SCIENCE NEWS

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BIOLOGY, THE SCIENCE OF PEACE

BIOLOGY, unlike physics and chemistry, has not been heavily drawn upon in the service of war, Dr. Edwin Grant Conklin, president of the American Philosophical Society and of Science Service, pointed out in an address on March 1 given before the Science Talent Institute, attended by the forty topflight high school Seniors, in Washington to compete for scholarship prizes in the Second Annual Science Talent Search.

Biology is the science of peace, Dr. Conklin emphasized; it is the science of life rather than of death. Biologists have been left at their normal posts, to teach medical students and to carry on research in agriculture, nutrition and public health.

Dr. Conklin pointed out that "Biology is in times of war less applied than these other subjects, but it is no less important. Nothing concerns man so much as understanding life—his own life and that of animals and plants. The great lesson of evolution is not that we are descended from monkeys (which we are not), but the fact that all life, that of plants, animals and men, is fundamentally alike."

The speaker warned his young hearers against the heresy, too prevalent in the period between the two World Wars, that the chief aim of science is material success in war or in peace. He challenged them to produce from their ranks a new Darwin who will discover the unknown factors of evolution, a new Pasteur who will demonstrate the causes of cancer, a new Columbus of biology who will venture out on the dark unknown sea between the living and the non-living and find the connection between them.

VANADIUM IN ANCIENT OCEAN BEDS IN IDAHO AND WYOMING

DEVELOPMENT tunnels to tap a jackpot of the war metal, vanadium, are being driven into the canyon walls of Sublette ridge. This formation, running off the southeastern tip of Idaho into Wyoming, is the site of old ocean beds which it is estimated contain millions of tons of vanadium ore. From it comes the light gray metal used as a toughener for armor plate, guns, machine tools and other victory ingredients.

Discovered by the U. S. Geological Survey, the deposits will go far toward making the nation self-sufficient in this war necessity. Up to this time an important part of our vanadium came across submarine-infested sea routes from foreign mines, mainly in Peru. Utilization of the newly found deposits would free much needed shipping space.

More than two years ago phosphate miners in this region began to recover vanadium as a by-product without knowing of the richer beds which lay near-by. But about this time, W. W. Rubey, of the Geological Survey, searching for phosphate fertilizer, sent in some unimportant-appearing dark shales and mud-stones for analysis. Back came the report on vanadium—a much higher percentage than appeared in the phosphate rock itself.

Then came a tedious period of exploration and sampling. Along a gulch at the foot of Sublette ridge, the searchers came upon the long-abandoned diggings of an old fertilizer prospector. Here a vanadium-rich sample was found which led them to still others. Most of the better analyses seemed to come from one particular bed.

After Pearl Harbor the work was pushed with renewed vigor. Hundreds of old samples were reexamined. With this correlated data, Mr. Rubey again went into the field last spring to test his theory that a single workable vanadium bed of wide extent had been discovered.

Establishing a field laboratory, he took more samples and analyzed them on the spot. Engineers from the Bureau of Mines then came in to cooperate. Finally it was proved that the bed was vanadium-bearing nearly everywhere and its position was carefully mapped. The results were turned over to the Bureau of Mines, the War Production Board and the Metals Reserve Company for action. Secretary Ickes has banned speculative claim-staking to insure rigorous testing and proper public control of this important war project.

SOUTHERN PINE STUMP AND PINE OIL

PINE stump salvaging has become a profitable enterprise in southern states where reduction plants have been established to chew them up and extract their turpentine, resin and pine oil. The plants are working at full speed these days as the war activities use up their products as fast as they can turn them out.

Generally the stumps are left in the ground to rot if the land is to be used for another timber crop. They must be cleared if the land is to be used for farming. Leaving them in the ground or pulling and burning them wastes their valuable resinous and oil contents. Much experimental work has been done during the past two or three decades by the U. S. Department of Agriculture and by private companies interested in naval stores, to find a profitable method of extracting resinous contents for commercial purposes. Processes have now been simplified and a great expansion in the industry may be expected.

Before the stumps are processed they must be thoroughly dried. Usually they are left in the ground to dry. This may take several years. While drying important changes take place in the composition of their resinous contents. Then they are pulled with special machines, loaded on trucks and taken to the mill. They are washed free of all earth in long troughs through which they are dragged on an endless chain in a stream of running water.

The next step is their mastication. They are ground in drums with heavy cutting blades that crush, cut and chew them into small pieces. In another machine they are further shredded into tiny chips. What was once an ungainly stump is now a mass of very small pieces, and ready for the treatment necessary to extract the oil, turpentine and resin. The extraction is accomplished in large tanks, some of which will hold as much as 15 tons

of the chips. The tanks are sealed and the contents treated with a solvent—benzole, naphtha or other petroleum product—which is steam-heated and forced in under pressure. The solvent mixes with the tiny chips and takes up the resin, turpentine and oil in solution. When the process is completed the liquid is drawn off and the resin-free wood is used for fuel under the boilers of the plant.

The liquid solution is first cooled. A resinous pitch settles which is easily separated. It is sold to foundries where it is used as a core binder. The remaining liquid is separated by distillation. The petroleum solvent is evaporated off first, as it has the lowest boiling point. It is reused. The turpentine is evaporated off next, then the pine oil. The resin is left in the retort, from which it is drained as a heavy fluid that hardens as it cools.

Longleaf pine and slash pine stumps are used in these processes. There are some nine or ten well-equipped plants operated in the country. The uses of turpentine and resin are well known. Pine oil is used in the manufacture of textile sizes, disinfectants, liquid and industrial soaps, and in a variety of sprays. It is used also as a flotation agent in recovering metals in copper refining.

NUTRITIONAL STANDARDS

RECONSTRUCTION in the postwar world, and advances to new achievements in civilization and culture, will depend to a very considerable extent on a high nutritional standard—higher than was ever known in prewar ways, according to Dr. Frank G. Boudreau, executive director of the Milbank Memorial Fund, who spoke at the mid-winter meeting of the American Philosophical Society.

The advantages of abundant nutrition over just-sufficient feeding have been repeatedly demonstrated, both in sociological field observations and in controlled experiments, Dr. Boudreau pointed out. Even with animals the results are beyond argument. Colonies of laboratory rats, descended from long lines of sleek and well-fed ancestors, immediately showed improvements in health, vigor and longevity when they were given extra feedings of vitamins and other health-making factors. As negative evidence, Dr. Boudreau cited the cultural stagnation of the late middle ages and early modern times, when famines occurred on the average of seven times in a century, keeping whole populations hungry as much as a tenth of the time.

If we are to move forward into the gleaming civilization that forward-looking statesmen see for us beyond the present smoky horizon, we shall have to see to it that the American people, to say nothing of the rest of the world, receive far better nutrition than the average American prewar diet represented. Prewar consumption, on the basis of careful studies by the Food and Nutrition Board of the National Research Council, showed some astonishing lacks, for a people who boasted themselves the best fed in the world. From the diet designated by the National Research Council studies as best adapted, the following deficiencies were noted: 59 per cent. in leafy green and yellow vegetables, of 45 per cent. in milk, 28 per cent. in citrus fruits and tomatoes, 25 per cent. in beans, peas, and nuts, 17 per cent. in eggs, 14 per cent. in tomatoes, 4 per cent. in meat, poultry, and fish, and 2 per cent. in flour and other cereals. There was an excess production of 8 per cent. in butter and other fats and of 15 per cent. in sugar.

To right this, even for the United States alone, will require a reorientation of our agriculture that is not much short of a revolution.

ITEMS

EVIDENCE that luminous hydrogen gas is streaming from a faint star known to astronomers as HD 242257 in the constellation of Auriga, the Charioteer, at the rate of 1,200,000 miles an hour, has been obtained by Dr. Paul W. Merrill, of the Mount Wilson Observatory. If the sun were expanding with the same speed it would swell to the size of the earth's orbit in three days. The evidence is based upon photographs of the spectrum of the star taken with the 100-inch reflecting telescope. Dr. Merrill suggests that possibly forces are at work in the atmosphere of the star similar in nature to those that cause sudden eruptions of vast clouds from the surface of our sun. "So far as I am aware, no other star except a nova is known to be surrounded by an atmospheric shell of hydrogen expanding at so tremendous a rate," said Dr. Merrill.

WAR plane output is being speeded by the production of aircraft parts by thousands of factories scattered throughout the country. These converted plants are assisted in their war work by the use of standard specifications distributed by the Society of Automotive Engineers. The specifications include precise engineering instructions covering processes and materials, types, qualities and tolerances. They have enabled widely separated plants to turn out standard aircraft parts which on the assembly line in the warplane factory are used in the assembling of the completed plane. Metallurgists and materials engineers representing the aircraft industries, and Army and Navy officials cooperated in writing the specifications. Some 283 specifications have been completed. Others are in preparation. Nearly half of those originally issued have been revised to meet newer aircraft specifications.

ABOUT 36,000 residents of Washington, D. C., most of them employees of the Federal Government, have been vaccinated against smallpox since last December, has been announced by the District of Columbia Health Department. About 10,000 of these vaccinations were given by physicians of the health department and the rest by the medical staffs of various Federal and District agencies. The outbreak of smallpox in near-by Pennsylvania stimulated the current vaccination drive, but Dr. George C. Ruhland, health officer of the District of Columbia, is still urging that all persons living there who have never been vaccinated should take this health protection immediately. The reason is that Washington is the crossroads of the world in war activities. People are coming not only from the entire nation but from all over the world, many of them from regions where vaccination against smallpox is not practiced, and this increases the danger to unvaccinated persons there. No case of smallpox has been reported in that city in the past 10 years.