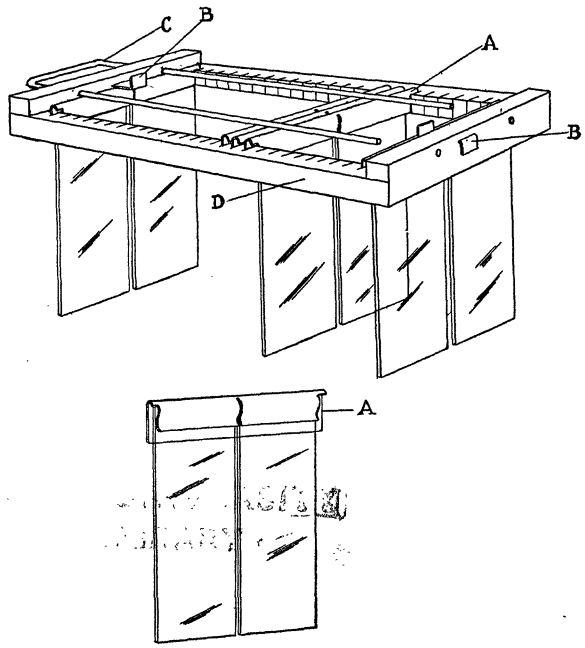
direction of the fold, fit into the slots in the frame and hold the clips in place. The shorter fold of the clip is cut in half by a vertical slit. The clips are designed to hold the slides by one end only. Each clip will hold two slides each one inch wide, or one wider slide up to two inches in width. When two one-inch slides are in a clip, either can be removed without disturbing the other. In use, the two end clips and their slides are made to serve as legs, or supports, for the rack by pushing in the catch (B) at each end of the frame; the other clips with their slides are then dropped in place. The rack and clips are supported by these legs above the level of the staining bath. Every clip in the frame is held inde-



pendently of the others and apart from the two end clips serving as legs, as few or as many as may be desired can be put in up to the capacity of the rack. Any clip with its slides, except the end ones, can be readily removed for examination at any stage of the staining process without disturbing the others. If desired, all the clips in the frame can be secured against falling out when the rack is in any position by sliding the U-shaped rod (C) into the holes in the ends of the frame.

Compared with the ordinary basket-like type of rack in which the rack and slides are more or less completely submerged in the staining bath, this new rack, in contrast, is not immersed at all; only the free portions of the slides are immersed and then not more than deep enough to submerge the specimens on them. On taking the slides out of the bath, the quantity of fluid adhering and withdrawn with them is small in comparison with that taken out by the ordinary style rack. A noticeable economy is achieved in the quantity of stain used, and at the same time the quantity carried over into any succeeding bath, contaminating it more or less, is reduced to the minimum practicable in quantity staining.

When compared with other staining racks in which the slides are held at one end but secured by a screw this new rack is decidedly the more convenient to work with; the slides can be taken out and put back without disturbing the others and in a fraction of the time required to unscrew and again tighten the screw type of holder.

Another advantage of this new rack is that it will hold two-inch slides as easily as one-inch ones, and both widths of slides may be stained at one and the same time.

The staining rack here described is not on the market; it was made as an experiment and has been found the most satisfactory rack for quantity staining with which the subscribed is familiar. The size of the rack is approximately 6 inches long by 2⅞ inches wide, and holds 62 one-inch slides or 31 two-inch slides.

This particular size was selected because it fitted nicely in a covered dish that was obtainable in the market.

Made as a special job, the cost was quite high, but should the design appeal to microscopists it could be supplied at a less cost. The Arthur H. Thomas Company, of Philadelphia, Pennsylvania, had the rack made for me.

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SPECIAL ARTICLES

THE LETHAL DOSE OF ULTRA-VIOLET LIGHT FOR BROOK TROUT (SALVELINUS FONTINALIS)

MANY chemical agents have been studied by fish culturists in attempts to check the epidemics of parasitic diseases that frequently cause severe financial losses in the best trout hatcheries. Although some of these agents are quite effective in checking fungus growths, they are often difficult to apply since the fish must be removed from the troughs and the troughs must be sterilized separately.

Ultra-violet light affords new opportunities for the control of fish diseases. It is unique in providing a means for the simultaneous treatment of both the fish and the water in which it swims. Since no experiments have been reported which deal with the ultra-violet radiation of normal fish we have summarized in the accompanying table some of our data. Before being radiated the trout were placed in a wire cage twelve inches square. This cage contained a screen bottom and top so that the fish could be confined in a water stratum at a definite distance from the surface. Ten trout about 2 to 3 inches in length were used in each experiment. During the radiation the trout were kept in their usual habitat of flowing spring water at a temperature of 10° C.

TABLE I

THE LETHAL DOSE OF ULTRA-VIOLET RADIATION FOR BROOK TROUT

Depth of water in inches	Distance of lamp from water in inches	Time of exposure in minutes	Time between exposures in hours	No. of exposures	No. trout killed	Results
1	6	5	24	3	4	Two died after third exposure. Two more died next day.
1	12	5	24	4	1	One died fifth day—others appeared grayish as if burned.
1	6	3	24	5	10	Three dead after fourth exposure. Four more dead after fifth exposure. Rest died next day.
1	12	3	24	16	1	No deaths until tenth day. Had not appeared normal or eaten well for a few days before.
1	12	3	18	5	0	No deaths. Held for 6 days after last exposure.
3–4	12	1	24	10	0	Apparently no detrimental effect.
3–4	6	90		1	3	Very grayish in appearance when removed—two died next day, one some time later. All appeared burned.

Our table shows that trout are killed by one long period of radiation or by a series of short periods at daily intervals. It also shows that trout can withstand a certain amount of radiation without injury. This affords a zone for further experiments in attempts to destroy the parasites without injuring the fish. No reliable comparison can be made between the sensitiveness of fish and the higher animals to ultra-violet radiation since the penetration of water by ultra-violet light seems unsettled. If water is readily penetrable, trout are less sensitive to radiation than man; if the reverse is true they are probably more sensitive.

The lamp used in these experiments was the Uviarc poultry lamp which was furnished us through the courtesy of the General Electric Company.

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ON THE OXIDATIVE NATURE OF THE NERVE IMPULSE[1]

A YEAR or so ago I succeeded in demonstrating[2] that although nerve conduction may go on in nitrogen for some time, for which chemically bound oxidative reserves were presumably used, no excess carbon dioxide was given off as is the case in aerobic conduction. The tentative view was adopted that the initial phase of conduction, manifested by the action potential as usually recorded, was conditioned by if not caused by a union of some substance in nerve with oxygen, rather than a complete oxidation with the accompanying production of carbon dioxide. I attempted at that time to determine manometrically whether this oxygen, required for stimulation, had first to be activated or whether molecular oxygen sufficed. Owing to inadequacies in the technique, the results were only suggestive and were not published. This work was made the starting-point of a program of research aimed at a clearer elucidation of the physical chemical processes responsible for the propagation of the impulse in nerve; the purpose of the present notice is to report a few of the results thus far obtained.

For this work I have turned to the theory of Warburg as being the most promising experimentally. Warburg believes to have shown that the respiratory enzyme is an iron-containing, hemin-like substance which can be poisoned by cyanides, hydrogen sulphide and carbon monoxide. Neither Warburg nor his collaborators have ever worked on nerve, however. Hence it became our first task to see whether nerve behaves towards these poisons as does Warburg's yeast.

To be very brief, it appears that sodium cyanide may inhibit nerve respiration very completely. In dilute solutions, *e.g.*, N/1000 NaCN, the inhibition is

[1] From a paper presented at the Marine Biological Laboratory, Woods Hole, Massachusetts, on July 25, 1930, and summarized in *The Collecting Net*, 5: 145, 1930.

[2] F. O. Schmitt, *Biochem. Zeitschr.*, 213: 443, 1929.