

sea; (2) erosion; and (3) accretion. Since Neolithic man arrived in Britain, there is evidence of a submergence along the coasts of England and Wales and the South of Ireland, and of an emergence along the coasts of Scotland and the North of Ireland. These movements took place prior to the time of the Roman occupation of Britain. Whether movements have taken place in still more recent times is somewhat doubtful, but there are slight indications of a subsidence in the extreme North of Scotland, and at one or two places on the coasts of England and Wales. Reference was made to the need of systematic observations being carried out by the Ordnance Survey to ascertain whether such movements are now in progress, and, if so, to what extent.

Estimates were given as to the extent of erosion and accretion in the United Kingdom within recent years, and it was shown that more land had been gained by accretion and artificial reclamation than has been lost by erosion. But while the gain has been almost entirely in tidal estuaries, the loss has been on the open coasts. Further, the gains have been due not so much to the accumulation of material eroded by the sea as to the deposition of sediment brought down by rivers from their drainage areas.

The serious erosion on the coasts of Holderness and of East Anglia were described and illustrated by views. While the chief agents of erosion are well understood, it was pointed out that there is a great lack of knowledge as to what takes place below the level of low water. Observations are needed regarding such questions as submarine erosion, the travel of material below the low-water line, and the movements of outlying sandbanks. There is much obscurity as to the limits of depth at which materials are moved on the floor of the submerged continental platform by waves of current action, or both combined; and again as to what depth the movement of detritus on the sea-floor is really effective in producing abrasion. The intermittent character of the erosion at many places on the east coast of England was noted as a puzzling fact. It may be due to an alteration in the point of attack of the sea on the coastline, brought about by the shifting of outlying sandbanks or shoals.

Another factor in erosion, the importance of which has been overlooked, is the action of rock-boring organisms. An account was given of the present state of knowledge regarding their work and of their effect on the sea-bed near Cromer. Little is known as yet as to the rate of boring, or as to the depth to which it occurs.

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#### CORRESPONDENCE.

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##### DIFFERENTIATION IN IGNEOUS ROCKS.

SIR,—Having occasion to refer to the report of my contribution to the discussion “*Sur la différenciation dans les magmas ignés*” at the Toronto Geological Congress, in the *Compte Rendu* (pp. 248–9), I find that through some typographical accident, which in the absence of a proof remained uncorrected, the meaning of one paragraph has been seriously obscured.

After suggesting that the presence of a considerable amount of water in a magma might result in its separation in the liquid state into two immiscible portions, the lighter containing the greater part of the water and of the more acid and alkaline constituents, representing quartz and the alkali feldspars, and the heavier consisting mainly of the basic constituents with comparatively little water, I continued: "It was to be expected that the character of the differentiation would depend on the amount of water present. If this were larger, one would expect a comparatively complete removal of the alkali feldspar materials." ["With less water one may expect a greater amount of the alkaline material to remain with the more basic portion"], "and with further differentiation by other processes this would naturally give rise to a series of rocks of the alkali or 'Atlantic' type. This suggestion—it was intended to be nothing more—appeared to derive some support from the frequent association of rocks of this character with block faulting, while rocks of the normal or 'Pacific' type were usually found within areas characterized by folding, where there was less facility for the escape of water to the surface."

The words in square brackets are those actually used in the first draft of the summary of my remarks supplied to the Secretary of the Congress. They were probably modified in the fair copy, but those appearing in their place in the printed text do not make sense. Indeed, the only meaning that might be extracted from them would be exactly the opposite of that intended, as shown by the context. A brief but correct version will, however, be found in my contribution to the discussion on a paper by Professor P. Marshall (*Quart. Journ. Geol. Soc.*, vol. lxx, p. 406, 1914).

It is immaterial for the present purpose whether my suggestion with regard to the origin and distribution of the alkali rocks was well founded. I merely wish to have it correctly recorded.

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## OBITUARY.

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### PROFESSOR JOHN WESLEY JUDD.

MANY friends and numerous old pupils will deeply regret the death of Professor J. W. Judd, who passed away at his home in Kew on March 3. In 1905, when he retired from the Chair of Geology in the Royal College of Science, this Magazine published the story of his life, with a list of his many contributions to science, so that it will now suffice to continue that story to the closing days. These were spent either at Kew or at a small house which he had acquired at Walmer; for he had ceased to travel, partly on account of his own health, since before retirement he had begun to suffer from a form of