

## METALLURGY

# Progress Reported

**Government announces new developments in production of war metals and quartz crystals and in the speeding of mapping from aerial photographs.**

► PRODUCTION of high-purity metallic manganese from low-grade ores, production of quartz crystals in Arkansas for use in military radio, new tests for boiler-damaging water, advanced apparatus for aerial mapping, and investigation of hundreds of suggested processes for aluminum and magnesium production are new war developments on the scientific front.

Manganese, strategic war metal, used to give steel greater strength and workability, can now be obtained in nearly pure form from the vast low-grade deposits in the United States. The process, developed by Stephen M. Shelton of the U. S. Bureau of Mines, and covered by government patents is now putting high-purity manganese into special alloys for war weapons.

Two other scientists in the U. S. Bureau of Mines, William C. Schroeder and Abraham A. Berk, have developed a device that should minimize boiler failures in war plants and railway engines. Testing of embrittlement cracking characteristics of water is improved by the instrument.

The "photoalidade" is helping to speed the mapping of many war fronts, thanks to the ingenuity of Ronald M. Wilson of the U. S. Geological Survey. Cameras used in aerial photography are set on a slant and Mr. Wilson's de-

vice measures the vertical and horizontal angles.

Following discovery of quartz crystal deposits of electronic grade existing in Arkansas, engineers are now blowing the tops off two mountains to uncover new sources. Hundreds of pounds of top-notch crystals have already gone into the production of war equipment, WPB's Office of Production Research and Development reported. A steady but small supply of crystals is expected to flow from the Arkansas beds as development proceeds.

The U. S. Bureau of Mines and the U. S. Geological Survey are exploring in a dozen more states. OPRD has seen to it that other experts and millions of dollars in equipment were sent to expand production in Brazil, source of most of our quartz crystals.

Even more important is the discovery of an improved method of cutting the crystals. Other studies have found uses for some of the less perfect crystals which were formerly discarded.

Sixty different processes for stepping up aluminum production have been studied; a half dozen have been approved by the OPRD for further development. They use high-silica bauxite of which the nation has heavy deposits and also make use of clays with heavy alumina content.

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the U. S. Geological Survey are now pushing exploration in these and a dozen more western states.

During the past year deposits of electronic-grade crystals also have been unearthed in Arkansas and hundreds of pounds of top-notch crystals have already been produced, put into war equipment, and sent on their way to fighting fronts.

Thousands of pounds of crystals—good and bad—have been brought to light. Although quartz had been known to exist there for decades—the beautiful, transparent, six-sided crystals being sold to tourists as souvenirs—industrial production was not considered until urgent war needs developed.

Further search revealed favorable territory just northwest of Hot Springs, 30 miles wide and 100 miles long, stretching in a westerly direction almost to the Oklahoma border. Further prospecting is expected to reveal hundreds of small workable deposits throughout this region for years to come.

## Much More Needed

Government mineral experts consider the Arkansas find as a reserve, however, and warn that our entire domestic production probably will be only a small part of the quartz crystals needed. Experts and equipment have recently been sent to Brazil to expand production there. Deposits deep in the Amazon jungle remain our chief source of supply.

Meanwhile, research workers have made three quartz crystals do the work of four. They have developed new methods that add to the supply as effectively as the discovery of new deposits. Thinner saws for cutting the crystals into the wafer-thin plates were developed, saving much of the crystal that was formerly sawed away into useless dust. Then the scientists found that they could cut the crystals into still thinner slices, thus doing away with much wasteful grinding in the finishing operation.

In use for only the past few weeks, the new cutting methods are producing at least a third more usable material.

Next the scientists took a look at the thousands of pounds of low-quality crystals that have been piling up in warehouses, discarded as unfit for electronic use. Experiments revealed special uses for some of these crystals and the huge amount of waste material on hand was converted into a usable stockpile.

More quartz crystals are needed. Quartz is among the world's commonest minerals. But the large, clear crystals

## RESOURCES

# Bottleneck Broken

**Quartz crystals for radar and other military radios are now more plentiful as result of discovery of new sources and other research results.**

► QUARTZ CRYSTALS, essential for military radio and radar apparatus, have finally been pushed off the "desperately needed" list by discovery of quartz deposits, by salvage of crystals formerly discarded, and by research successes that have just upped production of crystal oscillator plates more than a third.

Supplies are still barely adequate.

WPB reports, but only a few months ago it looked like there would be only half enough.

Prospectors tracked down every clue that might lead to the hiding place of one of the nation's most badly needed natural resources. Recently they have discovered deposits in North Carolina, Virginia and California. Experts from

required for radio purposes are rare. Amateur prospectors who want to help the war effort may send sample crystals, which they may discover mining cavities in rock or in the dirt and gravel nearby, to the Miscellaneous Minerals Division, War Production Board, Temporary R Building, Washington, D. C.

Only separate crystals as clear as glass are wanted, not clusters or grainy masses. Colored quartz, such as amethyst and onyx, cannot be used. Each crystal must

weigh at least a half pound; measured in inches such a crystal will be about an inch in diameter and three inches long. The whole crystal need not be perfect but large portions must be entirely free from specks, bubbles, lines, clouds, or flaws of any kind. Good parts must be at least two cubic inches in size and at least half as large as the imperfect section, otherwise it is not practicable to saw out the good portions.

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## PUBLIC HEALTH

## Major Epidemic Feared

National Foundation for Infantile Paralysis sees signs in cases already reported that 1943 may be one for the records. Peak will come later.

► "1943 MAY go down on the records as one of the major epidemic years for infantile paralysis," the National Foundation for Infantile Paralysis warns on the basis of the number of cases reported so far (See page 83 for new figures.)

The warning, carried to local chapters of the Foundation in its publication, *National Foundation News* (July), points out that "accurate predictions are impossible.

"Analysis of the situation at the end of the first 26 weeks of the year," the statement continues, "shows the total number of cases to be higher than for any of the past 12 years, excepting 1934. During the first six months, 1,084 cases were reported from 42 states. The six-

month average for the past ten years is 841.

"We know from records for the past 25 years that the peak of each year's outbreak, when figured for the country as a whole, is not reached until sometime between mid-August and mid-September. These records further reveal that the sharp increase in incidence occurs between July 1 and September 1 with a corresponding sharp decline during the ensuing two months.

"Even if 1943 has only an average number of cases there will be difficult problems for those areas that experience epidemics. With so many doctors, public health workers, nurses and physical therapy technicians serving in the Armed Forces, most communities won't be as well prepared as in former years to cope with an outbreak. Many will find a real challenge in the problem of providing ordinary and adequate care for their population without the added burden of an epidemic of infantile paralysis."

The National Foundation is doing all it can to supply epidemic areas with workers trained in the Kenny treatment. Local chapters are urged to work and plan with local and state medical and health authorities as well as with the National Foundation in order to be able to meet the needs that will arise when and if the epidemic strikes them.

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Bulgaria, it is reported, gathered and exported in 1942 nearly 7,000 tons of medicinal herbs from wild and cultivated plants.

## RADIO

Saturday, Aug. 14, 1:30 p.m., EWT

"Adventures in Science" with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. E. D. Merrill, of Arnold Arboretum, Harvard University, will tell about his South Seas Manual of Emergency Foods and Poisonous Plants.

## PHOTOGRAPHY

## Washing and Fixing Films With Sea Water Speeds Job

► SEA WATER with a final wash of fresh water will reduce the time of removing hypo and permit a fairly better non-fading image on films and prints than that of washing in fresh water alone. Mr. G. T. Eaton and J. I. Crabtree of Kodak Research Laboratories offer this time-saving possibility. (*American Photography*, June).

They have found that salts in seawater dehydrate the gelatin in the film, making it possible for the hypo to be washed from the film rapidly. When the film is washed in fresh water the retained hypo diffuses from the gelatin only slowly.

The one fault found in this washing in sea water was in the fact that the image was prone to fade more rapidly than when it was washed in fresh water, due to the presence of the sea salts. They found that this could be eliminated by removing the sea salts with a final fresh-water wash. Despite the necessity of this additional fresh-water wash, the time of removing the hypo and fixation of the image was still reduced by five to 25 minutes or better.

The procedure they suggest would be to wash in sea water for one-half the prescribed washing time for the material and then wash in fresh water for about five minutes, either in running water or two changes of water.

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