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Production of Neutropenia in Swiss Mice by Injection of Potassium Dicarboxy-benzanthracene.

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Leukopenia, found in one of Dr. A. T. Bradbury's Swiss mice dying after the injection of dicarboxy-benzanthracene, led to the investigation of the blood changes produced by this drug.

Swiss mice, both male and female, were used, the 9 controls being kept in the same cages and on the same food as the injected animals. Blood was taken from the tail, using the standard technic, and United States Bureau of Standards checked apparatus. The 9 experimental animals received subcutaneous injections of 5 mg of water-soluble potassium salt of dicarboxy-benzanthracene on 2 occasions, one week apart. The mice and corresponding controls varied in age from 1½ to 3½ months.

In normal Swiss mice, untreated, the average of 36 red blood cell counts on 18 mice was 8,930,000 ± 1,150,000 per cu mm. The average of 86 white blood cell counts on 18 normal Swiss mice was 10,100 ± 3,600 per cu mm. The absolute number of polymorphonuclear neutrophils (average of 94 counts on 18 untreated animals) was 5,848 ± 2,713 per cu mm.

One week after a single injection of the soluble potassium salt of dicarboxy-benzanthracene the average total white blood cell count fell to 8,655 ± 4,000 per cu mm, and in 2 weeks the average fell to 7,300 ± 2,600 per cu mm. The decrease was primarily the result of a fall in the number of neutrophils, as shown in Table I.

The eosinophils averaged 153.2 per cu mm in 93 counts in non-treated mice, with extremes of 0 to 510 per cu mm. The variation after injection of the benzanthracene solution was not significant.

TABLE I.

Control period— Absolute No. of neutrophils	5,448 ± 2,713 per mm³
One week after first injection	4,569 ± 2,100 " "
Second week after first injection	2,623 ± 1,070
Received second injection at this time.	
Third week after first injection	1,299 ± 627
Fifth " " " "	1,650 ± 890
Sixth " " " "	3,613 ± 1,585
Seventh " " " "	4,437 ± 2,215
Eighth " " " "	5,518 ± 957

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Before treatment, the average number of monocytes was 702.4 per cu mm (average 6.8%; extremes 1-11%). The variations 1, 2, 3, 5, 6, 7, and 8 weeks after the first injection were (averages) 672, 588, 510, 417, 678, 652, and 903 per cu mm.

Before treatment the lymphocytes averaged 3,735 per cu mm (36.16%: extremes, 15 and 62%). The variations 1, 2, 3, 5, 6, 7, and 8 weeks after the first injection were (averages) 3241, 4281, 4283, 4201, 4953, 3829, 3189 per cu mm. Thus, while the lymphocytes were as high as 70 to 80% during the post-injection period, the absolute numbers did not vary greatly, the maximum increase (average) being 1218 per cu mm.

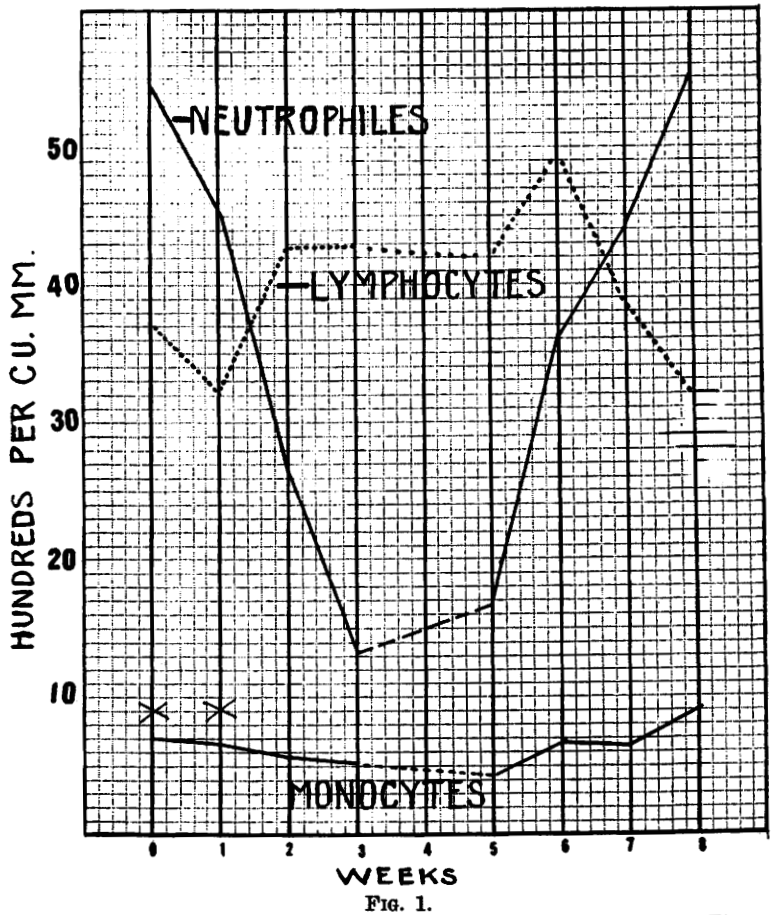

FIG. 1.

The leukocyte changes after injection of dicarboxy-benzanthracene. The curves represent the averages for 9 mice.

The point marked "O" represents the average for a control period of 2 weeks. Injections were made at the points marked "X."

There was no significant change in the number of basophils, which varied from 0 to 1%.

Summary and Conclusions. After the injection of the water-soluble potassium salt of dicarboxy-benzanthracene into Swiss mice there is a marked decrease in the number of polymorphonuclear neutrophils, a slower, and moderate decrease in the number of monocytes, with but slight changes in the number of lymphocytes, eosinophils, and basophils. Recovery is complete 7 weeks after the last injection. Data on the blood of normal Swiss mice are given.

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Relation Between Growth of Pneumococcus III and Concentration of Capsular Polysaccharide Appearing in Culture Filtrates.*‡

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A method of adapting the photronreflectometer[1] to the quantitative determination of pneumococcal capsular polysaccharide in solutions of unknown concentration has been described[2] In the present investigation, the method was employed to determine the concentrations of SSS III appearing in Seitz filtrates of blood broth cultures, following inoculation with varying amounts of a standardized strain of Pneumococcus III; these concentrations were correlated with the phase and amount of growth of the organisms.

A strain of Pneumococcus III obtained from the sputum of a pneumonia patient was brought to constant virulence after the suggestions of Schmidt and Hilles.[3] 5×10^{-4} ml of a 12-hour blood-

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