It is hoped that, if suitable material is obtainable, it may be possible to conduct genetic research on the insular and mainland forms with the view of studying their physiological relationship.

It may be stated that of recent years the fauna of Scilly has attracted the attention of zoological specialists in various groups, *e.g.* insects, birds, and mammals. Mr. K. G. Blair has made considerable progress in the study of the insects, while the discovery of a species of Crocidura, a genus of white-toothed shrews hitherto not recorded from the British Isles, is due to the diligence of Mr. W. Blair.

Recognition of the assistance rendered by numerous specialists must be deferred until a final report is prepared; but an early acknowledgment is due to Profs. J. Stanley Gardiner and E. S. Goodrich, the Trustees of the British Museum, Messrs. C. Tate Regan and Oldfield Thomas, Major A. Dorrien-Smith of Tresco, and Mr. W. N. Blair for valuable assistance in promoting and assisting this survey.

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Some Relations between the Band Spectra of Zinc, Cadmium and Mercury and their Atomic Spectra.

During recent years much attention has been given to the band-spectra of zinc, cadmium and mercury, and we can sum up the results therefrom as follows:

(1) The wide spacing of the band-lines shows (E. Hulthèn, *Zeit. f. Phys.*, 11, 284, 1922) that the spectra cannot originate from the pure molecules (Me_2) of these elements, but from their compounds with a lighter element, forming small molecular moments of inertia (due to the relation of line-spacing $\Delta\nu = h/8\pi^2 I$)—probably from the hydrides MeH (A. Kratzer, *Ann. d. Phys.*, 71, 72, 1923). This assumption was strongly confirmed by the fact that any other atomic combination would be expected to show an isotopic effect on the band-lines, which would be easily detected by the high resolving power of the spectrographs used (R. Mulliken, Nature, 113, 489, 1924). From their careful investigation on the exciting conditions of the mercury bands, Compton and Turner (*Phil. Mag.*, 48, 360, 1924) concluded that the excited mercury atom reacts with a hydrogen molecule forming a hydrogen atom and an excited molecule of mercury hydride. This excited molecule radiates the band-spectrum and then may dissociate into a normal atom and a hydrogen atom.

(2) It appeared further from the analysis of the mercury bands (E. Hulthèn, *Zeit. f. Phys.*, 32, 32, 1925), that they can be divided into two systems of bands, each one corresponding to the electron transition from two separate sets of vibrational states $\nu_1(n)$ and $\nu_2(n)$ into one final set $\nu(p)$. The band-spectra of zinc and cadmium show the same states of condition—as will be published later. In Table I. the electron frequences ν_1 and ν_2 of the systems are given:

Table I.

	ν_1.	ν_2.	$\nu_2 - \nu_1$.
Zn	23263·6	23594·0	330·4
Cd	22278·0	23279·0	1001·0
Hg	24933·9	28617·1	3683·2

In all three spectra the vibrational as well as the rotational states indicate considerably more stable conditions of the excited than of the not-excited molecules. Thus in the mercury spectrum, $\nu_1(n_1) = 1940$, $\nu_2(n_1) = 1986$ and $\nu(p_1) = 1204$. Moderate nuclear vibrations (p~5), corresponding to the energy of 0·37 volt, are able to dissociate the not-excited molecule. These facts are all in excellent agreement with the conclusions of Compton and Turner.

We are now able to advance a step further in the discussion of the problems. Comparing the values of (1) with those of (2), giving the terms $1S$ and $2p_2 - 2p_1$ of the atomic spectra, we find an interesting parallel between the two classes of spectra.

Table II.

	$1S$.	$2p_2 - 2p_1$.
Zn	75766·8	388·9
Cd	72538·8	1001·0
Hg	84178·5	4630·3

Especially convincing is the agreement between the last columns of (1) and (2), indicating that the excited molecules must have some close conformities with the $2p_i$ states of the excited atoms. Compton and Turner also found that the mercury bands were emitted from the striated regions of high concentration of mercury atoms excited to the $2p_i$ states. From the intensity rule for triplets (5 : 3 : 1), a third band-system, corresponding to the excited $2p_3$ state of the atoms, must be expected to be very faint. The question of its occurrence must here be left unanswered, although the photographs show a confusion of faint lines where the bands are expected to be situated.

From the present facts one may conclude that the Me-atoms remain in their metastable $2p_i$ states during the molisation-act with the hydrogen atom—the other hydrogen atom carrying away the energy not to be quantitiesed by the molecule. The electron transition is located in the Me-atom, the hydrogen atom being optically inactive. Returning to their normal states the Me-atoms soon lose touch with the hydrogen atom and so the molecule dissociates. The values of (1) are throughout smaller than those of (2). This can be ascribed to the hydrogen nucleus acting with a strong electric field (~10^7 volt/cm.) on the electron system of the Me-atoms.

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A Compound Thermostat for Students' Use.

In view of the expense involved in equipping laboratories with more accurate apparatus, the following device suggested to me by Prof. Lancelot Hogben may prove serviceable for class work in experimental biology, where thermostats are often required for various purposes such as the temperature curve of

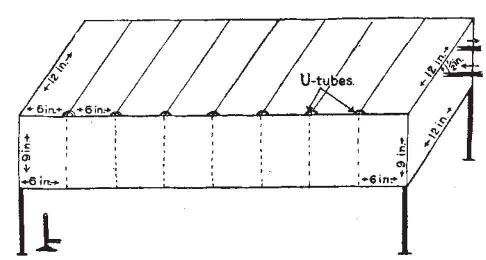

Fig. 1.

an enzyme reaction. By using the gradient between two fixed temperatures (that of boiling water and of the main water supply) sufficient constancy can be obtained for students' work.

The construction is as follows: A box of galvanised