

ing or mining, and that there was sure to be exaggeration. Mr. Smyth quoted likewise a report on the tin-stream district of Tenasserim, which was not likely to increase its production in any material degree. After referring to the Laurium mines, the President concluded by remarking upon the issue of a fourth edition of Lyell's "Antiquity of Man," and to Mr. Borlase's "Nænia Cornubiæ," a work in which the metalithic element was so strong as almost to stamp it as a work of applied geology, whilst the scientific treatment of the details of the sepulchral relics of the county entitled the author to the thanks of all who were not blind to the interest of the early history of the British race.

CORRESPONDENCE.

THE "SUB-WEALDEN" EXPLORATION—IMPORTANT DISCOVERY.

SIR,—I am able to announce to you an important fact in relation to our great "Sub-wealden" exploration. The specimens from the lowest part of the boring are marine deposits; they contain shells; among these are distinct small *Lingula*, which are identical with examples of *Lingula ovalis* from our Kimmeridge Clay in Shotover Hill. Mr. Peyton, to whose care in examining the shale from the boring, I am indebted for the specimens which, with the consent of Mr. Willett, have been placed in my hands for scrutiny, and the result is quite certain. There are other shells, but not sufficiently exhibited in these specimens (*Ostrea*, *Avicula*? Spine of *Acrosalenia*?).

It appears, then, that we have touched the great upper clays of the Oolites, without encountering shore sands or shelly Oolites—no Portlandian rocks have appeared. It is the open sea-bed which we have reached, and may not find other than clay deposits for a considerable depth. There may be no Triassic limestones or sandstones; and we may come on Palæozoic rocks at no enormous depth, and with no unusual difficulty.

JOHN PHILLIPS.

OXFORD, 26th Sept. 1873.

ON A NEW METHOD OF WRITING CRYSTALLOGRAPHIC FORMULÆ.

SIR,—In the September Number of this MAGAZINE (p. 428), Mr. Danby does me the honour to criticize my paper on Crystallographic Formulæ (p. 299).

His objections to my proposed system of writing formulæ appear to me to be just; and with regard to the application of the system to the more advanced requirements of the crystallographer, they seem not merely just, but important, and it was from anticipation of such objections that I refrained from making any mention of Professor Miller's system. Upon one point, however, Mr. Danby appears to have put a wrong construction, namely, in crediting me with the presumptuous notion that my method of writing these formulæ should be able "to sweep all others from the field."

I intended my little paper merely as a suggestion, capable of modification and improvement, but, nevertheless—a suggestion which

I thought, and still think, would be of some use, if adopted, in elementary teaching. But, if this be all, Mr. Danby will then "pronounce the system unprofitable." Here I differ from him, for probably out of every hundred students who commence crystallography, not more than a tithe of them ever learn, or care to learn, more than the rudiments of the science. An elementary knowledge of the subject is usually deemed sufficient for ordinary purposes; and a sound elementary knowledge is by no means without its value. Is it, then, "unprofitable" if ninety per cent of students can, by any means, acquire more easily that which they wish to acquire? I may here cite the well-worn proverb that a steam-hammer may be used for cracking small nuts, but that the same end may be attained by simpler means. With regard to the higher branches of crystallography, Mr. Danby's estimate of my system may possibly be correct. Still, I do not think that the student who used it would have anything to unlearn. I thank Mr. Danby for taking the trouble to test the merits or demerits of the system, and I trust that others whose requirements are more purely elementary may be induced to give it a fair trial.

FRANK RUTLEY.

H.M. GEOLOGICAL SURVEY.

GLACIATION OF THE LAKE-DISTRICT.

SIR,—I feel that some apology is due from me to Mr. Mackintosh, Dr. Bryce, and others, for not having alluded in my paper on "The Glaciation of the Northern Half of the Lake-district," to the work previously done by others on the same subject. My reason was this: The papers upon this subject are so numerous, and so generally—I do not say universally—the result of hasty runs through the country, that I felt it difficult to allude to some, and give no notice of others. It was my intention, moreover, when the subject should be treated more completely in a forthcoming Survey Memoir, to give a list of all papers bearing upon it. My official work has enabled me to go more minutely over the district than perhaps any previous worker, and I need hardly say that all conclusions arrived at in my recent paper were founded on self-observed facts. Since its reading and publication in the Journal, I have learnt that Dr. Bryce, in 1853 and following years, opposed the idea of a great ice-cap coming from the north-east, and completely riding over the Lake-district mountains, in papers communicated to the Philosophical Magazine, British Association, and Glasgow Philosophical Society.

KESWICK.

J. CLIFTON WARD.

.GEOLOGY OF THE LAKE-DISTRICT.

SIR,—May I be allowed through the medium of your MAGAZINE to ask authors of Papers on the Geology of the Lake-district to do me the favour of sending the titles of the same upon post-cards or otherwise?

GRETA BANK COTTAGE, KESWICK.

J. CLIFTON WARD.