Do You Know?

Heavy fires sometimes injure *shade trees* seriously by "cooking" growing tissues.

The American *sweetgum,* in the fall, may have colors from yellow through gorgeous red and crimson to dark purple.

Overall production of *building materials* during the first half of the present year exceeded the record-breaking production of last year.

American cheese, nonfat dry milk, peanut butter, canned tomatoes, tomato juice and concentrated orange juice are a few of the *foods* distributed under the National School Lunch act of Congress.

Foresters are selecting seed for growing *trees* with the same care that farmers select seed for their crops; there are strains of trees that produce better wood than do other strains of the same kind of tree.

Pinkish tan-colored fresh and frozen *shrimp,* now on the market, are not spoiled common shrimp but are a species known as grooved or brown or Brazilian shrimp, which is now being taken in unusual quantities from the Gulf of Mexico.

AERONAUTICS

Radio Navigation System

➤ AIRCRAFT TODAY, with the newly designed Bendix radio navigation system, can tell exact position automatically while in flight, it was revealed in Cleveland at the National Air Races which include the Bendix long-distance event with a take-off from Long Beach, Calif.

A "fix" can be read by the pilot on a meter at any time and any place during flight as easily as the automobile speedometer is read, according to Howard K. Morgan of the Bendix Radio Division. Also new electronic devices used in Ground Controlled Approach apparatus aid landing with precision and safety, regardless of weather.

For higher speed aircraft, both in landing and in flight, the accent is on better and more reliable radio instrumentation and communication. Very high frequency (VHF) waves are replacing the low and medium frequencies long used. The advantage is static-free communication, which means that a pilot can understand communications from the ground while in storm areas, the time when he needs to hear best. Airports operated by the U. S. Civil Aeronautics Administration are being rapidly equipped with VHF apparatus. So also are the radio ranges which guide pilots along the air routes.

The new VHF Omni-Directional Ranges already installed by the CAA throughout the country provide facilities never before available in radio ranges. The design of the Bendix NA-3 Navigational System makes these available to the pilot with great convenience and reliability. The frequency range used eliminates not only the atmospheric static but also what is known as precipitation static caused by rain, snow or dust.

More communication channels are available in the Very High Frequency band than in the lower frequency band. There is less interference between channels since the transmissions do not extend beyond "line of sight" distances. The Omni-Directional Range is not limited to two or four courses, but will supply accurate information on any course to the station the pilot may select. This accounts for its name, Omni-Directional.

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CHEMISTRY

Oil Recovery Progressing

➤ BITUMINOUS SANDS of Alberta, a great untapped source of fuel oil and gasoline, are gradually yielding to research scientists trying to find an economical process for the extraction of their petroleum. The research is being undertaken both by the Canadian government and the Research Council of Alberta, located at the provincial university, Edmonton, Canada.

The so-called Athabasca tar sands are in a 10,000-square-mile area north of Edmonton. Estimates vary on their petroleum content but it has been placed as high as 250,000,000,000 barrels. There is no question regarding the possibilities of extracting oil from them; the problem is to find a way at a low enough cost.

A government-sponsored separation plant is being erected at Bitumount on the Athabasca river. It contains a hot water separation unit designed on the results of researches of the Alberta Council. The recovery of oil by the hot water separation process is from 80% to 90% from good grades of sand. Water-flooding of the sands in place is a promising method of oil recovery.

Work has continued during the past year on applicability of water-flooding to the bituminous sands, an annual report of the council, just issued, states. Measurements of the viscosity of the bituminous sand oil and of the viscosity-temperature relationship show that the viscosity decreases very rapidly as the temperature rises above 32 degrees Fahrenheit to about 100 degrees. It decreases slowly above 150 degrees.

It can be said with considerable definiteness, the council asserts, that the viscosity of the bituminous sand oil at formation temperature is too great for water-flooding, and that a successful application of this method of oil recovery will involve the heating of the sand beds, in place, to temperatures above 100 degrees.

Water under practicable pressures will flow through bituminous sand at 36 degrees Fahrenheit, and will displace oil. The flow of oil is small, however. At 150 degrees, on the other hand, the flow is usefully great and half the oil is displaced before the ratio of water to oil in the flow becomes unduly high.

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RADIO-ASTRONOMY

Meteors Enable Us To Hear Distant Programs at Night

➤ MILLIONS of tiny meteors entering the earth's atmosphere may be responsible for our ability to receive radio broadcasts from long distances during the night, states Dr. A. G. McNish of the National Bureau of Standards.

Radio waves, which travel in straight