

OUR BOOK SHELF

Elementary Geology. A Course of Nine Lectures, specially adapted for the use of Schools and Junior Students. By J. C. Ward. (London: Trübner & Co.)

THIS little volume is a praiseworthy attempt to popularise the study of Geology. The descriptions and explanations are, for the most part, well done, and will be easily followed by those for whom the book has been written. The introductory "lectures," which treat of the origin and classification of rocks, of geological agents, of waste and renovation, and of physical geography, are the most satisfactory. When the author comes to deal with the geological history of the English formations, the necessity for condensation often leads him into obscurity; but upon the whole he has managed to give a more readable account than will be found in other introductory lesson books. As the lectures are addressed to a popular audience, we ought not, perhaps, to object to the fine writing in which the author is prone to indulge. But if his little book should come to a second edition (as we hope it may), he might tone down the "beauties," and his work be none the worse, but all the better for the process. Especially would we advise him to expunge the absurd and incoherent "Geological Dream on Skiddaw," and substitute for it a simple and intelligible summary, such as we are sure he is quite capable of giving. The illustrations are unequal; none of them are very creditable works of art, and some are so smudgy as to be almost illegible; but for the most part they serve their purpose.

J. G.

LETTERS TO THE EDITOR

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

London University Examinations

MR. CHRISTOPHER HEATH, in his Introductory Address at University College, puts forward the following question, set in the Preliminary School Examination, in support of his remarkable statement that Mechanical and Natural Philosophy have little to do with Medicine:—

"Calculate the quantity of heat lost per hour from each square metre of the surface of an iron steam boiler 0·8 centimetres in thickness, when the temperature of the inner surface of the boiler is 120° and that of the outer surface 119½°, the coefficient of conductivity of iron being 11·5° (referred to 1 cm. as unit of length, 1 min. as unit of time, and the quantity of heat required to raise the temperature of 1 gramme of water from 0° to 1° c. as unit of heat).

"Solution: A difference of temperature of 1° in a thickness of 1 cm. of iron will give a loss of 11·5° in 1 min. from a surface of 1 sq. centimetre."

But a difference of ½° in the thickness 0·8 cm. is at the rate of ½ ÷ 0·8 = ⅝° in the thickness of 1 cm. Hence the loss in 1 min. from 1 sq. centimetre is 11·5 × ⅝ = 7·1875. Hence the loss in the same time from 1 sq. metre is 71875 units. The loss of heat per hour will now be evident.

Now this is what Mr. Heath designates as a problem on steam boilers which a medical man can never want to solve; would he say that it is entirely foreign to the subject, and expect any member of Senate or Convocation to bear him out, if the examiners inquired how much heat a man would lose through a blanket or through a sealskin coat 0·8 cm. in thickness, &c.? Yet the question is the same, and the iron jacket of the boiler or the sealskin coat are only accidents. Should not a medical student have some idea of the relation between the surface temperature of the body, the quantity of heat passing away from it, and the amount of heat generated in the body by the food given to a patient? Is the production of heat in the human body by the consumption of food carried on on principles so entirely different from those of the production of steam in a boiler that a medical student can afford to be ignorant of and to despise the simplest principles of heat, and to be unable to answer the mildest questions in that subject? Moreover, is it so clearly shown that "the two learned professors

have such singularly incorrect ideas as to the requirements of medical students" when they ask a simple question as to the loss of heat from a hot body? It may be that Mr. Heath passed his first M.B. examination before it was considered a matter of importance to note the changes of temperature of the body, or before the use of thermometers by the Faculty, and that he regards those who are guided by such things in their treatment of a patient as altogether Utopian in their ideas. The above consideration of the question may perhaps be a sufficient answer to the shallow statement of the editor of the *Lancet*, in support of Mr. Heath, that "the relation of the question to medical requirements is absurd on the face of it."

As regards the examiners, Mr. Heath is not quite correct in his statement of facts, for the present examiners are not the examiners on whom the sub-committee of Convocation reported four years ago. With regard to the candidates who are rejected at the preliminary scientific examinations, has it ever occurred to the sub-committee of Convocation to inquire of the examiners what standard is actually required for the Pass Examination? If they have not obtained this information from the examiners themselves, their decisions can have very little weight, for they cannot be in a position to judge whether it is from the high standard set by the examiners or from the bad quality of the work that so many are rejected.

What stronger evidence could be adduced of the great value of the Preliminary Scientific Examination than the report of this Committee that "it has tended to give prominence to theoretical and scientific knowledge," seeing that it is in consequence of such knowledge that medical science has advanced with such rapid strides, and that in many cases the whole course of medical treatment has been changed.

The pages of the number of the *Lancet* in which Mr. Heath's lecture is contained, show clearly that to the surgeon, as well as to the doctor, a knowledge of mechanical as well as natural philosophy is of the first importance. Take, for instance, the case reported on page 490 of that journal.

How natural for a man who understands the laws of pressure of air, to apply the cupping-glass for the elevation of depressed cranial bone, in place of an operation which kills in seventy-five cases out of a hundred! Can a surgeon dare to be ignorant of these laws, when the consequences of neglecting them may be so disastrous

It is satisfactory to find, on turning to other medical schools, that it is not the general opinion that the study of Natural Philosophy may be neglected, but rather that "it is matter for regret that more prominence is not given to Physical Science;" for "it is in Physics that we find the explanation of a great mass of medical phenomena; and to the student who has not attained considerable proficiency in that science, many of these phenomena must be unintelligible."

Such being the case, the student will readily see that it will be for his best interests, and will best promote his future usefulness as an intelligent medical man, to acquire a thorough knowledge of the first principles of Mechanical and Natural Philosophy: in so doing, he will have the additional advantage that he will not run such risk of being landed among those who are rejected at the examinations of the University of London, and that not by a severe examiner, but through the ill-advice of which he has been the victim.

W. G. ADAMS

Physical Laboratory, King's College, Oct. 19

Solar Spectroscope Observations

IN NATURE of the 17th inst. there appear letters from Col. Tennant and Mr. Capron, who seem to doubt that the solar prominences can be seen in England with the facility described by Capt. Herschel in India. I might almost apply Capt. Herschel's words to my own experience last month. With a seven-prism direct-vision spectroscope of Browning (open slit) attached to a 2½ inch glass mounted on a drawing-room stand, not only the bright lines, but the forms of the prominences, could be plainly seen and were sketched. Of course there were many cloudy days which prevented observations, and there would be many more such in England than in India; but it does not require exceptionally fine weather, only a great deal of practice. Experience only will tell the exact distance at which the slit must be from the sun's limit, and the slightest movement will either put the prominence out of the field or swamp it with a flood of light.

Blackheath, Oct. 18

J. P. MACLEAR