

similar nature, but it should be stated that in an occasional individual animal dying from tumor, a monocytic rise was not observed. It is possible that this feature would have been revealed by more frequent examination of the blood or that certain rabbits are incapable of exhibiting this reaction. These few exceptions, however, do not affect the group results.

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Basophilia as an Index of Resistance.

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In a recent study of the blood cytology of rabbits¹ which included differential white cell counts with the supravital technic, some observations were made which suggested that the absolute numbers of basophils in the circulating blood might have some relationship to the character of the reaction to infection with *Treponema pallidum*. In general, it was found that those animals which had the highest preinoculation basophil values developed the mildest syphilis and those animals which had the lowest pre-inoculation basophil values developed the most severe syphilis, as determined by clinical examination. The basophils as well as other cells of the blood have also been studied during the course of the disease, and the result of this investigation will be reported later.

Observations were made on 5 groups of male rabbits, a total of 39 animals. The experiments were done at different periods during 1927-28. The blood was examined a variable number of times before inoculation with *T. pallidum*, the number of counts ranging from 4 to 36 per animal per group. The average number of basophils in these counts determined the pre-inoculation level for each animal. The lapse of time between the blood counts and inoculation also varied; in 3 groups the cells were counted during the 3 weeks immediately preceding inoculation, in the fourth group more than a month before inoculation, and in the fifth group the counts were made during a 9 months' period which ended 3 months before inoculation. In each experiment, a tissue emulsion containing actively motile spirochetes was injected in the right testicle. The course of disease was followed systematically over a period of 3 to 4 months.

¹ Pearce, L., and Casey, A. E., *Proc. Soc. Exp. Biol. and Med.*, 1929, **xxvi**, 668.

The relation found between the values for basophils before inoculation and the reaction to the syphilitic infection may be illustrated by a simple comparison of the results obtained with respect to the incubation time of the primary lesion and the metastatic orchitis, and by the occurrence and non-occurrence of such disease manifestations as edema of the inoculated testicle, metastatic orchitis, and generalized lesions.

All animals developed a primary orchitis. In 4 instances, the primary and metastatic orchitis were delayed more than 10 days beyond the average time for the group; 31 animals developed a metastatic orchitis and 6 did not (2 animals were without left testicles); an edema of the inoculated testicle occurred in 13 but not in 26 animals; generalized lesions developed in 24 but not in 14 rabbits (1 animal died of a concomitant infection). The character of the generalized lesions was as follows: bone, with or without skin, 20 animals; skin, with or without bone, 13 animals.

An analysis of the pre-inoculation basophil counts from the standpoint of these features of the disease (Table I) shows the following relations:

TABLE I.
Modes of the Pre-Inoculation Basophil Counts Classified According to Certain Features of the Syphilitic Infection.

Group	No. of rabbits	Mode	Group	No. of rabbits	Mode
		per cmm			per cmm.
Delayed incubation period	4	2093	No delay	35	875
Edema of inoculated testicle	13	1100	No edema	26	750
No metastatic orchitis	6	1375	Metastatic orchitis	31	875
No generalized lesions	14	1125	Generalized lesions	34	750
No bone lesions	18	1375	Bone lesions	20	750

The results have also been analyzed from the inverse point of view as shown in Table II. The value 972 used in this comparison represents the average number of basophils per cm. of blood as derived from 1045 counts upon normal male rabbits.

From the data so far collected, it can not be predicated that the apparent relation of a low basophil count preceding inoculation and severe syphilitic manifestations, or *vice versa*, are fixed relations or that they will hold under all circumstances. But if a delay in the development of orchitis, the absence of metastatic orchitis, the occurrence of edema, and the absence of generalized lesions are indices of resistance to infection with *T. pallidum*, then it would seem that

TABLE II.
Pre-Inoculation Basophil Values and Events in the Course of the Syphilitic Infection.

Events	19 animals with basophils above 972 per cmm.	20 animals with basophils below 972 per cmm.
	%	%
Primary orchitis	100.0	100.0
Delayed incubation period	21.0	5.0
Edema in inoculated testicle	47.0	20.0
Metastatic orchitis	65.0	95.0
Generalized lesions	47.0	79.0
Bone lesions	26.0	79.0
Skin lesions	37.0	32.0
Number of generalized lesions per animal	1.46	4.47

the pre-inoculation basophil count might be used as a rough index of the potential reaction of the rabbit to syphilis. It has been found, however, that there are striking exceptions to this rule when applied to individual animals, and at present, the extent to which such exceptions may affect group results is not entirely clear. An analysis of the material from the standpoint of the relation of basophils to other cells of the blood may clarify this situation.

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Diagnostic Significance of Precipitin Tests With Anderson Phosphatide Fractions from Human, Bovine, and Avian Tubercle Bacilli.

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Working in cooperation with the Research Committee of the National Tuberculosis Association, Drs. F. R. Sabin, C. E. Forkner, and the writer, in this laboratory, have been assaying biologically during the past 3 years the various chemical fractions obtained from the tubercle bacillus by Drs. T. B. Johnson and R. J. Anderson of the Sterling Chemistry Laboratory, Yale University. The investigation includes a parallel study of the chemistry and biology of several members of the acid-fast group of bacteria grown in large quantities by Mulford and Parke, Davis under standard conditions on Long's synthetic media. It has been found that the phosphatide fraction isolated from the tubercle bacillus by Anderson¹ contains an active principle capable of stimulating and maturing monocytes and

¹ Anderson, R. J., *J. Biol. Chem.*, 1927, lxxiv, 537.