fluorescent substances found in the intact larva at that stage were detected in these explants, although no quantitative results were obtained.

These results indicated clearly that the fluorescent substances of pterin type found in the intact larvæ of *Hynobius* and *Triturus* were synthesized in the pro-pigment cells in the process of their differentiation. This may strongly suggest that the simultaneous appearance of the pigmentation and pterins during the chromatophore differentiation is an expression of the inseparable relation of the two. However, this does not necessarily mean that all pterins found in intact larvæ are formed in the pro-pigment cells during pigmentation. In fact, a very small but perceptible amount of fluorescent substances of pterin type is found usually in larval and adult tissues other than skin. Whether these small quantities of pterins are derived from pigment cells, or synthesized *in situ*, or even supplied by way of nutrition, remains to be settled.

We wish to thank Prof. Adrien Albert of the Australian National University for his assistance in the preparation of this manuscript.

TADAO HAMA
MASATAKA OBIKA

Biological Laboratory,
Keio University,
Yokohama-Hiyoshi,
Japan.

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PHYSIOLOGY

Effect of Cortisone on Degenerating Nerve Fibres in Birds

THE observation that the usual appearance of the Marchi stage of Wallerian nerve fibre degeneration in experimental material is strikingly altered by cortisone acetate (Pfizer, Ltd.) led us to try to discover whether cortisone would also alter in any way the effects of tri*ortho*cresyl phosphate poisoning, which are usually most apparent in the myelin sheaths of nerve fibres. Our results so far seem encouraging. A single application of tri*ortho*cresyl phosphate painted on the combs of hens (the dose being 0·1 c.c. per kgm. body-weight) invariably causes general symptoms of intoxication and paralysis in the legs after 8–25 days[1]. The administration of 25 mgm. of cortisone by mouth three days before the application of tri*ortho*cresyl phosphate and further doses of 25 mgm. every third day thereafter in all cases prevented the onset of paralysis and reduced the other general symptoms. Even if the administration of cortisone was delayed until the hens were severely stricken by the poison, its beneficial effects were still apparent, for the general condition of the birds rapidly improved, they began to feed avidly, and the paralysis was reduced to a mild state of postural imbalance. Similar results were obtained if the dose of tri*ortho*cresyl phosphate was increased to 0·15 c.c./kgm.

In view of the outbreak of tri*ortho*cresyl phosphate poisoning in Morocco last year involving 10,000 people, these preliminary results may be of assistance in efforts to treat the crippled victims.

P. GLEES

University Laboratory of Physiology,
Oxford.

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Potentiation of Contractility in the Heart Muscle of the Rat and Some Other Mammals

THE steady-state amplitude of rhythmical myocardial contractions reached after the period of 'staircase' varies regularly with the frequency, following a typical curve in most animal species: it decreases at first, at very low frequencies, passes through a minimum (least favourable frequency), then at higher rates it increases up to a maximum (optimal frequency), to decrease again, at still higher rates, up to the limit of frequency which the preparation can follow[1]. The shape of the curve is, however, much modified in the rat in comparison with that of other species, the initial decrease of contractility being very marked, while the following increase to the optimum is, on the contrary, only small or absent[2]. In contrast to the classical staircase phenomenon, an inverted staircase (decrease of contraction) has been observed in the auricular or ventricular strips of the rat after a period of rest, or after the transition from a lower to a higher rate of stimulation[3].

These variations of contractility as a function of frequency may be interpreted as resulting from the interaction of two factors or effects, varying in opposite senses with the interval between the succeeding contractions[1]. One, namely, augmentation of amplitude on lengthening and diminution on shortening of preceding interval, has been called 'restitution'; the other, an augmenting effect on the shortening of the previous interval, has been termed 'potentiation' (Fig. 1). The 'potentiation' effect occurs only at short (least favourable) intervals, is cumulative and forms, in our interpretation, the common basis of the positive staircase, of the post-stimulation and post-extrasystolic potentiation, as well as of the steady-state amplitude variations. The terms 'restitution' and 'potentiation' are meant to be provisional, without any prejudice concerning the true nature of each of these effects, which may be dissociated and followed separately in their variation as a function of frequency[4] (Fig. 1).

The restitution effect may be measured by the change of amplitude in a number of single premature and delayed beats, intercalated in regular steady-state contractions. The 'potentiation' effect is indicated by the augmentation of the contraction next to the premature one (conditioning contraction), provided it follows at the basal interval. This point is very important, since in the case of an extra beat followed by a longer (compensatory) interval as well as in that of an intrapolated beat followed by a shorter interval, the change of contractility of the next contraction is due to both effects. The immediate return to the previous (basal) interval maintains, however, the 'restitution' effect constant, so that only a pure 'potentiation' effect appears. (For details of technique see our previous paper[4].)