

tilaginous sternum. The scapula furnished an important character in its widening, which formed a distinct acromion process. Mr. Seeley remarked that double-headed ribs occur only in animals with a four-chambered heart; and that, considering this and other characters, there was no reason for placing *Ichthyosaurus* lower than among the highest Saurians. He considered that the Teleosaurian snout differed from all known types.

Dr. Macdonald believed that what is called the coracoid has nothing to do with the shoulder-girdle, and thought it might be a part of the palate.

Mr. Mansel stated, in answer to the President, that the fossils were obtained from about the middle of the Kimmeridge Clay.

Mr. Etheridge suggested that it would be desirable to ascertain whether the horizon of the *Ichthyosaurus* described was the same as that of the specimens from Ely.

Mr. Gwyn Jeffreys inquired as to the food and habits of the *Ichthyosaurus*.

Mr. Hulke, in reply, stated that, from the presence of a stain and of numerous small scales under the ribs, the food of the *Ichthyosaurus* probably consisted of Squida and small fishes. He showed that the so-called coracoid was clearly a part of the shoulder-girdle.

CORRESPONDENCE.

THE GEOLOGICAL SURVEY OF VICTORIA.

SIR,—You have been good enough to draw attention to my paper on the present condition of the Geological Survey of Victoria, and although I might well let pass, without comment, the just and fair account which you have given of it, I think it right to offer one or two observations on the subject, which you may publish if you think fit. Whilst Mr. Selwyn was Director-General of the Geological Survey of Victoria, I stated, when giving my evidence before a Royal Commission, in what manner I differed from him as to the mode in which a Geological Survey should be conducted in a new and partially explored country, but I always recognized his abilities as a Geological Surveyor, and I never hesitated to express publicly my opinion of his services. My scheme for the continuation of the Survey was offered in the hope that it would be accepted if nothing better presented itself. That there should be one geologist in the field who would continue the survey after what I conceive to be a better method than that of Mr. Selwyn, appeared to me preferable to its being abandoned as a national work.

In naming the sum of £1,500 per annum as the probable cost of the Survey, I should have stated, for the information of those not acquainted with the economy of the government departments of this Colony, that it was not intended to include in it the cost of drawing maps and sections, the preparation of coloured lithographed maps, or the printing of reports. These costs I intended should be borne by the Mining Department and the Department of the Government Printer, where skilful lithographers and engravers and printers are employed. Some small costs for preparing tracings and plans for the officer in the field would necessarily be chargeable to the sum I set down. It was not proposed to pay the officer in the field a smaller salary than was paid to the chief officers who acted as field geologists under Mr. Selwyn, and there is an analyst attached to the

Department of Mines who would examine the minerals and ores collected by the field geologist without much extra expense.

With reference to your suggestion—that we should rather work steadily on than map out in detail more or less isolated areas—I may remind you that in our Colony there is a wide band of Palæozoic rocks stretching from west to east; that both on the north and on the south that band is bordered by Tertiaries; and that the wide expanse of basaltic and volcanic rocks, which lies between the river Plenty and the river Glenelg, is scarcely in any part broken by the protrusion of any large masses of granite or sedimentary rocks except on the margins, and that a broad line carried across any one formation would serve for a connexion, as well as if the boundaries of that formation were carefully laid down.

In other words, I conceive it is not necessary to delineate exactly and completely the boundaries of a large mass of granite which may lie between two gold-fields in order to connect these fields. I would survey a sufficient extent of the boundary, and I would leave the rest for future explorations.

Undoubtedly the plan advocated by you is preferable, and I would gladly adopt it if there were a large staff to make it practicable, and if the delays which it would necessitate would not prejudice the interests of the miners. But when it is considered that at this moment the prosperity of one great gold-field, Ballarat, is checked, and the enterprize of the miners paralyzed by the want of knowledge of the connexion and course of the deep auriferous *leads*; that a wide area in the vicinity of our richest reefing district, Sandhurst, cannot be prospected by the miner with any hope of advantage, because he has no map to guide him; and that in North Gipps Land there are two hundred square miles of country covered by basalts and lavas with intercalated beds of auriferous gravel, respecting which little or nothing is known; I may be pardoned for recommending a method of survey which, as regards the results, shall be of an immediate benefit to the miner.

My scheme embraces also the regular publication of drawings and descriptions of the fossil flora and fauna of the Colony. The first plate and description, which I send herewith, prepared by Dr. von Mueller, C.M.G., our Government Botanist, will satisfy you that much credit will redound to the Colony if the work be continued as it has been begun.

Though the Geological Survey was continued under Mr. Selwyn's direction for about fourteen years, I think you will find, if you examine his reports, that there has not been published in this Colony one plate or description illustrative of the fossil fauna of our Silurian rocks, rich as they are in organic remains and with many forms quite new to science.

The assistance which I stated would be given by gentlemen in the country had reference to such observations as would be made by Mr. Thomas Couchman, the Chief Mining Surveyor of the Colony; Mr. A. W. Howitt, the Explorer; Mr. John Lynch, Mining Surveyor at Smythesdale; and Mr. Reginald Murray, Mining Surveyor at

Sandhurst; gentlemen who have proved that they are qualified to give accurate descriptions of the topography and geology of the country.

R. BROUGH SMYTH.

MELBOURNE, 18th May, 1871.

CONCRETIONARY STRUCTURE IN PLASTER.

SIR,—The concretionary structure in plaster noticed by your correspondent Benwyman has been frequently noticed by me, as it must have been by many. I do not think that the explanation given by him, that it results from segregation or crystallization, can be the true one; for if that were so, the nuclei of the concretions should be *inside* the plaster; whereas I think they will be observed to be external. The concretions resemble saucers nested, rather than spherical shells nested. I have been used to attribute the appearance to the habit that plasterers have of casting the mortar on with a dash, so that it spreads from a central spot in concentric waves around. Thus the particles of the mortar are arranged in shallow saucer-shaped layers. And possibly, owing to some mechanical law in the distribution of the pressure from the central spot towards the periphery of the lump thrown on, the density of the mortar may alternately be greater and less in successive layers; and it is even possible that an arrangement of the particles analogous to cleavage may be produced. The subsequent passage of the smoothing tool over the whole obliterates the structure superficially, but time reveals it again by the process of weathering.

O. FISHER.

DENUDATON OF THE SHROPSHIRE COAL-FIELD.

We are favoured by Mr. John Randall, F.G.S., of Madeley, Salop, with a lengthened criticism upon a paper by Mr. Daniel Jones, F.G.S., "On the Denudation of the Coalbrook-dale Coal-field," published at p. 200 of our May number.¹ Mr. Randall states that the conclusions arrived at by Mr. Jones are identical with those of Mr. Scott, Sir R. Murchison, and himself as unmistakably shown by the sections published by Mr. Scott (Quart. Journ. Geol. Soc., 1861, vol. 17, p. 457), and that Mr. Purton has since figured the same thing (see GEOLOGICAL MAGAZINE, 1865, Vol. II., p. 515).

Mr. Randall always held the opinion "that denudation took place prior to the general elevation of the Coal-field and the great faults by which it is intersected." The quotation from Mr. Randall's letter to the *Mining Journal*, given by Mr. Jones, refers to "one particular case on the eastern boundary of the Shropshire Coal-field, showing evidence of denudation and disturbance combined."

"The case refers exclusively to the Coals in the Halesfield and Kemberton pits, and not to the general question."

¹ Its earlier appearance has been delayed from want of space, and, indeed, we cannot now give Mr. Randall's criticism in full.