Thus, starting both from $_5B^{10}$ and from $_6C^{12}$, one gets the same kind of radioactive nitrogen $_7N^{13}$ with the same characteristic constants.

The energy distribution in the case of aluminium and magnesium is similar to that of the β-spectrum of thorium C′ + C″, the limit lying above 2×10^6 ev.

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Absorption Spectrum of Diatomic Arsenic

A NEW system of some eighty absorption bands has been discovered in the spectrum of arsenic between 2200 A. and 2750 A., which can be definitely assigned to the diatomic molecule. This includes the five faint fluorescence bands observed by Rosen[1] and tentatively ascribed to As_2. The whole system bears a striking resemblance to that of P_2, investigated by Herzberg[2], where $\Delta G''$ is about 750 cm.$^{-1}$ and $\Delta G'$ 470 cm.$^{-1}$. A preliminary analysis gives for arsenic ΔG values that are about 420 cm.$^{-1}$ for the lower and 270 cm.$^{-1}$ for the upper state. The vibrational levels of both states converge very slowly.

The emission spectrum of phosphorus is attributed by Herzberg to a $^1\Sigma_g^+ \leftarrow {}^1\Sigma_u^+$ transition, in which the upper potential curve is crossed by another, possessing a flat minimum and a lower heat of dissociation, which is either a $^3\Sigma_u^+$ or a $^3\Pi_u$ state. This causes predissociation in the upper and perturbation of the lower vibrational levels of the $^1\Sigma_u^+$ state. The graph of the $\Delta G'$ values of our arsenic bands shows a discontinuity at $v' = 4$, which appears to represent perturbation similar to that observed by Herzberg.

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Bands of 'Heavy' Acetylene in the Near Infra-Red

THE infra-red spectrum of acetylene prepared from calcium carbide and 93 per cent heavy water has been examined photographically up to 12,000 A. with a 4 m. absorbing length at 2 atmospheres[1]. Four bands have been observed, all of which belong to C_2HD as indicated by the absence of alternating intensities. In spite of the high concentration of the heavy water used, no bands due to C_2D_2 have been observed in this region.

So far, the fine structure of the strongest two bands (1·030 μ and 1·094 μ) has been measured. The moment of inertia of C_2HD in its lowest state was found to be $27{\cdot}90 \times 10^{-40}$ gm. cm.^{2}. From the moment of inertia of ordinary C_2H_2 ($23{\cdot}50 \times 10^{-40}$ gm. cm.^{2}) alone, it is impossible to get exact values for both the C–C and C–H distances. It is now possible, however, by combination of the moments of inertia of C_2H_2 and C_2HD to get an accurate value for both these distances without making any outside assumptions. (Naturally the nuclear distances are supposed to be the same in both molecules.) The result is $r_{CC} = 1{\cdot}205$ A. and $r_{CH} = 1{\cdot}062$ A.

As C_2HD is not symmetrical, part of the selection rules valid for C_2H_2 no longer hold. Therefore more transitions occur in C_2HD than in C_2H_2. This fact is illustrated by the accompanying table, where preliminary values for the origins of the C_2HD bands are compared with the corresponding C_2H_2 bands. The nomenclature of Mecke[2] is used with Lochte-Holtgreven and Eastwood's[3] interpretation of the C_2H_2 bands. The combinations $2\nu_a + \nu_1$ and $2\nu_a + \nu_2$ are forbidden for C_2H_2 according to Dennison's selection rules, but not for C_2HD. As will be seen, the strongest band, $3\nu_a$, is slightly shifted to *shorter* wave-lengths in spite of the larger mass of one of the vibrating nuclei, whereas the band $\nu_a + 2\nu_1$ is appreciably shifted to *longer* wave-lengths. It follows that $\nu_a \approx 3300$ cm.$^{-1}$, $\nu_1(s) \approx 2650$ cm.$^{-1}$ against 3277 and 3230 respectively in C_2H_2. This frequency shift is somewhat analogous to that observed by Wood[4] in the Raman spectrum of HDO.

	C_2HD	C_2H_2
$3\nu_a$	9706 cm.$^{-1}$	9641 cm.$^{-1}$
$2\nu_a + \nu_1$	9139	—
$\nu_a + 2\nu_1$	8550	9835
$2\nu_a + \nu_2$	8410	—

We are preparing to investigate HDO, CH_3D, DCN, and other heavy molecules in the same spectral region.

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De Causis Plantarum

IN a review of Dr. Gunther's edition of Goodyer's Dioscorides in NATURE of February 17, reference is made to Goodyer's translations of Theophrastus, and the statement is made that: "so far as is known, the manuscript translation in the library of Magdalen College prepared by Goodyer in 1622–23 is still the only English version of 'De Causis Plantarum'."

It may be of interest, therefore, to direct attention to the fact that the text of Book I of "De Causis Plantarum", with translation and commentary by Robert Ewing Dengler, was presented in 1927 as a dissertation for the doctor's degree at the University of Pennsylvania, and was published by the University among the theses for that year.

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