"In times past, there can be but little doubt, that this region was actually a part of the Bay of Bengal and that with the gradual extension of the Delta seawards the water of the rivers and lakes gradually became less and less salt, though the actual process must have been extremely slow. A certain number of marine species that had established themselves within the area during the early stages of the formation of the Delta would doubtless be able to acclimatise themselves to the gradually changing conditions and thus equally be able to persist in their original habitat and form a relict fauna."

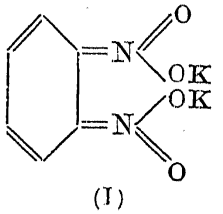
The paper as a whole is a most striking and important contribution, and the author's treatment of the general biological problems connected with this fauna is very clear and stimulating. In a country like India, where there are several estuarine regions, the paper should prove a boon to the general biologist, especially as it contains a big list of useful references. Col. Sewell deserves to be heartily congratulated on this magnificent piece of work.

Letters to the Editor.

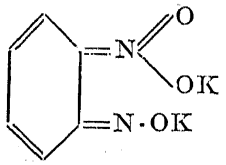
Truhaut's Colour Reaction for Uric Acid.

QUITE recently Truhaut (*J. Pharm. Chim.*, 1933, **125**, 339) observed that many compounds having a –CO– grouping in the molecule gave a colour reaction with *m*-dinitrobenzene in alkaline solution. Uric acid is stated to give a stable and characteristic violet colour, when to a warmed mixture of 1 c.c. of 1 % *m*-dinitrobenzene (in alcohol) and 2 c.c. of 10% aqueous sodium hydroxide solution, 0·1 g. of uric acid is added. As a matter of fact, a specimen of "pure" *m*-dinitrobenzene (supplied by Dr. Fraenkel and Dr. Landau of Berlin) gave a positive reaction under the above conditions. No colour reaction was, however, observed after this sample had been repeatedly crystallised from absolute alcohol. *o*-Dinitrobenzene, on the other hand, produced a violet colour even in *very minute* quantities. It is therefore believed that the sample of *m*-dinitrobenzene used by Truhaut was not free from *o*-dinitrobenzene and hence the colour.

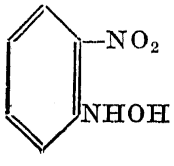
The violet colour may be due to the formation of a quinonoid salt (I) (Meisenheimer, *Ber.*, 1903, **36**, 4174), or (II). Prof.



(I)



(II)



(III)

W. Lipschitz (private communication) on the other hand prefers the structure (III).

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March 8, 1934.

A Note on the Course of Crystallisation of a Basaltic Magma.

IN the study of the order of crystallisation of the different minerals in a cooling magma, according to Dr. Holmes[1] "the real order of formation is most likely to be ascertained from comparative observations on a series of rocks of similar chemical composition which have been quenched at different stages in their cooling history." A very good opportunity for such a study is afforded by an olivine dolerite dyke, occurring near Mysore. This dyke is about 65 feet in width and a good section is exposed in a channel cutting across the dyke. The dyke shows gradual textural changes from a porphyritic basalt at the selvages in contact with the gneissic country rock—to a coarse gabbro with sub-ophitic texture in the centre. The different stages of cooling history are thus clearly revealed, and from a microscopic examination of a series of graded sections from the margin to the centre, it is possible to study the order in which the minerals appeared and the order in which their crystallisation ceased.

[1] A. Holmes, *Petrographic Methods and Calculations*, 1930, pp. 350-351.

Starting from the margin, the early start of the olivine in the crystallisation of the magma is indicated by its occurrence in the selvage rock, as phenocrysts in a groundmass of minute grains of hypidiomorphic pyroxene with interstitial felspar. The study of the groundmass further suggests that the pyroxene started crystallising earlier than the plagioclase. As we approach the centre, the rock becomes a fine grained dolerite with ophitic to sub-ophitic texture. Both the plagioclase and the pyroxene are idiomorphic and the pyroxene often shows evidences of reaction with the magma as revealed by the presence of corroded borders and of reaction minerals like biotite. The material from the centre of the dyke is a coarse gabbro with sub-ophitic texture. The continued corrosion of the pyroxene has effaced any tendency in it towards idiomorphism. The moulding of the pyroxene round the plagioclase suggests that the pyroxene had a longer range of crystallisation than the felspar.

It would thus appear that these observations of ours are distinctly in support of the views recently expressed by Fenner[2] regarding the interpretation of the ophitic texture.

A full account of the rocks including chemical analyses will shortly be published elsewhere.

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March 12, 1934.

Sex Control in Papaya.

PAPITA *Carica papayah* is a dieceous tree and about half of the trees are male and half female. Various attempts have been made to eliminate the male papaya and to secure a type which will produce only female plants. Normally flowers in the male are small and are borne in long branching panicles 2 to 3 ft. in length. The flowers in the female tree on the other hand are large and almost sessile and are borne along the side of the trunk in the axils of the leaves.

The fruit is of great commercial value and it is a constant source of trouble to the grower to see about half of his papaya trees develop male flowers. It has been found possible to change the sex by mutilation. At the Hawaii Experiment Station 22 perfectly sterile staminate papaya trees were beheaded. When the new growth appeared on those trees it was found that the trees had become strictly female trees bearing large fruit.[1]

From the Botanical Garden at Jaswant College, Jodhpur, I supplied some papaya seedlings to Mr. G. N. Singhal, Head Master, Darbar High School, Jodhpur. After about a year he complained of all of them turning out to be male. I suggested beheading. Accordingly the plants were beheaded to remove the cluster of leaves at the top, so that no axillary male shoots may develop. This distance is about a foot from the apex. Two new shoots appeared in two cases and only one was kept in each case. Only one shoot developed in each of the other two.

All the four beheaded have developed into strictly female trees. One of them is bearing large fruits. The other is bearing female flowers. The third was killed after it had borne female flowers. The fourth has also produced female flowers.

Beheading according to some observers never produces the desired result. It is advisable, however, to try beheading before cutting the male papaya.

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Jaswant College,
Jodhpur,
March 12, 1934.

A Note on the Life History of *Sagittaria guayanensis* H.B.K.

FOLLOWING my observations on the life history of *Limnophyton obtusifolium* Miq. (*Current Science*, **2**, p. 12), I have been able to investigate *Sagittaria guayanensis* H.B.K. another member of the *Alismaceæ* collected from Bharatpur. The following is a brief summary of this work.

There is a many-celled archesporium in the anther. The tapetum, the endothecium and a single middle layer are formed as usual, by the divisions of the primary parietal layer. The tapetum gives rise to a periplasmodium. The middle layer degenerates very early, even before the mother cells have finished the reduction divisions.

The divisions are successive and the resulting tetrads are usually iso-bilateral.

[1] Wilcox, E. V., *Tropical Agriculture*, p. 120, 1916, Appleton & Co., N. York.

[2] C. N. Fenner, *Journ. Geol.*, **34**, 1926, p. 756.