transplanted tumors on the morphology of the blood of rats, a study was made of the variability in the morphology of the blood of normal rats of several closely inbred strains. Among these findings was one of general interest and practical value, especially if it proves to be applicable to man.

It was found that each strain of rats had a characteristic peripheral blood picture. The total leucocyte counts varied from 14.0± .10 to 25.1 ± .51 thousand per cu. mm. Fischer Line 344 rats had the lowest average white cell count and Line 2331 Copenhagen rats had the highest count. The total number of leucocytes and the percentage of neutrophile polys were characteristically highest in the latter and lowest in the former. These data are recorded in Table I and

TABLE I

THE MEAN LEUCOCYTE COUNT AND PERCENTAGE OF NEUTROPHILE POLYS AND THE AVERAGE LIFE SPAN OF SEVERAL STRAINS OF INBRED RATS

Strain	No. of rats	Mean W.B.C. in thousand per cu mm	Per cent. polys	Mean life span days/30
Copenhagen ...	174	25.1 ± .51	38	19.83 ± .13
A × C	228	17.5 ± .33	34	21.67 ± .13*
August	120	14.6 ± .38	31	14.03 ± .04
Marshall	250	17.1 ± .24	26	13.53 ± .09
Zimmerman ...	287	15.5 ± .23	26	11.86 ± .17
Fischer	719	14.0 ± .10	24	9.37 ± .14

* Based on rats of the first 7 B × S generations and would presumably be somewhat lower for the rats tested which had been inbred another 8 to 10 generations.

represented graphically in Fig. 1. In the final column of the table is recorded the mean life span values in

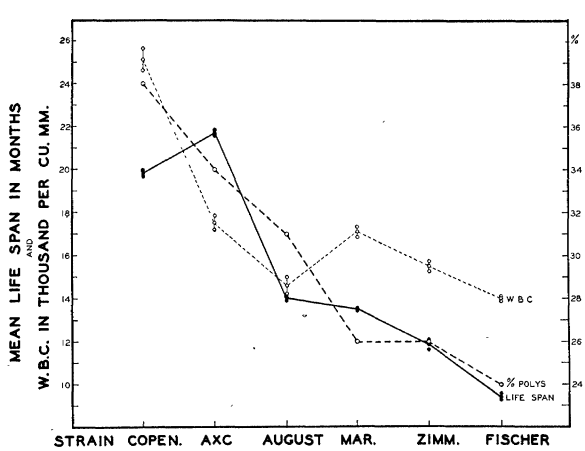

FIG. 1. Shows the relation of the mean total leucocyte count and percentage of neutrophile polys to the average life span in six inbred strains of rats.

months which had been previously determined for rats of these strains.

A parallelism in the observed total number of leucocytes and the relative percentage values of neutrophile polys and the expected average life span is strikingly apparent. Further the females were found to have a significantly higher leucocyte count than the males (the difference being 0.82 ± .16 thousand per cu. mm) and females of most of these strains were previously shown[1] to have significantly longer average life spans than males. This suggests that the association of a relatively high total number of neutrophile polys and a long average life span is probably not accidental.

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ON THE SIZE OF THE LITTER AND THE GESTATION PERIOD OF PROCAVIA CAPENSIS

AN article has just come to hand by G. B. Wislocki and O. P. van der Westhuysen on "The Placentation of *Procavia capensis* with a Discussion of the Placental Affinities of the Hyracoidea" (Contributions to Embryology, No. 171, August, 1940). In this article the authors mention that of their eleven specimens of *Procavia capensis* two had six embryos, one four and the others three, two and one embryo. Therefore they regard it as highly probable that *Procavia capensis* carries from one to six embryos. This impression, caused by lack of adequate material, is evidently wrong. As so little is known about the breeding of this animal it may be worth while to give here the data provided by my more abundant material.

The sheep farmers of the Karroo in South Africa have practically exterminated the carnivorous mammals and the large birds of prey that could do harm to their flocks. The result is that the dassie, the natural prey of these predatory animals, has multiplied to such an extent that once I read a short note in a newspaper headed "Dassies like rabbits." That put me on the track and I came in contact with a native professional dassie hunter. The dassies have become so numerous that they are serious food competitors to the sheep and the farmers paid the native a small premium for each dassie. In this way I have collected uteri of *Procavia capensis* over a number of years and have accumulated well over 400 specimens in all stages of development.

The two uteri with six embryos of Wislocki and van der Westhuysen must be very rare exceptions indeed. I have never seen more than four embryos. Most of my material was shared with Professor Nils Holmgren of Stockholm, and in these instances the bicornuate uteri were cut into halves. In my series of entire uteri there are 10 with one embryo, 59 with two, 35 with three and 10 with four embryos. Of the divided, half uteri 179 have one embryo and 62 have two. So we can safely conclude that *Procavia capensis* normally

[1] M. R. Curtis, W. F. Dunning and F. D. Bullock, *Am. Jour. Cancer*, 17: 894, 1933.

carries two or three embryos and sometimes one or four.

Nothing is known about the length of the gestation period of this mammal, as is also stated by Wislocki and van der Westhuysen. All I could find in the literature was that the young are born in November and December. The year I commenced to collect this material I started in the first week of November expecting to find all stages of development in this animal, which is hardly bigger than a rabbit. All fetuses were near birth or the young were already born. The following year I started collecting in August and got embryos about 8 cm. long. The animals caught in May of the succeeding year possessed already small embryos. It was only in April of the fourth year that I succeeded in obtaining uteri without any outward sign of gravidity. From this we may infer that the length of the gestation period of *Procavia capensis* is six to seven months. This is a very long time for an animal of that size, but Dr. Broom of the Transvaal Museum informs me that the probable ancestors of the dassie were much larger animals, and the length of the gestation period supports that view.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

AN IMPROVED CELL FOR OPTICAL DIFFUSION MEASUREMENTS ON SOLUTIONS[1]

MEASUREMENTS of the absolute diffusion rate in solutions require transparent cells in which the original boundary between solvent and solution and its spreading incidental to diffusion can be recorded photographically by either light absorption or light refraction methods.[2,3]

The stainless steel cell of Lamm,[4] now in general use, offers the great advantage of plane parallel glass windows that eliminate optical distortions seen with cylindrical glass tubes. On the other hand, boundary formation in the Lamm cell, accomplished by gradual withdrawal of a steel or bakelite diaphragm separating solvent from underlying solution, causes displacement of the upper column of liquid which may adversely influence the diffusion measurements when a high degree of precision is required.

To eliminate this difficulty, a simple diffusion cell of small volume has been designed on the principle of the new Tiselius electrophoresis cell.[5] In the cell described here, solvent and solution surfaces are in direct contact as the boundary is formed. However, unlike the conditions with the Tiselius cell, the boundary is formed in the photographic field and thus does not have to be moved by special compensating arrangements. This cell, somewhat similar to that of Loughborough and Stamm,[6] has been designed and built in cooperation with Mr. H. S. Bush, instrument maker of Cornell University.

Two stainless steel blocks A and A_1, with rectangular slots, constructed as shown in Fig. 1, are placed

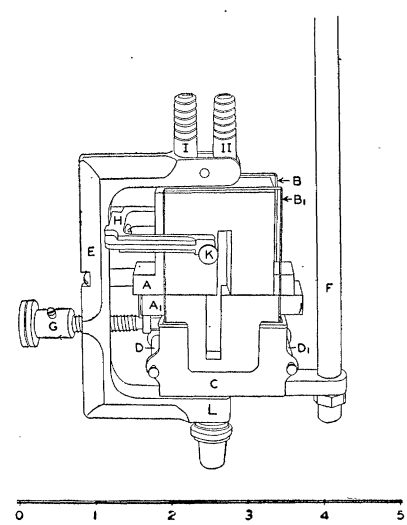

FIG. 1

one above the other. The upper block is fixed at the top and the side to the frame, E. The lower block is pressed against the upper one by the spring at L and can be moved laterally by means of a screw, G. The sliding surfaces of the blocks and their vertical front and back surfaces are ground and polished flat to within 1/10,000 of an inch. Two optically flat glass windows, B and B_1, fit against the cell surfaces and, together with block A_1, are held in place by means of two brackets C and C_1 (the latter not shown), clamped together by the screws D and D_1. H is a C-shaped clamp attached loosely to E and carrying the screw K, which can be tightened to exert pressure on the upper part of the glass windows.[7] The vertical

[1] This work has been made possible by a grant from the Rockefeller Foundation.

[2] A. Tiselius and D. Gross, *Kolloid. Z.*, 66: 12, 1934.

[3] O. Lamm and A. Polson, *Biochem. J.*, 30: 528, 1936.

[4] O. Lamm, *Nova acta regiae soc. scient. Upsaliensis* 10, No. 6, 1937.

[5] A. Tiselius, *Trans. Farad. Soc.*, 33: 524, 1937.

[6] D. L. Loughborough and A. J. Stamm, *J. Phys. Chem.*, 40: 1113, 1936.

[7] In a recent design of the cell, the attachment of the clamp H has been moved from the frame E to the rod F. This permits the screw K to be left tightened during boundary formation.