

ART. XX.—*On the use of the term Esker or Kām Drift*; by
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FROM the papers read at the British Association Meeting at Montreal it is evident that the American geologists classify, under the names of Eskers and Kāms, gravels that are not so classified in Ireland.

These two words are Celtic. Cām, Kām or Kāme, should be pronounced short. Kāme, the lowland Scotch and English pronunciation, is incorrect. Curiously the English river Cām is pronounced right; while the town on it, usually, although not always, is pronounced wrong, Cāmbridge.

Cām or Kām means *crooked* or *winding*. In Ireland and England this name is generally used in reference to a winding river; but in the former it is also sometimes used in reference

to winding ridges, or a winding or wrinkled structure; thus ophiolyte is called serpentine in English on account of its structure but in Ireland it is "Cāmstone." This latter name for serpentine is now nearly obsolete, except in parts of Ulster, where an impure steatite with a wrinkled structure is still called *Cāmstone*.

Eiscir, pronounced Esker, is a well defined but small ridge. A nearly continuous ridge of gravel—Kāms—extends from Dublin to Galway, dividing Ireland into two nearly equal portions. This ridge, when Ireland, in the early historic period, was divided into two kingdoms, was taken as the divisional line; and hence the term Esker has generally been used in that country in place of Kām, to designate the winding or crooked ridges of gravels, which in Scotland still retain commonly the more correct name of Kām. Although in America the pronunciation Kām seems some way to have become general, yet, as far as my experience in Scotland goes, the word is generally pronounced Kām.

True Esker or Kām drift comprises more or less winding or crooked ridges and irregular hills of sands and gravels, due to the current and eddies generated by the meeting or colliding of two or more currents in a mass of water, such as that of a sea or large lake. Wind-driftage may also aid in forming esker sands, as for instance the long irregular ridges and hills constituting in many places the dividing ridge between a lagoon and a sea, where there is a rise and fall of tide: that is, a colliding of two or more currents;—in a tideless sea the enclosing materials of the lagoons are of a quite different nature from Esker or Kām drift. In the dividing bars between a tidal sea and a lagoon the combination of the water and wind drifts are very interesting; high tides accumulating layers of gravel (fine or coarse) to be covered up by layers of fine sand due to the wind driftage.

The normal esker drift-ridges that are solely due to the colliding of currents in a mass of water, or those combined with wind-driftage, have a peculiar character of their own and should not be again confounded, as they were formerly, with other gravel and sand hills, such as the subaerial gravels on hill slopes, due probably to the water given off from a névé or mass of ice on a hill, during the summer; or the long regular ridges in valleys, due to excessive or sudden floods.

There are, both in the United States and the adjoining Canadian prairies, ridges of drift somewhat like the Irish Eskers, but at the same time totally different from them. What they are due to would be presumptuous in me to say, but they seem to be adjuncts of the great glacial moraines, because, as far as I was able to study them, they appear to be in connection with the breasts or marginal faces of such accumulations; as if for some

reason, to me unknown, there were at times "flashes," or areas of shallow water, accumulated margining the faces, portions of which were still water, while in other portions there were currents; or it might have been a mass of snow margining a narrow flash of flowing water. This latter suggestion is put forward on account of what can be seen, but on a very small scale, in some of the Irish mountains, but more largely in some of the valleys of the Canadian Rockies. If such is their origin they may be considered in part allied to true eskers.

The above notes are written because it appears that American observers are unwittingly confounding the true Esker drift with the others which are more or less similar; and as the writer was the first, or one of the first, who pointed out the very different, but in some cases, rather similar drifts, that were gradually being included under the terms, As or Òsar, Esker, Cam, Kam, Kaim, Kame, all of which are names for the one and the same class of drift, he may perhaps be excused for drawing attention to the subject.

Esker or Kām drift *par excellence* occurs in narrow, well defined, winding ridges, on a more or less level tract or area, and in such an area they are all on or at about one altitude, such as we might expect to find near the margin of a sea or large lake; while ridges of gravel running down a steep slope or the slope of a valley must necessarily have quite different origins. Up in valleys near their terminations, or in tributary valleys, there are other ridges that are very nearly allied to Eskers, they having originally been the marginal barriers of a lagoon; but if you take the outward appearance of true Eskers, combined with their peculiar internal structure, there is nearly invariably a marked difference between them and any other gravel accumulations. The writer of this has very fully gone into the subject of the Irish Eskers in a paper on "The Eskers of the Central Plain of Ireland," Dublin Geol. Soc., vol. x, or the Dublin Quarterly Journal of Science, vol. iv, and in the Geology of Ireland, Chap. xv, page 251, etc.

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