Note on the Blood of Necturus[1]

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Since 1867, when van der Hoeven first recorded measurements of the red blood cells of *Necturus,* at least 60 papers have been published dealing in whole or in part with its blood. A few additional notes are included here.

Previous measurements indicate a great range in the size of the red blood cells of *Necturus.* Claypole (1893, 1896) gives an average size (based on measurements of 50 or more cells) of 58.4 × 31.1 micra; and Smith (1925) gives an average size of 53.4 × 28.9 micra. My measurements give average dimensions of the red cells as 54.4 × 28.2 micra, with one cell 80 × 34 micra in size. The nucleus averaged 23.7 × 14.4 micra.

Claypole (1896) reported 56,000 rbc/cu.mm. of whole blood; Gordon (1935), 42,000 rbc/cu.mm. In three different specimens I have counted 51,000, 38,000, and 36,000 rbc/cu.mm. Chang, Chen & Shen (1943) found a gradual decrease in red cell count in *Triturus orientalis,* and thought it probably was the result of starvation. The latter two of my *Necturus* specimens had been starved at least two months when the blood counts were made.

Dawson (1931) mentioned that the shape of the fully differentiated erythrocyte of *Necturus* is an elongated flattened oval, but did not indicate how flat the erythrocyte really is. In dried smears it is very thin; its nucleus makes a conspicuous bulge in the center of the cell. Shadow-casts of the blood were prepared by the vaporization of palladium from a tungsten filament in a vacuum. In some shadow-casts, the angle of incidence at the glass slide was 5 – 1; this gave satisfactory shadows for the measurement of the thickness at the edge of the cells. In other shadow-casts the angle of incidence was decreased to 8 – 1, in an effort to obtain good shadows from which the thickness of the nucleus might be measured. Shadow measurements indicate that the erythrocytes are about 2.1 micra thick at the ends of the oval, and possibly are slightly thinner (2 micra) along the sides of the oval. The nucleus is at least two micra thicker than the rest of the cell.

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Images of 100 red cells were traced at 3000× magnification. From these tracings, I measured the area by planimeter, and circumference by a map-measurer, and found an average surface of 3017 square micra, and an average volume of 3306 cubic micra for the erythrocytes.

The packed-cell volume of the whole blood is 25.5 per cent (average of 8 tubes). Hemoglobin content is 4.2 grams per 100 cc. of blood (average of four tests).

Blood cells were mixed with isotonic NaCl solution, and tested by the test-tube method versus human serums as follows:

Anti C serum	No agglutination
Anti D serum	No agglutination
Anti E serum	No agglutination
Anti c serum	No agglutination
Anti A serum	No agglutination
Anti B serum	No agglutination

There was no absorption of the human antibodies by *Necturus* blood cells. This was proved by centrifuging the above mixtures, removing the supernatant serum, and then adding to it human red cells containing the antigen for which the various sera were specific. Agglutination occurred in each case, demonstrating that the antibody was still in the serum.

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Ornithological Notes

MICROFILARIAE, A POSSIBLE CAUSE OF DEATH IN THE BRONZED GRACKLE, *Quiscalus quiscula versicolor* Veillot.——About three miles S and one mile E of Lawrence, Kansas, is a dense bois d'arc thicket with trees of nine to ten feet, covering about 18 acres. Each fall and spring this area serves as the roosting site for hundreds of thousands of birds in migration, mostly blackbirds of several species. I estimated that on the night of April 19, 1951, for example, some 113,000 birds roosted there. Of these, about 75,000 or 66% appeared to be bronzed grackles; and the rest were mainly cowbirds and red wings. On examination, I found in the area several dead or dying birds, all bronzed grackles, and with no apparent injury.

I set up a transect through the area and on the three following mornings diligently searched this transect. All dead or dying birds (all grackles) were collected, and were refrigerated at a low temperature to prevent decomposition. Five of them were sent to Dr. Robert W.