

his statements made in 1916. While it is impossible to attribute more than a minor rôle to this, nevertheless, it is just as striking and constant as the other pigment effects. This alteration in the epithelial "free" pigment would appear to have escaped detection along with the decided changes in the xantholeucophore cells. Attention has already been called to the solvent action of many fixatives on these cells. Their identification is not interfered with by the use of Helly's fluid and is rendered easiest of all when whole mounts preserved in this way are explored with the polariscope with which the doubly refractive powers of the guanin substance is brought out. It is proper here to call attention to the fact that the maximal expansion which these cells enjoy in albinous larvæ can also be overlooked because of a subsequent contraction in them which occurs with the use of anesthetics and in many conditions of impaired vitality occurring through disease or intentionally experimentally produced as with too strong doses of adrenalin. In another place comment will be made on the change in the physiological and pharmacological reactions of both types of pigment cells; but it may be stated here that the widely expanded xantholeucophores of albinos are singularly unamenable to most experimental influences and in this they are in striking contrast to the iridescent cells of normal animals. That the expanded xantholeucophores contribute decidedly to the albinous appearance is shown by the behavior of those albinous larvæ fed on posterior lobe substance. These animals exhibit a partial recovery of the melanin deficiency which may indeed approach the normal. In spite of this, they are always conspicuously lighter than their normal controls, a fact readily explainable by failure of this treatment to influence the persistent expansion of the iridescent cells.

44 (1419)

On the reaction of the pigment cells in normal and albinous frog larvæ.

By **P. E. SMITH** (by invitation).

[From the Anatomical Laboratory, University of California.]

In the experimentally produced albinous frog larvæ which follow a successful early extirpation of the epithelial portion of

the hypophysis, a pigmentary system is produced which is not only strikingly different from the normal in its anatomical and physiological condition but also exhibits striking departures from the normal in its physiological responses.

Normal larvæ kept in diffuse light and on an indifferent background usually show a fully expanded, or only slightly contracted, condition of the epidermal melanophores¹ and a completely contracted, or but slightly expanded, condition of the corial xantholeucophores. This condition can almost always be somewhat exaggerated by submitting the larvæ to the simultaneous action of low temperature and darkness, when the epidermal pigment cells are fully expanded and the corial xantholeucophores minute, silvery dots. When such larvæ, or those from an indifferent environment, are submitted to reverse conditions, *i. e.*, the simultaneous action of warmth (33°–35° C.) and sunlight, these two classes of pigment cells react in the reverse way and in from one half to one hour exhibit a picture of contracted melanophores and widely expanded silver cells. It is thus seen that the reactions of the two groups of superficial pigment cells—the epidermal melanophores and the corial xantholeucophores—go hand in hand and are in a reverse direction.

Attention has already been called to the constant great expansion of the corial xantholeucophores in the albinos, an expansion which exceeds considerably that which can ever be obtained by the action of sunlight and heat on normal larvæ. Moreover, it is difficult to influence by physiological means this great expansion of the xantholeucophores in the albino. On the other hand, the epidermal melanophores of the albinos, which exhibit various stages of contraction, are widely expanded by the action

¹ This condition is the same as that characterizing the deep melanophores which harmonize in their behavior under exaggerated conditions of light and temperature with their more intimate associates, the xantholeucophores. The reactions of the deep melanophores have been the object of considerable study and in the experience of the writer are identical in albinous and normal individuals. Attention must again be called to the necessity in all experiments of this type of not merely submitting the animals and their controls to identical conditions, but also to start with a known physiological condition which has been produced by the action of a practically constant environment over a considerable period of time preceding the experiment, the effect of which upon the larvæ is known through careful examination of the living and unanæsthetized specimens immediately preceding the tests.

of heat and light, an effect just the opposite of that which the same factors produce in the normal skin.

Finally it may be mentioned that when all stimuli are removed the resulting condition of the pigment cells does not differ greatly in normal and albinous larvæ. A study of animals which have recently died in the aquaria, or have been purposely killed, shows that the pigment cells in both normal and albinous individuals come to approximately the same condition, which is one of partial expansion of the xantholeucophores and an expansion of the epidermal melanophores greater than can be produced by the action of light or heat or other experimental means in living animals. The reaction of the xantholeucophores in albinous and normal larvæ is also identical when subjected to all the anesthetics tried by the writer (paraldehyd, chloretone, and ethylurethan). In both they are greatly contracted.

45 (1420)

Upon the experimental exchange of skin transplants between normal and albinous larvæ.

By **P. E. SMITH** (by invitation).

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If sufficient speed is exercised, an exchange of the middorsal area of skin can be successfully accomplished between two frog larvæ, a normal one and its albinous mate. Since there are striking and constant differences between two such larvæ as concerns both classes of superficial pigment cells, a highly interesting opportunity to test the influence on such cells of a new host was presented. Four such successful skin exchanges were accomplished and in all instances definite and constant changes in the condition of the xantholeucophores were produced as a result of the exchange. The changes, which are well under way in an hour after such an experiment and which have yielded harmonious results, would appear to be of great value in the interpretation of the change in the physiological state of these cells which albinism produces. It will be recalled that the corial xantholeucophores