

Do You Know?

America made 6,000 tons of *synthetic rubber* in 1941 and 700,000 tons in 1945.

A ready-mixed *paint* is now available that gives a close natural silver chrome finish.

Though *rayon* is indigestible to clothes moths it is eaten by silverfish, which are wingless insects.

A new magnetic alloy, called *silmanal*, is magnetized across its width rather than along its length; as a compass needle it points east and west.

Lespedeza, now regarded as one of the most valuable crops for forage, green manuring and soil erosion prevention, was known in the South a century ago as a "harmless weed"; its value has been appreciated only in the past 25 years.

The Para rubber tree, *Hevea brasiliensis*, is extremely variable in yield, especially in upper Amazon regions; because of this scientists believe that high producing plantations can be developed from selected cuttings.

SECRETS OF INDUSTRY

BY LEWIS C. ORD

Consulting Industrial Engineer, with large-scale experience on three continents.

Production methods that have cut millions from manufacturing costs. Shows how to simplify operations, eliminate unnecessary ones, cut out waste, slash paper work.

Ordered by foremost U. S. corporations* in large quantities, as "required reading" for department heads, engineers, executives, research men, board members, etc.

Combines common sense with latest "know-how," especially short cuts. READ AT NO RISK (see below)!

COMPANIES THAT DO—

- \$1,000,000 business annually, can save millions;
- \$1,000,000 annually, can save thousands;
- \$100,000 and less annually, can speed their growth, with best and latest methods used by the most successful industrial managers.

"Contains valuable practical information for all interested in the large and economical output of commodities."

—PRODUCTION ENGINEERING

* Bendix Aviation Corp., Aluminum Co. of Amer., Amer. Type Founders Sales Corp., etc., etc.

5-DAY
MONEY-BACK
GUARANTEE

PRICE \$3.00, POSTPAID
Emerson Books, Inc.

Dept. 601-C, 251 W. 19th St., New York 11

ELECTRONICS

Revolution in Radio

A television tube no bigger than a pocket flashlight, radio waves created at the rate of 5,000,000 a second and up among war developments.

➤ RADIO WAVES created at the rate of 5,000,000 a second and up, television tubes no bigger than a pocket flashlight yet almost able to see in the dark, and other wartime miracles of electronic communication were described before the meeting of the National Academy of Sciences by Dr. O. E. Buckley, president of the Bell Telephone Laboratories.

Dr. Buckley limited his discussion to radio communication, excluding radar and kindred devices as being too vast a field for brief description, and wire communications because they were not essentially different from systems in common use.

Although the basal network of wires handled the bulk of military communications, he said, revolutionary things had to be done with radio to take care of the highly mobile combat units, all the way from airplanes to foot-slogging infantry companies. And revolutionary things, accordingly, were done by the physicists and engineers whose business is radio.

The speaker described a new development known as velocity modulation. In this the electrons are sent out in bunches, instead of in a steady stream. This manipulation literally lifted the radio ceiling, making frequencies up to 5,000 megacycles possible. It was in this newly-opened-up realm of very short waves that the techniques of frequency modulation and pulse modulation were most usefully exploited.

In pulse modulation, Dr. Buckley explained, the signal is not carried on a steady band as in ordinary low-frequency radio, but on an intermittent band whose "breaks" come at almost unimaginably close intervals. One of the uses of pulse-modification radio was the transmission of multiplex telegraphic messages at very high speeds. A late development in pulse modulation was a portable antenna in the form of parabolic mirror mounted on a quickly erected tower, which gave highly directive transmission with signals of only two watts' power to a range of 20 miles. The beam could carry eight telephone conversations at the same time, or 18 printing telegraph circuits. Relays could extend the range apparently in-

definitely; tests carried it as far as 4,000 miles.

These intensely high frequencies and the very close adjustments they required called for great numbers of accurately-cut quartz crystals. More than 80 million crystal units for frequency control were made in this country, Dr. Buckley stated.

The great bulk of overseas communication was handled by telegraph, he continued. Transoceanic telephone conversations were largely limited to "contacts of high rank and urgency." Transoceanic radiotelegraphy was made much more reliable than it had been in prewar times. One device that helped greatly was the use of two receiving antennas separated by a few wavelengths. Since the fading out of radio signals is extremely unlikely to occur at both receiving points at the same time, the likelihood of legible signals is much increased, Dr. Buckley pointed out.

Science News Letter, May 18, 1946

SEISMOLOGY

Strong Earthquake West of Sumatra

➤ A STRONG earthquake shook the Indian ocean floor at a spot about 150 miles west of Sumatra at 20.4 minutes after midnight, on the morning of May 8. The epicenter was in the general region of latitude 2 degrees south, longitude 98 degrees east. There was a major earthquake very close to this locality on Dec. 28, 1935; it was in the same longitude, but 1.5 degrees nearer the equator.

Seismograph stations reporting by wire and radio were: New Zealand Observatory at Wellington, N. Z.; Dominion Observatory at Ottawa; observatories of the Jesuit Seismological Association at St. Louis, Georgetown and Fordham Universities and Weston College, and the observatories of the U. S. Coast and Geodetic Survey at San Juan, P. R., Tucson, Ariz., and Sitka and College, Alaska.

Science News Letter, May 18, 1946

A *synthetic wax*, based on German processes now released in America, is claimed to be as good as natural Carnauba wax obtained from the wax palm grown in Brazil.