attention to some places in Sweden where this denuding power also could be traced. Prof. Torell also mentioned the marine fauna at Gothenburg, and Mr. Börtzell made some remarks on the deep-boring at Gothenburg.



## CORRESPONDENCE.

### APPARENT AND TRUE DIP.

Sir,—Mr. Penning's very simple construction for direction of dip, given in the May Number of this Magazine, is only approximate, and in extreme cases might be rather widely wrong. In the case he has taken for his figure the error will be about 3°; in the case of dips of 30° and 60° at right angles to each other, his construction would be 8° wrong.

The accurate rule would be as follows:—

Draw two lines from a point in directions of the two observed dips. Set off along each line lengths proportional to the tangent of the other dip (or to the cotangent of its own). Join the ends of these lengths: the joining line will be the direction of the strike, the perpendicular to it from the angle will be the direction of the dip.

Moreover, if cotangents have been used, the *length* of this perpendicular is proportional to the cotangent of the true dip, whose magnitude as well as direction will thus be determined by one construction.

Mr. Penning's construction would give the magnitude of the dip by the formula: Length of perpendicular : length of a side :: dip in direction of *other* side : true dip. And as accurate values of dips are usually needless, this would probably give sufficiently correct results.

Mr. Penning's rule, as any one acquainted with Trigonometry may see, is equivalent to assuming that angles are proportional to their tangents.

E. Hill.

Cambridge, *May* 23*rd*, 1876.

### SOUTH AUSTRALIAN POST-TERTIARY FORAMINIFERA AND OSTRACODA.

Sir,—A notice of the occurrence of the following species of Foraminifera and Ostracoda in the Post-Tertiary beds of South Australia may be of interest to some of your readers. A small collection of Mollusca was presented to the Museum of Practical Geology, London, many years ago, by Mr. H. Challoner, of the Burra-Burra Mines, South Australia. From the matrix contained in and surrounding these the minute fossils were washed by Mr. J. Bennie and myself.

According to the label accompanying the shells, they were found in sinking a Government well in the Murray River Flats, on the road from the Burra-Burra Mines to the Great Bend of the Murray River, about half way (thirty miles) between the two points named. For the determination of the Foraminifera I am much indebted to Mr. H. B. Brady, F.R.S., and to Prof. G. S. Brady, for a like examination of the Ostracoda.

The Foraminifera are—

*Biloculina contraria*, D'Orb.
" *depressa*, D'Orb.
" *elongata*, D'Orb.
" *ringens*, Lamk.
*Cornuspira foliacea*, Phil.
" *involvens*, Reuss.
*Cristellaria rotulata*, Lamk.
*Glandulina lævigata*, D'Orb.
*Hauerina compressa*, D'Orb.
*Orbitolites complanatus*, Lamk.
*Planorbulina reticulata*, Czjzek.
" *Ungeriana*, D'Orb.
*Polystomella craticulata*, F. & M.
" *macella*, F. & M.
*Pulvinulina elegans*, D'Orb.
*Quinqueloculina agglutinans*, D'Orb.
" *secans*, D'Orb.
" *seminulum*, Linn. (var.)
" *subrotunda*, Montagu.
*Rotalia Soldanii*, D'Orb.
*Spiroloculina canaliculata*, D'Orb.
*Triloculina oblonga*, Montg.
" *tricarinata*, D'Orb.
*Truncatulina lobatula*, W. & J.

The Ostracoda are—

*Bairdia ovata*, G. Brady.
*Macrocypris acuminata*, Reuss.
*Cythere Normani*, G. Brady.
*Paracypris decora*, G. Brady.

Prof. Brady remarks that these appear to be perfectly identical with the Ostracodal fauna now living in the seas of Australia and the Malay Archipelago. A few other Ostracoda were also present, probably new; but from the paucity of individuals it was scarcely advisable to describe them at present.

The Murray River Flats consist of a flat scrubby plain extending from the Murray River on the East, between the Great Bend and Lake Victoria, to the South Australian Chain, or Cape Jervis Range, on the West, and must be composed of strata, geologically speaking, of no great antiquity; in fact, the whole of that portion of the southern coast of Australia bears evident traces of recent upheaval, even in places now going on.

R. Etheridge, Jun.

Edinburgh, *May*, 1876.

## LLANDOVERY ROCKS IN THE LAKE DISTRICT.

Sir,—The assertion made by Mr. Aveline in the last Number of the Geol. Mag., that "both the Upper and Lower Llandovery Rocks are absent in the Lake District," is not borne out by the researches of other observers, nor is it in accordance with the published statements of such well-known authorities as Prof. Harkness and Dr. Nicholson. The Coniston Limestone is generally acknowledged to be the equivalent of the Bala Limestone, and the succession up to this point is quite clear. Upon this limestone the Graptolitic Mudstones, according to Mr. Aveline, rest "with a very slight unconformity," and he considers the mudstones to be the equivalents of the Tarannon shales of Wales. The Tarannon shales he considers form the base of the Wenlock series, and hence to be higher in the scale than the Upper Llandovery or May Hill sandstones. Now, by a strange coincidence, we find the following statement by Dr.