

Hatcher,⁴ in the rye grain the major proportion of auxin is concentrated in the aleurone layer. Seeds of the varieties whose extracts did not inhibit root growth were, therefore, soaked in water for about half an hour just to soften them and were then pricked at four places near the embryo with a pin with a view to puncturing the aleurone layer and testa. Extracts from such seeds were found to contain the inhibiting substance as seen from data in Table II, column 6.

It is evident from the data above that the inhibiting substance does not diffuse through the aleurone layer or testa (whereas salts and sugar do) when seeds of these varieties are extracted with water at room temperature—about 95° F. That the inhibiting effect was not due to salts was ascertained by testing the ashed extract.

It was possible to extract this substance by treating seeds of NP 165 with water at a temperature of about 80°C. on a water-bath for about half an hour. Evidently the aleurone layer and the testa became more permeable at this temperature. Conversely when seeds of Khapli were extracted with water at a lower temperature—about 50°F.—they yielded a much smaller quantity of the inhibiting substance.

In conclusion, the differential effect of water-soaking treatment at room temperature on the release of a hormone-like substance—presumably auxin—from grains of different wheats, as estimated by the 'root' test, is emphasized. It is possible that the more delicate 'Avena' test—which could not be carried out for want of equipment—might detect the presence of the hormone in extracts of those seeds which gave a negative result with the 'root' test. It is, however, felt that the quantitative difference in the yield of the substance between varieties would still persist. How far this differential effect would influence the subsequent performance of the varieties under different environments would appear to be worth consideration.

Our thanks are due to Dr. B. P. Pal, Head of the Division of Botany, for kindly interest and encouragement.

Division of Botany,
Indian Agri. Res. Institute,
New Delhi,
November 1, 1948.

R. D. ASANA.
V. S. MANI.

1. Nelson, A., *Principles Agri. Bot.*, London, 1946.
2. Duym, C. P. A., et al., *Proc. Kon. Ned. Akad. V. Wetensch. Amsterdam*, 1947, 50, 527-35.
3. Bonner, D. M., et al., *Bot. Gaz.*, 1940, 101, 128-43.
4. Hatcher, E. S. J., *Ann. Bot. N.S.*, 1945, 9, 235-66.
5. Avery, G. S., et al., *Am. J. Bot.*, 1942, 29, 612-16.
6. Haagen-Smit, A. J., et al., *Ibid.*, 1942, 29, 500-6.
7. Henkel, et al., Quoted by Whyte in "Crop Production and Environment," London, 1946.
8. Chinoy, J. J., *Ind. Farm.* 1947, 8, 72-74.
9. Thimann, K. V., *Am. J. Bot.*, 1937, 24, 407-12.

THE SPECTRUM OF IODINE VII

ABOUT a decade ago, L. and E. Bloch and Felici¹ published a long list of lines due to highly excited Iodine in the region λ 200 to λ 1,000. They divided their data however, into seven

groups denominated 2-, 2, 2+, 3-, 3, 3+ and 4, but not into I, II, III, IV groups familiar in spectroscopic notation. From group 4, they picked up two lines ν 515060 and ν 525925 and identified them as due to I VIII. Starting with the clue that their data contains lines of I V, VI and VII too, the writer made an attempt to pick up from the same, the doublets of I VII by way of partly clearing up the data for the solution of I III and I IV, which are in progress in this laboratory.

Table I, which shows the application of the so-called Irregular Doublet Law, helped in the identification.

TABLE I
Corresponding lines in Ag I-like spectra.

Spectrum	$5s^2S_{\frac{1}{2}} - 5p^2P_{\frac{1}{2}}$	$5s^2S_{\frac{1}{2}} - 5p^2P_{1\frac{1}{2}}$	$5p^2P_{\frac{1}{2}} - 5d^2D_{1\frac{1}{2}}$
In III	57185	61527	71273
Sn IV	69559	76077	95738
Sb V	81566	90554	120341
Te VI	93336	105151	144745
I VII	104960	119957	169059

of three lines and Hartley's Law, to fix up a fourth i.e. ν 154055.

TABLE II
Doublets of I. VII.

	$5p$	$2P_{\frac{1}{2}}$	$2P_{1\frac{1}{2}}$
$5s^2S_{\frac{1}{2}}$	104960 (5)	119957 (6)	
$5d^2D_{1\frac{1}{2}}$	169059 (4)	154055 (20)	
$2D_{2\frac{1}{2}}$		156294 (6)	

Further support to the scheme presented in Table II is afforded by the fact that the two intervals $5p$ ($2P_{\frac{1}{2}} - 2P_{1\frac{1}{2}}$) and $5d$ ($2D_{1\frac{1}{2}} - 2D_{2\frac{1}{2}}$) obey the law of screening constants. The line ν 154055 (20) is of abnormal intensity but is found to represent also the combination, $5p^3P_2 - 5d^3D_3$ in I VI.

Presidency College,
Madras;
November 3, 1948.

I. FERNANDO.

1. *Jour. de Phy. et le Rad.*, 1937, 8, No. 9.

A NOTE ON CARP OVA AND THEIR HATCHING

IN the river Halda of Chittagong, East Bengal, millions of ova of *Catla catla* (Hamilton), *Labeo rohita* (Hamilton) and *Cirrhina mrigala* (Hamilton) are collected in various stages of development and are hatched in specially prepared hatchery pits excavated

on the banks of the river.¹ The larvæ thus obtained are nursed till these are transformed into fry and attained the age of 4-5 days. By this time the fry are sufficiently grown up to stand transportation and are exported in earthen vessels to long distances for cultural purposes. A large number of developing ova were collected during the spawning seasons of 1946, 1947 and 1948 and weighed with a fairly sensitive balance to ascertain the correlation between their weight and number. Several observations were made and it was found that on an average 7,520 ova weighed one lb. In the year 1947 as much as 100 lbs. and this year 113 lbs. of ova were collected by us. The collection was a mixture of eggs of the three major carps named above but with those of *Mrigala* dominating.

Incidentally it may be pointed out that Khan² found 1,85,854; 65,450 and 35,378 ova weighing one lb. in each case in gravid females of *L. rohita*, *C. mrigala* and *C. catla* respectively. The writer counted 13,920 ova of different sizes in the ovaries, 3.2 oz. in weight, of *Barbus (Lissochilus) hexagonolepis* McClelland, in the breeding season. Similarly in ovaries, weighing 2 oz., of the same species of *Barbus*, 8,724 ova were found. The ova while inside the ovary are closely surrounded by membranes but as soon as shed and fertilized, swell enormously by absorption of water. Thus egg^{3,4,5} of *C. catla* increases from 2.0-2.2 mm. to 5.3-6.5 mm. in diameter, egg of *L. rohita* from 1.5 mm. to 4.5-6.0 mm. and of *C. mrigala* from 1.5 mm. to 3.0-4.0 mm., while the increase in diameter in *B. (Lissochilus) hexagonolepis* is not very appreciable. The increase in weight of the egg is, however, many times more than in diameter.

In the nursery pits larvæ of the major carps hatch out within 24 hours of fertilization of ova. These were collected a day after hatching and weighed. About 3,53,280 of them weighed one lb. On this basis, out of 94 lbs. of fertilized ova, only 2 lbs. (at that stage) of larvæ can be obtained, if the hatching percentage be cent per cent. In the departmental hatchery temporarily set up at the river Halda, out of 113 lbs. of ova (8,49,760 in number approximately,) 6,10,080 fry were obtained on the 4th day after hatching. The weight of these fry on the day was 4 lbs., i.e., approximately 1,52,520 of them were equal to one lb. The same number of specimens, i.e., 6,10,080 which weighed 4 lbs. on the 4th day, weighed only 1.8 lbs. a day after hatching. The hatching percentage in this case, on the basis of calculation on the 4th day, comes to about 72%.

"The local hatchers are under the impression that they get 75 per cent. and even 100 per cent. of the eggs hatched but as they get generally something like 1 oz. of larval fish to 75 oz. of eggs, their contention seems to be very doubtful," observed Mazumdar.⁶ According to the information collected by the writer the spawn catchers usually get from 25 to 50% hatching by following their usual methods. They do not have very clear idea about the weight, number, etc., because they seldom

count them and weigh them only after 4-5 days when actual sale begins.

Directorate of Fisheries, Nazir AHMAD.
East Bengal, Comilla,
November 5, 1948.

-
1. Ahmad, Nazir (in press). 2. Khan, Hamid, *The Punjab Fisheries Manual*, 1945, 6. 3. Ahmad, Nazir, *Proc. Nat. Inst. Sci. India*, 1948, 23. 4. Khan, Hamid, *Bomb. Nat. Hist. Soc.*, 1934, 657-59. 5. Mookerjee, H. K., *Science and Culture*, 1944-45, 401. 6. Majumdar, C. H., *Ibid.*, 1940, 735.

PHOTO-ELECTRIC ESTIMATION OF SILICON IN STEELS

IN the course of our investigations on colorimetry and metallurgical analysis we had occasion to devote considerable attention to the estimation of silicon in steel by employing the molybdenum blue method. In the present note it is proposed to summarise the broad features of our observations which may be stated as follows:

(1) It would be highly advantageous to employ 35 m.l. of an oxidising solvent mixture, prepared by dissolving 6 to 7 grams of ammonium persulphate in 100 m.l. of 10 per cent. sulphuric acid, instead of 70 m.l. of 5 per cent. acid alone as recommended by Vaughan¹ for the initial treatment of the steel samples. This results in a saving of at least ten minutes in the time taken for dissolving the sample; further, the addition of $KMnO_4$ can be avoided.

(2) There seems to be no need to drive off the residual sulphurous acid. On the other hand, it is found that in the presence of adequate excess of this reagent the results obtained are very satisfactory and easily reproducible.

(3) Attempts to replace sulphurous acid by hydrogen peroxide in Vaughan's procedure (*loc. cit.*) showed that greater care is needed in this case since even a slight excess of hydrogen peroxide lowers the drum differences considerably. A reducing medium is distinctly more favourable than an oxidising one.

(4) Increasing the concentration of hydrochloric acid in the stannous chloride reagent has the effect of increasing its stability without exerting any adverse influence on the intensity or stability of the final blue colour.

(5) The concentration of sulphuric acid added at the second stage can be varied conveniently between 20 to 40 per cent.

(6) Waiting for fifteen minutes after the addition of stannous chloride has been found to be unnecessary in tropics where the prevailing laboratory temperature is considerably high. A saving of ten minutes could easily be effected at this stage. It has also been noted that the estimation must be completed within thirty minutes after the addition of stannous chloride, failing which the blue colour gradually begins to fade.

(7) After the initial treatment, the steel solutions can be preserved for a considerable number of days without any deterioration,