

The other collection is from a section ($30^{\circ} 9' : 67^{\circ} 59\frac{1}{2}'$) in the Mehrab Tangi near Harnai. Some 1,300 feet of "Dunghan Limestone" had there been judged to succeed the Parh Limestones. I found that the lower and upper elements of the Dunghan Range section seem here to be cut out; but the central element, or Upper Ranikot, expands to a great thickness of limestone whose fauna increases in richness from below upwards until, some 1,200 feet above the base of the series, it presents such a typical Upper Ranikot assemblage as *Nummulites nuttalli* Davies, *Nummulites thalicus* Davies, *Miscellanea stampi* (Davies), *Miscellanea miscella* (d'Arch. and Haime), *Operculinoides sindensis* (Davies), *Lockhartia haimeii* (Davies), etc. This seems to correlate with the upper levels of the Khairabad Limestone of the Salt Range, and I suggest that this Baluchistan equivalent of the latter be called the "Harnai Limestone". The topmost 30-ft. limestone of this section shows a rather abrupt change in fauna, but contains numerous *Discocyclus ranikotensis* Davies, so cannot be later than lowest Laki in age.

I am much indebted to the Burmah Oil Company for sending me these collections, with permission to publish my results. I hope to describe and figure the contents of the Harnai Limestone in some detail after further examination. One of its most interesting features is the appearance in it of a species of *Orbitolina*, a genus long supposed to be confined to the Cretaceous.

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GLACIAL DRIFTS

SIR,—No great foresight was needed to see that before long there would be found in Scotland that evidence for a post-Glacial "tundra" condition already noted elsewhere in Britain and Northern Ireland (Carruthers and Anderson, W., 1941.) But the times are out of joint for such inquiries, and I am therefore all the more obliged to Dr. J. G. C. Anderson, whose paper (1940) reached me but a few days after our letter to *Nature* appeared, for so promptly supplying the desired proof. For that is what his most striking piece of information amounts to; these vertical wedges of till, narrowing downwards into subjacent

sands, are of post-Glacial date. They are "frost-wedges" of the type so well known elsewhere: at the present time such things are forming in Baffin Land (Paterson, 1940), in Siberia, in Alaska, and doubtless many other places. Such an explanation has not occurred to Dr. Anderson, so that his evidence is all the stronger because it is given unwittingly. He envisages a waste of frozen sand with wide-gaping fissures open to the very bottom—a state of affairs unknown nowadays in any region, Arctic or temperate. Further, he believes that these fissures were subsequently filled by the "ground-moraine" of an advancing ice-sheet, which—in utter contrast to the effect of such a thing on pre-Glacial sediments, whether consolidated or not—left the frozen sand undisturbed by forward movement of any kind. Finally, since other local till-on-sand contacts are equally unaffected (as indeed are countless others within my experience), he extends his hypothesis to them also.

That a great ice-sheet can move over sand without the faintest sign of disturbance is, of course, a cardinal "orthodox" axiom, for which mere superposition is held to be adequate proof. In one form or another (the "freezing" idea, or for that matter any other *raison-d'être*, is commonly omitted) it has been the basis of an endless stream of publications, and I cannot help feeling that it has had far too long a run. There is about it a *naïveté*, an unthinking acceptance of current dogma, which ill accords with a scientific outlook. Whether that be so or not, this very question of undisturbed till-on-sand contacts has received extended notice in "Northern Glacial Drifts", wherein ample reason was given in disproof of the orthodox view, and evidence led for an interpretation of a totally different kind. It is idle to dismiss that contribution, as Dr. Anderson does, with a mere footnote reference and the comment that the new ideas are "novel": rather should he consider, earnestly, the evidence which gave rise to those ideas. For the gage has been thrown and, unless the verdict is to go by default, the challenge must be met. I await the result with interest.

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