	$\lambda\beta_4$(x.u.)	$\nu\beta_4$	$\nu K\alpha_1+\nu L\alpha_1$ $M_{33}-L_{22}-K$	$\nu K\alpha_2+\nu L\beta_1$ $M_{32}-L_{21}-K$	$\nu K\alpha_1+\nu L\alpha_1$ $M_{32}-L_{22}-K$
Mo	625.66	1457.1	1457.01	1456.79	1456.83
Rh	539.81	1688.9	1688.42	1688.02	1688.09
Pd	515.65	1768.0	1769.48	1769.26	1769.09
Ag	492.17	1852.4	1852.92	1852.49	1852.49

Whether the transition is to be regarded as a single drop $M_{33}-K$ (or $M_{32}-K$) or as a double electron drop in quick succession of the type ($L_{22}-K$, $M_{33}-L_{22}$) or ($L_{21}-K$, $M_{32}-L_{21}$) or ($L_{22}-K$, $M_{32}-L_{22}$) is at present a matter of personal preference. A single drop transfer of this general type is already known in the x-ray L region. The non-diagram line $L\beta_9$ (Siegbahn) is a transition $M_{33}-L_{11}$ and the line $L\beta_{10}$ is a transition $M_{32}-L_{11}$.

The intensity of $K\beta_4$ in molybdenum and rhodium is of the order of 1/1000 that of $K\alpha_1$. In palladium the intensity of β_4 has increased to 1/250 of α_1, and the line has become wider and distinctly unsymmetrical indicating a fainter component on the long wave-length side and about 0.15 x.u. distant.

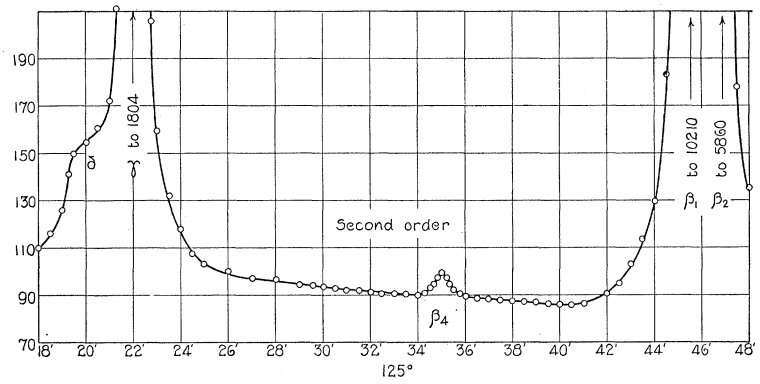

Fig. 1. Rhodium, 90 k.v., 27 m. a, 40 sec.

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The Crystal Structure of Magnesium Platinocyanide Heptahydrate

The crystal structure of $MgPt(CN)_4\cdot 7H_2O$ has been examined by Bozorth and Haworth,[1] who concluded on the basis of their data, obtained from Laue and reflection photographs, that the Mg and Pt atoms were arranged in parallel rows so that the two kinds of atoms alternated with each other in the same row, the distance between their centers being 1.57A.

More recently one of us[2] has formulated the principles governing the structure of complex ionic crystals and of crystals containing electron-pair bonds. Application of these principles to $MgPt(CN)_4\cdot 7H_2O$ showed either that the principles must be modified or that the arrangement of Mg and Pt atoms in these crystals was not that supposed by Bozorth and Haworth. This led us to examine some of the more unsymmetrical Laue photographs in a search for spots which could not be accounted for by the structure assigned. These photographs were taken at the same time as the three used in the original structure-determination but were not analyzed at that time.

On one of the three additional photographs recently analyzed there is one diffraction spot inconsistent with the previously assigned body-centered unit of structure, and on another are eleven spots nine of which lie in the zone [100]. The planes responsible for

[1] Bozorth and Haworth, Phys. Rev. [2] **29,** 223 (1927).

[2] Linus Pauling, J. Am. Chem. Soc. **51,** 1010 (1929); **53,** 1367 (1931).

these eleven spots, and the wave-lengths of the x-rays (in A) calculated on the basis of the unit assigned by Bozorth and Haworth are: $(03\bar{1})$, 0.40; (041); 0.32; $(04\bar{1})$, 0.39; (061), 0.28; $(0.6\bar{1})$, 0.33; (081), 0.24; $(08\bar{1})$, 0.27; $(0\cdot12\cdot1)$, 0.18; $(0\cdot12\cdot\bar{1})$, 0.19; $(2\bar{6}3)$, 0.17: and $(2\bar{6}\bar{3})$, 0.22. Since the smallest wave-length consistent with the voltage on the x-ray tube is 0.21A, the above data show both that this unit must be doubled in the direction of the c-axis and that the lattice is not body centered. The correct unit has the dimensions $14.6\times14.6\times6.26$A^3 containing four molecules, and has a simple tetragonal lattice. The space-group cannot be determined because of the faintness of crucial reflections. On account of the relatively large reflecting power of the Pt atoms, the x-ray data indicate that these atoms are in the positions previously assigned; 0 0 0, $\frac{1}{2}\frac{1}{2}\frac{1}{4}$, 0 0 $\frac{1}{2}$, $\frac{1}{2}\frac{1}{2}\frac{3}{4}$, referred to the new unit. Application of the principles mentioned above indicate that each Pt atom is surrounded by 4 CN groups at the corners of a square, a configuration similar to that of $PtCl_4$ in K_2PtCl_4,[3] and that the Mg atoms are not between the Pt atoms as previously supposed.

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[3] R. G. Dickinson, J. Am. Chem. Soc. **44,** 2409 (1922).

Note on the Spectrum of Sb II

An analysis of the first spark spectrum of antimony has been in progress for more than a year and it is hoped to make a full report on the work shortly when more accurate wave-length measurements now in progress have been completed.

This spectrum consists of a large number of lines extending throughout the entire range from the infrared to well below 1000A. The two active p electrons give a set of deepest terms, $^3P^1D^1S$, which have their strongest combinations throughout the Schumann region, some 25 of which have been located.

Since the second spark spectrum, which was reported on previously,[1] also has many of its strong lines in this region, I am re-examining this spectrum as well, not only to correct some known errors in the previous report, but also to extend it. To this end the entire Schumann region is being measured in the second or higher orders of the two-meter vacuum spectrograph against the standards of iron and neon. It is hoped in this way also to obtain some standard lines throughout this region which will be of greater accuracy than most of those in use at the present time

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January 14, 1932.

[1] Lang, Phy. Rev. **35,** 445–454 (1930).

Zeeman Effect of the Third Positive Carbon Bands

According to Asundi (Proc. Roy. Soc. **124,** 277, 1929) the third positive carbon bands, are ascribed to a $^5\Sigma\rightarrow{}^5\Pi$ transition. On the other hand, Birge, Mulliken and Weizel ("Bandenspektren" by Weizel p. 353 in 1st Supplement of the Wien-Harms "Handbuch der Experimentalphysik") postulate a $^3\Sigma\rightarrow{}^3\Pi$ transition.

It has been brought to the writer's attention (through the kindness of Professors Mulliken and Dieke) that a new rotational analysis of these bands will be published in the near future. Pending the assignment of rotational quantum numbers, the writer wishes to sketch qualitatively, the behaviour of the band-lines in a magnetic field.

The accompanying reproduction shows the bands near 2978A. The central part shows the Zeeman pattern, at 29,000 gauss, while the two outer portions are the no-field patterns (for purposes of comparison). The photograph (Fig. 1) was taken in the first order of a 21 foot grating.

All the band lines are strongly affected by the magnetic field, but the splittings or broadenings of lines are greater near the heads than at the higher rotational states. The second and third heads seem to be split into asymmetrical triplets with an over-all width of $5\sim6$ cm^{-1}, while the over-all width of the