$(2^3S_1 \rightarrow 2^3P_1)$ have been explained by Hanle and Richter[2] who showed experimentally that with a magnetic field parallel to the exciting beam, 4047 was 100% polarized with its electric vector perpendicular to the magnetic field and 4358 33% polarized with its electric vector parallel to the field, in agreement with the theory. From the known Zeeman levels of 2967 $(3^3D_1-2^3P_0)$ and 3131 $(3^3D_1-2^3P_1)$, it is easy to show theoretically that 2967 should be 100% polarized corresponding to 4047 and 3131 33% corresponding to 4358. These experiments are in qualitative agreement with the theory.

It has further been shown, by using a large quartz spectrograph (Hilger E_1), that the line seen at 3131 on the small spectrograph is actually that line and not a composite of 3131 and 3125, the latter line being absent or at any rate very weak compared to 3131 in the fluorescence. The line at 3660 is a composite of 3650, 3654 and 3663 and therefore shows no polarization.

The fact that the line 2967 is largely polarized (practically 100%) when 3 mm of nitrogen is present means that the 3^3D_1 state has a short mean life, for a calculation based on the time between collisions of mercury atoms and N_2 molecules shows that the mean life is probably 10^{-8} sec or less. The work is being continued with a view to measuring the mean life of this 3^3D_1 state by a magnetic depolarization experiment and will be reported in detail at a later time in this Journal.

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[2] W. Hanle and F. Richter, Zeits f. Physik **54**, 811, (1929).

On the Attempt to Detect Collisions of Photons

A. L. Hughes and G. E. M. Jauncey (Phys. Rev. **36**, 772, (1930)) describe some experiments intended to detect the self-scattering of light bundles due to collisions of photons. Some years ago similar experiments were performed and published by me in Russian (Jour. russ. phys.chem. **60**, 555, 1928) with the same negative results. Light of condensed sparks was used, its momentum intensity being much greater than that of condensed sun light as used by the American authors. At the same time it was pointed out that experiments of this kind are unnecessary.

Phenomena in the neighborhood of the sun give us much more information about the subject. Very intense bundles meet and intercross near the sun's surface. In case collisions of photons exist—light in the neighborhood of the sun must be powerfully scattered. We know that near the sun some scattered light really exists—it is the solar corona. From data about the intensity of the corona and from the law of distribution of its intensity as a function of the distance from the sun it is easy to calculate that the coefficient of the scattering near the sun is of the order 10^{-17}. Theories advanced about the corona explain this scattering as a scattering of sun light by atoms or electrons.

But even if we had some reasons to ascribe the corona to the hypothetical self-scattering of photons, its value (10^{-17}) must be so small that it is hopeless to detect it with terrestrial experiments. The effective radius of photons must be smaller than 10^{-20} cm.

The principle of superposition of the incoherent light bundles is also fulfilled with great accuracy.

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A Note on Zeeman Patterns

Many Zeeman patterns are quite unresolvable, even with powerful apparatus, and appear as spurious triplets or quartets, according as $\Delta J = \pm 1$ or 0. Shenstone and Blair,[1] assuming that in this case the measured position coincides with the theoretical center of intensity of the unresolved pattern, have derived formulae which are of great utility in determining g-values from observations of complex spectra. The present note calls attention to the very simple values which the unresolved shifts assume when the g's follow Landé's formula.

If B_σ, B_π are the mean displacements of

[1] Phil. Mag. **8**, 765–771 (1929).