

CHEMISTRY

More Petroleum Than Drinking Water Used Here

THE United States uses twice as much petroleum as drinking water. Each day enough crude oil is pumped from the ground to cover Manhattan Island—twelve miles long and averaging a mile wide—to a depth of a foot and one half.

Thus did Dr. M. R. Fenske, director of the petroleum refining laboratory of Pennsylvania State College, describe America's enormous consumption of its oil resources.

Speaking before the New York Section of the American Chemical Society Dr. Fenske predicted that when the real nature of petroleum is finally learned by chemistry a vast field of new and unsuspected industrial uses will come.

He likened the future of petroleum to that of the "black troublesome" coal tar of a century ago which has become the basis of important dyes, explosives and drugs.

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METALLURGY

300,000 Pound Pressures Retard Alloy Hardening

WHY high pressures up to 300,000 pounds to the square inch help retard the rates of hardening in much-used industrial alloy metals is suggested by new research just reported by Dr. Leland R. van Wert of the Harvard Graduate School of Engineering.

Using pressures of 12,000 atmospheres, or 180,000 pounds to the square inch, Dr. van Wert found the aging rate was measurably slowed up by the squeezing force on the alloys. But the final metal hardness was not affected by the process.

During the hardening process in an alloy, it is explained, there is a migration of atoms of the alloying metal to strategic points in the atomic lattice work of the basic metal. The rate of aging depends on the rapidity with which these moving atoms can congregate or diffuse at these positions.

The accelerating effect of temperature on the process is supposedly the result of an increase in diffusion rate with the temperature rise, Dr. van Wert says.

"Thus it is conceivable that pressure's decelerating effect on aging comes about through interference with this diffusion

process. High hydrostatic pressures compress the metal lattice; conceivably the 'viscosity' of, and the difficulty of atomic movement within, the solid solution is proportionately increased. Diffusion then becomes slower and the age-hardening process is retarded."

Six alloys, commercial duralumin, three aluminum alloys, a lead-calcium alloy and an iron-nitrogen alloy, were subjected to pressure tests. Most marked effects were found on the lead alloy, with the aluminum alloys next. The iron-nitrogen alloy was not affected at all even under 20,000 atmospheres of pressure.

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METALLURGY

World's Purest Iron Helps Experts to Learn New Facts

THE PUREST iron in the world is now being made to help science learn more about highly important industrial metal, it was reported before the Metallurgical Advisory Board to the Carnegie Institute of Technology meeting at Pittsburgh.

Dr. Cyril Wells of the Metals Research Laboratory at Carnegie Tech told attending metallurgists of the unique iron, 99.95 per cent. pure, in which the last remaining impurities are present in not more than a few parts each per million of iron.

Now being made in a special furnace about three pounds at a time, the highly pure iron has been subjected to a variety of standard tests to learn its basic properties.

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GEOLOGY

Insects Made Rocks, Reported in Germany

WE HAVE long been used to thinking of coral-animals, clams and oysters as rock builders; great layers of stone laid down by massive deposits of their skeletons and shells are common throughout the world. But now insects come in for their turn at world-building honors. Prof. August Thienemann of the Kaiser-Wilhelm-Gesellschaft, describes extensive rock strata formed almost entirely from the limy tubes or cases secreted by the larvae of certain water-loving species of flies. (*Forschungen und Fortschritte*, Jan. 19).

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IN SCIENCE

HOME ECONOMICS

Probe Darkening Trait Of Cut Bananas

THE DEPRESSING experience—for a hostess—of seeing an array of fresh banana concoctions turn dark and sticky before reaching the table is getting attention of laboratory investigators.

Ways and means of retarding the darkening process, which begins about half an hour after cut bananas are exposed to air, have been tested by Dr. Mary de Garmo Bryan of Columbia University and Ethel Plotz. (*Journal of Home Economics*, February). They mention these points:

Riper bananas do not darken so quickly as less ripe fruit.

The sharper the knife, the lighter the slices will remain.

Cross-slicing is most satisfactory. Longitudinal slices darken readily, and crushed bananas darken fastest of all.

"Waxed paper and Cellophane were found ineffective as covers for containers filled with banana slices."

Banana slices immersed in grapefruit juice keep light almost indefinitely. Pineapple juice is almost as effective. Both these juices, fresh or canned, will restore color of cut bananas that have darkened from air exposure. Even dipping fresh-cut slices in the juice for 30 seconds will keep the bananas light for several hours.

A solution of cream of tartar and glucose was found effective in preserving color and firmness of cut bananas, for dishes in which the flavor of pineapple or grapefruit juice was not desired.

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ICHTHYOLOGY

American Crayfish Found in French Rivers

THE common American crayfish, or "crawdad," has appeared in French rivers. It first developed in large numbers in the Seine, and lately has also been found in the Marne.

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E FIELDS

MEDICINE

Chewing Gum Found Cause Of Asthma and Hay Fever

PERSONS sensitive to chewing gum are something new under the medical sun. Dr. A. I. Kleinman, Brooklyn, reports two cases in which sneezing, coughing and nasal and asthmatic symptoms have been traced to chicle, the substance that forms the base of all chewing gums.

Dr. Kleinman's report (*Journal of the American Medical Association*, Feb 9) brings evidence of "chicle allergy" to the attention of physicians for the first time. Probably other cases of sensitivity may now be traced to this offending substance, it is believed.

Chicle is the solidified sap from a tree that grows in Mexico and Central and South American countries. Chicle, sugar, corn syrup and flavoring oils are the ingredients of ordinary chewing gum. Medicated gums also employ chicle as a base.

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DENDRO-CHRONOLOGY

Oak Trees Reveal Medieval Dates in American Midwest

BY READING dates in tree rings from timbers of the Norris Basin of Tennessee, archaeologists have pushed the midwestern American tree ring calendar back to the Middle Ages—1315 A.D.

Thus, the archaeologists' dream of knowing exactly when Mound Builder civilizations flourished in the great Mississippi Valley is very near to being realized.

How this has been achieved was reported to the American Anthropological Association by Dr. Florence M. Hawley of the University of New Mexico.

Early in 1934, Dr. Hawley set out to construct a calendar of tree rings, hoping to date ancient Indian towns in the Middle West, as pueblos and cliff dwellings of the Southwest have been dated. In the Tennessee Valley, where timber is being cut in dam construction,

Dr. Hawley and her associate, Roy Lassetter, have been able to read dates in oak and cedar trees from modern times back to 1315 A.D. This is done by applying the principle that annual growth rings in trees vary in appearance from year to year, according to the water the tree receives. Very dry years, for example, produce very narrow rings. By beginning with current, known dates and examining older and older sections of trees, and overlapping series of rings that match, an expert can make a complete calendar.

In western Kentucky the tree ring calendar has so far been carried back to 1638, Dr. Hawley reported.

With a master calendar of tree rings, the archaeologists can match dated rings with similar rings found in timbers in Mound Builder ruins. Thus, they can learn the century, even the year, in which Mound Builder Indians cut down trees to build a house or other construction in a village.

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METALLURGY

Find Best "Spiegel" Is 5-1 Manganese-Silicon

THE BEST "spiegel," which sounds like a new breed of dog but is the steelman's name for alloys that help deoxidize iron ore in steel making, was revealed at the meeting of the Metallurgical Advisory Board to the Carnegie Institute of Technology.

Reporting on the culmination of eight years of steel research, F. N. Speller, chairman, and John D. Beatty, secretary of the Board, indicated that a spiegel, or silico-manganese alloy, in the ratio of five parts manganese to one part silicon proves to be best in freeing iron from the grip of oxygen in iron ore.

Dr. C. H. Herty, Jr., director of research of the Advisory Board, described how manganese and silicon release free iron from the reddish iron ore arriving at the steel mill.

Both manganese and silicon are needed in steel making to break up the iron ore molecules consisting of FeO, or iron oxide.

Manganese and silicon go after the oxygen in the iron ore, seize the oxygen atom from the iron ore molecule and yield iron atoms. The 5 to 1 ratio of the two elements was determined only after the long period of research. Better steel in all its varied uses is expected from the finding.

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PSYCHOLOGY

Rockefeller Funds Aid Human Behavior Studies

STUDIES of human behavior and projects relating most closely to world conditions of economic and political stress had first claim to the funds of the Rockefeller Foundation during 1933, it appears from a report of the Foundation's activities for that year just made public. The sum of \$9,890,806.31 was appropriated for various philanthropic projects during that year.

"In the fields of medical and natural science the major emphasis has been placed on the problem of mental health and on the development of those sciences whose advance is imperatively demanded to form the substantial scientific basis for the rapidly evolving modern science of man," states President Max Mason.

"In the social sciences the problems of economic structure and process, international relations, and community organization and planning have been considered of principal importance.

"The emphasis in the humanities has been on the encouragement of international cultural understanding and the preservation and interpretation of American culture.

"In the International Health Division, there has been increased attention to studies of disease in its environment, with closely related laboratory investigations.

"Early in 1933 a fund was set aside for projects having to do with the present national and world situation. The projects which have been supported fall under two general headings: studies providing for concurrent appraisal and studies furnishing a factual basis for improved planning of important sections of the recovery, relief, and reconstruction program; and undertakings involving the collaboration of private agencies in the prosecution of the emergency programs of the federal, state, and local governments.

"Another emergency requiring special funds was the displacement of eminent scholars in Europe for political reasons and the consequent interruption of important scientific work. Dealing directly with universities in Europe and America which wished to add these men to their staffs, the Foundation has contributed toward their salaries. The situation was an emergency; the solution of the problem is as yet temporary."

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