

served in various diseases, as for example, in tuberculosis, measles, syphilis, vaccinia, and small pox. There is evidence to indicate that in some, if not in the majority of these cases, examination of the fresh blood by the supravital technic would show that many of the cells classified as large mononuclears are monocytes. If this be true, it is reasonable to assume that some feature of the disease process common to these diverse conditions is associated with or responsible for the monocytosis, and the suggestion is here made that a proliferative phase of the general reaction may be the feature in question.

4452

The Monocytic Reaction in Neoplasia of the Rabbit.

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A study has been made of the cells of the circulating blood of normal rabbits and of rabbits inoculated with various disease-producing agents^{1, 2} including a transplantable malignant neoplasm³ believed to be of epithelial origin. The results concerning the monocytes in this condition are referred to in the present report.

A variable number of blood counts were taken preceding inoculation and thereafter for 2 months, at which time the experiments were arbitrarily terminated by killing all surviving animals. For the most part, the blood was examined at weekly intervals; a differential white cell count with the supravital technic (vital neutral red) was made at each examination. Six experiments comprising 47 rabbits have been carried out from October, 1927, to March, 1929. In each experiment, a suspension of fresh tumor tissue in normal saline was injected in one testicle of young adult male animals. The course of the disease was followed clinically and the autopsy findings furnished further information concerning the extent and degree of the disease process.

The blood observations have been analyzed with respect to the clinical and postmortem findings and in the present instance, are considered from a group standpoint. The following classification

¹ Pearce, L., and Casey, A. E., *PROC. SOC. EXP. BIOL. AND MED.*, 1929, xxvi, 666.

² Casey, A. E., *PROC. SOC. EXP. BIOL. AND MED.*, 1929, xxvi, 670.

³ Brown, W. H., and Pearce, L., *J. Exp. Med.*, 1923, xxxvii, 601.

of animals has been employed: deaths, probable deaths, and recoveries. The first group includes examples of widespread metastatic involvement; the probable deaths comprise those rabbits in which the site and character of the growth found at autopsy 2 months after inoculation were such as to make it appear probable that death would ultimately have resulted from tumor; the recoveries include those animals in which healing of tumor had occurred and in addition, a few instances of slight residual tumor, the nature or location of which was considered as not constituting a probable cause of death.

An outstanding feature of the study of the blood in the 6 experiments so far carried out was a pronounced increase in the number of monocytes in those rabbits which died with more or less widespread distribution of tumor. The findings in one experiment are shown in the accompanying graph (Fig. 1), in which the results are expressed as percentage deviations from the figure 1021, the mean value of the monocytic counts in 1045 observations of normal male rabbits obtained in this laboratory. It will also be noted that in the group designated as probable deaths, the monocytes eventually rose to high levels. In the recovered animals, on the other hand, the fluctuations of the monocytes before and after inoculation were of approximately the same magnitude, and at no time approached the high levels observed in the deaths and probable death groups. The findings in all 6 experiments were of an essentially

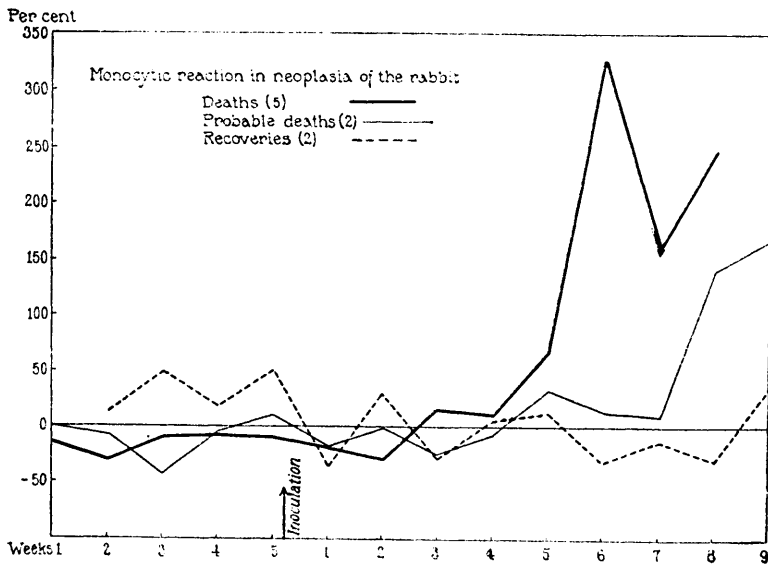


FIG. 1.

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.

4453

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.