# EARLY DISCOVERERS
## XXIV

# GEORGE WILLIAM LAMPLUGH (1859–1926)

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THE career of George William Lamplugh was one which could probably never be repeated in these days of strict professionalism. He was a self-taught and very able amateur geologist, who at the age of 33 gave up a promising business career in Yorkshire to join the Geological Survey as a Temporary Assistant Geologist, at a salary of seven shillings a day. He retired 28 years later, an Assistant Director, a Fellow of the Royal Society and President of the Geological Society of London.

His position as an "early discoverer", however, does not rest on any spectacular examples of foresight or intuition, but rather on the part he played in British glaciology at a time when theories were developing with unusual rapidity, and when a sound field man was needed to pull some of them down to ground level and test them against field observation.

Lamplugh, of course, was not only a glaciologist. His work, in fact, falls roughly into four groups: his studies of glacial deposits, which began near his home at Bridlington, Yorkshire, and gradually extended to wider aspects of the Pleistocene; his classic work on the Speeton Clay (Lower Cretaceous), which similarly led to a general interest in Mesozoic stratigraphy; his official work for the Geological Survey from 1892 onward; and lastly, the accounts of his numerous visits abroad, during which he acquired a knowledge of glacial phenomena which he constantly applied to the interpretation of Pleistocene deposits in England. It is with the first and fourth of these groups that this article is mainly concerned.

Looking back on Lamplugh's work, it is clear that one of his most valuable assets was an ability to observe, and to write lucid factual accounts of what he had seen. Interpretation, of course, is added; but there is always in Lamplugh's writings a clear distinction between fact and opinion, and it is this which makes his early papers so valuable to the present generation; not merely because many of them deal with sections no longer exposed, but also as examples of how such observations should be made.

Lamplugh's first geological work was on the Bridlington Crag, which he described in a number of papers between 1878 and 1890 (e.g. Lamplugh, 1878, 1884), and which to a certain extent shaped the course of all his later studies of the Pleistocene. This deposit, which is now hidden by sea walls and only very rarely exposed on the foreshore, occurred in the form of lenticular patches of shelly sand and clay, in the boulder-clay cliffs near Bridlington harbour. It was by no means unknown before Lamplugh's time; but his particular (and memorable) contribution was to establish for the first time its field relationships (contorted masses within the Basement Clay), its mode of origin (torn from the sea bed by advancing ice) and, with the help of others, to bring the faunal list up to date (over 100 species by 1884). This early acquaintance with glacial shell beds undoubtedly led to his life-long interest in shelly drifts, to which we find him being drawn during his later travels abroad. Describing to the Geological Society of London the occurrence of glacial shell beds in British Columbia, he was obviously happy to be able to say that "so far as the irregular distribution of the species was concerned, I might have been examining sections in Yorkshire such as I described to the Society two years ago" (Lamplugh, 1886). It was during this trip that he also visited Muir Glacier in Alaska; and one must admit to a certain fellow-feeling when he says: "This is the first glacier I have visited, and I brought away the impression that on the whole it was easier to give explanations of glacial phenomena before I had seen ice".

Better known, perhaps, is his account of Sefstrømbreen (Vestspitsbergen), which between 1882 and 1896 had advanced across part of Ekmanfjord to Cora Island, where it left a shelly moraine.* Lamplugh visited Cora Island in 1910 under De Geer's leadership, and in the following year he described to the Yorkshire Geological Society how he had always been convinced that the transport of shells could be effected by an ice sheet moving across the sea bed, "and here, at last, I saw for myself a complete demonstration of it. The advancing glacier had acted like a great dredge; in crossing the trough of the fjord, it had dragged the material of the sea-bottom up the slope and spread it out for investigation upon the land" (Lamplugh, 1911).

The question of marine shells in, or associated with, boulder clay had been an important point in the "land ice versus sea ice" controversy. And although this had virtually been settled, so far as Scotland was concerned, by Jamieson and Geikie in the 1860's, it was still necessary for geologists to examine their own areas to see how far the land-ice theory was valid elsewhere; for it was generally felt that, although in Scotland land ice might be acceptable, a submergence could still be the answer for the greater part of the English "drifts". Lamplugh (1891[b]) summed up his views on this point in a paper on the drifts of Flamborough Head, accepting the land-ice theory for East Yorkshire and Lincolnshire generally. And there is no doubt that his correct explanation of the way in which shelly deposits can become associated with land ice influenced many others in their conversion from the old "drift" hypothesis—though it has not, even now, eradicated the word from geological literature.

Concurrently with his work on the Bridlington Crag, Lamplugh had a good deal to do with the buried "pre-glacial" cliff at Sewerby, about a mile away. This was discovered in about 1884 by Clement Reid, whose attention had been drawn to the place by Lamplugh's discovery of a bone bed near the base of the modern cliff. The bone bed proved to be one of the deposits which had accumulated at the foot of the buried cliff before the arrival of the ice which deposited the Holderness boulder clays. During the next few years careful excavations were made under Lamplugh's supervision and, apart from Reid's (1885) brief account in the Holderness memoir, our present knowledge of this important marine episode in the Pleistocene of East Yorkshire is derived almost entirely from Lamplugh's reports (e.g. 1891[a]).

With the start of Lamplugh's survey career in 1892, his more local work gradually diminished and, with the wider experience which survey work gave him, he was able to apply himself to more general topics of Pleistocene geology. The survey of the Isle of Man was one such opportunity. Here again he found himself dealing (in part) with shelly drifts, and a "pre-glacial" cliff; but from a historical point of view the main interest of his Isle of Man memoir lies in the section called "Theoretical conclusions and review" (Lamplugh, 1903, p. 389–98) in which we see, among other interesting conclusions, the development of the monoglacialism to which Lamplugh later became a staunch adherent. Already in 1891 he had described how, in the Flamborough area, he had begun his investigations "with a learner's faith . . . in the recurrence of interglacial periods. . . . But with the gradual accumulation of opposing evidence my confidence was weakened, until at length I have been driven to contrary conclusions". In the Isle of Man he again found no evidence of a complete deglaciation during the Pleistocene (though he would always allow small oscillations of the ice front), and supported Kendall's conclusion that "the glacial period [in that area] was one and indivisible".

These experiences undoubtedly laid the foundation of his notable Presidential Address to Section C of the British Association in 1906 "On British drifts and the interglacial problem" (Lamplugh, 1907), a subject to which he returned at the International Geological Congress (Lamplugh, 1913). These papers in a way represent the high-water mark of Lamplugh's glaciological work; and, although one may not subscribe to his monoglacialist views, they are still eminently readable if only for their clarity, their logical arguments, and in places a

* The later movements of this glacier have been described by Dineley and Waters (1960, p. 693–97).

remarkably modern approach. In his British Association address, for example, he touched on Croll's astronomical hypothesis which was supposed to explain the alternation of glacial and interglacial periods. "But the glamour", he says, "of the astronomical theory has waned, and it is recognized that there are flaws in the physical aspect of the theory and in its geological application that render it untrustworthy." How many of us, without knowing the date of this quotation, would have supposed that it was written in 1906? Other points which he made on the same occasion were the importance of increased moisture and precipitation, rather than increased cold, as the essential factor causing the advance of an ice sheet; and his emphasis on stagnation in the interpretation of glacial deposits (which he had already used in the Isle of Man as, earlier, Goodchild had in the Vale of Eden). Both of these were ideas which, though not quite forgotten, were certainly not fully appreciated for at least 20 years.

Lamplugh's last important glaciological paper was his Presidential Address to the Geological Society of London (Lamplugh, 1920), an occasion which was notable also for the award of the Wollaston Medal to Professor Gerard De Geer. This address, given in the year of his retirement from the Geological Survey, sums up his accumulated ideas on the Pleistocene glaciation of England. It is still unreservedly monoglacial, and again we find him stressing the idea that "it seems certain that they [the boulder clays] have sometimes, perhaps often, been formed from the decay of detritus-charged stagnant ice". The address was also something of a landmark in that it included the first-published drift map of England and Wales, although it naturally does not separate deposits which are now generally regarded as belonging to different glaciations.

Lamplugh's work is therefore important as representing a stage in the development of glacial theory in Britain, in which he himself was very largely influential; for his part in the elucidation of Pleistocene history through meticulous observation of modern glacial phenomena; and for his insistence on accurate and critical field work as the basis for all geological hypotheses. This needed to be said, in some circles, in the early 1900's; and we would do well to remember it today—particularly in the study of the Pleistocene, in which it is so easy to allow pre-conceived ideas to lead one to false conclusions.

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