

rhomb, {100} becomes a possible twin plane and is commonly observed. In general each case would have to be considered separately in conjunction with a knowledge of the structure obtained by X-rays.

G. D. PRESTON.

The National Physical Laboratory,
Teddington, Middlesex,
Mar. 16.

X-ray Diffraction in Liquids.

IN order to find experimental support for the theory of X-ray diffraction in liquids put forward some three years ago by C. V. Raman and K. R. Ramanathan (*Proc. Indian Association for the Cultivation of Science*, vol. 8, p. 127, 1923), extensive studies have been undertaken in the authors' laboratory of the phenomena observed when a pencil of monochromatic X-rays passes through a layer of fluid, particularly with the view of determining how the effects are influenced by the physical condition and the chemical nature of the substance under investigation. The

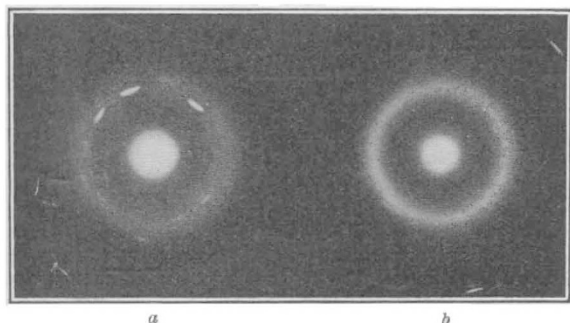


FIG. 1.—X-ray diffraction haloes of liquids.
a, Hexane; *b*, cyclo-hexane.

photographs here reproduced (Fig. 1, *a* and *b*) were obtained in the course of work on this line by one of us (C. M. Sogani) and represent the X-ray liquid-haloes of hexane and cyclo-hexane respectively. The fluids were contained in cells with very thin walls of mica, and the *K*-radiation of copper from a Shearer X-ray tube was used.

The differences between the two patterns are sufficiently striking; cyclo-hexane shows a bright and sharply defined halo with a very clear dark space within, while hexane, on the other hand, shows a less intense and relatively diffuse halo, the inner margin of which is not sharply terminated but extends almost up to the direction of the incident rays. These differences indicate very clearly the effect of the geometrical form of the molecules on the X-ray scattering by a liquid. From an X-ray point of view, cyclo-hexane consisting of ring-formed—though arbitrarily orientated—molecules has a nearly homogeneous structure, while on the other hand the elongated shape and varying orientations of the molecules in hexane cause it to be much less homogeneous in X-ray scattering. This explanation is supported by the observation that the diffraction halo of benzene resembles very closely that of cyclo-hexane.

It is very interesting to contrast these facts with the optical behaviour of the three liquids with regard to the scattering of ordinary light. Optically, hexane and cyclo-hexane are far more nearly similar to each other, and differ strikingly from benzene, the depolarisation of the scattered light being small for hexane and cyclo-hexane and relatively large for benzene. Here, evidently, the geometrical form of the molecule is of much less importance than its chemical character.

Further studies of the liquid-haloes for various organic substances of the aromatic and aliphatic series, and specially with the long-chain compounds, are in progress.

C. V. RAMAN.
C. M. SOGANI.

210 Bowbazar Street,
Calcutta, India, Feb. 10.

Prehistoric Archæology in Yorkshire.

IT is difficult to see what connexion there is between the East Riding Antiquarian Society forming an outdoor museum in the Old Tithe Barn at Easington, Yorkshire, and the fact that the Hull Corporation has the Mortimer collection of prehistoric antiquities in its possession, though not on proper exhibition (*NATURE*, April 2, p. 494).

The Tithe Barn at Easington has been handed over to the East Riding Antiquarian Society by the Ecclesiastical Commissioners, and the Society is taking the responsibility of its restoration and preservation, and is converting it into a museum of old farming appliances, at its own cost. The only part the Hull Corporation is playing in the matter is that it is permitting its Museum Director to select such objects as are likely to be suitable for exhibition, and placing them in the Tithe Barn, where they will be in much more appropriate surroundings, while the space in the other Corporation museums which they now occupy can be more suitably utilised.

The case against the Hull Corporation is scarcely so black as Mr. Crawford paints it. Certainly the Mortimer collection was purchased from the family, on advantageous terms, and the money given for its purchase to the Hull Corporation by Colonel G. H. Clarke, who stipulated that so important a collection should not be merged in any of the other museums, but should have a building to itself. This condition the Corporation accepted, and this condition Colonel Clarke quite properly is pressing the Corporation to fulfil. Unfortunately, soon after the purchase the War broke out, and as the Driffield Museum was likely to be wanted for military purposes, the collection had to be packed and removed to Hull, where a large house was rented for its reception. Afterwards this was required for other purposes, and the collection was again removed into a warehouse adjoining one of the museums. The matter of the proper accommodation of the collection has been brought up many times, but the conditions which obtained during the War and afterwards made building a separate museum a difficult proposition. However, at the present moment negotiations are on foot for the purchase of a large building in the centre of the city which will admirably answer the purpose, and personally I hope that this will be concluded.

It is scarcely correct, however, to say that the specimens are all in packing-cases. As a matter of fact, some little time ago the Corporation erected a special large workshop for the proper restoration, labelling, and display of the Mortimer collection, and also appointed a junior assistant whose whole time is occupied in the work. In addition, most of the important bronze age pottery, the bronzes and other more valuable specimens from the tumuli, are on temporary exhibition at the Albion Street Museum.

However, may I sincerely thank Mr. Crawford for writing his letter, as the matter has been taken up rather vigorously by the local press as a result, and I trust, now the attention of the Hull City Council has been directed to the matter, something tangible may accrue.

T. SHEPPARD
(Director.)

The Municipal Museums,
Hull, April 6.