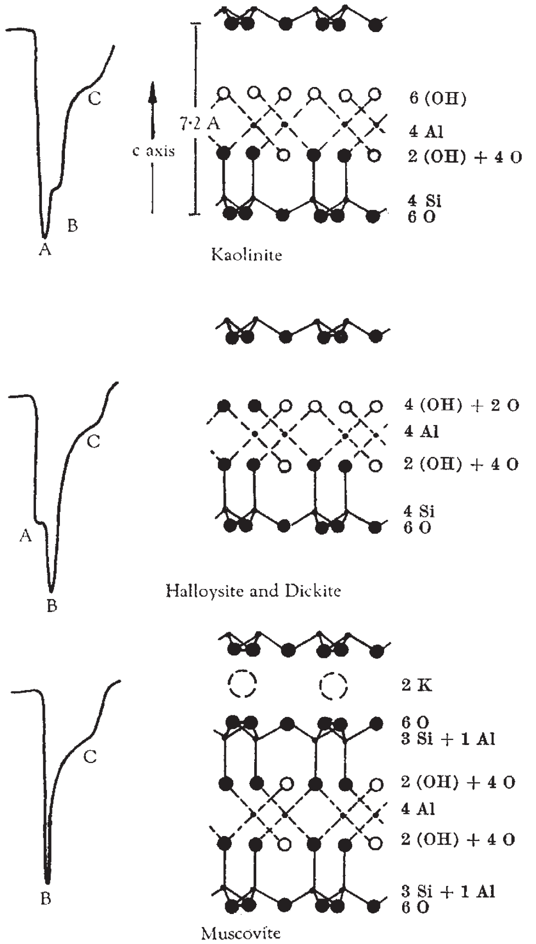

Fig. 1. Suggested oxygen–hydroxyl configuration for halloysite and dickite as compared with kaolinite and muscovite. Hydroxyl portions of their infra-red curves appear to the left of each structure

the brucite crystal. The $2\cdot75\mu$ (B) absorption is common to all micas and three-layer minerals, which differ from kaolinite in that their upper layer of oxygen–hydroxyls is only one-third hydroxyl, two-thirds oxygen.

A modification of the general kaolinite structure is proposed to explain the similarity in A/B ratio in halloysite and dickite as contrasted to that of kaolinite. The frequency of hydroxyls in the upper oxygen–hydroxyl level in the kaolin structure must vary between 3/3 (as in kaolinite) and 1/3 (as in the micas, when both upper and lower levels of the octahedral layer become symmetrical) (Fig. 1). Micas thus have a single (B) hydroxyl absorption. Kaolinite itself shows a full upper level of (A) type and full lower level of (B) type. Halloysite and dickite must lie at an intermediate value where 2/3 of the upper level are hydroxyls. This would decrease the strength of the (A) type absorption and increase the strength of the (B) type absorption, lowering the A/B ratio.

Aluminium–silicon substitution (Y number) in the basal, tetrahedrally co-ordinated levels of kaolinite, as proposed by Bates[1], should be very easy to determine in the same manner as used in the chlorite and other mica studies[2].

A more complete study on this subject will be presented at the forthcoming Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy in March 1960.

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Sea-Level Fluctuations during the Past Four Thousand Years

Study of constructional details of a chenier plain along the coast of the Firth of Thames, New Zealand, together with radiocarbon dating of seven shell samples, has enabled the production of Fig. 1. Criteria used in interpreting the past sea-levels were (*a*) storm ridges, (*b*) high-spring-tide wash benches and (*c*) tidal stream flats. Often all three criteria could be used to determine one sea-level. Periods of sea-level highs correlate well with periods of transgression recorded along the European coast[1–3].

Tectonic movement, compaction and other causes could have led to misleading results; but their effects are considered small. Thus neglecting the minor fluctuations shown in Fig. 1, sea-level fell 7 ft. from 2000 B.C. to about the beginning of the Christian era and has remained relatively stable since. The present rise of sea-level is locally 8–9 in. per century and may well be only another minor fluctuation in an otherwise stable sea.

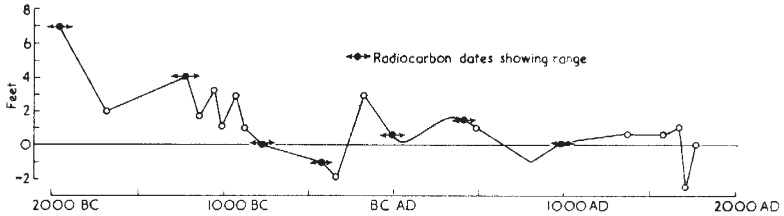

Fig. 1

Details will be published shortly in the *New Zealand Journal of Geology and Geophysics*.

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