and $\rho = 0$ ($\pi\Pi_a$, the term which gives the Q-branches in the $s \rightarrow p$ bands) behaves like a $\sigma\Sigma$-term.

The constants $B = \frac{h}{8\pi^2 I}$ and A, which expresses the degree of coupling of the vector l to the internuclear axis, for the most important terms are:

	2π	3π	4π	3δ	4δ	Par 3δ
A	8890	2971	1482	165	75·06	132
B	7·336	7·173	7·130	7·072	7·088	7·079

For the degree of accuracy, way of calculating, etc., I must refer to the full paper which will be published elsewhere and will contain all the details. The ideas expressed in the present note have also proved fruitful for the understanding of the spectrum of the hydrogen molecule.

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Elastic Collisions of Electrons with Helium.

IN view of the recent experiments of Dymond and Watson on the scattering of electrons in helium (*Proc. Roy. Soc.*, vol. 122, p. 571), it has been of interest to work out the scattering predicted by the wave mechanics. The method used is that of Born (*Göttinger Nachrichten*, p. 146, 1926), and involves two separate approximations. In the first place, we neglect the polarisation of the atom by the incident

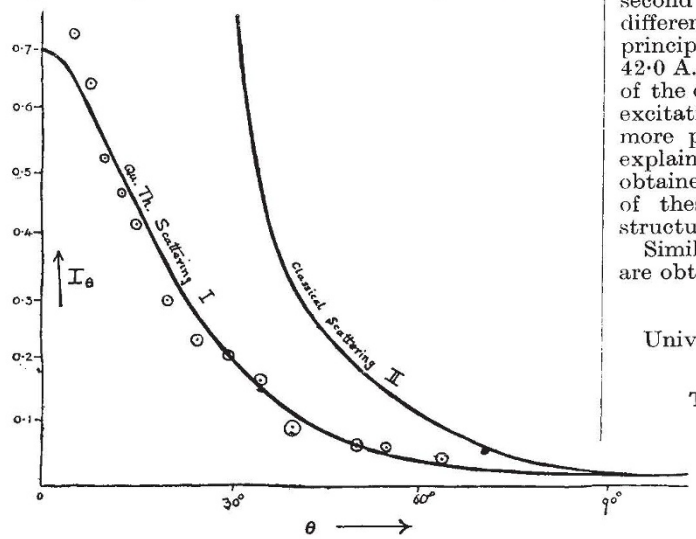

FIG. 1.—Elastic scattering of 210-volt electrons by helium. Experimental readings fitted at 30° are indicated by ⊙.

electron, the atom being treated as an electrostatic centre of force. We have used the field calculated for helium by Hartree (*Proc. Camb. Phil. Soc.*, vol. 24, p. 111). Secondly, we have calculated only the first approximation of Born, which is sufficient only if the de Broglie wave-length of the incident electrons is large compared to the classical distance of closest approach. Neither approximation will introduce a serious error if the energy of the incident electrons is large compared to the ionisation energy of the atom. For 200-volt electrons the error should not be greater than about 20 per cent.

Fig. 1 shows the variation of scattering with angle to be expected for elastic collisions with 210-volt electrons. I_ϑ is the scattering per unit solid angle. Curve I gives the quantum theory scattering, and curve II the classical scattering by the Hartree field of the atom. The two curves lie close together for large angles, where the scattering is mainly nuclear. For small angles there is a marked difference, the classical I_θ becoming infinite for θ equal to zero, as the following table suggests:

θ . . .	3·3°	5·7°	19°	30°	44°
I_θ (classical) .	190	54	2·1	0·81	0·26

It is not true, as is often stated, that the scattering integrated over all angles is the same both classically and on the quantum theory.

The results of Dymond give relative scattering only, and we have therefore fitted our curve and his readings at 30°. Considering the approximate nature of our calculations, the agreement is as good as can be expected. It is obvious that the experimental readings could not be fitted to the classical theory curve.

An account of these calculations will be published shortly, in which it is hoped to consider also inelastic collisions.

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Densitometric Measurements of the *K*-α Line of Carbon.

(BY CABLE.)

DENSITOMETRIC measurements of the K-α line of carbon in three orders obtained with a grating having twelve hundred lines per millimetre show distinct, clearly measurable separation of components in the second and third orders, wave-lengths checking in different orders and on different plates. There are four principal components in the main line at 44·2 A., 42·0 A., 45·4 A., and 46·15 A. The relative intensities of the components apparently depend on conditions of excitation, some of the longer components becoming more prominent at higher driving potentials, thus explaining the divergence of wave-length values obtained by other observers in the third order. Some of these components apparently have a doublet structure.

Similar but broad and more complex separations are obtained in boron K-α.

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The Assembling of Male Moths due to the Sense of Smell.

DR. ERNEST WARREN, in his interesting letter published in NATURE of Feb. 23 (p. 278), suggests that the assembling of male moths around the female is evidence for the existence of "recondite influences". It is, however, clear that the flight of the males is stimulated and directed by air-borne odoriferous particles, which, however, have no effect upon the human olfactory sense. If a virgin female of certain moths, such as the Oak Egger, be carried in a closed box, males are not attracted, but they begin to assemble directly the cover is taken off. Furthermore, the box itself may continue to attract for some days after the female has been removed. Porous substances continue to be attractive longer than dense ones. Such 'assembling' males possess wide-spreading antennæ, adapted to comb the air during their rapid, characteristic flight, which is such as to test a large cross-section as they proceed. Some of the detailed evidence that the attraction is due to scent has been brought together in the *Proceedings of the Entomological Society of London*, vol. ii. 1927–28, pp. 75-82.

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Oxford, Mar. 29.