DECEMBER-HATCHED PHEASANTS LAY IN JULY ON NORMAL DAYLIGHT

RECENTLY we[2] reported the hatching of three ring-necked pheasant chicks (*Phasianus colchicus torquatus*) on Christmas day. They were from eggs laid, beginning on November 8, by a pair of pheasants hatched on the preceding May 7. The two females that survived grew well in an improvised brooder.

Early in June they were placed with a yearling male in the hope that they might begin to lay some time during the summer. They were not experimentally lighted and their food was similar to that of the other pheasants at the sanctuary.

Two eggs only were laid on July 25 and 27. They were judged to be from the same hen because they were almost identical in size, color and shape. They were infertile; probably because the cock had passed his period of sexual activity and was consequently unable to ejaculate sperm. The first was laid when the hens were 212 days of age. Days had been increasing normally in length and luminous intensity for 178 days to June 21 and decreasing in length, but probably not in luminous intensity, for 34 days thereafter.

The parent of these birds was induced to lay at 185 days of age by an increase of light per day commencing 151 days after hatching and more rapid than the natural spring increase operating in this case. She was not subject to a final period of decreasing days. If these two birds had begun to lay at the same age as she did, the first egg would have been laid on June 28, or seven days after daylength began to recede.

The results of this experiment and the preceding one indicate that chicks of this species would lay several eggs beginning about six and a half months after hatching, but for the decreasing daylength in summer and autumn or but for the lack of increasing daylength to stimulate the hypophysis to induce sexual activity.

It has been shown[3] that reduction of daylength in spring retards or inhibits laying in pheasants. So the almost immediate cessation of laying was probably due to the 34 days of falling daylength. We found that a six-hour reduction of daylength, to normal on April 1, resulted in periods of cessation followed by resumption of laying at a slower rate, with birds experimentally brought into early laying in January and February (data to be published elsewhere).

If these two birds had been hatched in November, they would not have come under the influence of the 34 days of diminishing length. They would probably have been well started into laying before becoming affected by the decreasing light. It becomes evident that artificial lighting is not necessary to induce pheasants hatched at the right time of year to lay within seven months of that time.

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[1] Aided by grants from the National Research Council, Committee for Research in Problems of Sex, 1936–7, and by cooperation of the State Department of Fish and Game for Connecticut, Arthur L. Clark, superintendent.

[2] T. H. Bissonnette and A. G. Csech, *Am. Nat.*, 71 (5): 525–8, 1937.

[3] L. B. Clark, S. L. Leonard and G. Bump, SCIENCE, 85: 2205, 339–340, 1937.

A NEW COLOR REACTION OF VITAMIN B_1 (THIAMIN)

THE reported identifying reactions of Vitamin B_1 (thiamin) are few, consisting of several modifications of diazo reactions,[1] the reaction with p-dimethyl-aminobenzaldehyde,[2] the reaction with potassium bismuth iodide[3] and the thiochrome reaction.[4]

It has now been found that Vitamin B_1 (crystalline synthetic Merck) reacts with 2–6 dibromoquinone—chloro-imide (other chloro-imides should react also) to give orange solutions, color extractable by immiscible solvents (chloroform, *e. g.*).

About one mg of thiamin is dissolved in a few cc of borax of pH approx. 9.6[5] (saturated borax solution will do for demonstration) and to it is added a drop of alcoholic 2–6 dibromo-quinone-chloro-imide (Eastman). The color develops at once, gradually increasing in intensity.

From tests on *technical* 2-methyl-4-amino-5-ethoxymethyl pyrimidine and 4-methyl-5 (β hydroxy) ethyl thiazole (kindly furnished by Dr. R. T. Major, director of research of Merck and Co.) it appears that only the thiazole portion gives a color (yellow) with the reagent.

Many amines, phenols and derivatives interfere, which will be reported elsewhere in a study of the color reactions of 2–6 dibromo-quinone-chloro-imide.

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A NEW DIETARY WATER SOLUBLE FACTOR REQUIRED BY CHICKS

IT has been found that a diet containing 59.5 per cent. polished rice, 24 per cent. water washed fish meal, 5 per cent. rice bran filtrate,[1] 5 per cent. whey adsorbate, 200 micrograms thiamin per 100 grams of diet, 3 per cent. salt mixture, 3 per cent. soybean oil and 0.5 per cent. high potency sardine oil did not support

[1] H. W. Kennersley and R. A. Peters, *Bio. Journ.*, 28: 667–70, 1934; H. J. Prebluda and E. V. MacCollum, SCIENCE, 84: 488, 1936; H. A. Willstaedt, *Naturwissenchaften*, 25: 682, 1937.

[2] H. Tauber, SCIENCE, 86: 594, 1937.

[3] B. Naiman, SCIENCE, 85: 290, 1937.

[4] "Ergebnisse der Vitamin und Hormanforschung," Ruzicka, Leipzig, 1938.

[5] "Standard Methods of Water and Sewage Analysis," Am. Pub. Health Asn., 1936.

[1] Supplied by Vitab Products Inc., Emeryville, Calif.

growth. The rice bran filtrate furnished adequate amounts of filtrate factor and the whey adsorbate adequate amounts of riboflavin as determined by separate assays. The soybean oil furnished ample vitamin K and the sardine oil adequate amounts of vitamins A and D. Growth was restored when dried brewers' yeast or extracts made from it were added. Representative weights, at 6 weeks, of chicks not receiving the yeast supplement were 156 grams and of those receiving it 451 grams.

This growth factor has been found in dried brewers' yeast, yeast grown in a whey medium, wheat bran, middlings and alfalfa meal. The factor is insoluble in ether, acetone, isopropanol, and slightly soluble in methanol. It can readily be extracted by 50 per cent. methanol. The factor can be adsorbed on fuller's earth and on activated charcoal. A 1:1:4 solution of pyridine, methanol and water will elute the factor from fuller's earth. Refluxing for thirty minutes at pH 11.0 and at pH 1.7 did not destroy the factor present in a yeast extract. Autoclaving for five hours at 120° C. destroyed the factor present in alfalfa meal but not in dried yeast.

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REPORTS

NATIONAL RESEARCH FELLOWSHIPS IN THE NATURAL SCIENCES OF THE NATIONAL RESEARCH COUNCIL

THE National Research Fellowships Board in the Natural Sciences, of the National Research Council, has made the following fellowship appointments for the academic year, 1938–1939:

REAPPOINTMENTS FOR A SECOND YEAR

James Forbes Bell (Ph.D. in geology, University of Munich, 1935). To work at Massachusetts Institute of Technology. Subject: The plastic deformation of crystals with especial attention to twin-gliding.

Ralph Philip Boas, Jr. (Ph.D. in mathematics, Harvard University, 1937). To work at Princeton University. Subject: Trigonometric integrals; moment problems; Laplace transforms.

Bryce Low Crawford, Jr. (Ph.D. in chemistry, Stanford University, 1937). To work at Harvard University. Subject: The spectroscopic determination of molecular structure and energetics of organic compounds.

Ralph Emerson (Ph.D. in biology, Harvard University, 1937). To work at the University of Cambridge, England. Subject: An experimental investigation of *Allomyces* and related forms, bearing on general biological problems of sexuality, alternation of generations, and cytoplasmic heredity.

Jesse Leonard Greenstein (Ph.D. in astronomy, Harvard University, 1937). To work at Yerkes and McDonald Observatories of the University of Chicago. Subject: The interstellar medium and problems of interstellar absorption.

William Conyers Herring (Ph.D. in mathematical physics, Princeton University, 1937). To work at Massachusetts Institute of Technology. Subject: The quantum mechanics of crystals.

Paul Henry Settlage (Ph.D. in psychology, University of Wisconsin, 1937). To work at the Sprague Institute, University of Chicago. Subject: Corticalization of function in man: the parieto-occipital area.

Fred Beals Stitt (Ph.D. in physical chemistry, California Institute of Technology, 1936). To work at Harvard University. Subject: Internal rotation in ethane and diborane.

NEW APPOINTMENTS

Arthur B. Burch (Ph.D. in zoology, University of California, 1938). To work at the Zoologisches Institut, Freiburg, Germany. Subject: The early embryology of the pituitary body; investigation of the developmental relationships of the *pars buccalis* and the *pars neuralis*.

Ray Fields Dawson (Ph.D. in botany, Yale University, 1938). To work at Columbia University. Subject: The physiology of nicotine in tobacco.

Philip Drucker (Ph.D. in anthropology, University of California, 1936). To work at Columbia University. Subject: Archeological survey of the Northwest Coast.

Robert Eli Duncan (Ph.D. in botany, University of Wisconsin, 1938). To work at Victoria University of Manchester, England. Subject: Experimental induction of apogamy and study of allied phenomena in ferns.

Eugene Henderson Eyster (Ph.D. in physical chemistry, California Institute of Technology, 1938). To work at the University of Michigan. Subject: The application of infrared spectroscopy to problems of molecular structure.

William D. Gray (Ph.D. in phytopathology, University of Pennsylvania, 1938). To work at the University of Wisconsin. Subject: Physiological studies on myxomycetes; their laboratory cultivation and factors influencing rhythmical fruiting.

George Kenneth Green (Ph.D. in physics, University of Illinois, 1937). To work at the University of California. Subject: The scattering of charged particles at high energies.

Arthur Feodor Hagner (Ph.D. in geology, Columbia University, 1938). To work at Columbia University. Subject: Fundamental studies of the montmorillonite group of clay minerals.

Dick Wick Hall (Ph.D. in mathematics, University of Virginia, 1938). To work at the University of Pennsylvania. Subject: The structure of true cyclic elements and the properties of sets under pointwise