absorbents, was published in 1867, preceding the completion of the second volume on visceral anatomy in the following year, the third volume of the German work, with the whole of the nervous system, has not yet appeared. In this respect the only English work on descriptive anatomy which can rival Henle's has a great advantage; each edition of what was originally Dr. Quain's Anatomy has been published complete, and on this ground, as well as that of conciseness, the last edition of this work may, with the help of Prof. Sharpey's masterly introduction on general anatomy, take rank with those of France and Germany.

The department of osteology is not that which Prof. Henle has done best. In minute accuracy of detail it is decidedly inferior to Mr. Ward's treatise, which at least equals the best efforts of the French School of Anatomy. And there is a want of attention to broad views of morphology almost as conspicuous as in M. Cruveilhier's work. Thus the comparison between the upper and lower extremities (pp. 226—229) is very insufficient, giving no account of the important and opposing views which have been maintained on this subject, and admitting the demonstrably false position that the radius answers to the fibula, and the ulna with the olecranon to the tibia with the patella. The difficult subject of the homologies of the cranial and facial bones is also entirely omitted, an omission rendered necessary by the absence of any account of their foetal development. The rigid specialisation of human osteology so as to exclude all reference to embryology and comparative anatomy on the one hand, and on the other to the mechanism of the skeleton, makes what ought to be the most interesting part of anatomy the most arid and forbidding. In the last edition of "Quain's Anatomy" we have within a shorter compass a good account of the antecedent development, as well as the mere ossification of the several bones, with illustrative diagrams, and a sufficient account of its homologies to awaken interest in this attractive study. On the other hand, there is nowhere to be found so complete an account of Abnormalities as in Prof. Henle's work, a subject of which the importance is only beginning to be recognised in England. The references to observations in this branch of the subject are very full, and include many only lately published. On this, as on other points, the author has added many fresh facts in the present edition. On the whole, however, it differs but little from the first issue in 1855, and the number of woodcuts remains the same. Among the more important additions may be mentioned one on the differences in the skull of the two sexes (p. 216). No mention is made of the little tympano-hyal bone described by Prof. Flower, and even the ordinary variations of the styloid process, which throw so much light on its homology, are scarcely alluded to.

In conclusion, every anatomist will acknowledge the industry and care with which even small advances in knowledge are added in this edition, but will also hope that nothing may delay the appearance of the volume which is to complete the whole treatise, and no doubt complete it worthily of its distinguished author, and of what he has already published.

H. P.

LETTERS TO THE EDITOR

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

Science Lectures for the People

OF the justice of your remarks on "Science Lectures for the People" there can be no doubt whatever. The lectures in question are perfect models of what lectures should be, and while reading them I pictured to myself the rich feast that had been prepared for the people who were fortunate enough to hear them—especially for those who had some previous acquaintance with the subjects of which they treat. They are couched in simple language, so that those who run may read. They are strictly to the point, well calculated to excite further inquiry, and in every way adapted for the purpose for which they were intended. It may be, however, doubted, whether lectures on scientific subjects before the general public, however delivered, do that amount of good which they certainly ought to do. A lecture to be thoroughly and lastingly effective presupposes a certain acquaintance with the subject already. To listen even to the most brilliant and never so simply worded address on Spectrum Analysis or Coral Reefs, has a very transient effect, I take it, upon those who have rarely or never heard of such things. However praiseworthy, therefore, every effort to scatter scientific knowledge among our population may be—and it certainly deserves every commendation—my decided opinion, arrived at after large experience with the people in towns and country, especially the latter—is that it will fail, unless we begin with the young. People in masses may be compared with fuel laid in the grate. If you ignite it from the top, a considerable time will elapse before it reaches the whole mass; but if the fire be applied from below, the course is more rapid, and the fuel sooner feels the effect. So with science teaching, or any teaching, we must begin in our schools. Every school, from the primary to the highest, must be opened to its influence. Teachers, I am sure, would welcome the innovation, for it would dispel many a weary hour both for teacher and taught. The everlasting monotony of reading, writing, arithmetic, and scripture, would be enlivened by simple explanations of the human body, plants, &c., and thus children would be taught to take an interest in all matters connected with their future welfare even from their infancy. The same remarks, slightly modified, would apply to many of our middle class and upper schools; for scientific matters, in far too many cases, have still to find a place even here—parents being themselves quite as much, in many instances far more, to blame than the regulations of the school.

It is precisely owing to this want of early training, and consequently to an utter ignorance of the subject, that the lectures on divinity, science, &c., in our universities are of such little real value, and of such little interest to the students. They attend them, it is true, not from any genuine love, but simply because they must attend some for certificates or otherwise. No fault whatever attaches to the lectures themselves; on the contrary, they are of the greatest possible value, and had the students themselves been trained properly and gradatim when at school, the attendance would be vastly increased, a genuine love for the lectures would be engendered, and incalculable results would be the consequence. Or take another instance—our farmers' clubs. With laudable zeal these have been formed all over the kingdom. Lectures on scientific subjects connected with agriculture are delivered from time to time. All very admirable no doubt in its way. The attendance generally is good, but from the vacant stare, the nodding head, and subsequent remarks, nothing can be clearer than that nine-tenths of the lecturer's address on the abstruse niceties of chemical analysis, &c., have been utterly thrown away. What subjects can be more valuable to a farmer than a knowledge of the constituents of the air, the origin of soils, the inner life of plants, the wonderful dependence of animals and plants upon each other, the means of judging artificial manures, &c.; and yet, except among the upper favoured few, utter ignorance of these matters almost universally prevails. It is not from indifference to the subject, far from it, but, as in the former case, from a want of early training in this particular line of thought. The farmer acts just as his father acted before him. He is of all people the most backward in leaving the old routine, and considers such subjects as geology and botany altogether beside the purpose, and a waste of time for his children to learn, though he will praise them in the same breath.

There is nothing more trying for a master's patience—and I speak from experience—than this persistent and short-sighted adherence to what has gone before, just as if the world (the agricultural world particularly) had to jog on to the end of time in the self-same fashion.

Whatever united action, therefore, may be taken by our leaders in science for bringing about a more healthy feeling on this subject, for scattering science and a love for it in every household, depend upon it the readiest and surest way will be to urge on Government to introduce, nay, force, the subject freely and universally into all schools, so that it may grow up with the rising generation, and become a part of their very existence. The task is Herculean, no doubt. An enormous amount of prejudice will have to be overcome, but

*Sedit, qui timuit ne non succederet; esto:
Quid? qui pervenit fecitne viriliter?*

Lectures on science will thus be not merely listened to as now, but understood and appreciated. Superstition, the child of Ignorance, will be dispelled, and a nation of reasoning and thinking men and women inaugurated as the glorious and inevitable consequence.

THOMAS FAWCETT

Blencowe School

Preponderance of West Winds

I HOPE you will publish this reply to Mr. Laughton's letter in NATURE of May 4, on the Prevalence of West Winds.

He maintains from statistical evidence that west winds occupy a greater portion of the earth's surface than east winds; that their force is greater; and that in the upper regions of the atmosphere the preponderance of west winds is still more decided than at the earth's surface; so that on the whole the atmosphere moves round the earth from west to east.

It is in my opinion certain that this is on the whole proved. I do not question Mr. Laughton's facts but his inferences from them. He thinks this rotation points to some force acting from without—some cosmical cause of a nature quite unlike the sun's heat. I maintain, on the contrary, that all the phenomena of the great atmospheric currents, of which the trade-winds are a part, are to be accounted for by the heat of the sun as the motive power, combined with the rotation of the earth as a modifying influence.

In discussing the question of whether the phenomena point to such a cause as that suggested by Mr. Laughton, the motion of the upper strata of the atmosphere is quite unimportant. It is only the currents at the surface of the earth that can in however infinitesimal a degree increase or diminish the velocity of the earth's rotation; and if the circulation of the atmosphere is due to the sun's heat as its motive power, it cannot have the slightest effect on the earth's rotation; while if it is due to any mechanical force acting from without, as Mr. Laughton thinks—if the Cartesian theory is true, and the circulation of our atmosphere is part of a cosmical vortex—the earth's rotation must be accelerated by its friction. This follows from the simplest dynamical principles. It is true that the acceleration which could be produced in such a way would at the greatest be far too small for us to detect; but it is quite possible for us to ascertain whether or not the currents of air that sweep over the surface of the earth are by their united action capable of affecting its rotation; or, to state the problem more definitely, whether or not the effect of west winds in accelerating the rotation is balanced by the effect of east winds in retarding it. I maintain that such evidence as we have tends to the conclusion that the effects of the two are so balanced.

The separate effect of any wind covering a given area on the earth's rotation = the east and west component of its force \times the radius of the parallel of latitude. The latter factor gives leverage. An east wind near the equator has more effect in retarding the rotation of the earth than a west wind of equal extent and force at a higher latitude has in accelerating it, just as a weight at the end of the long arm of a lever outweighs an equal weight at the end of the short arm. Now, the east winds, under the name of trade-winds, are chiefly to be found in the lower latitudes, and for the reason just given they are able to balance the west winds, which are certainly more forcible, and according to Mr. Laughton, occupy a greater area, but being at higher latitudes act at a disadvantage. If it can be shown—and the facts certainly point to it—that the total mechanical effect of the winds is not such as to produce any effect

on the earth's rotation, this goes very far to prove that they have no motive power except the sun's heat.

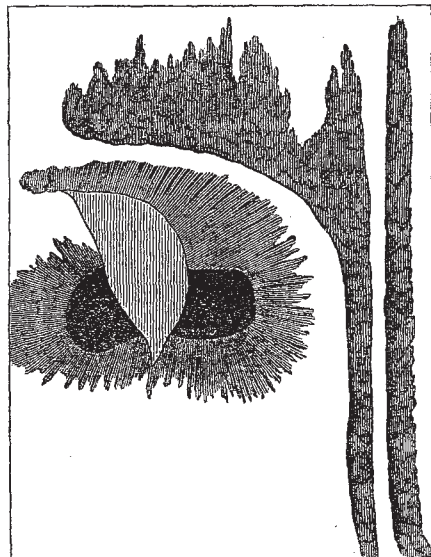
But how is the motion of the upper strata of the atmosphere from west to east to be accounted for? The answer to this will involve the entire theory of the great currents of atmospheric circulation. There is always a current of air towards a heated place along the earth's surface, like the draft towards a fire, and a compensating current of air away from it in the upper regions of the atmosphere. The equatorial latitudes being the hottest, there are currents to them from the higher latitudes, which bring with them the smaller velocity due to the rotation of the higher latitudes, and thus move less rapidly than the earth in those lower latitudes to which they flow. Moving with a less velocity than the earth is the same as moving from the east, and thus are the trade-winds constituted; they are from north-east in the northern hemisphere and from south-east in the southern. This is generally understood and believed; what follows is less generally understood, though I claim no originality for it.

The air rises up over the equatorial regions like a column of smoke over a fire, and flows off towards the poles. Coming from the latitudes where the velocity of the earth's rotation is greatest, it carries that greater velocity with it, and spends the energy of its motion in the form of the west winds of the higher latitudes. The reason, then, that the upper strata of the atmosphere (in all latitudes except on the equator) have a motion round the earth from west to east, is simply that they are at the same time moving from latitudes where the velocity of the earth's rotation is greater to latitudes where it is less.

JOSEPH JOHN MURPHY

Remarkable Sun-spots

THE accompanying sketch shows in a rough way the umbra and a small portion of the penumbra of a sun spot that I observed on the 6th and 7th of this month, and which was made remarkable by the presence of a reddish-brown object like a cloud, that seemed to hang over the nucleus of the principal umbra, apparently dividing it in two. Could this object be seen without the intervention of the dark glass, it would doubtless show a bright red instead of a reddish-brown colour; and from its fog-like aspect, though it was well defined in outline and acuminate at both ends, the impression was inevitable that it hung at a certain altitude above the spot. However, it evi-



dently had no motion distinct from the latter, as on the 7th it occupied the same position as on the day before, but it was much reduced in size. On the 8th it was seen no longer, and the nucleus was now in one, seeming to show pretty clearly that its previous apparent division in two was really caused by the intervention of the brown cloud suspended over it, and that the phenomenon did not consist of two distinct nuclei with the brown object lying between them. I am not aware that anything like this was observed before.

J. BIRMINGHAM

Millbrook, Tuam, May 18