

Prof. A. E. Nordenskiöld next described some new discoveries of minerals at Nordmarken and Långban in the Province Wermland. Magnificent crystals of zinkblende, in tetrahedrons with one-inch edges, of magnetic iron-pyrites, etc., had been found. The Professor then made some remarks in connexion with a paper: "Om de Nordenskiöldske jærnmasser" (On the Nordenskiöldian Iron-masses) by Kand. K. A. V. Steenstrup.

GEOLOGISKA FÖRENINGENS I STOCKHOLM FÖRHANDLINGEN.

(Proceedings of the Geological Society of Stockholm.)

Vol. III. No. 1. (Contents).—Nordenström, G. Further Account of the Solstad Copper-mine in Sweden.—Gumalius, O. Some Observations on the Glacial Deposits of Sweden.—Thorold, A. F. Is the Length of Time wanted for the Reproduction of Lake- and Bog-ores known? and if so, how large is that Time?—List of Members of the Geol. Soc. of Stockholm at the beginning of the year 1876.

Vol. III. No. 2.—Sjögren, A. On the Mode of Occurrence of the Taberg Iron-ore in the Province Småland, Sweden.—Pettersen, K. On Serpentine- and Olivine-rocks in Northern Norway.—Linnarsson, G. Geological Observations during a journey on Öland.

Vol. III. No. 3.—Lundgren, B. On the Species of *Inoceramus* in the Cretaceous Beds of Sweden.—Holst, N. O. On the Glacial Gravel-ridges (Åsar).—Widman, O. Contribution to the Knowledge of the Composition of Condrodite.—Engström, N. Analysis of so-called pale Knebelit from Dannemora. (The mineral is, according to Prof. Nordenskiöld, Pyrosomalite).—Nordenskiöld, A. E. Kupfferpecherz from Ural.

CORRESPONDENCE.

ABSENCE OF THE LLANDOVERY ROCKS IN THE LAKE DISTRICT.

SIR,—I see in his Table of Silurian Strata,<sup>1</sup> Mr. Hicks assumes that both the Upper and Lower Llandovery beds are represented in the Lake District. This is not the case, both the Upper and Lower Llandovery are absent in the Lake District. The lowest beds of the Upper Silurian in the Lake District are the equivalents of the Tarannon Shales (locally called Stockdale Shales), lying at the base of the Coniston Grits and Flags, which are equivalent to the Denbighshire Grits and Flags.

The Tarannon or Stockdale Shales, with which are associated the black Graptolitic mudstones, rest, with a very slight unconformity, on the Coniston Limestone series, which is not the representative of the Hirnant Limestone only (a small calcareous band near the top of the Bala Beds in North Wales), but of a much greater thickness of the Bala series. The Coniston Limestone series consists of various thicknesses of shale, limestone, and ashy sandstone. Between this series and the great subaerial volcanic series of the Lake District there is, as I have before shown,<sup>2</sup> a considerable break.

KENDAL, 7th April, 1876.

W. TALBOT AVELINE.

WASTE OF INSULAR LAND BY THE SEA.

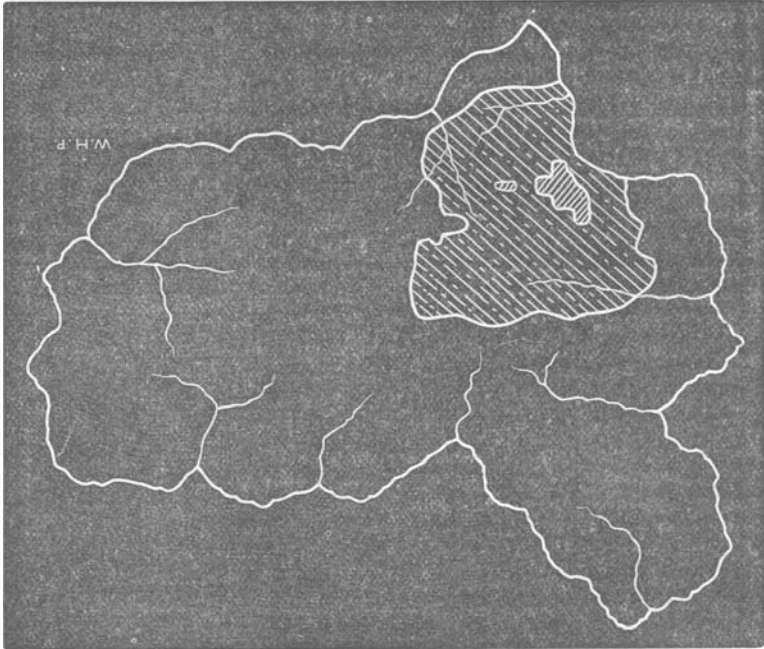
SIR,—Some time ago I came across an ancient map showing, at three different periods, the size and form of the Island Helgelandt (Helgoland). Even if the map is not strictly accurate, it may, I think, be considered approximately so, and worthy of being repro-

<sup>1</sup> GEOL. MAG. April, 1876.

<sup>2</sup> GEOL. MAG. Vol. IX. p. 441.

duced on a smaller scale in the *GEOLOGICAL MAGAZINE*. A full-sized copy, on a scale of 4 miles to an inch, has been deposited with the Geological Society of London.

Scale 10 miles to 1 inch.



Map of Helgelandt at three different periods reduced from one said to have been “copied from an old map in the possession of the Governor of Helgelandt.”



A.D. 800, when 120 miles in circumference.



„ 1300, „ 45 „ „



„ 1649, Since this time it has been rapidly diminishing, the smaller Island having entirely disappeared, and the larger being considerably reduced.

On looking at the map, one cannot fail to notice the rapidity with which the island formerly disappeared, an area of something like 500 square miles having been removed in a period of 500 years. In the following 350 years, 100 miles only were reduced, leaving an area of 4 miles, which since 1649 has diminished to a mere speck less than  $\frac{1}{3}$  of a mile in superficial extent.

There are traditions that the island was suddenly reduced by incursions of the sea, but these probably are true as regards comparatively small portions only. The erosion has doubtless been constant and gradual, the portion which still remains having been from some cause able the longest to resist the agencies of denudation.

The diminution of the island has taken place almost entirely from one direction, the sea having encroached 30 miles on the N.E. side, and 1 mile only on the S.W.; this is probably owing to the south-westerly set of the current, and to the harder (? *volcanic*) rocks forming that portion which now remains as an island.

A series of soundings over the N.E. area would be valuable, as showing the form of surface presented by this modern "plain of marine denudation."

W. H. PENNING.

#### APPARENT AND TRUE DIP.<sup>1</sup>

SIR,—The wording of Mr. Penning's ingenious paper involves one or two unfortunate slips of the pen.

In the first rule, instead of "the number of degrees of dip," write "the tangent of the angle of apparent dip."

In the second rule, proceed as before; but measure the length along one of the lines produced backwards.

The truth of the principle so modified is obvious from the following considerations.

If, along the line *b*, the rise is 1 in 20; and, along the line *a*, 1 in 10; then, taking 20 units along one line, and 10 along the other, we arrive at the horizontal line in the plane, *i.e.* at the line of strike.

ST. LEONARD'S HOUSE, LUDLOW.

HENRY GEORGE DAY.

#### PHYSICAL GEOLOGY OF EAST ANGLIA IN THE GLACIAL EPOCH.

SIR,—When the abstract of Mr. Penning's paper, "*On the Physical Geology of East Anglia during the Glacial Period*," read before the Geological Society in December last, with the report of the discussion thereon, appeared, I addressed the following letter to the author, in the hope that so much of it as consisted of an explanation of the views I held upon the subject of the East Anglian valley system might be allowed to be printed at the end of his paper. This, I believe, Mr. Penning was willing should be done, but the Council of the Society refused to allow it. I therefore, in order to prevent further misapprehension of my views, ask of you the favour of giving the letter a place in your columns.

SEABLES V. WOOD, jun.

[Copy letter.]

"Dear Sir,—So far as the abstract of it affords information, the principal fact brought to notice in your paper, 'On the Physical Geology of East Anglia during the Glacial Period,' is that the Middle Glacial gravels do not generally range in East Anglia above an altitude of 300 feet, that they are at about this height overlapped on the south side of the Cambridgeshire Chalk escarpment by the Boulder-clay, which ranges to the top of that escarpment, resting on the older formations; and that this Boulder-clay recurs on the opposite side of the escarpment, similarly resting on the older rocks, without any Middle Glacial beneath it.

"You will find that this limit of the elevation of the Middle Glacial in East Anglia is expressly pointed out by me in a paper in the

<sup>1</sup> See *GEOL. MAG.* for May last, p. 236.