First Appearance of Red-eye in the wild *Gammarus chevreuxi,* Sexton

IN a letter to NATURE[1], we were able to show that heterozygosity existed in the wild stock of this species —eggs from an outside mating, hatched some days later in the laboratory, gave 2 red-eyed recessives in a brood of 11 young.

Although dredging had been carried on at frequent intervals since 1912, and heterozygosity in the wild stock had been suspected for eleven years past, this was the first definite proof obtained, and it was again noted that no red-eyed had yet been found in the open. We have now to record its first appearance. In the dredging brought in on October 22 and examined for eye colour, one *red-eyed* was found amongst 2,000 black-eyed animals.

E. W. SEXTON.
A. R. CLARK.
G. M. SPOONER.
Marine Biological Laboratory,
Plymouth.
Oct. 30.

[1] Sexton and Clark, "New Developments in *Gammarus chevreuxi*, Sexton". NATURE, **133**, 27; 1934.

Hyperfine Structure and the Gross Structure Analysis of the Spectrum of Doubly Ionised Antimony

THE hyperfine structure of two doublets of the spectrum Sb III has recently been investigated by me at the Reichsanstalt, Berlin. The structures were diffuse, but each line was resolved clearly as a doublet. The wave-lengths, classification[1] and the observed hyperfine structure separations in cm.$^{-1}$ are given below.

Wave-length	Classification	$\Delta\nu$
4265·09	$6s\ {}^2S_{1/2} - 6p\ {}^2P_{3/2}$	1·27
4591·89	$6s\ {}^2S_{1/2} - 6p\ {}^2P_{1/2}$	1·40
4352·16	$5s\ 5p^2\ {}^2S_{1/2} - 6p\ {}^2P_{3/2}$	0·45
4692·91	$5s\ 5p^2\ {}^2S_{1/2} - 6p\ {}^2P_{1/2}$	0·55

Taking the nuclear spin-moments of the two antimony isotopes as $5/2.h/2\pi$ and the ratio of their $g(I)$ factors as 1·37[2], and using the graphical method of Fisher and Goudsmit[3], the splitting factor of the $6s\ {}^2S$ term for Sb^{121} could be estimated to about 0·53 ν. Applying the formulæ given by Goudsmit[4], the magnetic moment of the nucleus Sb^{121} could be calculated to be about 7·2 proton-magnetons. From my data[5] on the structure of the lines of the first spark spectrum, Goudsmit[4] has deduced a value 2·7 for the magnetic moment of Sb^{121}, compared with which the value obtained above is much too large. The reason for this is to be found in the incorrect analysis of the gross structure. If the $6s\ {}^2S$ and the $5s\ 5p^2\ {}^2S$ terms are interchanged, the calculated value of the magnetic moment comes out to be 2·7, in quite good agreement with the value quoted above. Thus of the two ${}^2S$ terms, the deeper should arise from the configuration $5s\ 5p^2$ and the higher from the configuration $5s^2\ 6s$. This would assign to the $5s\ 5p^2$ term a much larger splitting than that of the $6s$ term, which is not unexpected.

The two terms are very close together, their values differing only by 469 cm.$^{-1}$. The pair λλ 4352, 4693 is decidedly the stronger of the two, and it is more likely that the weaker pair should involve the double electron transition $5s\ 5p^2 \leftarrow 5s^2\ 6p$, and this is in accord with the suggested modification. A comparison of the values of the two terms in the iso-electronic spectra of In I, Sn II, Sb III and Se IV shows that the change suggested is quite consistent. In the corresponding case of As III, however, the pair of shorter wave-lengths is the stronger; it is therefore likely that the $5s\ {}^2S$ term is deeper than $4s\ 4p^2\ {}^2S$. Here, too, the two terms are close together and a study of the structures of the lines in question would decide the correct configuration.

It is very interesting to note that the small energy changes in the radiation due to the interaction of the nuclear magnet with the extra-nuclear electrons helps to decide the electron configuration involved in a particular transition, and this is particularly useful when the terms are close together and it is otherwise difficult to assign the correct electronic configuration.

Details of the above investigation will be published elsewhere.

J. S. BADAMI.
Department of Physics,
Wilson College,
Bombay.
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[1] Lang, *Phys. Rev.*, **35**, 445; 1930.
[2] Tolansky, *Proc. Roy. Soc.*, A, **146**, 182; 1934.
[3] Fisher and Goudsmit, *Phys. Rev.*, **137**, 1059; 1931.
[4] Goudsmit, *Phys. Rev.*, **43**, 636; 1933.
[5] Badami, *Z. Phys.*, **79**, 206; 1932.

Occurrence of the Reversed Absorption Edges of the Long Wave-Lengths of X-Rays

IN the region of the long wave-lengths of X-rays, there are difficulties in obtaining absorption edges, for the intensity of the continuous ground of the X-radiation is very small. A further difficulty is in the classification of some of these edges, as, for example, the M_V-edges. Also it is well known that the calculated energy values of the M_V-edges for higher elements do not agree with the measured values[1], and it is not possible to extrapolate or to say what differences can be expected in this region. We have found some reversed edges in this region[2], which must be classified as M-edges of silver and bromine. The classification of these edges requires a detailed discussion for which space cannot be afforded in NATURE. It may, however, be of interest to give the results and the difficulties in obtaining a L_{III}-reversed edge.

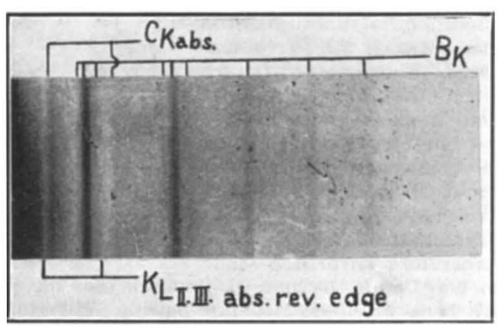

FIG. 1.

Two years ago, we obtained a reversed absorption edge of the wave-length λ = 42·1 A., which corresponds to ν/R = 21·6. But on some plates, made with different anticathodes, this absorption has been either displaced, or appeared as a white absorption line or entirely disappeared. We have now found