18th January 1877.

JAMES BRYCE, Esq., LL.D., *Vice-President*, in the Chair.

The following Communication was read :—

Notice of Glaciated Rock Surfaces (displaying Corals) near Bathgate, recently quarried away. By RALPH RICHARDSON, F.R.S.E., *Honorary Secretary.*

Mr James Linn kindly showed me, on 28th June last, an interesting glaciated rock about a mile distant from Bathgate. It was the surface of a bed of Carboniferous limestone (marine) in Petershill quarry, dipping, from E.S.E. to W.N.W. (true), at an angle of 30°. This glaciated surface was laid bare about a year before we saw it, and has been recently quarried away ; so that a notice is desirable, if only to record the fact of its having once existed.

The rock in question was about 15 yards long by 3 wide, and a great portion had been already removed by the quarrying operations. At the north end of the rock, in particular, the original glaciated surface was well preserved, and a beautiful specimen of *Lonsdaleia floriformis* coral was displayed. It had been polished quite smooth by the glaciating agent. In the case of another specimen of the same coral, which was also visible, the polishing had been obliterated by weathering. Various corals of the same species, also Spirifers and Encrinites, and a specimen of *Cauda galli* (supposed by Professor Ramsay to be a seaweed*) were also displayed—in every case polished. The polishing was much more perfect where the corals appeared in the surface of the limestone, their structure being harder than the limestone. Indeed, this hardness of the fossils produced protuberances in the surface of the rock in which they appeared, the glaciating agent having eroded the rock-surface around the corals. The erosive power and action of the agent (ice) is shown by its having removed the softer limestone surrounding the corals, which consequently protruded from it slightly.

The rock under notice was situated about 700 feet above the sea-level. Striæ crossed its surface at various places, running E.S.E. and W.N.W. (true), the line of the dip. No cross striæ were observed ; consequently the rock seems to have been planed, polished, and striated by some agent moving persistently in one direction, such as a glacier—not an iceberg. Above the rock occurred a bed of boulder-clay about 13 feet deep, proving that

* Mr Salter's Appendix to Geol. Survey's Memoir 32, p. 150.

previous to the deposition of the boulder-clay, the subjacent rock under notice had been completely polished and striated by the passage over it of some heavy, closely-enveloping agent, presumably ice. In the middle of the boulder clay a somewhat singular regular line of boulders occurred, some of greenstone, some of sandstone full of vegetable remains, and some of coarse limestone. About 4 feet of tiring topped the bed of boulder clay.

Another, but much smaller, glaciated rock surface occurred in a bed of limestone about a quarter of a mile to the north of that just noticed. Its surface was polished like the other, and the dip of this bed and the striæ upon its surface corresponded with those of the bed first mentioned. I am glad to say that Mr Linn arranged with the quarrymen to preserve for him the beautiful glaciated specimen of *Lonsdaleia floriformis* above noted. He informs me that, on visiting Petershill in company with our last elected Foreign Corresponding Fellow, Major Brooks of the Geological Survey of Wisconsin, U.S., on 6th July last (our visit had taken place only a week before), he found that the ice markings on the bed first described in this paper had all been quarried away. He secured two fragments, however, from the quarrymen. The rapidity with which interesting geological phenomena often disappear, by human as well as by elemental agencies, proves the desirability of their being observed and recorded without any delay; and this, I think, should be regarded as one of the prime uses and duties of a Society such as ours.

2d February 1877.

D. MILNE HOME, Esq., LL.D., *President*, in the Chair.

The following Communication was read:—

Note on a Striated Erratic recently exposed at Granton; with Observations on the Requisites for Determining the Parent Rocks of Erratics. By RALPH RICHARDSON, F.R.S.E., *Honorary Secretary*.

The portion of an erratic exposed at Granton Harbour by the recent storm is certainly one of the most perfectly striated rocks I ever saw. As an instance of striation it well deserves a visit, and as the tide will probably soon obliterate the striæ upon it, the rock itself should be briefly noticed in this Society. It