there is a *lag* in the re-assumption of ancestral characters.

It required, according to Kammerer, no less than six generations in the modified environment to awaken in *Alytes* the ancestral potency to produce the nuptial pad; and the offspring of *Salamandra maculosa*, which had been reared in a yellow environment, became yellower for the first eighteen months of their lives in spite of the fact that they were reared in a black environment. Similar results were obtained by Dürkhen with the pupæ of white butterflies, and the cumulative effect of succeeding generations in intensifying acquired immunity has been beautifully shown by Metalnikoff in the caterpillars of the bees-wax moth *Galleria*.

In conclusion, let me describe a series of experiments carried out in my own laboratory at the Imperial College of Science under my supervision by my former colleague Dr. (now Prof.) Hogben. We had specimens of two very similar newts living in our tanks, namely, the axolotl (*Siredon pisciformis*) and the mud-puppy (*Necturus lateralis*). Both normally live all their lives in water and retain external gills and open gill slits through life. Both were fed in the same way with thyroid, and the miracle of the change in a few weeks of the axolotl into a small black land newt was enacted before our eyes. But no amount of thyroid feeding made the smallest change in the appearance of the mud-puppy. In one case the power to metamorphose into a land newt, though overlaid by the new perennibranchiate character, still survived as a 'suppressed complex'; in the other, owing to the deeper engraining of the perennibranchiate character, it had apparently been irretrievably lost.

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Adsorption on the Crystal Lattice of Cellulose.

INVESTIGATIONS into the adsorption of various substances by cellulose in the presence of dispersive mediums such as sulphuric acid, zinc chloride solution, etc., have resulted in some very interesting observations in my laboratory during the past two years.

The more important of these will be published in due course, but meanwhile the nature of the blue, violet, and red iodine adsorptions from a solution of iodine in potassium iodide in the presence of the dispersive solutions is of considerable theoretical interest to those who are working either with cellulose or similar colloidal substances.

1. A pencil of light, passing through a natural fibre of cellulose (a flat spruce tracheid, for example), the latter being deeply stained with iodine by the methods indicated above but still translucent enough to pass light, is completely polarised by absorption.

2. Two fibres stained with iodine in this way, when crossed at right angles, behave like tourmaline plates, giving total absorption of the light at the area of crossing.

3. Microscopical analysis of this phenomenon proves that the polarisation of the light is caused by ultramicroscopic crystalline particles of iodine oriented on the crystal lattice of the cellulose either as an isomorphic or an isogonic overgrowth, or intergrowth.

4. It is presumed from the optical properties of the smallest crystals of iodine observed under the microscope that these crystalline particles of iodine are rhombic prisms.

5. The iodine penetrates into the interior of the cell-walls, but the concentration is greatest on the surface, where it tends to develop into an actual microcrystalline overgrowth of iodine crystals.

In other experiments definitely oriented crystal overgrowths of calcium carbonate and barium sulphate (both rhombic) have been produced on natural fibres of cellulose. In the case of natural dendritic growths (arising from a particle of bronze or copper) in paper, the actively spreading material during the fern-like growth is copper sulphide which is also rhombic in structure.

With regard to the blue and red absorptions of iodine on cellulose, which are still under investigation, the following points may be noted:

1. It is expected that some further light will be thrown on the problem of the formation of similar coloured adsorption compounds of iodine with other substances, now a subject of considerable interest in colloidal chemistry.

2. This type of adsorption of one crystal lattice upon a second may possibly take place in the dyeing of cellulose. The iodine-stained fibres, like those dyed with cotton and basic dyes, are strongly dichroic. In the latter case dichroism is the only evidence of orientation, but in the case of iodine we have both strong dichroism and complete absorption of one ray giving polarisation of transmitted light. It appears probable that the dichroism of the dyed fibres may not be due merely to the orientation of the cellulose micellæ, but also to the crystalline structure of the dye micellæ similarly oriented.

3. The iodo-sulphates of quinine (artificial tourmaline or 'herapathite') which are also strongly dichroic may be isomorphous crystalline compounds, as their peculiar optical properties are clearly due to similar properties in the iodine itself.

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Atmospheric Light Columns from Artificial Lights.

WHEN travelling by tram, I have often seen the light of street lamps drawn out into beams perpendicular to the direction of streaks left upon the window glass. Effective fibres of the cleaners' cloth are sensibly parallel, and though I had mentally noted that the beams were due to diffraction, it had not hitherto seemed worth while publishing the observation. I would suggest, however, that it provides a simple analogue for the atmospheric light columns mentioned by Dr. Currie in NATURE of April 5.

There can be no doubt that the vertical atmospheric beams are due to horizontal particles, which need not be laminar as suggested by Dr. Whipple. Some readers may find difficulty in accepting a horizontal orientation of falling particles, and it is therefore of interest to recall the observations of Dr. John S. Owens (*Brit. Assoc. Rep.*, p. 611; 1913) upon the deposition of silt and sand in water. He found that when bodies of different shape (discs, rectangular plates, or rods) were allowed to settle in water, they settled in every case in the position offering the greatest resistance to movement.

Construction of a model to produce light columns presents no difficulty in principle; all that is required is a suspension of lamellar or acicular particles within a transparent chamber having plane parallel sides. I believe I have obtained an indication of the effect with crude apparatus, but a successful result could be obtained only under rigorous conditions in which the effects of convection and tremor can be eliminated.

The apparently contradictory orientation of both lamellar and acicular particles when suspended in a fluid at rest, and when giving rise to the phenomenon

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