

DR. FRANCIS PEYTON ROUS, of the Rockefeller Institute for Medical Research, New York, delivered the fourth annual Barnard Free Skin and Cancer Hospital Lecture before the St. Louis Medical Society on November 17. His address was entitled "The Nearer Causes of Cancer."

THE one hundred and twenty-fifth annual meeting of the New York Academy of Sciences for the presentation of the annual reports and for the election of officers will be held on Tuesday evening, December 15, in the Roosevelt Memorial Building of the American Museum of Natural History. Addresses will be made by Dr. Frank Baldwin Jewett on "The Mobilization of American Scientists for War" and by Dr. Igor I. Sikorsky on "Direct Lift Aircraft."

THE sixty-ninth meeting of the American Astronomical Society under the presidency of Dr. Joel Stebbins will be held at Dearborn Observatory, Northwestern University, on December 28, 29 and 30.

THE U. S. Civil Service Commission announces that there is special need for workers who have basic training in economics, sociology and statistics. Salaries range from \$2,000 to \$6,500 a year. Information in regard to these positions can be obtained by addressing the U. S. Civil Service Commission, Washington, D. C.

A SCHOLARSHIP in chemical research at McGill University has been established by the Gottesman Foundation of New York. It is open to any British or United States graduate of a recognized university, and is valued at \$800 a year.

THE American Optical Company at Southbridge, Mass., has been awarded the E production emblem of the Army and Navy.

AT the request of the Internal Security Division of the office of the Provost Marshal General in the

War Department, a special course in "Plant Protection Engineering" is being given by New York University at its Washington Square Center. It is aimed to provide intensive training in methods of maintaining safety and security in industrial plants engaged in producing war materials. The course will be attended by some forty inspectors employed by the War Department in the various Army service commands in the East under its plant-inspection program, which is directed by Colonel A. B. Johnson, of the Internal Security Division.

AFTER the publication of Volume V, Number 4 (December, 1942), the *Journal of Geomorphology* will suspend publication for the duration of the war. This step is necessary, much to the regret of the editors, because the war has resulted in the loss of almost all foreign subscriptions and has made it impossible to secure, from either American or foreign scholars, sufficient manuscripts of high quality.

THE Board of Trustees of Stanford University has voted to accept as first-year students, beginning with the opening of the winter quarter on January 5, a limited number of highly competent students who have qualified for the senior year in high school. This plan will permit boys and girls 16 and 17 years of age to have at least one year of college life and work before being called to military service and will give the university an earlier opportunity to secure for the military and other war services young people qualified in such technical fields as medicine, engineering, chemistry, physics, mathematics, military science, industrial management, bacteriology, nursing, geology, mining, foreign languages, government economics and nutrition. All curricula will be coordinated with the needs of the Army, Navy and other governmental services and particularly with the requirements of the post-war world.

DISCUSSION

THE PRODUCTION OF SALTPETER IN THE SOUTH DURING THE CIVIL WAR

THE recent paper by Dr. Eisenschiml on "The Chemist in Three Wars" is interesting and timely, but it contains one minor error which should be corrected. He states that during the Civil War saltpeter was mined from "deposits in limestone caverns near Columbia, Charleston, Savannah, Augusta, Mobile and Selma";¹ but caves are not found in the vicinity of these cities.

The saltpeter used in the manufacture of gunpowder for the Confederate Army was obtained through a special agency, known as the Niter and Mining Bureau, with Colonel I. M. St. John as its

¹ Otto Eisenschiml, *SCIENCE*, 96: 348, 1942.

chief. Dr. Joseph LeConte, then professor of chemistry and geology at the South Carolina College, was appointed chemist for the bureau with the rank and pay of major. LeConte states that it was his business to "test all nitrous earth whether from caves or niter beds," and that he "visited all the niter caves in northern Georgia, Alabama and Tennessee, all the niter beds in South Carolina, Georgia and Alabama, and the iron mines and blast-furnaces at Shelbyville, Alabama."²

Nitrates were found in the caves of Virginia, Kentucky and Tennessee, chiefly in the form of calcium nitrate. Bat guano and other organic material ac-

² "The Autobiography of Joseph LeConte," p. 184, New York, 1903.

cumulating in the caves underwent bacterial decomposition with the formation of nitric acid which reacted with the limestone to form calcium nitrate. The calcium nitrate was leached from the cave earth with water, and the resulting solution allowed to percolate through wood-ashes where a reaction took place between the calcium nitrate and potassium carbonate with the formation of potassium nitrate. During the first World War, Thomas L. Bailey explored the caves in the eastern part of Middle Tennessee for the State Geological Survey in order again to determine the value of the caves as possible sources of niter.³

The "niter beds" visited by LeConte are also referred to as "niter plantations" and "nitriaries." The largest nitriary, according to Colonel St. John, was located at Columbia, S. C., with 45,000 square feet of surface under cover of open sheds. Here, 122 laborers were employed with 12 horses and 13 mules.⁴

Beds of manure and other nitrogenous animal refuse, loosely piled in contact with wood-ashes derived from oak trees, were periodically moistened with urine. The sheds protected the beds from rain while permitting ready access of air. Decomposition resulted in the formation of ammonia, which, through oxidation, was converted into nitric acid. The nitric acid in turn reacted with the potassium carbonate of the wood-ashes to yield potassium nitrate. The important role played by bacteria in this process for the formation of nitric acid was not discovered until several years after the close of the war. One group of bacteria brings about the formation of ammonia from organic matter, a second group oxidizes the ammonia to form nitrous acid, and a third group oxidizes the nitrous acid to nitric acid.

Some nitrate was also obtained from the earth under tobacco barns, smoke houses and other buildings.

The importance of the nitriaries is evidenced by the fact that the applications of officers of the Niter and Mining Bureau for transfer to field service were denied and by the fact that conscript labor was used to supplement the work of slave and volunteer labor.

STEPHEN TABER

GEOLOGY DEPARTMENT,
UNIVERSITY OF SOUTH CAROLINA

THE EFFECT OF DEHYDRATION UPON THE VITAMIN A CONTENT OF EGGS¹

TREMENDOUS quantities of fresh eggs are being dried for shipment to our armed forces and to our

³ Report on the Caves of the Eastern Highland Rim and Cumberland Mountains, "The Resources of Tennessee," VIII, 85-138, 1918.

⁴ Official Records of the Union and Confederate Armies, Ser. IV, Vol. 3, p. 698-9.

¹ Journal Paper No. 52 of the Purdue University Agricultural Experiment Station.

allies under the Lend-Lease Program. It is vitally important to know whether or not the nutritive value of eggs has been lowered during the dehydration process. Since vitamin A is one of the most labile food factors, a study was made to determine the effect of the dehydration process upon the vitamin A value of dried eggs.

The samples of fresh liquid and dried eggs were collected at a commercial plant which employed a Mojonnier spray drier. In order to minimize sampling error, samples were collected every half hour during a six-hour period from large batches of mixed eggs as the homogenized eggs entered the drier and from the dried eggs a few minutes later. From the samples collected on the hour, definite quantities of each sample were taken and made into one composite sample of liquid eggs and one composite sample of dried eggs. Similarly, the samples collected on the half hour were made into composite samples. In order to test the uniformity of sampling, spectroscopic examinations were made upon the two series of composite samples of liquid and dried eggs as well as upon the individual samples.

For spectroscopic observations, samples were saponified and extracted with ether. Determinations of absorption were made at 3,240 Å to indicate changes in vitamin A content and at 4,370 Å to indicate changes in total carotenoid content. The characteristic absorption curves of extracts from fresh homogenized and dried eggs were identical in the visible region and very similar in the ultraviolet. The drying process caused less than 2 per cent. loss of carotenoid and ca. 5 per cent. loss of absorption in the ultraviolet. These losses are comparable to the sampling errors, which were small. Losses during storage of both liquid and dried eggs at -18° C. for 14 weeks were no greater than those caused by drying.

For the biological assays, the composite samples of liquid eggs were broken down into weighed portions of 25 grams each which were stored at -18° C. until needed when they were diluted to 500 ml with one per cent. saline solution. The samples were assayed by the usual rat-growth method, using U.S.P. Reference Oil as a standard. The results of the biological assays indicated that little or no deterioration of the vitamin A took place during the dehydration. These samples compared very favorably on a moisture-free basis, with potencies of approximately 44 I.U. per gram.

S. M. HAUGE
F. P. ZSCHEILE

PURDUE UNIVERSITY AGRICULTURAL
EXPERIMENT STATION

THE PREPARATION OF HIGH-SCHOOL SCIENCE TEACHERS

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