be removal of metabolic CO_2 from CNS a process slowed by acetazolamide. N^5-t-butyl acetazolamide (J. Pharm. Exp. Therap. **117**, p. 385) was used as a control and produced none of the effects reported for acetazolamide.

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Drug Transfer from Blood to Brain, Ventricular and Cerebrospinal Fluids of *S. Acanthias*

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Previous work on the blood-brain and blood-cerebrospinal fluid barriers in the dogfish led to the hypothesis that the fluid surrounding the brain was extradural in position and displayed drug transfer characteristics different from those of brain. To test this conclusion further a direct comparison was made of the rates of appearance and steady state ratios of several drugs in dogfish brain, ventricular and extradural fluids. Sulfadiazine, antipyrine and sulfanilic acid were injected intravenously and samples of blood, extradural fluid, ventricular fluid and brain obtained at intervals. In ventricular fluid sulfadiazine appeared rapidly and reached a fluid/plasma ratio of 0.8-1.10; sulfanilic acid a ratio of 0.13 and antipyrine a ratio of 1.0-1.2. In brain antipyrine was not measured but at 4 hours sulfadiazine reached a brain/plasma ratio of 0.53 and sulfanilic acid 0.17. In extradural fluid all three substances appeared slowly and the 4 hour fluid/plasma ratios were sulfadiazine 0.24, sulfanilic acid 0.26. If diamox was given before sulfadiazine, the final ratio to plasma became greater than 1.0 for ventricular fluid and brain, but was unchanged for extradural fluid. All the observations lead to the conclusion that the extradural fluid of the dogfish resembles a slowly formed dialysate of plasma, rather than true ventricular fluid in its drug transfer characteristics. This has also been shown in limited observation to be true for a cyclostome (*P. marinus dosatus*) and a marine teleost (*G. callarias*).

Renal Excretion of Tetraethylammonium in Lophius americanus

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With R. P. Forster and F. Berglund the excretion of an organic base, tetraethylammonium was studied in Lophius. The aglomerular fish rapidly excreted the injected tetraethylammonium in the urine to the extent of 35-66 per cent in 24 hours. In a few experiments the dogfish excreted 10-20 per cent in 17 hours. Simultaneous studies of endogenous creatine and

trimethylamineoxide excretion in Lophius revealed no change in creatine excretion but usually complete cessation of TMAO excretion in the presence of tetraethylammonium. Cyanine dye 863, a potent inhibitor of tetraethylammonium excretion, decreased TMAO excretion in Lophius without an effect on creatine.

Photodynamic Action, Dark Action and Effect on Oxygen Uptake of Rose Bengal on Sperm of *Echinarachnius Parma*

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Time dilution curves were made for the inactivation of *Echinarachnius parma* sperm with rose bengal at 15°C. These curves plotted concentration of dye against the time required for complete inactivation of a sperm suspension kept in the dye solution. If less than one percent of the eggs with which these sperm were mixed exhibited fertilization membranes, inactivation was considered complete. A concentration of 4.07 x 10-6M required 900 seconds in the dark to inactivate sperm, whereas, the same dilution required less than 10 seconds when exposed to light (photodynamic action). This was the minimum concentration (4.07 x 10-6M) to show a dark action. Light had no detectable additional effect at concentrations above 2.02 x 10 - 5M. The minimum concentration for demonstration of photodynamic action was 6.6 x 10-9M and required 1500 seconds. The curves of this study did not have the sigmoid inflection in either the light or dark portion as described by Blum, et al., J.C.C.P., 9:37. Photodynamic action was inhibited with Na_2SO_3, whereas, the dark action was not.

The oxygen uptake of comparable sperm suspensions was measured in a Warburg. Rose bengal was added from the side arm of the flask to give a final concentration of dye equal to the minimum for a dark action. Sea water added from the side arm acted as the control to indicate the dilution effects. Half the flasks were kept dark with aluminum foil and the others were exposed to light (300 W bulb in the water bath at a distance of 14 cm.). When dye was added to the dark flasks the increase in oxygen uptake was equivalent to the dilution factor of sea water and would plateau near the higher level. The addition of dye and light resulted in an increase of oxygen uptake much above the dilution factor but this would drop relatively quickly to a level equal to the difference between the respiratory O_2 uptake and the O_2 used in photodynamic action. Na_2SO_3 inhibited this increase in O_2 uptake in the light and a plateau similar to the dilution factor resulted.