

respective neighborhoods for others that may still be bearing the disease.

The scouting and eradication campaign conducted by the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, has now reached impressive proportions. In the infested area, covering parts of Connecticut, New York and New Jersey a total of over 1700 square miles has been scouted to date, and specimens from more than 30,000 suspected trees have been collected and sent in to the laboratories for examination. About a third of these have received positive identification and the trees have been destroyed.

In all this work, the Federal forces are receiving full aid and cooperation from state and local authorities.

Science News Letter, September 7, 1935

CHEMISTRY

Increase in Research Projects Hints Economic Gains

INCREASING magnitude of chemical research is the latest sign pointing to improved economic conditions, Prof. E. J. Crane of Ohio State University, head of the American Chemical Society's international reporting system, announced that during the first six months of 1935 the number of research projects completed was ten per cent. greater than in the first half of 1934. Abstracts of chemical reports from all parts of the world totalled 20,342 this year, as compared to 18,664 during the first six months last year. A staff of 400 men scattered over the globe is required to keep the abstracts of chemical research up to date.

According to the latest figures available to the Society's committee on unemployment there are some 931 trained chemists without employment at the present time, and an additional 683 who have been driven out of the chemical work into other fields. This situation is not believed to be hopeless, despite the fact that the number of chemists was augmented by 5,800 college graduates during the years 1933 and 1934. It is the committee's belief that the major unemployment difficulty is among chemists over thirty-five years of age whose places are being taken by younger men.

Kansas City, Mo., will be the scene of the Society's ninety-first meeting in the spring of 1936, and Pittsburgh will welcome it for the ninety-second meeting in the fall of 1936. The spring and fall meetings of 1937 will be held in Chapel Hill, N. C., and Rochester, N. Y., respectively.

Science News Letter, September 7, 1935

GENERAL SCIENCE

Government Aid Demanded For Research in Pure Science

THE UNITED STATES Government, because of its failure to recognize the importance of sponsoring theoretical scientific research, is in danger of losing out in the race for fundamental discoveries upon which the future progress of the nation, industrially and otherwise, must depend.

A warning to this effect was issued recently by Dr. Roger Adams, President of the American Chemical Society in his presidential address before that organization's ninetieth meeting at San Francisco.

Dr. Adams said, in part: "Active participation of industry in the development of a national program of pure science to assure continued industrial progress is demanded, and the government should be a leader in this movement. The federal government, although it spends a staggering amount of money each year for applied research, at no time has shown a proper respect for research in pure science, even in its own bureaus."

To indicate the importance of theoretical research, Dr. Adams said: "The basic and fundamental information for over

ninety-five per cent. of our industrial processes has been originally discovered and described by university investigators in pure science."

Among countless examples he cited the development of the dye and aluminum industries, and the production of ammonia, X-rays, insulin, procaine and other anesthetics, war gases, rare gases such as helium for balloons or dirigibles and neon for illuminated signs, tantalum, an inexpensive substitute for platinum, and other substances such as titanium, tellurium, and gallium.

Among recent discoveries in pure science which are not yet but will some day be of importance to industry, he referred to heavy hydrogen and heavy water, and the many facts now being learned about the structure of atoms.

In conclusion he asked: "Is it not time to recognize the handicaps under which our scientific research in the United States has been accomplished and to seek the factors contributing to the improvement of pure science so it may be on a par with applied science?"

Science News Letter, September 7, 1935

ENGINEERING

Thin Aluminum Foil Highly Efficient as Heat Insulator

THIN aluminum foil is found to be a highly efficient heat insulator in experiments being conducted in the torrid heat of Egypt, where tests include the metal for use in tropical helmets, the linings of tents and corrugated iron buildings.

Dr. G. P. Crowden of the London School of Hygiene and Tropical Medicine reports his Egyptian tests (*Bulletin of Hygiene*, April).

Laboratory experiments showed that a single such diaphragm of aluminum foil medially placed in an inclosed one-inch air space has the heat-insulating value equivalent to that of one inch of cork. In practical experiments conducted in corrugated iron buildings in Egypt, the temperature on the inner surface of a 3-ply lining was 12 degrees Fahrenheit lower than that on the inner surface of

the corrugated iron; while in a similar building which was provided with metallic insulation of aluminum foil in addition to the 3-ply lining, the temperature of the inner lining surface was 23 degrees Fahrenheit lower than that of the inner surface of the corrugated iron, and the air temperature of the latter building was 3.6 degrees Fahrenheit lower than that of the first.

Interesting results have also been obtained with the use of aluminum foil as a lining for tropical helmets. Laboratory experiments showed that the temperature inside a helmet lined with the foil was as much as 20 degrees Fahrenheit lower than in an otherwise similar helmet but having the usual fabric lining.

Dr. Crowden also emphasizes the value of reinforced aluminum foil for use in lining tents in hot countries. Field ex-

periments conducted in England during the hot summer weather demonstrated the remarkable efficiency of this method of increasing the comfort of those housed under canvas. This method has also been used for the insulation of food stores, with efficiency and economy, and aboard ships for the insulation of corridors and

apartments in the vicinity of funnels.

In fact, it appears that reinforced aluminum foil can be used for insulation against heat or cold in a wide variety of ways, and this material has the advantages of being durable, cheap, easy to apply, and light in weight.

Science News Letter, September 7, 1935

CHEMISTRY

Chemist Sees Eventual Profit In Gold From Sea Water

A "MILESTONE" in the path leading to the commercial extraction of gold from sea water was the opinion of Thomas Midgley, Jr., chemist and vice-president of the Ethyl Gasoline Corporation, regarding the report of the new gold extraction process announced by Dr. William E. Caldwell of Oregon State College at the recent meeting of the American Chemical Society. Mr. Midgley said:

"Despite Dr. Caldwell's modesty in depreciating the advance that he has made in extracting gold from sea water, it is my opinion that this is one of the milestones on the path to progress that eventually will lead to the commercial

extraction of gold from sea water.

"Less than two years have passed since I made the statement at the American Chemical Society meeting in St. Petersburg, Fla., when the announcement was made that bromine was being commercially extracted from the sea for use in ethyl gasoline, that 'it is no more impossible to extract gold from sea water now than it was to extract bromine from sea water ten years ago.' The work of Dr. Caldwell and the recently announced proposal of Dr. Colin G. Fink of Columbia University to extract gold by electroplating it upon the propellers of ships carry science forward to its goal."

Science News Letter, September 7, 1935

CHEMISTRY

Government Chemist Less Optimistic on Ocean Gold

By DR. EDWARD WICHERS

Chemist, National Bureau of Standards

RECENT articles in scientific journals and in the public press indicate that speculation about the economic recovery of gold from the sea is again to the fore. The published reports, however, make one suspect that important evidence on the actual content of gold in ocean water is being overlooked or ignored. Of the numerous scientific investigations on this subject, the most thorough and comprehensive work is undoubtedly that of the late Prof. Fritz Haber and his associates, published in Germany in 1925 and 1927.

Before this work was done, the weight of the evidence seemed to indicate that ocean water contained 5 to 10 milligrams of gold per ton (5 to 10 parts per billion). Although it would be necessary, on this basis, to treat 1 to 2 tons of water

to get 1 cent's worth of gold (at \$35 per ounce), a process was developed by Haber which was thought to be capable of profitable operation. In fact, the work was undertaken with the hope that the inexhaustible supply of gold in the sea and in the Rhine might be used to rescue Germany from its post-war economic collapse.

Much to the surprise of Haber and his associates, their results showed that the average content of gold in the Atlantic Ocean is only 0.008 milligram per ton (about one-thousandth as much as previously supposed), that water from a certain part of San Francisco Bay contains about twice that amount, water from polar regions perhaps 5 or 6 times as much, and that an occasional sample of glacial ice, carrying detritus scoured from rocks, may contain a few milligrams of gold per ton.

[Editor's note: Recent technical articles and statements in the press by L. C. Stewart, W. H. Dow and Prof. C. G. Fink state that gold occurs in sea water of the Atlantic Ocean in concentrations of 2.3 parts per billion.]

The difference between current estimates of 2.3 parts per billion and the value found by Haber, which amounts to a ratio of 300 to 1, largely determines whether the economic recovery of gold from the seas is almost within reach or must remain a will-o'-the-wisp. Of course, no one can be dead sure that Haber's estimate is the correct one. On the other hand, there is no published work on this subject which can begin to compare with that of Haber and his associates (at least ten in number). Carried on, as it was, over a period of years, involving the assay of over 5000 samples, with the most minute attention to every conceivable source of error, stimulated by the glamorous hope that Germany might be financially redeemed, and directed by a thoroughly dependable scientific mind, this work may well be regarded as a classic of chemical research.

It would be well for all who concern themselves with this subject to refrain from further public speculation about it unless they are able either to successfully refute Haber's conclusions, or to show that the economic recovery of gold from water containing 1 part in 50-100 billions is even within the shadow of reason.

Since much of the recent speculation on the subject has been related to the Dow Company's bromine plant, a few calculations based on Haber's estimate of

● RADIO

Tuesday, Sept. 10, 3:30 p. m., E.S.T.
AMERICA'S EARLIEST MAN, by Charles Amsden, Secretary, Southwest Museum.

Tuesday, Sept. 17, 3:30 p. m., E.S.T.
SCIENCE IN TRANSPORTATION, by Dr. C. F. Hirschfeld, chief of research, Detroit Edison Company.

In the Science Service series of radio addresses given by eminent scientists over the Columbia Broadcasting System.

HIGHLIGHTS of MODERN KNOWLEDGE

Wheat without the Chaff of detail
Biological and Physical Sciences

For further information write
THE UNIVERSITY SOCIETY, INC.
470 Fourth Ave., New York, N. Y.