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OIL CHEMISTS HEAR ABOUT INDUSTRIAL RESEARCH PROBLEMS.

(By Science Service)

Release Wednesday, May 18.

Chicago, May ----. Governmental scientific research should be organized so that each investigative unit deals with a given field of work or a certain commodity, not a theoretical or didactic division of pure science or economics, Dr. C. L. Alsberg, chief of the Bureau of Chemistry of the U. S. Department of Agriculture, told the convention of the American Oil Chemists Society here today.

"While chemistry, botany, biology and the other sciences must each be utilized in tackling a certain problem, they must be blended and used together," he pointed out. "Neither can research in applied science be organized under the theoretical divisions of the economist, such as agriculture, transportation, trade or commerce."

Industry will receive even greater practical benefit than now from technical research, whether governmental or private, if the investigations are organized according to practical divisions of the industries themselves, he told the chemists who control and devise processes for extracting and refining edible and technical oils and fats used in foods, drugs and the industries.

Rancidity, that yearly spoils a large number of fatty food products, has been found to be a chemical change or alteration in the composition of fats due to the action of the oxygen of the air, Robert H. Kerr of the Bureau of Animal Industry of the U. S. Department of Agriculture, told the oil chemists, today. As a result of investigations just completed it has been found that the action of the air is promoted by several accessory factors, chief of which are heat, light, moisture, and contact with certain metals, notably copper and zinc.

"Rancidity can be absolutely prevented by complete exclusion of air and can be delayed by avoiding exposure to air under conditions favorable to oxidation," he declared.

FIND TNT AND WAR GAS IN CONGRESS-- BUT IT'S CHEMICAL EXHIBIT.

(By Science Service)

Washington, May ----. Bottles of TNT, nitroglycerine, phosgene war gas and deadly mustard gas were discovered in the Caucus Room of the House of Representatives Office Building today by representatives and senators.

Detectives were not called in. There was a rush toward the deadly chemicals, rather than away from them.

It was found that uniformed officers of the Chemical Warfare Service and scientists from the National Research Council had installed an exhibit to show the need of fundamental chemical research and how synthetic organic chemistry enters into nearly all of the things that are used in modern civilization from the drugs that cure and the perfumes that please to explosives and war gases that destroy.

The genealogies of many of the important drugs, gases, explosives and dyes were given on four large charts decorated with bottles containing the actual substances.

Members of Congress were shown the drugs that are aiding in the curing of dread diseases and told how these were made by the chemist's rearrangement of the atoms in the molecule. Pleasanter and more powerful flavors and perfumes than nature herself can produce were shown. A model of miniature buildings showed that the first steps in the crude and partly finished materials used in the manufacture of the drugs, dyes, explosives and gases were the same, and that even the plants used for peace time activities of the chemical industry can be quickly converted into gas and explosive plants.

CONFERENCE CONSIDERS GREAT
SHORTAGE OF WATCHMAKERS.

(By Science Service)

For use Wednesday afternoon or Thursday morning, May 18 or 19.

Washington, May 18.- Means to remedy the great shortage of watchmakers in this country will be considered at the Horological Conference to be held here tomorrow and Friday under the auspices of the National Research Council. A survey of the situation just made shows that there are about 4,000 expert watchmakers too few, and that there are only about 10,000 to supply the factories and the 25,000 jewelry stores of the country

"As was shown during the war when many expert watchmakers were drafted for use as fine mechanics for scientific instrument making, the watchmaking industry is of great importance during a war emergency," Dr. H. E. Howe of the National Research Council points out, in explaining that the conference will probably take the first steps toward the establishment of a National Horological Institute, which by working in close agreement with the trade, schools and government will establish the standards of the horological work in this country in the same way as the national institutes of Switzerland and England.

As a means of overcoming the scarcity of watchmakers, most of whom up to now have come from abroad, there will be considered the possibility of providing curricula in the public manual training schools that will interest the students in becoming fitted for watchmaking. The conference will also discuss the relation to the general situation of higher schools at which the skill and knowledge necessary for the exacting work will be acquired.

"Watchmaking will soon be a profession, not a trade," declares George W. Spier, curator of watches of the National Museum and prominent jeweler of this city. The feasibility of certifying watchmaking and how this may be accomplished is to be considered, and steps toward the giving of degrees in horological engineering will be discussed. Schools for the teaching of watchmaking are fast causing the apprenticeship method of learning watchmaking to be abandoned, and the proposed linking of the public school system with the teaching of this work will doom the unnecessarily long days of apprentice learning. Among those interested in the education and increase of interest in watchmaking who will speak at the conference are: John J. Bowman, Director, Bowman Technical School, Lancaster, Pa.; A. T. Westlake, Dean, Horological Department, Bradley Polytechnic Institute, Peoria, Ill.; F. C. Daniel, principal of the McKinley Manual Training High School, Washington, D. C.; R. T. Fisher and Robert J. Fuller of the Federal Board for Vocational Education, Washington, D. C.; E. F. Lilley, dean of the New England Jewelers' Institute, Milford, Mass.; W. T. Bawden of the U.S. Bureau of Education, Washington, D. C.; and W. Calver Moore, of the Keyston Publishing Co., Philadelphia. Watch manufacturers and the trade will be represented by Robert F. Nattan, editor of the "Jewelers' Circular", New York City; E. A. March, of the Waltham Watch Co., Waltham, Mass.; Tell B. Nusbaum of the Hamilton Watch Co. Lancaster, Pa.; and Ferd. T. Naschka, Tiffany and Co., New York City;

\$50,000,000 AVAILABLE ANNUALLY
FOR SCIENTIFIC RESEARCH.

(By Science Service)

Washington, May .- Information about funds available for scientific research has been compiled by the Research Information Service of the National Research Council. From this compilation it appears that there are hundreds of special funds, trusts, or foundations for the encouragement or support of research, in the mathematical, physical and biological sciences, and their applications in engineering, machine, agriculture and other useful arts. The income from these funds, which amounts annually to at least fifty million dollars, is used principally for prizes, medals, research scholarships and fellowships, grants and sustaining appropriations or endowments.

So numerous have been the requests to the Research Council for information about sources of research funds, availability of support for specific projects and mode of administration of particular trusts or foundations, that the Research

Information Service has created a special file which it is proposed to keep up to date in order to answer the questions of those interested in such funds. Furthermore, in order to give wider publicity to the immediately available information about research funds, the Council has issued a bulletin under the title "Funds available in 1920 in the United States of America for the encouragement of scientific research."

Inquiries concerning the bulletin or for information about research funds should be addressed to the National Research Council, Information Service, 1701 Massachusetts Avenue, Washington, D. C.

GALLS, OR PLANT DEFORMITIES,
CAUSED BY 1500 INSECTS.

(By Science Service)

Albany, N. Y., May .- Galls or plant deformities that often take fantastic shapes and a few of which are edible or valuable as products of commerce are produced by about 1500 American species of insects and mites, according to investigations made by E. P. Felt, State Entomologist of New York, whose laboratory is here at the State Museum.

These galls occur rather commonly upon a large variety of plants, especially oaks and willows, and he has found that they may affect all parts of the plant such as the fruit, flower, leaf, twig, branch, stem or even the root. As a rule each species produces a characteristic deformity.

"The galls vary from hard, woody distortions of branches to beautiful, flower-like growths showing a marked contrast to the rich dark green foliage of the bald cypress or the delicate colored, wooly growth of the wool sower", says Mr. Felt. "This latter is a modified bud development not uncommon on white oak and with its beautiful creamy white, red tinted fibers is one of the most attractive objects in nature. Some gall insects affect the plant to such a slight extent that a scarcely appreciable distortion or swelling results."

"A little less than one third of this large number of galls are caused by gall wasps, many of which are remarkable because of that strange phenomenon known as alternation of generations. That is succeeding generations are unlike. The parents and grand-parents are similar. Each generation produces characteristic galls and in some species the galls of one generation are on the leaf and those of the other on the root. The differences between the two are so striking that up to recently all have been regarded as distinct and the relationship existing between many of these alternate generations has yet to be ascertained. Although there is a large number of gall wasps, a very considerable proportion, some five sixths, live upon various species of oaks and cause such familiar deformities as oak apples and oak bullet galls."

"The gall midges, though less known than the gall wasps, comprise over one third of our gall makers and differ strikingly from gall wasps in that they occur on a much larger variety of plants, though willows and goldenrods are favorites with relatively large proportions of these exceedingly delicate and interesting flies. Some are important enemies of crops such as the Hessian Fly, the Wheat Midge and Pear Midge, though most species are comparatively harmless."

"The microscopic gall mites produce various deformations, usually hairy, of leaf and bud and among other things are responsible for the peculiar growths on certain trees known as witches brooms. These developments are caused by the mites killing certain buds and compelling the plant to develop a large number of shoots from the greatly stunted portion of the tree."

Mr. Felt points out that the story of the plant galls is by no means completed, since many are still unknown and the connections between different generations are for the most part unsolved mysteries. These abnormal growths may be found at all seasons of the year. This branch of Natural History is a most enticing field for the student of nature, since it is comparatively easy to find numerous galls and by no means difficult to learn something new in regard to the relations existing between these numerous insects and the plants they attack.

INSECTS MAY BE A FACTOR
IN TIPBURN OF POTATOES

(By Science Service)

Geneva, N. Y., May .- Investigators have long been in doubt as to the exact cause of the drying up of the tips and margins of potato leaves, generally referred to as "tipburn". This injury was usually thought to be due to a diseased condition of the plant until entomologists directed attention to the prevalence of certain small insects, known as leafhoppers, on vines affected with tipburn.

By means of careful field and cage experiments, the entomologists at the New York Agricultural Experiment Station found that the leafhopper, which commonly lives on the apple, migrates to the potato during June, and from then until frost the insect can be found in all stages from the egg to the adult.

From the fact that plants infested with leafhoppers showed characteristic tipburn, while nearby plants which were protected from the insect failed to develop tipburn, it was concluded that these insects were at least an important factor in producing the injury.

The number of leafhoppers was greatly reduced by spraying the plants with bordeaux mixture (bluestone, 10 lbs.; lump lime, 10 lbs.; and water, 100 gallons) either alone or with the addition of 60 lbs. of lime or 6 lbs. of lead arsenate paste.

GLASS OF "POP" BOTTLE WILL
FIZZ LIKE SOFT DRINK.

(By Science Service)

The fizzing, cooling soft drink and the glass of the bottle that contains it are much alike. Like the "pop", the glass contains dissolved gases, that will cause foam to form on the top. In fact, the drink and the bottle both have the properties of a liquid, except that the bottle is not fluid. When a bottle of pop is opened thus releasing the pressure, the liquid effervesces violently, owing to the rapid escape of the dissolved carbonic acid gas. Prof. Edward W. Washburn, Frank F. Footitt and Elmer N. Bunting, investigators in the ceramic laboratories of the University of Illinois, have found that ordinary glass behaves in a similar manner when treated in the same way. In an experiment a piece of clear glass free from bubbles was heated in a closed furnace until it was in a fluid molten condition. The pressure inside the furnace was then suddenly reduced by connecting the furnace to a large tank which had been previously evacuated with an air pump. On opening the furnace after it had cooled, practically all of the glass was found on top of the pot in the form of a large mass of white foam filled with countless tiny bubbles of gas. Analysis of the evolved gas showed that it consisted of oxygen, nitrogen and carbonic acid gas.

COLOR OF PEACH'S FLESH
FORETOLD BY FLOWER.

(By Science Service)

You may not be able to foretell the color of the chicken from the color of the egg, but you can surely tell the color of the flesh of a peach from an examination of its flowers. Just break open the greenish or reddish cone-shaped part of the flower, the calyx tube, to which the petals are attached. If the inside of the calyx tube is orange or salmon in color, the peaches on that tree will have yellow flesh; if the inside of the calyx tube is yellowish or greenish, the peaches will have white flesh. Why is this so? Well, it is just another one of those correlations that we see around us every day, like the Scandinavian with his customary fair hair and blue eyes, only in this case the horticulturist has made the observation and used it to advantage. That's all.

HOW OLD IS
A FISH?

(By Science Service)

You can tell the age of a tree by the number of annual rings it shows when cut across. Each growing season the tree adds on a new layer of wood to its circumference and each winter it ceases growing for a time.

Similarly the scales of a fish add to their outer margins each season. If you examine an individual scale carefully you will see wide bands representing the rapid growing period of spring and summer, separated by narrow, broken, darker bands, the bands of winter when growth and life are at an ebb.

In the case of the tree you can tell by the width and condition of a ring whether a particular season was one of plentiful rainfall or of drought. So from the bands on a fish's scales you can determine whether a particular summer of its life was favorable or unfavorable in warmth, food and other living conditions.

Different species of fish have very different lengths of life. The Pacific coast salmon spends two or three years at sea, comes to an inland lake to spawn and then dies before reaching the ocean again, whereas the carp and some other fish are reported to live as long as a century.

The scales of the longer living fishes may be much worn down from hard usage, but each year a new band of growth is always added on to the weathered edge.

CHAINS OF MONKEYS DO NOT BRIDGE RIVERS.

(By Science Service.)

Do you remember that interesting picture in your primary school geography showing a troupe of monkeys merrily crossing a river by the seemingly simple expedient of grasping tails and swinging themselves across in a chain? That interesting scene that has probably stuck in your mind all these years is fiction, originated in the seventeenth century, according to E. A. Goldman, of Washington, who has watched many monkey gatherings and expeditions in the tree tops in the tropics.

Lionel Wafer, a surgeon and explorer of 200 years ago, visited Panama and published many quaint accounts of the mammals there, and up to a few years ago his observations had been accepted as facts. But thorough investigations of today show him to be a candidate for Roosevelt's famous club of nature fakers.

Monkeys do not take to water very well and do not cross large streams, except possibly on drift wood, according to Mr. Goldman's observations and the authentic data of modern investigations.

TAPPING THE ENERGY OF ATOMS.

(By Science Service)

Nowadays everyone knows that the peculiar behavior of radium is due to the fact that its atoms disintegrate, setting free the large amount of energy which all atoms are supposed to possess inside themselves. The disintegration of radium is not controllable but goes on at a constant rate which man can neither increase nor retard. Ever since the nature of radioactivity has been understood it has been a dream of scientist and novelist alike that man would one day learn how to control atomic disintegration such as that of radium and how to utilize the vast stores of energy inside of atoms, stores so large that the total energy of the world's coal beds is tiny in comparison.

The first step toward realization of this great scientific dream was taken some months ago when Professor Rutherford announced that he had succeeded in shooting the nitrogen atom apart. When nitrogen was bombarded by minute but very rapidly moving particles of matter, the so-called alpha particles, a few of the nitrogen atoms broke up, giving out other tiny particles which proved to be hydrogen atoms. Professor Rutherford and Dr. Chadwick have now announced in a recent number of Nature (London) that this same experiment has been repeated successfully with the elements boron, fluorine, sodium, aluminum and phosphorus. In each case Hydrogen atoms are produced as they were from nitrogen. In the case of aluminum the velocity of the hydrogen atoms shot out is exceptionally great, suggesting that the energy set free by the disintegration of the aluminum atom is larger than in the case of the others.

It is a common mistake to suppose that extinct animals of long ago were generally larger than their modern descendants. Mammoths and mastodons were no larger than African elephants of today. Modern horses are bigger than extinct ones, and much bigger than the three-toed and four-toed ancestors of horses. Lastly, existing species of whale -- the sperm whale, the great rorqual and the whalebone whale -- are, so far as known, the biggest creatures that have ever inhabited the earth.

Many of the glowing gas-clouds in the heavens, known as nebulae, present shapes that have given rise to nicknames, used by astronomers as alternatives of the more formal catalogue-numbers of these objects. Among these are the Keyhole Nebula, the Crab Nebula, the Pinwheel Nebula, the Dumb-bell Nebula, the Owl Nebula, the Horse-shoe or Swan Nebula, the Whirlpool Nebula, the Omega Nebula, and the North American Nebula. The outline of the latter bears a rather striking resemblance to that of the North American Continent.

The smallest known member of the animal kingdom is the *Pleuromonas jaculans*, which lives in water. Specimens have been found as small as one-thirteenth thousandth of an inch in diameter. It has a kidney-shaped body and two little whip-like appendages, by means of which it swims.

What with atoms, electrons and war indemnities, the word "billion" comes in for pretty frequent use nowadays. It is, therefore, high time an international conference was called to settle the meaning of this word. American and French writers use it to mean a thousand million; English and German writers to mean a million million.

A pinhead contains something like 8,000,000,000,000,000,000,000 atoms. If one of these atoms were magnified to the size of the earth, each of the electrons of which it is composed would have a diameter of about 5 inches.

The city of Des Moines has the distinction of owning a fine astronomical observatory, opened in 1920.

Typhoid fever is a vanishing disease in this country, according to statistics gathered by the American Medical Association. In 68 large cities of the United States having an aggregate population of twenty-seven and one-third millions, there were 1,007 deaths from typhoid in 1920. This is equivalent to a rate of 3.7 deaths per 100,000 population. In 1910 the rate for the same cities was 19.6 per 100,000. In New York City the typhoid death rate in 1920 was only 2.4 per 100,000, and in Chicago only 1.1.

At the London Zoological Gardens a hippopotamus has been observed on two occasions to remain half an hour under water without coming to the surface for air.

Astronomers are preparing to make another test of the Einstein relativity theory, as it applies to the deflection of light-rays by gravitation, during the total solar eclipse of September 20, 1922, which will be observed from stations on islands of the Indian Ocean and in Australia.

Only two chimpanzees have been born in captivity, so far as known. The later of these happy events occurred at the New York Zoo on July 14, 1920.

A sculpture of the extinct dodo, dating from 1561, was recently discovered in the little island of Walcheren, Holland. It is the oldest known representation of this bird, which became extinct in the seventeenth century, and is believed to have been modeled from an actual specimen.

A Polar Research Institute is about to be established at the University of Cambridge, England. It will provide a place where the scientific results of polar expeditions can be worked up, where the manuscripts and log-books of such expeditions can be permanently deposited, and where information of all kinds relating to the polar regions can be accumulated for the use of prospective explorers and others. A museum of polar gear and equipment will eventually form part of the establishment.

According to the National Association for the Study and Prevention of Tuberculosis, at least \$20,000,000 is invested in the business of making and exploiting fake cures for consumption in this country, and the miscreants engaged in the business make a net profit of \$10,000,000 a year.

Whether the North American Wild Pigeon, or passenger pigeon, once so exceedingly common in this country that flocks of two billion birds were sometimes seen, is now entirely extinct is a mooted question. What was said to be the last survivor died in the Cincinnati Zoological Gardens in 1914, but encounters with wild specimens have been reported since that date.

In two regiments recruited during the war from two Gulf states, hookworm infection was found in 54 per cent of one command and 32 per cent of the other.

In addition to its enormous toll of fatalities, it is estimated, by Sir Bernard Mallet, that the late war diminished the number of births that would normally have occurred in the belligerent countries of Europe to the extent of 12½ million.

The English lady who, referring to our Civil War, attributed the lack of harmony between the North and South to the fact that there was "only a narrow isthmus between them" has found a rival. To the chief of the forthcoming Mount Everest expedition a feminine acquaintance remarked: "Oh, how very interesting your going to Everest! I hope you may get to the top, and then you may bring back a piece of wood from the Ark."

Rainbows vary greatly with the size of the raindrops in which they are formed. Large drops produce narrow and distinctly colored bows; small drops, broad and whitish bows. Lunar rainbows tend to be colorless on account of their feeble illumination, but brightly colored lunar rainbows are sometimes seen.

Conventional art still shows lightning of zigzag shape, but such lightning does not occur in nature. The flashes meander and branch, but do not make sharp angles.

The United States is still backward among civilized countries in the matter of vital statistics. Birth statistics are now available for only 22 states and the District of Columbia.

Insects do not grow after they have attained wings. Flies of several sizes may often be seen on the same window pane, but the sizes are no indication of their ages.