

An expedition which had aeroplanes at command would have the advantage of photographic maps of the whole district it proposed to explore, and could therefore choose the best routes. Supplies also, which would take days to carry by canoes and porters, might be brought from the coast by air in a few hours; and one has only to read the accounts of previous expeditions to realise what a difference it would have made in the results had the geography of the country been known in advance and had there been no fear of scarcity of provisions.

Among the many ways in which aircraft could help in meteorology, not the least useful would be an examination of the trade winds, especially as regards their variations in altitude and their vertical components in different latitudes. At the present time not much more is known about these winds than their velocities and distribution on the earth's surface.

Exploration and meteorology are scarcely, or only indirectly, commercial matters, and comparatively few aircraft would be required for the purposes suggested, but results of great value might be obtained by their use.

A. MALLOCK.

September 21.

Minerals Hitherto Unknown in Derbyshire.

DURING the past three years I have been conducting investigations relating to the mineralogy of Derbyshire, checking and confirming (or contradicting) asserted occurrences, surveying mineral deposits, and also prospecting, with the result that several minerals—chiefly of scientific interest only—hitherto unknown in Derbyshire have been discovered. The work is not quite completed, and I have not yet issued any paper or other publication upon it, but the following observations may be worth putting on record now:

Zaratite, Nickel-ore.—Samples of this mineral, of a pale emerald-green colour, and usually containing a large quantity of hydrozincite, were recently found in old dumps of decomposed dolerite raised during the early working of a local mine driven in search of lead-ore. When following up the search for further nickel, some nickeliferous hydrozincite (or zinciferous zaratite) was found which was of a blue colour instead of the pure green of zaratite. On analysis this was found to contain *cobalt*, which probably existed as *remingtonite*, the accompanying zinc and nickel existing as their hydrous carbonates. The "mineral" is, therefore, probably a mixture of the three mineral species, hydrozincite, zaratite, and remingtonite.

Considerable difficulty attaches to the following up of such finds with the view of ascertaining the quantity available, as many of these mines are of considerable antiquity and dilapidation, having been driven in search of lead-ore when little or nothing was known of the rarer metals.

Nephrite, Jade.—Near the margin of a basalt quarry at Bonsall a somewhat lenticular nodule-shaped lump of white nephrite was found.

Diabantite.—Beautiful specimens of this uncommon member of the chlorite group of complex silicates were found at Mill Close Mine, Darley Dale, having been raised during the early working of the mine. It occurs in the much decomposed dolerite as radiated spherical aggregates (up to 2 cm. diameter) and of a dark green colour. It is usually associated with calcite in amygdaloidal cavities, has a specific gravity of 2.79, a hardness of 2.3, and is strongly pleochroic.

Cimolite.—A hydrous aluminium silicate. A thin bed of this mineral occurs near Hopton. It is quite white, amorphous, and chalk-like.

Allophane.—A hydrous aluminium silicate. Many of the numerous rake-veins in the mountain limestone

of the Middle Peak region are rich in forms of limonite, but chiefly the earthy variety—ochre. In one of these veins which is cut in the Coal Hills Quarry, near Wirksworth, allophane is to be found in more than one form. The commonest form is that of a light amorphous powder; it also occurs as an opaque, white encrustation, and as a translucent, sub-crystalline encrustation of the faintest green tinge due to the presence of a minute trace of malachite.

Utahite (?).—The limestone-shale in the vicinity of Wensley contains a quantity of an insoluble basic ferric sulphate as dull, yellowish-brown films in the shale. Its mode of occurrence renders its accurate analysis difficult, but it seems to be a variety of utahite.

Native Sulphur.—"Native sulphur is said to have been found" is recorded by ancient writers, but no confirmation in recent years seems to have been made. A good specimen was recently found near Eyam. It is a greyish-yellow powder, burning readily when ignited.

Manganese-ore.—Manganese is not a new discovery; the indefinite hydrous oxide—wad—has long been known to exist in certain districts in the county. It has also been previously worked, but the present scarcity (recently mentioned in the House of Commons) led to the work of prospecting for a deposit to be mined on as large a scale as possible. This work has been successful, and arrangements are being made, by the company for which the work was undertaken, for the mining of the ore.

C. S. GARNETT.

Riber View, Oak Road, Matlock,
September 16.

Wheat-bulb Disease.

IN view of their economic bearing and of the nearness of the wheat-sowing season, the data given below should be widely known, all the more that in the latest notice I have seen regarding the life-history of the insect pest concerned (*Rev. Applied Entom.*, June, 1920, abstract of papers by R. Kleine in *Zeitschr. f. angew. Entom.*, Berlin, 1915-16) the practical conclusions given appear to be entirely misleading. These conclusions are that "wheat should be preceded by root crops" and "it is apparently useless to attempt to grow wheat or rye on ground which has not been under cultivation for some time." Now it is chiefly among root crops, especially potatoes, and on fallow ground that the insect elects to lay its eggs. This month, for example, in one infected area I find that the number of potential "wheat-bulb" larvae in a particular potato-field ranges from six to twenty per square foot of surface, while the next field (pasture) has very few, and the neighbouring wheat-field, which was the sufferer last spring, has still fewer. Obviously to sow wheat on infected ground means laying up progressive trouble for the future. The disease has done much damage this year in the East of Scotland and elsewhere, and is evidently spreading, in this locality at any rate. Larvæ obtained from infected wheat were allowed to pupate in the laboratory here, and the flies which hatched out (*Hylemyia coarctata*, vide Theobald's "Agricultural Zoology," 1913, p. 242) were kept until they laid their eggs. (Two of them still survive, though the field *Hylemyias* are all apparently dead.) The distribution of the eggs in nature was then studied (so far as time allowed) by a method permitting accurate enumeration.

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College, Dundee, September 23.