

To forestall this misery, Dutch officials developed agriculture and industry until limits were virtually reached by 1930.

Inducing Javanese natives to colonize the less densely inhabited Outer Provinces of the Indies is the only other way out which officials have evolved. This colonization has the added merit, for the Dutch, of filling empty space, thus removing temptation from land-hungry Japan.

Seriousness of the situation is increased, the report points out, by vulnerability of

Netherlands Indies economy to changes in world trade. The richly endowed islands produce important quantities of rubber, tin, sugar, coffee, tea, cinchona for quinine, and other agricultural and mineral trade goods. But if trade demand falls, as it did during depression times, the islands are severely stricken.

"One hesitates to contemplate the situation," says the report, "if the extension of hostilities in the Far East should cut Java from Western markets, on which the actual lives of the natives depend."

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## INDUSTRY

## War Causes Shortage of Jewels Used in Watches

**W**AR in Europe threatens to cause a shortage of synthetic sapphires used as the jewels in fine American watches. These tiny bits of very hard material are essential as the bearing surfaces of pivots and other parts of watches, chronometers, and such scientific apparatus as balances and meters.

The supply from Switzerland, Germany and France, where they are made, has been cut off by the war. There is no American industry established because of the low cost at which the European manufacturers were able to furnish satisfactory watch jewels, the price being about a cent and a half each.

### Costume Jewelry Curtailed

Costume jewelry, largely made of synthetic gems and even cheaper glass imitations, is also being curtailed by the war.

It is known that at least one leading watch manufacturer has appealed to government agencies for help in meeting the shortage. An attempt may be made to establish an American industry to meet the need.

Since 1902 synthetic rubies and sapphires have been manufactured by the Verneuil process, which fuses alumina ( $Al_2O_3$ ) in an oxyhydrogen blowpipe to produce a substance that chemically is the same as the naturally-occurring rubies and sapphires.

Synthetic gems are chemically and physically identical with the natural stones, except for minor internal structure that does not affect their usefulness. Rubies or sapphires, either natural or manufactured, differ only in their coloring; red stones are called rubies and all others are

sapphires. The red of rubies is caused by chromium oxide in small amount; the blue of sapphires is due to iron or titanium. Synthetic white sapphire is the same as natural colorless corundum.

In the process of manufacture extremely pure, finely powdered alumina must be used. The fusing process results in a pear or carrot-shaped mass of alumina of from 300 to 400 carats. This boule, as it is called, is split into halves and then sawed into watch jewels and instrument bearings. The hardness of rubies and sapphires is 9 on the usual scale of hardness, ranking next to diamonds with a 10 rating.

The most important centers for the manufacture of the various types of synthetic rubies, sapphires and other gems are Locarno and Monthey, Switzerland; Annecy and Jarrie, France; and Bitterfeld and Zwickau, Germany. These plants are stated to have a daily capacity of 750,000 to 1,000,000 carats. Three-quarters of the output finds industrial use.

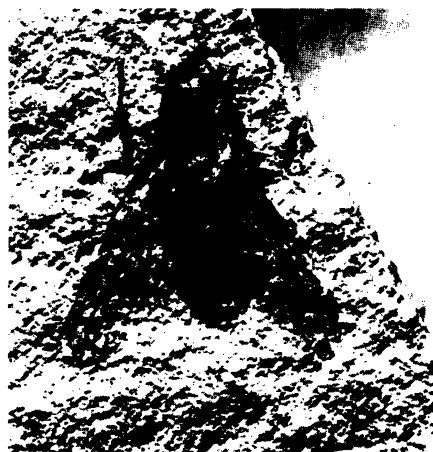
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## RADIO

### Television Relayed; Networks Now Possible

**B**Y MEANS of radio relay stations at two intermediate points, RCA television programs have been transmitted to Riverhead, Long Island, 70 miles from New York City. As a result of these developments, engineers state that it is now feasible to provide radio networks for television over wide areas.

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### FROM AN ANCIENT FLYTRAP

Millions of years ago, a fly fell into the soft mud on the edge of a lake in what is now the northern Caucasus region, in the USSR. Buried and hardened into stone, the insect's remains have just been brought to light.

## PALEONTOLOGY

### Fossil Insects Found In Russian Deposits

**F**OSSIL remains of insects that lived 13 million years ago in what is now the northern Caucasus region of the USSR have been found in large numbers by an expedition of the Russian Academy of Sciences. About 3,500 specimens have already been removed, it is reported by Tass, official Soviet telegraphic agency.

The finds were made near the town of Voroshilovsk. The region is arid and highly saline now, but in Miocene times there must have been abundant freshwater pools, for the insect fossils are those one would expect to find on the shores of summer ponds: flies, dragonflies, and a great many mosquitoes.

The soft, silty mud, which hardened into stone ages ago, must have been in exactly the right condition then to hold the insects it caught and to preserve the imprints of their bodies perfectly. Notable among the specimens collected are 60 butterflies, in which not only the wing-veins are in perfect condition, but the outlines of the scales with which the wings were covered.

Perfection of this degree, in fossil insects, has hitherto been found only in the rock strata of Florissant, Colo., and the region around Spokane, in this country, and in some of the great lignite pits near Halle, Germany.

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About 15% of a perfume is flower oil, as a rule.