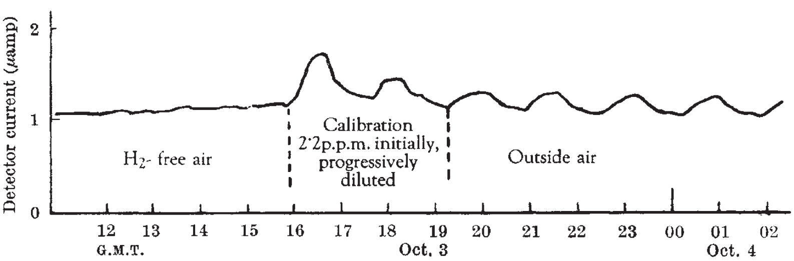

Fig. 2

but has been found equally effective the other way round.) The resulting trace on a pen recorder connected to the hygrometer is a square wave, distorted by the overall response time of the instrument, which is about 30 min.

It has been found that the hydrogen content of the atmosphere varies considerably. Extremely high values (> 2 p.p.m. by volume) are confined to the day and evening, and could well be attributed to exhaust fumes from the nearby road. During September 29–October 4 the apparatus was out of action while the P_2O_5 drying agent was changed, and the detector 'dried out' and calibrated with a sample of 0·027 c.c. of hydrogen mixed in 12 l. of hydrogen-free air (Fig. 2). It will be seen that the signal-to-noise ratio is adequate for atmospheric hydrogen measurement, while the cycling method eliminates errors due to long-term drift in the d.c. amplifier or detector. The results since then are shown in Fig. 1.

On October 12 the instrument was tested for sensitivity to methane, and found to be at least 10 times less sensitive than to hydrogen. A more precise test is intended later.

During October 4–7 the weather was fine, with clear nights, and mist in the mornings. A depression was moving past to the south, and south-easterly winds predominated. The night of October 7 was cloudy, and there was no mist on the mornings of October 8–13. During this time an anticyclone was centred over the Shetlands, with mainly north-easterly winds and cloudy nights. On October 13 and 14, fronts associated with a depression near Iceland passed over, and there was mist on the morning of October 14. Pressure began to rise again about midnight on October 14.

As far as can be judged from the short records available, it appears that anticyclonic conditions are associated with a low mean hydrogen concentration, and particularly with very low concentrations during the night. The possibility of contamination from vehicle exhausts cannot yet be ruled out, but the continuity of the readings from Sunday, October 10, to Monday, October 11, suggests that it is not serious. The wind was blowing from the direction of the road on both days. Large peaks of hydrogen concentration in the evening seem to be confined to nights on which mist forms. There is a marked diurnal variation, with a minimum about 0400 G.M.T. on most days. Whether this is of natural or artificial origin cannot yet be determined.

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GEOLOGY

Age of the Anorthosites in the Norwegian Caledonian Chain

The age of the anorthosites in the Caledonides of Norway has been much discussed, and both a pre-Caledonian and a Caledonian age has been considered[1]. This communication directs attention to a possible interpretation of the age problem, based on observations in the Möre region, central Norway, and the Bergen district, southern Norway.

According to my investigations in the Möre region, we have here an important Pre-Cambrian Caledonian stratigraphic sequence[2]. Dykes and lens-shaped bodies of metadolerites are found in the lower part of this sequence, and genetically related amphibolites occur as layers in the middle part. Titaniferous iron ore deposits occur both in the metadolerites and in the amphibolites[3].

In the eastern part of the Möre region, near the border of the Cambro–Silurian Caledonian Trondheim region, lenses and layers of anorthosite occur in the upper part of the Pre-Cambrian sequence[4]. Titaniferous iron ore concentrations are also found in the anorthosites.

The Bergen District. The gneiss area on the coast west of Bergen can be interpreted as being the core of a Caledonian anticline[5]. The axis of the anticline has a east-south-easterly direction, and the plunge of the fold is eastward.

The gneiss core dips to the east below a schist formation (the minor Bergen arc[6], in which the city of Bergen is situated), and the schists dip below a gneiss formation. There is no distinct boundary between the schist formation and the gneisses, and beds of mica schist and quartzite occur in the gneisses, and layers of gneiss are found in the schist formation. Bodies of metadolerite and amphibolite occur in this sequence. Magnetite and ilmenite can be present in considerable amounts within the bodies.

The gneiss formation dips to the east under an anorthosite formation. Titaniferous iron ore deposits occur in the anorthosites.

A Cambro–Silurian Caledonian schist sequence (the fossiliferous major Bergen arc) lies east of the anorthosite formation. Here we have a depression of the plunge of the anticline, and farther to the east anorthosites, gneisses and schists once more follow.

In my opinion, the gneisses, schists and anorthosites west and east of the fossiliferous Cambro–Silurian sequence form the Pre-Cambrian part of a Caledonian stratigraphic sequence. The schists are traditionally considered Cambro–Silurian, but there is much evidence in the field concerning the connexion between the schists and the gneisses. Correlations have been made between the Cambro–Silurian sequences in the Trondheim region east of the Möre region and in the Bergen district[7], and a correlation can also be made between the Pre-Cambrian sequence in the Möre region and in the Bergen district.

According to this interpretation of the Möre region and the Bergen district, metadolerites, amphibolites and anorthosites, with titaniferous iron ore concentrations, have a corresponding stratigraphic position in the two areas. Metadolerites and amphibolites are found in the lower and middle parts of the Pre-Cambrian Caledonian stratigraphic sequence, and the anorthosites occur in the upper part of the sequence. They represent basic products of the early Caledonian igneous activity in late Pre-Cambrian time[8].

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