Spectrum of Nova Herculis, 1934

IN many respects the most recent nova is following the usual course in its spectral changes. The present spectrum is a medley of bright bands and of absorption lines: the bright hydrogen bands are accompanied by a number of absorption components on the side of shorter wave-length, while corresponding to each component and with the same Doppler displacement are a number of absorption lines due to atoms of Fe+, Ti+, Cr+, Ca+, etc.

The chief feature of interest in the spectrum now is the emergence of several bright forbidden lines of O I, first weakly visible in the spectrum of December 27, 1934. They are increasing in brightness and now stand out from the rest of the spectrum, conspicuous both by their strength and by the absence of accompanying absorptions. They are the exact analogues in the spectrum of O I of three well-known lines in the spectra of nebulæ and novæ, which are forbidden lines of O III. The first of the three lines of O I has been identified with the principal auroral line. The other two lines of O I have been observed in nebulæ also[1] but have not previously been found in novæ. The two sets of lines are:

O I		O III	
5577	$^2p\ ^1D_2 - ^2p\ ^1S_0$	4363	$s^2p^2\ ^1D_2 - s^2p^2\ ^1S_0$
6300	$^2p\ ^3P_2 - ^2p\ ^1D_2$	5007	$s^2p^2\ ^3P_2 - s^2p^2\ ^1D_2$
6364	$^2p\ ^3P_2 - ^2p\ ^1D_2$	4959	$s^2p^2\ ^3P_1 - s^2p^2\ ^1D_2$

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[1] Bowen, *Astrophys. J.*, **81**, 12; 1935.

Points from Foregoing Letters

A DEFINITE relation is found by Prof. J. H. Orton between the mean diameter, or the mean axis, of the English native oyster and the volume of the entire animal; this relation is similar to that between the diameter, or thickness, and volume of a segment of a sphere. Prof. Orton supplies graphs showing these relations in oysters from several localities. He indicates upon the graphs the age of the oysters, known in a few cases from tank experiments and estimated empirically in the remaining instances from local knowledge. Prof. Orton believes that the probable increase of the stock on an oyster-bed in a given time could be predicted, given sufficient observations.

Photographic plates impregnated with borax register the action of neutrons (from a radon-beryllium source) upon the boron atoms in the borax. Messrs. H. J. Taylor and M. Goldhaber have found some 50,000 microscopic tracks produced per square centimetre, and from the length of these tracks they confirm the previous deduction that boron atoms are transmuted to lithium plus helium. Similar experiments show that lithium acted upon by neutrons gives helium plus hydrogen atoms of mass 3. These nuclear reactions release several million volts of energy.

Neutrons, the most efficient agents in atomic transmutations, can be directed or canalised along tubes having walls made of a substance of high hydrogen content. This prediction by Dr. Szilard has been confirmed by Prof. F. L. Hopwood and Mr. T. A. Chalmers, who used hollow cylinders of paraffin wax. A graphite tube also gave a small canalisation effect, but none was observed with impure ebonite.

If the spin of the electrons be taken into consideration, the value of the 'absolute field constant' calculated by Born and Infeld ($9{\cdot}18 \times 10^{15}$ E.S.U.) is considerably diminished. Drs. Max Born and E. Schrödinger estimate roughly that its value is decreased about twenty-fold, while the radius of the electron is increased ten-fold.

From a comparison of determinations of longitude in 1870 and 1932, Sabine I., East Greenland, seems to have drifted westwards several hundred metres. Dr. L. Hawkes advocates the establishment, in specially selected parts of the world, of stations specially fitted to determine by astronomical observations the occurrence of lateral drift. He points out that the results would throw light on the mechanism of mountain building; it should also prove or disprove Wegener's theory, which assumes that the continents are the broken pieces of a sheet of lighter and more acid rock 'floating' upon a denser and more basic rock, and that they are still moving laterally.

A large increase in respiration by organs of various invertebrate animals, under the action of thyroid extract, is reported by Dr. Rivka Ashbel. Comparative figures are given for the eggs of silkworms, crabs and molluscs, and the ovary of the sea-urchins and sea-squirts.

In NATURE of February 23, Prof. Robertson supported his earlier observations that cadmium vapour emits ultra-violet light of wave-lengths 2212 A. by pointing out that the cadmium arc emits such light, and that the zinc arc emits the corresponding light of wave-lengths 2060 A. Prof. J. G. Winans and Mr. S. W. Cram now write that the zinc arc shows no corresponding *maximum* at 2060 A., and maintain that the 2212 band observed by Robertson is probably due to an impurity such as cadmium oxide or hydride.

Mr. A. V. V. Iyengar has observed in 'spiked' sandal an increase not only in ammonia but also in hydroxy-acids (malic and succinic). He suggests that these are formed by an active deaminase (an enzyme capable of replacing the $-NH_2$ group of amino-acids by the $-OH$ group of water, leading to the formation of hydroxy-acids and ammonia). The same deaminase may be responsible for the increased production of ammonia in tobacco mosaic, spinach blight and mosaic, etc.

It has been found that ordinary cane-sugar (sucrose) is formed by starch-free plant leaves from either glucose or fructose alone, although its molecule is made up of both these simpler sugars. M. Nurmia now reports further experiments showing that plant tissues have the property of changing glucose into fructose.