

Alyn. Their origin is well indicated in these positions, by the manner in which they lie opposite the mouths of the valleys at right angles to the course of the present streams.

The most remarkable of all these is a long ridge running parallel to the Great Western Railway near Gresford. It is marked and shaded on the ordnance geological map. Bailey Hill, Mold, is another. This is attributed to the Danes—described in the guide books as a Danish fortification. I have proved the glacial origin of these mounds by finding in them striated subangular boulders, that have travelled considerable distances; such, for example, as large blocks of the Llanarmon limestone, and rounded lumps of curly cannel, that must have crossed the ridge of the Hope Mountain, the height of which varies from 300 to 800 feet above the Leeswood and Tryddn valleys from which the coal must have been carried. On one occasion, during the construction of the Wrexham Mold and Connah's Quay Railway, I saw a large fire blazing in a navy's shed, and upon examination found that the fuel was curly cannel they had found in making a cutting. They described this find as two pieces, each one "bigger than a man's head." I brought away an unburnt fragment of about 2 lbs. weight. It was a subangular corner, smoothed and faintly striated. The nearest cannel seam to this place—which is over the millstone grit—is about four miles, with the Hope Mountain intervening.

A curious example of the unexpected bearings of scientific investigations upon commercial interest was presented by these cannel boulders. Two or three years before I commenced the study of the ancient glaciation of this district, Mr. W. C. Hussey Jones had proved the value of this curly cannel as a source of paraffin, and what are called paraffin oils, &c. Great excitement resulted, and a great rush was made to "the Flintshire oilorado." This curly cannel was sold at prices varying from twenty-five shillings to thirty shillings per ton at the pit's mouth, while the price of ordinary main coal was only six shillings. The owners of this cannel, or holders of leases or "tak notes," giving a licence to work it, made large sums of money (as much as 80,000*l.* was paid for the transfer of one lease), and consequently great search was made for new seams. Among the searchers were the farmers, land-owners, and outside speculators, who commenced boring and sinking and forming companies for cannel mining in the region covered by these "hog wallows;" the evidence upon which their expectations were based being the discovery of pieces of cannel on or near the surface, turned up by the plough or otherwise. Many thousands of pounds were thus wasted. One very worthy man, that I knew very well—a hard-working Welsh farmer—spent the savings of a whole life-time in searching for cannel on his farm, where he had frequently turned up fragments in ploughing. His death speedily followed his ruin. There were many other similar cases. Had I commenced my investigations three years sooner I might have explained the strange and apparently incomprehensible anomaly of Leeswood cannel being found on the south side of the Chester and Mold Railway, and in the neighbourhood of Caergrwle, in spite of an intervening ridge of mountain.

One very curious and instructive feature of these mounds is their change of shape as we proceed from the hill slopes towards the great plain known as the Vale Royal, which was formerly a great estuary or fjord of the Dee. Instead of the long and rather steep hogback ridges we now find a general outspreading deposit dotted here and there rather sparsely with obtuse conical mounds, so obtuse and so much disturbed by agricultural operations that they can only be detected by careful observation.

My explanation of these differences is that the glacier which planned the millstone grit of the Hope Mountain by sweeping over and around it, originally spread out upon the waters of the estuary now forming the Vale Royal, and thus formed the outspread deposit; that it afterwards receded, and the icebergs that broke off and floated away from it were stranded here and there, thawed, deposited their contents, and thereby formed the mounds; while the oblong ridges mark the final step-by-step recession and oscillations of the dying glacier, which formed them partly as terminal moraines, and partly by ploughing up and thrusting before it, in the course of its advancing oscillations, the previously deposited glacial drift. I throw out these speculations suggestively, to be taken for what they are worth; they fit the facts well enough so far as I have been able to study them, but the main object of this letter is to direct attention to this and other corresponding deposits near at home that appear to me to be worthy of further investigation, especially by residents in the neighbourhood and the members of local field-clubs, &c. The Liverpool Naturalists' Field Club paid a visit to

the district while I lived there, and I showed the geological members some of these deposits. W. MATTIEU WILLIAMS Belmont, Twickenham, April 24

It is apparent from Prof. Le Conte's description of the prairie mounds (NATURE, vol. xv. p. 530) that the drift mounds figured and mentioned by me (vol. xv. p. 379) have quite different origins. The prairie mound would seem to be somewhat similar and have the same origin as a tussocky bog or mountain. The formation of a tussocky bog has been described in "Valleys and their Relation to Fissures, &c.," p. 14. A tussocky mountain is similarly formed very hot weather cracks the peaty upper soil forming deep fissures; while subsequent weathering changes the portions between the fissure into small hills. I lately saw on the coast of Wicklow a considerable area of Æolian drift of this hummocky nature; the hillocks being about four feet high. They were so regular as to have the appearance of being moulded from one model. These could not possibly have their origin in fissures; but they seemed to have a connection with bunches of bent, round which the wind collected heaps of sand. But again why should the bunches of this grass grow at regular intervals? In the same neighbourhood some of this Æolian drift is piled in long parallel ridges, about five or six feet high, and having quite an artificial look. These evidently are wind formed; but how it is hard to conjecture, as they run oblique to the prevailing and most effective winds. G. H. KINAHAN

Ovoca, April 24

Greenwich as a Meteorological Observatory

IN Mr. Buchan's objections to the hypothesis that the temperature of Greenwich is raised by the proximity of London one most important consideration has been omitted. Granted that the mean temperature of the summer months, June to September, is 0°9 higher at Greenwich than at the eight other stations referred to, it does not follow that this alone is the cause of the higher average temperature at the former place. Greenwich occupies a position farther from the Atlantic and nearer the Continent than the majority of the selected stations, and we might therefore expect to find it subject not only to a higher temperature in summer, but also to a lower temperature in winter. If this be so, the excess which Mr. Buchan admits may be accounted for by the raising of the mean winter temperature from artificial causes; and this view of the case seem to be confirmed by observation. The station at Leyton, Essex, supplies the requisite data; for, although near London and rapidly increasing in population, it is, or rather was, in a country district when the observations were made. It is situated on the verge of Epping Forest, is separated from London by the Hackney Marshes, is rather more than 6¼ miles in a direct line from St. Paul's Cathedral, from which Greenwich is 4¼ miles distant, and is 7 miles nearly north of the last-mentioned place. The meteorological observations were undertaken with the express intention of comparing them with those at the Royal Observatory, with which object the instruments were mounted on a stand precisely similar to the Greenwich stand, and the exposure was unexceptionable. The comparison relates to the daily maximum and minimum temperatures for the three years ending November, 1863. The average was at Greenwich 50°4, Leyton 49°9. Allowing for elevation, the results are:—

	Annual.	Maxima.	Minima.	June to September.	December to March.	Maxima June to September.	Minima June to September.	Maxima December to March.	Minima December to March.
Greenwich...	51°0	58°9	43°0	61°0	41°9	71°0	51°1	47°0	36°7
Leyton ...	50°2	58°3	42°1	61°3	40°8	72°0	50°7	46°9	34°8
Greenwich warmer than Leyton.	+0°8	+0°6	+0°9	-0°3	+1°1	-1°0	+0°4	+0°8	+1°3

These results prove that Greenwich is warmer than Leyton, which is farther removed from the influence of London, and that during the winter months the temperature is higher both by day and night, but chiefly by night, when the excess is 1°3; also that in summer, while the nights at Greenwich are warmer than at Leyton, the days are cooler. The inference is that the artificial