steady vibration with 100 or 10 per cent velocity modulation was a region of instability in which the shaft might run smoothly or might exhibit 'stick-slip' vibrations. The bearings were lubricated with a plain mineral oil, the conditions being such that a continuous oil film could not be maintained by hydrodynamic wedge action.

This small-amplitude vibration is believed to be associated with the time required for conditions in the bearings to come into equilibrium after a change in the velocity of the shaft.

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Aluminium Molybdate and its Formation in Clay Minerals

THE availability to plants of molybdate in some acidic soils may be increased by raising the pH. This behaviour of molybdate is analogous to that of phosphate, and suggests a study of its compounds with iron and aluminium, which are presumably responsible for holding molybdate in an insoluble form.

Unlike iron¹⁻³, aluminium has not been found as a naturally occurring molybdate. We have, however, prepared aluminium molybdates by precipitation from solutions of aluminium chloride and sodium molybdate. The precipitates have a Mo:Al ratio of 0.5, and have minimum solubility at pH 4.8. The temperatures of precipitation and digestion were varied, but no matter what these were over the range 20°–50° C. and 20°–90° C. respectively, the X-ray powder pattern and composition of the precipitates remained the same. The X-ray powder pattern consists of reflexions at 9.4 Å. (weak), 4.78 Å. (very strong), 3.25 Å. (very weak), 2.44 Å. (medium), 2.23 Å. (strong), 1.99 Å. (weak), 1.74 Å. (strong), 1.46 Å. (weak), and 1.35 Å. (very weak). The material is highly hydrated and loses 34 per cent of its weight on heating to 800° C., and a further 17 per cent on heating to 1,000° C. The Mo:Al ratio suggests a basic salt; the formula $2(\text{Al}(\text{H}_2\text{O})_4(\text{OH})_2)\text{MoO}_4$ would agree with our analyses.

The aluminium minerals boehmite and halloysite are both found to adsorb large amounts of molybdate from solution over the pH range 4.0–5.5. At pH's above and below this range the amounts of adsorbed molybdate decrease sharply. These observations led us to examine the products obtained in the range of maximum adsorption. The minerals were therefore digested with sodium molybdate in aqueous suspensions at pH's 4.5–5.5 at 20° C. for 10 days, and soluble molybdate was then removed by washing. On examining the solid phases by X-ray diffraction it was found that two of the strongest reflexions in the powder pattern of aluminium molybdate (4.78 Å. and 2.23 Å.) had appeared in the boehmite and halloysite patterns. These reflexions cannot be attributed to any other material of which the X-ray powder pattern is known, and we may assume that molybdate has been chemisorbed and aluminium molybdate thus formed. This presumably is analogous to the formation of aluminium phosphates obtained on phosphating aluminium minerals⁴. Likewise it may be one way in which molybdenum is held in soils.

This work was done while one of us (A. A. M.) was holding a fellowship of the International Federation of University Women and working in the Department of Geology, University of Melbourne.

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A Randomly Interstratified Kaolin-Montmorillonite in Acid Clay Deposits in Japan

IT has been accepted that, in general, the principal clay mineral in so-called bentonite and acid clay from Japan is montmorillonite. This fact is generally true, but closer examination has shown that these clays are, in general, very complex with regard to their mineral components. Recently, we have found certain clays closely associated with acid clay deposits and showing unusual properties; moreover, such clays are not so rare as we have hitherto anticipated. The purpose of this communication is to discuss the general mineralogical properties of such clays as illustrated by two representative reference specimens (Awazu and Nata clays from Ishikawa Prefecture) selected as samples which are as free from impurities as possible.

The X-ray powder reflexions of these clays consist of several broad reflexions near those of montmorillonite or hydrated halloysite (Fig. 1, 1, Awazu clay; 2, Nata clay), and a quartz reflexion (Q) is found associated with them. There is almost total absence of basal reflexions in the range 0°–20° (2θ) in spite of clear occurrences of principal prism reflex-