SCIENCE NEWS

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EFFECT OF THE GOVERNMENT ECONOMY MEASURE ON SCIENTIFIC EXPERTS

PALEMON H. DORSETT, veteran plant explorer for the U. S. Department of Agriculture, is one of the men whose expert services are lost to the government through the provision of the economy bill calling for compulsory retirement of those who have reached retirement age. Another outstanding scientist who must give up his vital research is Dr. H. H. Kimball, of the U. S. Weather Bureau. Dr. Kimball is an expert on atmospheric circulation, radiation from sun and sky and other phases of meteorology.

Among other important men lost from the scientific staff of the U. S. Department of Agriculture through forced retirement are: Senior Agriculturist Isaac W. Hill; Senior Agriculturist Henry C. Henricksen; Dr. Oliver L. Fassig, chief of the division of climatology at the Weather Bureau; Dr. Albert Hassel, senior zoologist in the Bureau of Animal Industry; Dr. Robert A. Ramsay, chief of the tick eradication division in the Bureau of Animal Industry, and many other forecasters and veterinarians—fifty-one in the professional service of the department.

The U. S. National Museum loses Barton A. Bean who has made a special study of the fishes of the Atlantic coast especially of Florida and the Bahamas.

The Bureau of Mines loses an assistant economic analyst, Jefferson Littleton, Marius R. Campbell, a geologist with special knowledge of coal testing and valuation, leaves the Geological Survey, as do also Dr. Edward O. Ulrich, geologist and paleontologist, and Frank C. Schrader, specialist on the physiography and mineral resources of Alaska and the western United States.

Three other men from the Geological Survey have been retained for one month by executive order of the president so that he might have a longer time in which to consider whether they should be kept in the service. These are the chief geologist, T. W. Stanton; John M. Nickles and S. J. Kubel.

A few of the scientists affected by this provision of the economy bill have been kept in their places by special order of the president. These include Professor Charles F. Marvin, chief of the Weather Bureau, and Dr. William J. Humphreys, and Dr. Isaac M. Cline of his staff. The Smithsonian Institution retains Dr. Walter Hough, Dr. Leonhard Stejneger, William H. Blackburne, head keeper at the National Zoological Park, and J. N. B. Hewitt. The Geological Survey keeps Dr. David White.

AVIATION RESEARCH

THE National Advisory Committee for Aeronautics will proceed with their scientific research in 1933 with no extraordinary curtailment of funds. Receiving something over one million dollars for such work in 1932, their budget will be encompassed by $850,000 this year, despite some opposition in the Senate, chiefly that of Senator James Couzens, Republican, of Michigan.

Senator Couzens feels that the experiments are conducted chiefly for large aviation companies. Senator Hiram Bingham declared that the Army and Navy requirements were the chief concern. He declared that the laboratories at Langley Field, Va., were the best equipped in the world. He emphasized that a group of young engineers and scientists are being trained in a highly technical manner to solve the special problems of aeronautics. Of the amount spent by the government on aviation, Senator Bingham said, only one per cent. went to research, "to assure the soundness and future safety of this investment."

Between the years 1927 and 1931, Senator Bingham noted, the Army has spent around $67,808,837 for aircraft, aircraft engines and accessories, and the Navy some $68,492,621. Close coordination of the research work in Army and Navy and National Advisory Committee for Aeronautics laboratories, insured no duplication, argued the Senator from Connecticut, himself a world war officer in the air corps and an enthusiastic friend of aviation.

Senator Couzens, however, made it plain that he was not opposing the aeronautic research work *per se*, but only because he thought that the chief influences behind the determination to maintain the appropriations for this work were commercial concerns.

IMPROVED FILMS FOR AMATEUR MOVIES

FINER grained photographic emulsion developed for recording sharp images of distant stars has allowed the commercial perfection of an eight millimeter amateur motion picture film that takes four pictures upon the film space of one ordinary amateur 16 millimeter movie frame.

Although experimentally perfected, the new type amateur motion picture camera, film and projector has not yet been put on the market by the Eastman Kodak Company in whose laboratories it has been developed.

The quadrupling of the number of images on a foot of film is accomplished by running a 16 millimeter film through a special type of camera twice. The camera takes twenty-five feet of film and is sufficiently small to fit into the coat pocket. The first time through one half of the width of the film is exposed. Then the film is changed from one reel to the other and the other half is exposed. Each picture taken is only half the depth of an ordinary 16 millimeter film image. Twenty-five feet of the new film will therefore contain as many pictures as a hundred feet of the conventional amateur movie film and will run four minutes.

When the film is processed it is split down the center and the two pieces spliced end to end. Fifty feet of film, eight millimeters wide with perforations down one side, is delivered to the amateur photographer who must utilize a new eight millimeter projector in showing it.

The new eight millimeter movies are made possible by very fine grained sensitive photographic emulsion that

resulted from a series of developments, among them the making of special films for astronomical use. The development of "koda-color" amateur movie film, the research striving for sound film that does not distort, and the commercial production of supersensitive 16 millimeter movie film, also contributed to the perfection of the new movies.

High optical and mechanical precision is necessary in the eight millimeter movie apparatus. The fast anastigmat lens of the camera is the size of a small pea, but is made of three pieces of glass each separately ground on each side with extreme accuracy.

The film image of the new eight millimeter movies is less than a twentieth of the area of the professional 35 millimeter movie film image.

CONTROL OF YEAST GROWTH

A POTENT chemical which seems to control and make possible the growth of yeast has been discovered in a wide variety of living materials by Dr. Roger J. Williams, biochemist in the University of Oregon. In a report given to the American Chemical Society, it appears that a yeast plant will not grow, even when given its full quota of sugar, phosphate, salt and other fundamental materials needed to build new structures, unless the special growth substance be present. This substance does not seem to belong to the so-called vitamin class.

Yeast was chosen because it grows rapidly, and, further, because its progress may quickly be reckoned by count of the simple cells under the microscope. For some years biochemists have vaguely understood that certain organic material, called "bios" fostered the growth of yeast. The investigations of Dr. Williams indicate that a relatively simple chemical, contained in the "bios" and elsewhere, is the real operating principle. While the substance has not yet been isolated in crystalline form, its behavior in purified solution indicates that its formula is less bulky than that of common sugar. While part of its chemical structure shows that it is like sugar, other reactions show it to be a weak acid.

Extracts were made of animals from each great division of zoology, including such diverse creatures as crabs, worms and oysters; and of plants as well. In every case the growth principle appeared, and was carefully separated from other material by electrolysis. Each time the purified extract caused yeast to grow prosperously on otherwise barren mineral food. Dr. Williams has been unable to find any type of animal from which he can not isolate the growth promoter.

The universal presence of the substance suggests the possibility that a single chemical may normally be in control of the greatest single life process. Until a precise chemical analysis reveals its exact structural formula, one can hardly gain even the first clue to the method by which it works. In the meantime there seems to be little cause for concern about the supply of the substance for either the baby, the puppy or the chick—as long as each of these young creatures eat most any natural food.

DYSENTERY IN RURAL AREAS

PEOPLE living in rural areas are in greater danger from the threatened epidemic of dysentery in the veterans' camp than residents of the District of Columbia or of other cities, in the opinion of health officials. This is because rural areas generally lack the sanitary facilities and careful protection of food and water supplies that metropolitan areas enjoy.

Dysentery is an intestinal disease. It may be caused by bacilli or germs, or by certain animal parasites called amebae. The amebic variety is generally found in the tropics and occasionally in southern United States. Epidemic dysentery in temperate zones is generally caused by bacilli. In the present outbreak, one case of bacillary dysentery has been reported to the District of Columbia health department and it is thought that the other, unofficially reported cases are probably of the same type.

Dysentery is spread through the intestinal discharges which carry the germs of the disease. Unless these are disposed of in a sanitary manner and drinking water protected from them, the germs will be ingested by healthy people who in turn may contract the disease. In primitive life, and to some extent in rural areas of civilized countries, water for drinking is taken from sources which may easily be contaminated in this way. Food may also be contaminated by unclean food handlers and by flies, both of which may carry the germs mechanically from intestinal wastes to the food.

The outbreak of dysentery in the veterans' camp is not unexpected. Surgeon General Cumming, of the U. S. Public Health Service, on June 11 called the sanitary facilities at the camp "entirely inadequate and dangerous" in a warning to health officers throughout the country that epidemics might follow the route of the men when they returned to their homes. The country towns and farm settlements of the near-by states, Maryland and Virginia, are thought to be particularly menaced.

THE FAT CONTENT OF TUMORS

THE more severe, malignant tumors of high killing power, such as cancer, contain a much higher percentage of fatty substances than the less malignant tumors, Dr. Morio Yasuda, of Tokyo Imperial University, and Dr. W. R. Bloor, of the University of Rochester School of Medicine and Dentistry, have reported to the American Society for Clinical Investigation. Their report, published in the current issue of the society's *Journal of Clinical Investigation*, is based on chemical analyses of various kinds of human and mouse tumors made at the University of Rochester.

The tumors analyzed were divided into three groups according to degree of malignancy, so far as this could be estimated. In the first group of less malignant tumors the various fatty substances, such as phospholipids, cholesterol and neutral fat, were present in low percentages. These tumors included the types known as fibrosarcoma, neurofibroma, fibromyoma of the uterus and colloid adenoma of the thyroid gland.

The two malignant groups, containing a high percentage of fats, included human carcinomas, or cancers, of stomach, pancreas, breast, uterus and colon, and mouse carcinomas. Some of the tissues upon which the human tumors were growing, such as uterus muscle and colon tissue, were also analyzed, and found to have a much lower percentage of fatty substances than the tumors or cancers.

Other investigators who hope to aid in the solution of the cancer problem by chemical studies have reported similar findings since the original report of the Rochester scientists. These are the German group, R. Bierich, A. Detzel and A. Lang and a French investigator, Le May.

SEED BRIQUETTES

PLANTING forests by the brick instead of by the tree is a new method of forestry developed in Norway, according to Professor Svend Heiberg, of the Department of Silviculture of the New York State College of Forestry at Syracuse, who recently returned from Europe where he had been studying reforestation methods under a scholarship of the Charles Lathrop Pack Forestry Trust.

The seed bricks, or briquettes, Professor Heiberg states, are made of good soil and are 1½ by 1½ inches in size. Three or four seeds are placed in one end near the surface. The briquette is then dipped in paraffin except the side in which the seeds have been placed. The result is an easily transported product, which can be placed in the ground by means of a special instrument designed for the purpose. A machine can turn out 16,000 of the briquettes in a day. Professor Heiberg suggests that the idle lands of the United States may be reforested by planting briquettes instead of trees. He states:

"Tree seeds have followed ice cream and fuel into the form of the briquette and possibly many agricultural crops will be planted in the future in this way. We have been experimenting with the new system of planting at the college but have not had sufficient time to make any absolute determinations. The method, however, seems practicable for comparatively clear land. On land where there is considerable heavy growth this system might not succeed, as the young trees must start as seedlings in their permanent location. It requires a tree three or four years old to compete with heavy brush, grass and weeds and the briquettes would not be practicable for three- and four-year-old trees as the briquettes would have to be so much enlarged that they could not be handled economically.

"In the reforestation of comparatively clear fields," Professor Heiberg continues, "the briquette system will do away with tree nurseries. It has other important advantages. It permits the root system to develop normally and also avoids disturbance of the roots at the time of planting. It also makes possible reforestation work at almost any season of the year. It is only necessary to place the briquettes in the ground and let nature do the rest."

ITEMS

THE force of gravity in the area between Rapid City, S. D., and across Wyoming to the Yellowstone National Park will be studied by a joint geological expedition during the next ten to twelve weeks. Geodesists of the U. S. Coast and Geodetic Survey will make precise determinations of the variations of gravity along profiles extending from Rapid City to the Yellowstone Park. A group of university geologists will cooperate by selecting the points at which observations are to be made. Professor Rollin T. Chamberlin, of the University of Chicago, Professor Walter H. Bucher, of the University of Cincinnati, and Professor W. T. Thom, Jr., of Princeton University, comprise this group.

SUGAR is the means of saving plants from drought, thickening their sap so that the sun and the winds can not pull all the water out. This is indicated by physiological researches reported by Dr. I. Vasiljev, of the Institute of Plant Industry, at Leningrad. Experimenting with wheat plants under varying conditions of drought, Dr. Vasiljev found that as drying proceeded, increasing amounts of starch and other insoluble carbohydrates were converted into sugars. When water conditions improved the process was reversed and the sugars again became insoluble carbohydrates of more complex structure.

HILDA BLACK KIFER and Hazel E. Munser, of the U. S. Bureau of Home Economics, report in the *Journal of Agricultural Research* that three varieties of spinach, Virginia Savoy, Princess Juliana and Viroflay, each of which has a different kind of leaf, one being dark green, one pale green and one bluish-green, and each having different degrees of curliness of leaf, had the same amount of vitamin A and B and nearly the same amount of vitamin C, judging from feeding tests on a small number of white rats.

THE idea that cortin, the vital hormone of the adrenal cortex gland, is a substance that is necessary for general well-being was supported by experiments reported by Dr. Frank A. Hartman, of the University of Buffalo, one of the group of experimenters who showed a few years ago that this extract effectively rescues from premature death patients suffering from Addison's disease. Dr. Hartman spoke at Syracuse before the meeting of the American Association for the Advancement of Science. Dr. Hartman finds that cortin is necessary for the maintenance of normal metabolism, growth, resistance to toxins and kidney function. Studies on neurotic sheep show that they become normal when injected with cortin, and success in treating the nervous sheep led to equally positive experiments on normal human beings which showed that cortin is necessary to brain functioning and smooth operation of other higher nervous centers. Cortin also enhances sexual activity, prevents fatigue and builds up resistance to cold. Dr. Hartman predicted that the hormone would prove to play an important part in the operation of other parts of the body.