cleavage of the entire mass, very like that shown in a cliff of compact limestone. In one or two bergs a fine cleavage lamination was noticed like that of slate or shale, the laminæ being parallel to the face of the cliff, and breaking up at their edges with a zigzag fracture, resembling diamond cleavage of slate; this condition may have been produced by a peculiar exertion of pressure in these particular bergs.

When the lower cliff of a two-storied berg (Pl. D. figs. 1, 2) had a shot fired into it, large masses of ice fell, raising a considerable swell in the sea. The pieces of the cliff split off in flat masses parallel to the face of the cliff, just as was noticed in the case of the splitting of the glacier cliffs at Heard Island, and did not tumble forward but slid down the face of the cliff, keeping their upper edges, parts of the old plateau surface, horizontal. The ice floated round the ship in some quantity; it was opaque and white-looking, somewhat like white porcelain, and the shattered fragments had remarkably sharp angular edges, showing that the ice was very hard and compact, far more so than its appearance in mass would lead one to suppose, since it looked at a distance as if it were hardly consolidated, but merely closely pressed snow. Its manner of cleavage only gives evidence at a distance of its very compact nature. Many of the floating fragments were traversed by parallel veins of transparent ice, those which, when seen on a cliff surface, looked blue.

During the short time that the ship was amongst the icebergs not one was met with that bore upon it any moraines or rocks which could with certainty be determined as such, but on the 24th February a large rock was reported on one. The scarcity of such appearances has been remarked by former voyagers. Nevertheless, there are numerous instances in which observers have met with rocks on southern bergs. Wilkes and Ross saw many; and the latter on one occasion landed a party on a berg on which there was a volcanic rock weighing many tons, and covered with mud and stones.[1] Mr. Darwin published a note on a rock seen on an Antarctic iceberg in lat. 61° S.[2] Dr. Wallich[3] remarks on the similar scarcity of the appearance of stones or gravel on northern bergs; not one in a thousand shows dirt, stones, or rocks. He attributes this to the very small disturbance of their centres of gravity which icebergs undergo when floating freely. Stones and gravel may be present in most cases, but generally remain invisible under water in the lower parts of the bergs.

On three occasions discolorations of bergs were seen. In one case there was a light yellow band on one surface of a cliff high up, possibly the result of birds' dung which had fallen on the snow when the layer was formed, or it might have been due to a fall of volcanic dust; it was too high up to be due to Diatoms. On another occasion two bergs were passed at a distance, which showed conspicuous black-looking bands, appa-

[1] Ross's Antarctic Voyage, vol. i. p. 173, London, 1847.

[2] C. Darwin, Notes on a Rock seen on an Iceberg in lat. 61° S., *Geogr. Soc. Journ.*, vol. ix. pp. 528, 529, 1839; see also Journal of Researches during the Voyage of H.M.S. "Beagle," p. 251, ed. 1879.

[3] G. C. Wallich, The North Atlantic Sea Bed, pt. i. p. 56, London, 1862.