SCIENCE NEWS

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PROTEIN AS A BY-PRODUCT OF ALCOHOL DISTILLATION

"MEAT" sandwiches without visible meat but rich in body-building proteins may result from a new process developed by chemists of the U. S. Department of Agriculture. A billion pounds of protein could thus be recovered annually by alcohol distillation from wheat. Equipment has already been designed for commercial production based on the process developed by Irwin W. Tucker, working under Dr. A. K. Balls, chief of the enzyme research laboratory of the department. Wheat is treated with sodium sulphite solution, a plentiful waste product of paper mills and other industries. The extracted protein clots and rises to the surface as a thick, yellow froth. When dried it looks much like dried egg white.

The protein is suitable for human consumption, especially when granular flour is used in the process. Its cost would be only about five cents a pound. Some look for the protein enrichment of bread, which would help make up for meat supplies that have been nearly cut in half. Cereal products could be similarly treated. Essential chemical products, such as casein, are also possibilities.

Meanwhile, distillers expect to use the solution that is left after the protein separation to replace barley malt, now the most expensive single ingredient of the alcohol distillation process. This, together with the protein by-product, will save the government $50,000,000 on the 500,000,000 gallons of war alcohol being bought from distillers annually.

After the war we may look forward to large-scale production of grain alcohol for synthetic rubber and other industrial products. Fully developed, the new process will cut former prohibitive costs of peacetime grain alcohol production by at least half. Some say it will pay for the production of the alcohol and then debate as to whether the protein or the alcohol is the by-product.

Production problems will also be solved by the Balls-Tucker discovery. Sticky gluten, extracted by the new process, has been gumming up distillation equipment, thereby forcing frequent shutdowns. In addition, the process reduces the distillation residue to a thin liquid which is much easier to dispose of than former wastes. Protein has heretofore been recovered at the end rather than at the beginning of distillation, and the product was good for little but livestock feed. The new, simpler process gives higher yields and the product is pure enough to be used in human food.

VOCATIONAL COURSES IN ENGINEERING

MORE than a million young men and women have received special training in engineering, scientific and technical subjects, to fit them for specific tasks in the armed services and in the nation's industrial war effort, according to the report of Dean A. A. Potter, of the Purdue University engineering department, speaking before the Lafayette, Ind., meeting of the American Society of Agricultural Engineers. This does not mean, however, that we have added a million engineers to our professional ranks. The courses given are to a large extent below college level, are designed specifically for particular ends, and do not lead to degrees.

"It is to be hoped," Dean Potter said, "that the experience which our engineering colleges have gained through the war training programs will be capitalized by them during the post-war period, not only in improving their regular programs of study leading to degrees, but also in establishing a large number of technical institutes all over the country with intensive practical programs closely linked to the needs of the industries in the communities."

There is an extreme need, he continued, for fully trained engineers, which is not being met by the present regular programs of the engineering schools. The National Roster of Scientific and Specialized Personnel estimates that 40,000 to 50,000 additional engineers will be needed during 1943 and that the potential college production during the current academic year is only 17,000.

Intensive efforts are being made to close the gap, which the speaker described. Thousands of young men in V–1 and V–7 classifications are being given special courses in a number of colleges, under Army and Navy auspices, and they will be given V–12 classification and assigned to continue their studies on completion of the preliminary courses. By streamlining the professional curricula, and by cutting vacations to a minimum, it is expected that a new supply of well-trained engineers can be brought out in much less than the conventionally required time.

One hitch looms: unless the present Selective Service regulation on deferment is changed to extend the period beyond July 1, 1945, "a serious gap in the continuity of supply of engineers will develop very shortly. In general, the needs of our war industries will not be fully satisfied unless an 'industry reserve' or some other scheme is set up . . . for the purpose of insuring an adequate supply of engineers."

BISMUTH AND RECOVERY FROM MALARIA

GIVING a bismuth compound with quinine may speed recovery in some cases of malaria, is suggested by Dr. Martin D. Young, Dr. Sol B. McLendon and Dr. Roy G. Smarr, of Columbia, S. C., in a report to the *Journal* of the American Medical Association. This report is based on paresis patients who were given malaria to cure their syphilitic condition, but it is stated that the combination of thiobismol and quinine "might be useful in malaria infections generally."

The bismuth compound seems to injure the half-grown vivax malaria parasites and reduce their numbers in the blood. As a result the drug eliminates the fever paroxysms which that brood of parasites would have produced. For patients of syphilis of the brain and nervous system, this means that the malaria given to cure their

syphilitic condition can be controlled to produce fever paroxysms every other day instead of every day. The daily paroxysms often tax the patient so severely that he can not continue the full course of treatment.

For curing the malaria, once its effect on the syphilis has been achieved, quinine is usually given. Quinine, however, frequently does not prevent the occurrence of the fever paroxysms for several days after it has been started. When the bismuth compound is given at the same time as the quinine, it prevents the paroxysm of the next day and after that the quinine controls the infection.

The bismuth compound used was sodium bismuth thioglycollate, known also as thiobismol. The studies were made at the South Carolina State Hospital, to which Dr. McLendon and Dr. Smarr are attached. Dr. Young is stationed at the malaria research laboratory at Columbia of the U. S. Public Health Service, National Institute of Health.

THE JAPANESE EARTHQUAKE

SEISMOLOGISTS of the U. S. Coast and Geodetic Survey reported after study of telegraphic and radio data transmitted through Science Service from a number of American and overseas observatories that the earthquake on Sunday, June 13, off the coast of Japan, was twins, with one shock at 1: 11.7 A.M. and the other at 4: 36.5 A.M., EWT. Both quakes started from beneath the same epicenter, which was in latitude 37.5 degrees north, longitude 142.5 degrees east.

This spot is in the Japan Deep, a "hole in the bottom of the sea" off the northeast coast of Honshu, the main Japanese island. It is possible that a tidal wave was caused. Such a wave was started by an earthquake under the same deep, but a few score miles northward of Sunday's epicenter, on March 2, 1933; it sent a 96-foot wave charging up narrow Ryori bay, and drowned out a number of fishing villages all along that coast. However, even if a big wave was started by the present double earthquake, it is not likely that material damage would be caused in the Tokyo-Yokohama industrial area, which is well to the south.

Another pair of earthquakes was reported from the China sea a few days before. Both occurred on Tuesday, June 8, but data from the remoter observatories were delayed in transmission. The first shock which started at 4: 42.2 P.M., EWT, centered in latitude 19 degrees north, longitude 116 degrees east. This is in the north central China sea, about midway between Luzon and the Chinese island of Hainan. The second occurred at 11: 06.7 P.M., EWT, and had its epicenter in latitude 9 degrees north, longitude 120 degrees east, in the northern part of the Sulu sea, in the southern Philippines. Both were strong shocks.

Stations reporting were the government observatories of Sydney, Australia, and Wellington, New Zealand; the Franklin Institute, Philadelphia; the Des Moines, Iowa, Observatory; the observatories of the Jesuit Seismological Association at St. Louis University and Weston College, Mass., and the stations of the U. S. Coast and Geodetic Survey at Sitka and College, Alaska; Tucson, Ariz.; Chicago, Ill., and Honolulu, H. T.

ITEMS

A NEW research laboratory, built at Akron, Ohio, at a cost of $1,325,000 by the Goodyear Tire and Rubber Company, is now ready for operation. It was dedicated at a two-day symposium on June 22 and 23, in which outstanding research workers representing many leading industrial and scientific laboratories participated. The laboratory building contains 74,000 square feet of floor space, and will house the activities of a large part of the Goodyear research staff, which at present comprises 125 chemists, physicists, engineers and metallurgists, along with some 400 others who spend full time on field work. Included in the equipment are such powerful research tools as an electron microscope, an analytical spectrograph and an infra-red spectrometer. All research work at present is of course devoted to winning the war. When victory comes, it will return to normal peacetime pursuits.

POTATO growers in parts of the country where length of season permits two crops a year to be produced are having difficulty in obtaining enough seed potatoes to put in the second crop. For their benefit, Dr. R. A. Jehle, state plant pathologist at the University of Maryland, suggests possible use of seed pieces from this year's early crop, chemically treated to induce them to sprout without waiting through the rest period usually required by seed potatoes. The treatment, first developed at the Boyce Thompson Institute for Plant Research in Yonkers, N. Y., consists in soaking the cut seed pieces for an hour in a solution of sodium thiocyanate, one pound of the chemical to 12 gallons of water. It is essential that the seed potatoes have a cut surface; whole ones will not respond.

CORN yields in bad years, when the weather is either too wet or too dry, can be materially increased by putting commercial fertilizer in the bottom of the furrow as the field is plowed, instead of spreading it broadcast as is now the practice. This discovery was made by agricultural engineers at the Indiana State College of Agriculture at Lafayette; it is reported in detail in the new issue of *Agricultural Engineering*. The problem, it is explained, was to get into place for most efficient use the second, or "sustaining" application of fertilizer. The "starting" fertilizer is already placed in strips at the right distance from the seed as planted. A mechanical attachment for use with plows has been developed, which drops the fertilizer at properly spaced intervals in every second furrow.

TEST periods for heavy-duty diesel lubricants have been cut from nearly three weeks to only a day by development of a new test engine. Success of a single-cylinder Fairbanks-Morse engine as a research tool was reported to the meeting of the Society of Automotive Engineers by H. L. Moir, W. J. Backoff and N. D. Williams, of the Pure Oil Company. Their tests revealed that ring-sticking or sluggish ring action caused more power loss than increased piston temperatures. Variations in ring-sticking time for each type of lubricant are reported due to differences in refining and sources of crude. Although some oils cause less ring-sticking, they may produce dirty pistons, so cleanliness also had to be considered in evaluating and producing heavy-duty type lubricants.