

Do You Know?

As oranges ripen, the juice volume and sugar content increase, while acidity decreases.

Truck traffic is increasing more rapidly than any other type of highway transportation.

Heated trucks for snow removal are being considered; the snow would be melted in them and emptied into nearby drainage openings.

The number of persons admitted to American mental institutions each year is nearly as large as the number who are graduated from colleges.

GENERAL SCIENCE

Criticize Attacks Made on Loyalty of Scientists

► FIVE member-societies of the Federation of American Societies for Experimental Biology passed resolutions criticizing charges against the loyalty of scientists. The resolutions were passed at the Federation meeting in Atlantic City.

The American Physiological Society warned that "the effect of such attacks is to discourage loyal scientists and other citizens from entering government service," and to "distract and intimidate" many now in the government.

Science News Letter, March 27, 1948

TECHNOLOGY

Assembly-Line Eating Is Invention of English Trio

► EATING in restaurants is put on an assembly-line basis by a highly mechanized beanery, the invention of a trio of Englishmen, T. M. Lewis, E. G. Rounce, and C. G. H. F. Dunham. Their design shows all the earmarks of the exasperation born of standing endlessly in line waiting for a table to be vacated by a group of lingerers over coffee and cigarettes who show no inclination whatever to give some one else his turn to get a meal.

In the new-type eating-place, seats are side by side on a slowly moving conveyor belt. In front of the diner is another conveyor belt which is the table. There may also be a traveling footrest so that the patron's toes won't drag.

You sit down on an empty seat at the head of the line, as it pops up from beneath. A waitress sets before you the

first course, which comes up on a dumb-waiter. You eat the first course as you are moved along. By the time you come opposite a second dumb-waiter, the second course appears in it; the waitress sets it before you and whisks away your empty dishes. Again you eat against time until you come opposite the third dumb-waiter, bringing up your dessert.

At the end of the run you vacate your seat. Or else.

It isn't wholly heartless and mechanical, at that. The inventors provide a lounge, where you may have your coffee and cigarette. But the next fellow does get a seat at the table.

U. S. patent 2,435,044 has been granted on this device.

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METEOROLOGY

Forecast Wave Conditions

Swell Forecasting Section had job of predicting sea conditions for amphibious landings during the war. They did "swell" job, Navy official indicates.

► THE story of a pioneering group of scientists who played an important but little-known role in the invasion of Normandy and in other amphibious landings in World War II was disclosed at a conference in New York on ocean surface waves held by the New York Academy of Sciences.

The group was known as the Swell Forecasting Section. These scientists had the task of predicting sea conditions for amphibious landings. They did a "swell" job, it was indicated in a report to the conference by Charles C. Bates of the U. S. Navy Hydrographic Office, Washington, D. C.

Early in the war, crude methods of forecasting wave conditions were developed. In 1943, military meteorologists were trained, and early in 1944, a joint Swell Forecasting Section was set up at the British Admiralty to make predictions of conditions in the English Channel as a part of the preparation for D-Day.

After the invasion of Normandy, wave forecasting continued and improved as an aid in the landing of troops and supplies. Mr. Bates said that relationships were worked out between the height of the waves and the tonnage of supplies unloaded and landing craft casualties.

Later the Swell forecasters were transferred to serve the British East Indies Fleet and the Southeast Asia Command. When the war ended, the scientists were completing plans for wave forecasting for the planned invasion of Kyushu, Japan.

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Wave Recorder Developed

► A new set of instruments which can record and analyze ocean waves at a point several miles offshore were de-

scribed at the conference by Arthur A. Klebb of the Woods Hole Oceanographic Institution, Woods Hole, Mass.

Developed under contract with the Navy's Bureau of Ships, the equipment is portable and boasts minimum power requirements. Wave studies of seaplane landing areas and harbors may be important uses for the wave recorder, the scientist suggested.

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CHEMISTRY

Ethyl Alcohol Could Help In Gasoline Shortage

► ONE WAY to save gasoline in coming shortages is to use ethyl alcohol with it, Dr. G. E. Hilbert of the U. S. Department of Agriculture told the National Farm Chemurgic Council meeting in Omaha, Neb.

Blending one gallon of ethyl alcohol and nine gallons of low-grade gasoline will make 10 gallons of premium grade anti-knock motor fuel, he said. Or using a small gadget that automatically injects a mixture of alcohol and water into the engine when it is under heavy load will let a truck driver take the hills in high instead of at five miles an hour.

The use of alcohol as a motor fuel is not new. However, it depends upon price. At present prices of grain, alcohol is too expensive, he stated. But alcohol can be made from farm wastes such as corncobs, and progress is being made in the development of a process to yield a cheap product. He cited work at the department's Northern Regional Research Laboratory, Peoria, Ill., of which he is director, in developing a fungal amylase that is produced by a mold that can be grown on distillers' stillage.

The amylase thus produced served as a substitute for the malt commonly used. This, he said, would lower the cost of ethyl alcohol about three cents a gallon.

A process developed at the laboratory for making alcohol from corn cobs was presented by Dr. Hilbert. It is the work of Drs. E. C. Lathrop and John W. Dunning. These studies are now being made on a semi-commercial scale. It

will be at least another year before full evaluation will be complete. It is not a question of being able to turn cobs into alcohol, he stated, but that of producing the alcohol at a reasonable cost. One of the largest cost factors is the transportation of the raw material. Another item is to find a profitable use for the by-products.

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ENGINEERING

Efficient Engines Needed

They need to be designed for better operation on the fuel produced. Closer cooperation is necessary between the automobile and the petroleum industries.

► **ECONOMY** in the use of gasoline demands full cooperation between the automobile industry and the petroleum industry so that engines will be designed to operate most efficiently on the fuels produced, the Society of Automotive Engineers was told at a meeting in New York by William M. Holaday, director of Socony-Vacuum Laboratories.

It is generally agreed that the refining industry must be expanded to handle another 1,000,000 barrels of crude oil per day in order to meet anticipated demands, he said. For fullest cooperation, the automotive industry must be fully acquainted with the fuel-production situation and steps that must be taken to satisfy expanded requirements.

The current domestic consumption is over 5,000,000 barrels of crude a day. Known reserves are larger now than at any other time, he declared. In addition, a potential productive capacity based upon the utilization of natural gas and coal gives added assurance of continued supplies of liquid hydrocarbon products.

The fact that significant increases in the octane number of motor fuels may be several years off, because of the necessary expensive construction, should not in any way impede the progress that the automotive industry can make in designing and producing engines and cars with improved performance and economy, he stated.

A critical examination of the manner in which antiknock quality is now utilized, and of the effect that various design changes may have on antiknock requirements will point the way to the goal desired by both the petroleum and the automotive industries, as well as the passenger car operator.

As a result of tests with cars, he suggested significant changes in engine de-

sign which would be effective in decreasing peak octane number requirements. They include a momentary decrease in spark advance at low speeds as the car is accelerated, improvement in intake manifolding to improve mixture distribution to the cylinders, the use of rich mixtures during high power operation, improved combustion chamber cooling, and use of water injection.

Mr. Holaday suggested a dual fuel system on autos, which would meter two fuels according to demand. One would be fuel high enough in octane quality to satisfy peak requirements during full-throttle operation, and the other a fuel of lower quality for normal cruising operations.

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PHYSICS

Supersonic Air Pressure Measured by Light Waves

► **LIGHT** waves have been harnessed for a new job. They are being used to measure the pressure and temperature of air moving at supersonic speeds through a glass-walled wind tunnel, Dr. Rudolf Ladenburg of Princeton University has revealed.

In these tunnels, tiny models of air-planes, wing sections or missiles are suspended and air forced through at high speeds simulating conditions encountered in flight. Light is passed through the tunnel from one side to the other, and also over the outside of the tunnel.

An instrument called a Mach interferometer, a new development in wind tunnel optics, is used to measure the air conditions. The device splits a beam of light into two coherent wave trains, one

of which passes through the wind tunnel and the other around it through a control chamber by means of mirrors. The two wave trains are recorded photographically, giving measurable optical effect.

In showing the action of a wing model on the air movement within a supersonic tunnel, what is called the "schlieren effect" has been used for several years. Dr. Ladenburg likened the schlieren effect to the glimmering above a pavement heated by strong sunlight due to air density changes.

The air movement, if traveling fast enough, builds up what are known as shock waves which seem to grasp the plane and hold it back. The shock waves can be photographed by schlieren photography. These are made by sending parallel rays of light crosswise through the tunnel above and below the model, and then into a camera.

The air in the shock wave is of a different density from that in other portions of the air flow and therefore refracts the light passing through it. When the light encounters the sensitized plate in the camera the refracted rays, no longer parallel to the others, make a record which is either a light or a dark spot.

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CHEMISTRY

Huge Metal Crystals Open New Field of Research

► **"SUPER CRYSTALS"** of metal created by University of Virginia chemists in Charlottesville, Va., are aiding research on surface chemistry which may help industry speed production or slow down corrosion.

Measuring up to one inch in diameter, the crystals are huge compared with millions of tiny crystals on the surface of ordinary metal. Because the sides of any crystal react differently to the same chemical process, the new, giant crystals are opening up a new field of research on metals.

From this study may come crystal faces on metals which are suited to special uses in industry. Thus, crystal faces with low reactivity might be used to reduce corrosion. Highly reactive surfaces might be developed to speed up reactions in the production of many products.

Dr. Allen T. Gwathmey, research associate in chemistry at the University, developed the "super-crystals" with the assistance of advanced students.

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