$^4P_1$	21364.3	$^4F_2$	20005.5	$^4D_1'$	17392.3
$^4P_2$	22194.0	$^4F_3$	20745.2	$^4D_2'$	17763.9
$^4P_3$	23289.4	$^4F_4$	21154.7	$^4D_3'$	17901.8
		$^4F_5$	21398.9	$^4D_4'$	18794.1
$^2P_1$	16487.2	$^2F_3$	18581.9	$^2D_2'$	16135.2
$^2P_2$	16428.8	$^2F_4$	17344.8	$^2D_3'$	15709.7

The quartet terms combine with the high ^4D term mentioned above, arising from the ^3D of the spark and give strong multiplets in the visible. They are analogous to the visible multiplets of highest multiplicity in the spectra of iron cobalt and nickel.

The following is the ^4F ^4D multiplet of this group. Wave numbers and intensities only are given.

	$^4F_5$ 21398.9	$^4F_4$ 21154.7	$^4F_3$ 20745.2	$^4F_2$ 20005.5
$^4D_4$ — 95.2	21494.1(8)	21249.9(6)	20840.4(2)	
$^4D_3$ — 640.2		21794.8(6u)	21385.5(2u)	20645.9(1u)
$^4D_2$ —1276.4			22021.7(4u)	21282.0(2u)
$^4D_1$ —2164.2				22169.7(4)

It will be noticed that the ^4D term is negative and that all the lines arising from $^4D_2$ and $^4D_3$ are diffuse. This is a peculiar characteristic of these two terms in all three multiplets.

In addition to the low terms given above there are eleven further terms which combine with ^2S and ^2D. They probably include the set ^2P, $^2D'$, ^2F, which arise from the ^1D spark term as well as terms arising from ^3F of the spark.

A set of thirty-five negative terms has been found from combinations with the low quartet and doublet terms. They account for some three hundred further lines, including practically every strong line in the spectrum as well as most of the weak lines above λ 2900. These negative terms should include the higher members of the two series which commence with the low ^2D term and which have as limits the ^1D and ^3D spark terms; but as yet it has not been found possible to pick out such terms with certainty.

As would be expected from the atomic structure which gives rise to this spectrum, it has many characteristics of a spectrum of the second rank, including g-values not at all in accordance with the Lande g's.

The structure of the copper spectrum here given is in complete disagreement with the analysis given by H. Stucklen.[2] A detailed discussion of the spectrum, including Zeeman effects and other evidence, will be published in the near future.

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2 *Zs. f. Phys.*, 34, 562, 1925.

BLOOD STUDIES IN GENERAL ANESTHESIA[1]

IN a previous communication we showed that eclampsia is associated with the following changes in blood constituents: a high uric acid, an increased lactic acid, a decrease in the CO_2 combining power and a definite tendency towards a hyperglycemia, which is often associated with a high inorganic phosphorus. We have tried to reproduce this blood picture in dogs by the use of anesthesia. Thus far we have worked with ether, chloroform, nitrous oxide and ethylene. Blood specimens were obtained before the administration of the anesthetic, the animals were then anesthetized for half an hour and additional blood samples were withdrawn at regular intervals.

The blood samples were analyzed for sugar, lactic acid, uric acid, inorganic phosphorus, non-protein nitrogen, urea nitrogen and CO_2 combining power, and we found in every case that ether, chloroform and nitrous oxide, each, produced a marked hyperglycemia, a lowering of the CO_2 combining power and an increase in lactic acid. Normally the dog's blood contains no uric acid, or very little, but we were able to note that it increased in amount under any one of the three anesthetics. The inorganic phosphorus seems to follow the sugar curve. The non-protein nitrogen and the urea nitrogen showed only minimal changes from normal. In other words, we found changes practically identical with those observed in eclampsia.

With ethylene gas the blood changes are the same as with the other anesthetics, except that they are not nearly so marked. Our findings seem to indicate that in all the general anesthetics we have to deal with a single fundamental picture. We are aware that anoxemia may produce somewhat similar changes, but further work in asphyxia and its prevention in general anesthesia, as well as in the use of insulin following the administration of anesthesia, leads us to believe that at most asphyxia plays only a small part in the production of the profound changes in the blood here reported.

A full description of this work, with the necessary protocols, will appear in the near future in the *American Journal of Obstetrics and Gynecology.*

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