tion of Ringer's solution for fresh water will affect the distribution of current pulses in relation to the fish and its environment. Further experiments are in progress, and will be reported in detail elsewhere.

However, we consider that the results so far indicate that a receptor system exists in *Mormyrus kannume* which is sensitive to electrical stimuli not delivered directly to it and that the receptor system is localized to the region of the base of the dorsal fin.

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Effect of Ultra-Violet Irradiation on Electrophoretic Properties of Serum Protein

IN the course of an investigation of the complement and antibody activities of animal sera (to be reported elsewhere) the effect of several agents on the serum protein has been examined by paper electrophoresis. It has recently been demonstrated that while controlled heat modified in various ways the electrophoretic pattern of serum protein[1] it also affected differently the reactiveness of the serum with complement[1]. It has also been reported[2] that ultra-violet irradiation of immune serum would either impair or completely destroy the ability to lyse, to agglutinate, to combine with toxins, to precipitate, to fix complement, or to confer passive anaphylaxis.

Preliminary experiments with ultra-violet irradiation of sera showed that the complement activity of guinea pig serum was completely destroyed by irradiating it for 6 hr. at 3° C. On the other hand, the complement-fixing antibody to canine hepatitis virus in canine serum was active, after it had been irradiated for 8 hr. at room temperature. All irradiated sera acquired a characteristic odour resembling burnt wool; otherwise no alteration in the appearance or in *p*H of the serum was observed. However, electrophoretic analysis suggested that some modification of the protein had taken place and, since no observations could be found in the literature, it was decided to examine electrophoretically the effect of ultra-violet irradiation on the protein of sera obtained from healthy adult human subjects and three animal species (the dog, rabbit and guinea pig).

Undiluted serum was irradiated either at room temperature or at 3° C. in a 'Vycor' glass tube, sealed with a rubber stopper. The tube was placed horizontally at a distance of 15 cm. from a 15-W. mercury vapour lamp ('Hanovia') emitting predominantly at 2537 A. The irradiation was controlled by varying the times of exposure. Serum aliquots in 'Vycor' tubes protected from irradiation with tinfoil served as controls. Serum aliquots exposed to irradiation were withdrawn at intervals and stored, together with the controls, at 3° C. until irradiation had been completed. 0·01-ml. aliquots of the control and irradiated sera were streaked on filter-paper strips for electrophoretic analysis. Paper electrophoresis was carried out essentially as described previously[1], using 3 *MM* Whatman paper strips. Electrophoresis was conducted at constant current (11 m.amp. for six strips) for 28 hr. at room temperature using sodium 5,5-diethylbarbiturate buffer, *p*H 8·6. The proteins were stained with bromophenol blue, and evaluated by direct photometry of the paper strip.

The results with rabbit serum (Fig. 1) show that the protein was similarly modified in all sera irradiated either at 3° C. or at room temperature. The migration velocities and probably dye-binding ability of the protein were affected by irradiation for 2 hr. Prolonged irradiation resulted in a complete change in the electrophoretic pattern.

Detailed analysis of the relationships between the mechanism of electrical transport of the protein and the activity *in vitro* of either antibody or complement must clearly await further experimental studies. The present work shows, however, that regardless of mechanism, electrophoretic analysis of native and modified serum protein may provide a better understanding of the activities of antibodies and complement. It shows also that serum protein is considerably denatured by ultra-violet irradiation, as judged by paper electrophoresis.

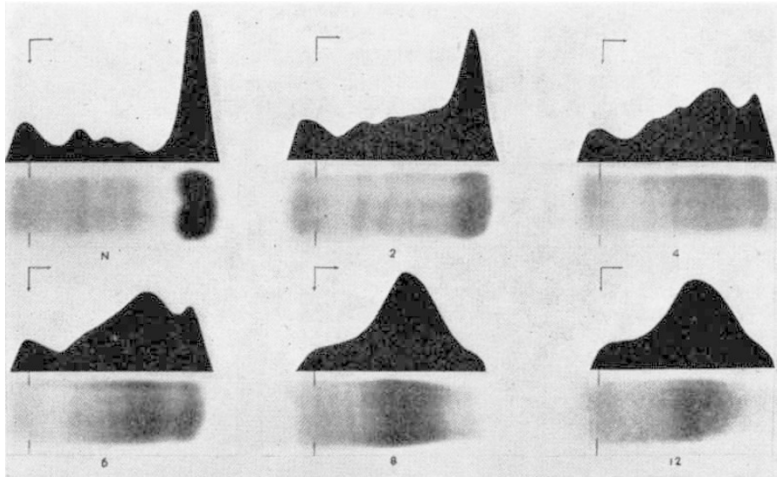

Fig. 1. Effect of ultra-violet irradiation upon proteins of normal rabbit serum. Paper electrophoretic pattern of control serum aliquot (*N*) compared with the patterns of aliquots irradiated for 2, 4, 6, 8 and 12 hr. Arrows indicate site of application and direction of run

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