ducted uninterruptedly, or portions taken out for individual measurements.

Before equilibrium is reached, the physical properties and densities in particular fluctuate all the time, and eventually they become stabilized and acquire definite values. Similarly, F. F. Nord[2] with collaborators has described volume changes in sodium oleate as a function of time.

These facts cannot be interpreted as surface phenomena, but must be attributed to changes in the bulk of solutions[3].

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[1] *Nature*, **154**, 146 (1944).
[2] Nord, F. F., and others, *Ber.*, **65**, 1148 (1932); *Koll. Z.*, **58**, 205 (1932).
[3] Antonoff, G., *Arch. Biochem.*, **6**, 199 (1945).

Occurrence of Boron Phosphate in Fireside Deposit from an Economizer

IN a recent communication in *Nature*, Rafter[1] has directed attention to the presence of appreciable proportions of boron in samples of New Zealand coal ashes.

In this connexion it may be of interest to note the presence of a comparatively large proportion of boron phosphate in a deposit recently examined here. This deposit was one of several typical deposits from the fireside of economizers and boiler tubes of certain high-pressure boiler plants which were examined in 1942 and 1943; the work was carried out at the request of the British Coal Utilisation Research Association acting on behalf of the Boiler Availability Committee sponsored by the Central Electricity Board.

The method of separating deposits taken from the fireside of economizers and boiler tubes into convenient fractions has been suggested by B.C.U.R.A. It is as follows: the sample is powdered, extracted by boiling water, then by 10 per cent aqueous nitric acid and finally the insoluble residue is analysed. The insoluble residue prepared in this way from the deposit removed from an economizer of a high-pressure boiler had the following composition:

SiO_2	50·93%	$K_2O + Na_2O$	1·92%
Fe_2O_3	8·7	CaO + MgO	0·82
Al_2O_3	4·16	P_2O_5	17·7
B_2O_3	7·6	SO_3	1·78

Loss on ignition, 8·04 per cent.

There was negligible loss of phosphoric acid when the material was boiled with water or with 10 per cent nitric acid. It was therefore probable that the phosphoric acid was not combined with the metallic oxides. A search was next made into the possibility of its being combined with silica or with boric oxide.

Comparatively stable silicyl phosphates have been prepared[2] and their X-ray powder patterns described[3]; the X-ray powder pattern of the insoluble residue from the economizer deposit did not correspond with that in ref. 3 or with that of the silicyl phosphate which we synthesized by the method given by Hautefeuille and Margottet.

On the other hand, boron phosphate made as described by Vogel[4] gave a pattern corresponding exactly with that produced from the insoluble residue. This pattern agrees with that determined by Schultze[5] and with that set out in the Index of X-Ray Diffraction Patterns published by the American Society for Testing Materials (Card 1301). Boron phosphate is therefore a major constituent of the insoluble residue from the economizer deposit; it amounted to about 4½ per cent of the particular sample of deposit which we examined. Unfortunately, it is not possible to relate this occurrence of boron phosphate to the fuel from which it was derived, because during the time the deposit was being formed, the fuel burned in the grate was drawn from a wide variety of sources.

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[1] *Nature*, **155**, 332 (1945).
[2] Hautefeuille and Margottet, *C.R. Acad. Sci.*, **96**, 1052 (1883); **99**, 789 (1884); **102**, 1017 (1886); **104**, 56 (1887).
[3] Levy and Peyronel, *Z. Kryst.*, **92**, 190 (1935).
[4] Vogel, *Z. Chem.*, (2) **6**, 125 (1870). See also Skey, *Chem. News*, **16**, 187 (1867), for the first description of this compound; and Mylius and Meusser, *Ber*, **37**, 397 (1904) for a detailed account.
[5] Schultze, *Z. phys. Chem.*, B, **24**, 215 (1934).

The Hazel Period in the Post-Glacial Development of Forests

POLLEN analysis shows the well-known hazel-maximum, especially in Central and Western Europe. In certain horizons hazel pollen is so frequent that there must have existed real hazel-scrub forests. This hazel period has been assigned to the beginning of the post-glacial warm period, and coincides with the mesolithic culture period (see, for example, Firbas[1]).

The reason for this high frequency of hazel pollen is, according to Firbas, difficult to understand to-day. This is shown too by the interesting attempt of Erdtman[2] to explain the apparent pollen frequency by modalities of sedimentation and preservation of hazel pollen.

Climatic changes, such as those in humidity, should not have been very important, according to Salisbury and Jane's[3] determinations of widths of annual rings.

I would not attempt to suggest a possible explanation for the problem, if I had not observed, during residence in Brazil, the great transformations in vegetation caused by natural or artificial fires. Modern ecology agrees that fires made by primitive man, to free land for the hunter and the cultivator, have swept over very large areas. It is probable that prehistoric man acted in the same way. Fire has a selective action among the plants, according to their capacity to survive it. *Corylus* seems to be fire-resistant. This is emphasized in the very interesting description that E. Chavannes[4] gives for Wisconsin: ". . . Names of a Richwood, Glenwood, Woodland type appear frequently, as do several forest townships in the north and east. Scrub vegetation characteristic of areas undergoing encroachment is described in Hazel Green, a village name referring not to a pioneer's sweetheart, but to a condition commonly found in burned-over woodland. After ground cover and trees were destroyed by recurrent prairie fires, hazel brush sprang up thickly, persisting through the fires by virtue of a sturdy root system, flourishing as a scrub between destructions."