as five days after the dipping only 1-2 nymphs in moult were observed. A second dipping at 8-10 days interval would almost certainly have given complete control. These results indicate that 1:1,700 of the gamma isomer alone or a 1:8,000 concentration as an addition to a plain arsenical dip with 0'2 per cent As_2O_3 will give complete control of the tick: a result that cannot at present be obtained by the arsenical dip alone. The nymphs in moult, however, are not sufficiently affected to obtain control by one dipping. control by one dipping. No adverse effects on the animals were observed, due to the

'Gammexane'. C. N. AULT Wm. Cooper & Nephews (S.A.), Ltd., Buenos Aires. April 29.

Artificial Fertilization of Cod (Gadus callarias Linn.) at Port Frin

Erin THE remoteness of most cod-fishing grounds from marine stations renders the accomplishment of the artificial fertilization of the cod (Gadus callarias Lin.) at Port Erin of considerable interest, particu-larly in relation to the experimental possibilities of investigating the variability exhibited by this species in different geographical regions'. This year the cod fishing has been productive off Port Erin, and acting on reports that the fish were running ripe, instructions were given to the fishery assistant. Mr. Kenneth Woodworth, to make artificial fertilization of the cod at sea by two methods, both of which were successful. Frive successful fertilizations were made simply by means of squeezing eggs from a freshly caught running ripe female into a large bottle half-filled with sea water, afterwards adding milt from a freshly caught running male. One fertilization—also successful —was made by the dry method used for salmon, that is, eggs were shed into an empty bottle with the addition of milt and, fifteen minutes later, sea water. The fertilized eggs were quickly transferred to the Marine Biological Station on the arrival of the boat in harbour, and were well washed with sea-water and kept under circulation by the admirable technique of the hatchery boxes in use at the Port Erin Station³. The mortality was high in the earlier experiments but low in the later ones with improved technique. Young fish hatched after ten days incubation at a mean temperature of 8.3°C. and mean salinity of about 33% too Segmentation into two blastomeres occurred after 5 hours, into four at mean temperature of 8.3°C. and mean salinity of about 1.3 mm. Further details will be given in later publications. K. WOODWORTH H. G. KEWALEAMANI

K. WOODWORTH H. G. KEWALRAMANI M. P. MOTWANI J. H. ORTON

Marine Biological Station, Port Erin, Isle of Man. April 12.

¹ Schmidt, J., C.R. des Trav. Lab. Carls., 18, No. 6 (1930).
² Herdman, W. A., 22nd Ann. Rep. Mar. Biol. Stat., Port Erin (1908).

Neotypes for Species Based on Pathological Specimens

In a recent discussion on "The Naming of Pathological Specimens", Dr. L. F. Spath' arrives at the conclusion that a species based on such a specimen must be considered valid. No exception can be taken to this conclusion, but Spath's view that "a normal type [can] obviously not be chosen while the holotype [is] still in existence" might well be questioned. Q. G. Simmers' list.

questioned. G. G. Simpson⁴ lists aberrance of a specific type explicitly among the cases in which "what is known about a specific type is . . . ambiguous". Such a type "fails to serve its purpose" (p. 29 of ref. 2) and has, therefore, to be replaced by a --normal--neotype. Selection of that neotype devolves upon the student who first recognizes the pathological character of the holdype upon comparing it with normal specimens considered conspecific by him. OTTO HAAS

OTTO HAAS

American Museum of Natural History, New York 24, N.Y. March 19.

¹ Geol. Mag., **82**, 251 (1945). ² Bull. Amer. Mus. Nat. Hist., **85**, 30 (1945).

Factorial Analysis of Colour Vision

HOUSTOUN¹ has pointed out that a three-colour theory, such as that of Young and Helmholtz, inevitably leads to mathematical contradictions. It is well known in addition that a theory in which there are only three primary sensitivities, such as red, green and blue, becomes unsatisfactory when the many different forms of defective colour vision are studied in detail. Piéron⁴ has recently attempted to meet these difficulties, but only by a complex and speculative hypothesis. Chapanis' has published results of experiments on variations of the saturations of spectrum colours, which are inconsistent with a three-colour theory.

saturations of spectrum colours, which are inconsistent with a three-colour theory. In experiments at Glasgow, factorial analysis has shown interesting results. From combined correlations between measurements of sensitivity to four colours and brightness, using six different tests and 345 subjects with normal colour vision, three factors were extracted. They were: (1) general (which, like other general factors mentioned below, may be interpreted as expressing the subjects' ability to carry out the experiments, special variations of colour vision apart); (2) bi-polar-red-green; (3) bipolar-yellow-blue. For 38 red-green blind subjects, who form a statistically distinct group, the factors were :

<text><text><text><text><text><text><text> R. W. PICKFORD

Psychology Department, University, Glasgow, W.2. March 26.

¹ Houstoun, R. A., "Vision and Colour Vision", chapter 14 (1932).
⁹ Piéron, H., "La Sensation: Guide de la Vie", pp. 152ff (1945).
⁸ Chapanis, A., J. Exp. Psych., 34, 24ff (1944).
⁴ Burt, Cyril, Eug. Rev., 37, 154 (1946).

Lantern Slides of Diagrams, Formulæ, etc.

Lantern Slides of Diagrams, Formulæ, etc. For the past five or six years I have been using a method for making lantern slides of line drawings which is easier and cheaper than that indicated in Nature of Nov. 10, 1945, p. 574 [see also Nature, May 4, 1946, p. 591]. Take a clean lantern slide and coat it with egg albumin by allowing white of egg to run over it; one egg will suffice for about twenty slides. Stand the slide against the wall for three or more hours to dry, taking eare that dust does not fall on it. When it is sufficiently dry, it is fairly easy to write on it with ordinary indian ink of any colour. An alternative method is to coat the slide with a thin solution of Canada balsam, just enough to cover the whole slide: run off excess Canada balsam, and stand the slide to dry. Use indian ink. Recently I have been using a still simpler method. Clean the slide until all traces of grease or fat have been removed, and dry it. Using any of the common glass inks, one may write directly without coating the slide. Apart from the saving in cost and time by any of these methods.

the slide. Apart from the saving in cost and time by any of these methods, the luminosity of these slides is such that they can be projected in a room with practically all the windows fully open or with most of the electric lights burning in the room. This has proved very practical during lectures, as students can see the screen and make notes of the slide diagram or text. Here in Bombay the cost of slides prepared by any of these methods is about 2d.-3d. each. With a little practice it is an easy matter to prepare biological slides, chemical formule, etc. St. Variar's Collage

St. Xavier's College, Bombay 1.