U. S. Department of Agriculture on "Environmental Conditions Favorable for Orchid Culture."

THE dedication exercises of the Administration Building of Bellevue Hospital, New York, were held on September 11. Dr. S. S. Goldwater, commissioner of the department of hospitals, presided. The speakers were Dr. I. Ogden Woodruff, representing the Medical Board; Dr. William F. Jacobs, medical superintendent; Mrs. Henry James, president of the Board of Managers of the Bellevue School of Nursing; Colonel E. W. Clark, commissioner of public work, Federal Works Agency; Hon. Irving V. A. Huie, commissioner of the department of public works, New York, and the Hon. F. H. LaGuardia, mayor of the city.

THE New York Medical College and Flower and Fifth Avenue Hospitals will receive $242,531, the residue of the estate of Mrs. Helen S. Case, who was the wife of the late Major James F. Case, mining engineer.

THE Rockefeller Foundation of New York City has made an appropriation to the Iowa State College of $21,000 to be used over a period of three years for work under the direction of Professor J. W. Gowen, of the department of genetics, on bacterial wilt of corn and mouse typhoid.

THE Illinois Institute of Technology, Chicago, has for the academic year 1940–41 received two fellowships of $900 for graduate study established by Universal Oil Products for work in the catalytic laboratory under the direction of Dr. Vasili I. Komarewsky.

THE General Education Board, New York, has given the University of California Institute of Child Welfare a grant of $61,700 for the continuation of studies on the mental and physical development of children.

Museum News reports that the collection of the Daniel B. Dyer Museum, which occupied four rooms in the basement of the Kansas City Public Library, has been assigned to the Kansas City Museum as a result of a decision by the circuit court. The collection was in custody of the Board of Education, which asked to be relieved of the trusteeship. The material transferred comprises American Indian, including mound builder and cliff dweller, material; Mexican and Oriental objects; Spanish-American war material; coins and medals; small fossils; minerals; glass, china and copperware.

DISCUSSION

APPARENT SPLITTING OF LIGHT FROM FLUORESCENT LAMPS BY REFLECTION FROM THIN PLATES

ATTENTION was recently directed to the apparent splitting of light from fluorescent lamps by moving objects.[1] This phenomenon was attributed to the intermittent emission of light of different wave-lengths. The latter characteristic has been described in detail by Fonda[2] and by Thayer[3] upon the basis of the time intervals between the mercury discharge and the different periods of excitation and decay of the "phosphors" coating the tube. A qualitatively different kind of splitting of this light has been noted incidental to the use of an oscillometric device consisting of a microscope slide separated by a thin wedge of air from a glass cover slip.[4] When pressure is applied to the thin slip the wedge is diminished in thickness so that on being viewed in ordinary white light from such sources as the sun or incandescent lamps colored interference bands or Newton's rings are seen. If the light is filtered through colored glass the interference bands are somewhat more clearly evident. When, however, the device is illuminated by light from fluorescent lamps still greater sensitivity is secured in that lesser increments of applied pressure are required to produce the first visible bands. On close inspection a double set of bands can be recognized. One of these varies with alternations of pressure; the other remains constant. The variable pattern is produced by the changing distances between the reflecting surfaces. The fixed pattern is produced by the cover slip alone, the slide showing no separation of the light. The production of interference patterns by reflection of ordinary white light is recognized only with much thinner plates, *viz.*, of the magnitude of oil films and soap bubbles. In contrast, the comparatively thick plates, glass cover slips from approximately 0.10 mm to 0.18 mm (No. 0 to No. 2), show definite patterns in fluorescent light. The bands produced by illumination from the "Daylight" lamp are red, yellow and blue. The bands are broad and few in number with the thin slips and comparatively narrow in number with the thicker slips. When viewed from comparatively larger angles and distances, microscope slides show similar colored bands. The general contour of the patterns is comparable to that produced by reflection of light from the sodium flame. Similar phenomena are recognized with other thin materials. For example, sheets of mica exhibit colored patterns consisting of wide bands, and Cellophane reveals on close examination fine streaks of color due to the irregular thickness of the

[1] C. Wesler Seull, C. G. Grosscup and E. G. Witting, SCIENCE, 91: 357, April 12, 1940.
[2] G. R. Fonda, SCIENCE, 91: 476, May 17, 1940.
[3] R. N. Thayer, SCIENCE, 91: 524, May 31, 1940.
[4] C. Wesler Seull, *Jour. Lab. Clin. Med.*, 24: 753, April, 1939.

film. The appearance of interference colors by the comparatively thick plates in fluorescent light is due, not to the intermittent flashing, but to the discontinuity of the spectral quality of the components of the light. The latter, *viz.*, that of the mercury discharge and of the various "phosphors" have individually fairly limited spectral ranges. The patterns are comparable to those which would be produced by the mixture of a few essentially monochromatic lights. It is apparent that illumination by fluorescent lamps provides a convenient means for estimating the relative thickness and the optical regularity of the reflecting surfaces of thin plates. It is further evident that such lamps provide a readily available source of light for interferometric devices.

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EXISTENCE OF ONLY ONE VARIETY OF CULTIVATED MANGOSTEEN EXPLAINED BY ASEXUALLY FORMED "SEED"

THE luxurious flavor, beauty and texture of the fruit of the mangosteen, *Garcinia mangostana,* makes it, in the opinion of most people who know it, the best of the tropical fruits. A great deal has been published about this Asiatic species, especially concerning the difficulty which in general is attributable to poor root growth of growing plants through the juvenile stage.

Examination of the normal shriveled anthers in many flowers from two 37-year-old trees at the Puerto Rico Experiment Station of the United States Department of Agriculture has shown no pollen to be present. These female trees are reproduced through "seed" without the presence of the functional male flowers that are borne on separate trees, none of which exist in Puerto Rico. Backer[1] in 1911 stated that male flowers of the mangosteen had nowhere been found during the last hundred years. Descriptions of the male flowers that were, nevertheless, dated during that one-hundred-year period[2,3] or more recently[4] have been studied. Backer's description[3] is admittedly based upon Roxburgh's, and that of Ochse also corresponds closely to Roxburgh's. Thus it appears that all are based upon Roxburgh's description. Whether that was made from living or herbarium specimens is not indicated. Backer's statement that male flowers had not been found within one hundred years leads, therefore, to the assumption that Roxburgh's description was probably based upon herbarium, not living, specimens. Study of these descriptions leaves no doubt about the male flowers being distinct from the female flowers of the Puerto Rican trees.

About half of the fruits produced by these trees have well-developed "seeds," each fruit rarely having more than one. A longitudinal section of this "seed" shows a structure much different from that of the normal dicotyledonous seed. The "seed" formation in the cultivated mangosteen is asexual. Sprecher[5] explained this freakish asexual reproduction mechanism in the mangosteen and called it apomixie. As he describes it, the adventitious embryo that develops to form the "seed" originates from a cell in the epithelium of the ovary inner integument. The reproduction is thus distinguished from nucellar budding that occurs in the apogamic reproduction in the mango and in Citrus. As the cell of the inner integument develops into a papilla and further to form the seed the nucellus and the embryo sac become nonfunctional. Similar adventitious embryony has been observed by Hegelmaier in *Allium odorum.*[6] Sprecher called the "seed" a hypocotyl-tubercle. According to him and Pierre[7] no traces of radicle, stem or cotyledons are present in the "seed." A similar structure has been observed at the Puerto Rico Experiment station in "seeds" of *Rheedia brasiliensis* and *R. macrophylla.*

Descriptions of mangosteen fruits from Java, Malaya, Trinidad and elsewhere conform precisely to the fruits produced in Puerto Rico. It would therefore seem that different varieties of the cultivated mangosteen do not exist. Fairchild,[8] traveling extensively in the Tropics studying the mangosteen, has stated that there are apparently no varieties of this fruit tree; seedlings everywhere bear curiously uniform fruits. Burbidge[9] in 1887 saw in British North Borneo what he considered a native form of the mangosteen. Fruits of this differed from those of the cultivated form, being 4-carpellate, each carpel having a well-developed seed, while in the cultivated form there are from four to eight carpels, rarely more than one or two of which develop "seed." Wester[10] describes the Jolo mangosteen as being rather larger than those of Singapore and Saigon and as having a thicker rind. Its flesh, too, is more acid and has more character than the milder flavored fruit of the Malay Peninsula

[1] C. A. Backer, "Schoolflora voor Java," p. 91. Batavia: N. V. Boekh and Visser and Company. 1911.

[2] William Roxburgh, "Flora Indica," 2: 618–620. London: Parbury, Allen and Company. 1832.

[3] C. A. Backer, "Flora van Batavia," pp. 84–85. Batavia: G. Kolff and Company. 1907.

[4] J. J. Ochse, "Fruits and Fruitculture in the Dutch East Indies," pp. 53–54. Batavia: G. Kolff and Company. 1931.

[5] M. Andreas Sprecher, *Rev. Gen. Bot.,* 31: 513–531. 1919.

[6] F. Hagelmaier, *Bot. Zeitung,* 55: 133–140. 1897.

[7] M. E. Pierre, *Bul. Mensual Soc. Linn. de Paris,* 1: 350. 1882.

[8] David Fairchild, "Exploring for Plants," p. 392. New York: The Macmillan Company. 1930.

[9] F. W. Burbidge, *Gardeners' Chronicle,* n. s., 21: 23, 1884.

[10] P. J. Wester, *Philip. Agr. Rev.,* 13: 50, 1920.