cellular fluid. By determining the theoretical whole blood concentration at the moment of injection by means of extrapolating the disappearance curve back to the zero time, and from estimating the total blood volume, according to Gibson and Evans' values[7] for normal subjects, it was calculated that approximately 44% of the acetylsulfanilamide was carried in the blood cells of this individual. Since at the zero time none had been excreted and none had been changed from the acetyl form to the free form, and since none was found to be in the extracellular fluid, as represented by the plasma, the other 56% was presumably combined with other cells of the body.

It is concluded that sulfanilamide and acetylsulfanilamide in man are not distributed within the blood cells and plasma in relation to the water content. Sulfanilamide has an affinity for the blood cells while acetylsulfanilamide has an even more marked affinity for these cells. There is some indication for believing that these drugs also combine in small amounts with other cells in the body.

10453 P

Does Acetylcholine Play a Part in the Mechanism of Melanophores Expansion?

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The action of acetylcholine (AC) on the melanophores was tested by Parker[1, 2] on the Fundulus and Ameiurus. When he found in 1931 that AC, unprotected by physostigmine, caused *dispersion* of the melanophore pigment in fairly large dose, he concluded that AC does not play a part in its normal control. And when he found in 1934 that AC, protected by physostigmine, caused a slight *concentration* of the melanophore pigment in fairly large amount, he made the same conclusion. Recent experiments done on the paradise fish *(Macropodus opercularis)* suggested, however, that AC may be involved in the mechanism of melanophore expansion in this species.

It was consistently demonstrated that 0.01γ AC chloride (E. Merck) injected into the body subcutaneously could produce a local

[7] Gibson, J. G., and Evans, W. A., *J. Clin. Invest.*, 1937, **16**, 317.

[1] Parker, G. H., *Proc. Nat. Acad. Sci.*, 1931, **17**, 596.

[2] Parker, G. H., *Proc. Nat. Acad. Sci.*, 1934, **20**, 596.

black area of 8x8 sq mm within 30-45 sec. after the injection, lasting for 10-13 min. Under binocular microscope, the melanophores were found to be expanded.

A purified extract was made from the caudal fins according to the method of Chang, Hsieh, Lee, Li and Lim[3] and was tested on toad's rectus and heart, and leech, (*Whitmania acranulata,* Whitman). AC was identified by the ratio between the unknown and the AC-standard before and after eserine on the rectus (Chang and Gaddum[4]), the atropine test on the heart, and the acid-alkali test on the leech. The extract was found to contain 0.5-1.0γ AC (as chloride) per g wet tissue.

Injection of an extract equivalent to 0.009γ AC could produce blackness in the caudal fin comparable to that produced by an equal amount of the AC-standard.

10454 P

Light-Pituitary Reflex and the Adrenergic-Cholinergic Sympathetic Nerve in a Teleost.

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Working on the snake fish (*Ophiocephalus argus,* Cantor), we found that its melanophores are under two types of control, one through the pituitary which is regulated by light and darkness, and the other through the sympathetic nerve which is partly adrenergic and partly cholinergic.

The Pituitary Control. After removal of the sympathetic chains at the level between the pectoral fin and cloaca, the fish developed, on a white background under the continuous illumination from a lamp of 100 W, a black color over the anterior denervated region. Subsequent enucleation of the eyes intensified this color into coal-black, whereas a previous hypophysectomy would prevent such an appearance. These results indicate clearly that the black color is due to the expansion of the melanophores produced by the pituitary principle whose continuous discharge is increased by darkness,[1] and

[3] Chang, H. C., Hsieh, W. M., Lee, L. Y., Li, T. H., and Lim, R. K. S., in press.

[4] Chang, H. C., and Gaddum, J. H., *J. Physiol.*, 1933, **79**, 255.

[1] Jores, A., *Klin. Wchsch.*, 1935, **14**, 1713; Stutinsky, F., *C. R. soc. Biol.*, 1938, **127**, 409.