

The four other islands visited are not described, and of their structure I can give no information. They are all older, and probably, as in Rarotonga, their cliffs have been disguised by subaerial denudation.

Much exploration remains to be done in this group, which I should consider myself fortunate to be able to attempt.

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The Variability of Long Diffraction Spacings in Paraffin Waxes.

So much interest is being manifested in the polymorphism of long chain compounds, particularly the fatty acids (Piper, Malkin, and Austin, *J. Chem. Soc.*, 1926, 2310. de Boer, *NATURE*, 119, 50, 635; 1927. Thibaud, *Compt. rend.*, 184, 24, 96; 1927. Müller, *Proc. Roy. Soc., A*, 114, 542; 1927), that it seems advisable to report the results of some X-ray experiments with ordinary commercial paraffin waxes. Only one mention of X-ray studies of these complex mixtures of many hydrocarbons has been made, that by Piper, Brown, and Dymont (*J. Chem. Soc.*, 127, 2194; 1925), who found that the lines of the C_{28} hydrocarbon appeared alone for a paraffin wax, although this fraction furnished only 16 per cent. of the mixture and other members as high as C_{32} were probably present.

In the present investigation samples were prepared from waxes melting at 135°, 130°, 125°, and 120° F. by solidifying on glass plates and photographing in an oscillating spectrograph with copper $K\alpha$ rays. Solidification took place under identical conditions, since cooling from above the melting-points to just below occupied 30 minutes. Remarkably sharp lines for three orders only were obtained corresponding to single long spacings, besides the 'side spacing' lines. These were all measured with greatest care and checked against photometric curves. The results are as follows:

Wax m.p.	d_1 .	No. C Atoms Indicated.	Side Spacings.		
			d_2 .	d_3 .	d_4 .
135° F.	39.42 Å.U.	20	4.24 Å.U.	3.73 Å.U.	2.56 Å.U.
130°	38.58	28.5	4.17	3.73	2.51
125°	35.22	26	4.44	3.88	2.44
120°	34.38	25	4.23	3.93	2.33

Particular care was taken in the measurement of the side spacings in order to discover any possible regularity in the slight variations running parallel with the change in the principal spacing. These were further studied with pinhole diagrams and molybdenum $K\alpha$ radiation. There is apparently no such regularity.

Some experiments demonstrated that the rate of cooling of the liquid wax film was a determining factor in the spacings. The 135° wax was studied further in this respect with the following result:

Cooling.	d_1 .	d_2 .	d_3 .	d_4 .
Instantaneous	36.64 Å.U.	4.12 Å.U.	3.82 Å.U.	2.58 Å.U.
2 min.	37.84	4.16	3.82	2.60
10 min.	38.24	4.21	3.86	2.63
30 min.	39.42	4.24	3.73	2.56
60 min.	40.20	4.13	3.82	2.60

It is evident that the longer the time given the molecules for orientation the greater the spacing for the same wax.

The presence of addition agents in small amounts

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also affects the spacings, when the solidification conditions are kept constant, as shown by the following results on 135° wax with cooling during 10 minutes:

Wax alone	d_1 .
„ +1 per cent. α -naphthylamine	38.24 Å.U.
„ +1 per cent. diphenyl oxide	39.75
„ +0.5 per cent. indigo	40.70
„ +1 per cent. lead oleate	37.5

It is interesting to note that the translucency of the films measured with a Martin polarising photometer varied directly with the spacings, a property of practical importance in the manufacture of transparent waxed paper. The single exception is the wax containing soap. Lead oleate itself has a spacing of 37.5 Å.U., and when added to paraffin wax even in so small amount as 1 per cent. seems to impress its own spacing upon the layers. It is still a matter of astonishment, not only that the principal spacing of a paraffin wax may be varied within limits almost at will, but also that these mixtures of as many as eighteen hydrocarbons with widely differing molecular lengths form equidistant parallel diffracting layers at all. The explanation of the variability of the long spacing for the same wax is complicated by the fact that under different conditions different molecular lengths in the mixture predominate and also varying tilts of the molecules to the diffracting layers are possible.

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Biological Fact and Theory.

It may seem scarcely sporting to intervene in a discussion between two such masters of controversy as Dr. C. Walker and Prof. J. S. Huxley, but there is a danger that ordinary biologists, in watching the clever play of these two duellists, may overlook the fact that the Mendelian theory so skilfully wielded by both is really a powerful weapon for the attack of biological problems.

Dr. Walker recognises that in many cases "the usual mode of distribution of the chromosomes between dividing cells before" (and after?) "fertilisation, provides a perfect mechanism for the distribution of 'genes' . . ." He then proceeds to criticise the 'Neo-Mendelian' theory on account of some apparent exceptions to this method of distribution, but this appears to be a hypercritical attitude. Exceptions are said to prove rules, and this "distribution of the chromosomes" is present in most cases of fertilisation. The exceptions are extremely interesting, of course; they should be and are being investigated, but what is the explanation of the normal behaviour of chromosomes before and after fertilisation? Dr. Walker would not claim that these very peculiar processes of reduction and fertilisation are present merely to mislead investigators, but he seems to think that they appear to be a perfect mechanism for the distribution of the genes and yet are not really such.

The transmission of paternal characters by the spermatozoon is not denied by Dr. Walker, and if he doubts the transmission of these characters in some way through the chromatin material of male sperm cell, there is very little left in the sperm. That would appear to make the problem more difficult still, and unnecessarily so. Admittedly it is difficult to imagine the potentialities (or half of them) for the development of an animal as being contained in the microscopic spermatozoon, but the facts of heredity indicate that they actually are. Then is it much more difficult to