both pools were isolated in other similar experiments; both formed precipitates with polyhaptenic antigens.

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Nosean as a Tracer Mineral

Eight miles south of Land's End stands the well-known Wolf Rock with its important lighthouse. The rock itself is a phonolite, the only one of its kind on the whole of the coast of the British Isles. Its petrography was accurately described by J. J. Harris Teal in 1888 ("British Petrography", Dulau and Co., London).

For our purpose the all-important mineral is nosean, a somewhat soluble sodium aluminium silicate with sodium sulphate; but fortunately it is found in two stages. It occurs as phenocrysts which are useless for the present purpose because of their solubility in sea-water, and it also occurs as inclusions in the felspar sanidine, as minute grains which are thus hermetically sealed within this colourless mineral which is practically as resistant to sea-water as quartz itself. Actually, one can boil small flakes of the sanidine in fairly strong hydrochloric acid without the nosean being destroyed.

Thus the nosean would appear to constitute an ideal tracer mineral for investigating the direction of deep, or bottom, sea-water drift around the British Isles.

Owing to the kindness of Major H. W. Hall, who readily placed his motor yacht *Manihine* at my disposal, we were able to carry out the first test on July 22.

Only one sample has been worked out so far, and that was one taken five miles east of the Wolf Rock at a depth of forty fathoms. It was thought that the work would entail a laborious microscopic examination of the bottom sand grains with the use of density fluids for floating off the sanidine flakes with the nosean. This, however, was found to be unnecessary in this case, for small pebbles of phonolite (about a third of an inch across) were readily separated out with a hand lens. These were crushed and the nosean enclosed in the sanidine recognized without difficulty.

Obviously, if pebbles of the phonolite are carried five miles away by the deep-water drift the minute flakes may be carried even hundreds of miles. Phonolite from the Wolf Rock has been broken up, and the nosean in conjunction with the sanidine is at once recognizable in flakes which are small enough to go through a 200-mesh sieve.

The refractive index of the sanidine is, of course, below that of the canada balsam, while that of the nosean is below that of the sanidine. This, coupled with the low density of the phonolite itself (2·54), makes the work comparatively simple and gives an indisputable diagnosis.

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Milk Yield of Hill Ewes

In the early stages the growth of the lamb is largely dependent on the milk yield of its dam. In hill sheep, where the environment constitutes the limiting factor to production, a study of the milking capacity of the ewe would seem to be of special interest, as it forms a large part of the lamb's environment at a most important period of growth.

Comparatively little work has been done on the lactation of non-dairy breeds of sheep, especially hill sheep. Some of the most extensive studies made on this problem are those by Bonsma in South Africa[1] and Wallace in Cambridge[2], although the sheep studied were not under natural conditions. Studies of the milk yields of sheep on pasture have been made by Barnicoat *et al.*[3] in New Zealand.

In the spring of 1953, an experiment was started at the University College of North Wales to study the milk-yielding capacity of Welsh Mountain ewes, both under their normal hill conditions and after being drafted to the lowland.

Previous workers have usually obtained estimates of the ewe's milk yield by weighing the lamb before and after suckling at various intervals in a weekly 24-hr. period. Between sucklings the ewes and the lambs were separated. At Bangor, however, the separation of the ewe from the lamb was regarded as likely to be a disturbing factor, which might seriously affect milk yield, and an attempt was made to devise a method whereby the lamb was prevented from suckling, and at the same time allowing both ewes and lambs to go out on pasture together in between suckling periods. This was achieved by fitting the ewes with a harness which effectively prevented the lamb from reaching the ewe's udder, and at the same time was both comfortable for the ewe and easy to manipulate at suckling time.

A pilot experiment using eight pedigree Welsh Mountain sheep kept on the lowland was first carried out early in the year to develop the required technique. The experiment proper was started early in April using thirty-two randomly selected hill ewes with single ewe lambs on 'ffridd' or 'inbye' land at about 1,000 ft. above sea-level. Mean daily yields during the six weeks of the experiment were 31·79 ± 6·04 oz. for the hill ewes compared with 47 oz. for the pedigree ewes during a shorter period. A preliminary analysis of this year's results gave a high correlation coefficient ($r = + 0{\cdot}79$) between the milk yield of the ewe and the growth of the lamb during the first month, demonstrating the importance of the dam's milk yield to the young lamb. Significant correlations were also obtained between the milk yield of the ewe and the birth weight of the lamb ($r = + 0{\cdot}51$) and the weight of the ewe at tupping time ($r = + 0{\cdot}36$). Although there appeared to be a correlation between milk yield and some fleece characters these were not highly significant, and further work is needed to prove any relationship.