METALLURGY

New Process Purifies Aluminum From Alunite

Years of Research and Experimentation Unlock Domestic Source in Huge Deposits in Southern Utah

A NEW domestic source of aluminum for the United States has been unlocked after years of research and experimentation.

Alunite, a white rock usually gray or pink tinted, has long been known as a combined sulfate of potash and alumina. Huge deposits in southern Utah, largest in the world, were worked during the first World War for potash.

When the United States became self-sufficient for potash from other domestic sources, scientists sought a practical process to obtain from alunite the material alumina, raw source of all metallic aluminum. The present source of alumina is bauxite, of which the United States has limited deposits in the South and is mainly dependent on high-grade imports from British and Dutch Guiana.

The U. S. Bureau of Mines recently estimated that there were 13,788,675 tons of pure alunite in Utah, Arizona, Colorado, California, Nevada and Washington, of which Utah has 11,680,000 tons.

Numerous patents have been issued on alunite processes, but all proved impractical in cost competition with bauxite until Kalunite, Inc., of Salt Lake City, after ten years of research and experiments in laboratory and pilot plant conducted by Dr. Arthur Fleischer, developed and patented the new process.

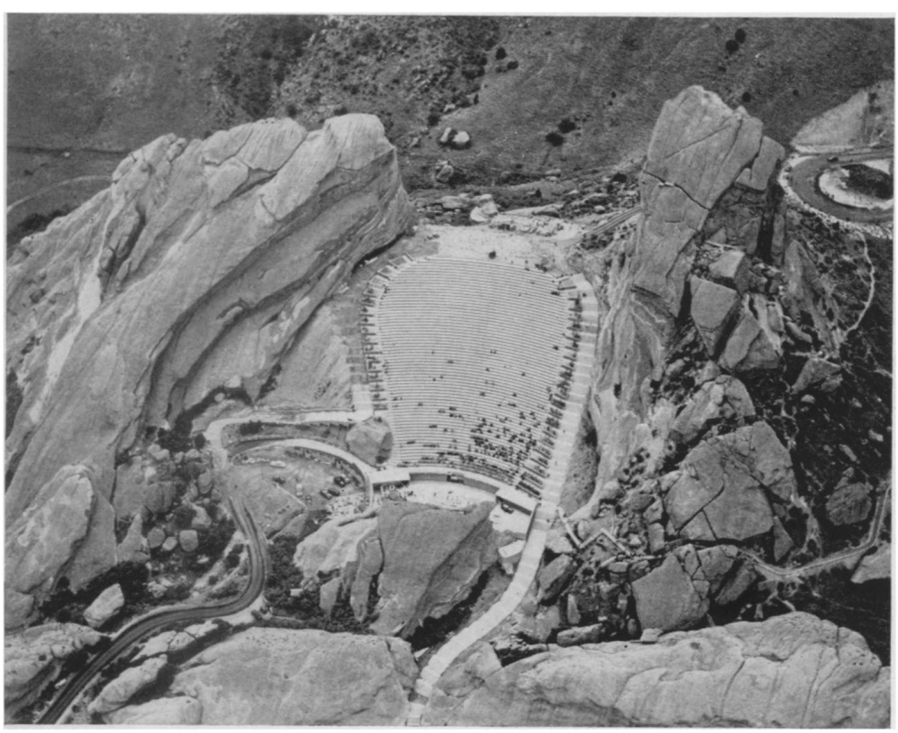
The Kalunite process produces alumina from alunite at a cost of $35 a ton, which means metallic aluminum at 11.865 cents a pound. This will permit it to compete in cost with Bayer alumina (the process used by the Aluminum Company of America).

Experts report that the metal produced from Kalunite alumina is equal in grade to that produced from Bayer alumina. There are available in the Marysvale region in Utah at least 3,800,000 tons of ore that can be treated by the Kalunite process for the cost reported. The amount of ore is sufficient to assure a life of at least 10 years for a plant producing 200 tons of alumina a day.

The Kalunite method produces alumina by the dilute sulfuric acid process and also produces as a by-product potassium sulfate. In brief, the Kalunite process starts with the long-known method of producing potassium alum and potassium sulfate from alunite. The potassium alum is utilized in order to take advantage of its property of separation by crystallization from solutions.

The alum is then put into an autoclave, which resembles an ordinary kitchen pressure cooker except that greater pressures are used. In the autoclave the normal potassium alum is changed to basic alum which is insoluble in water or dilute sulfuric acid. The alum is then calcined to separate the sulfuric acid from alumina resulting in the non-chemical mixture of alumina and potassium sulfate. The latter is removed by leaching.

Science News Letter, July 5, 1941



ROOMY

The size of the mountain theater is well indicated in this Lowry Field official aerial photo.

GEOLOGY—ENGINEERING

Great Amphitheater Carved Out of Mountain

CARVED by nature out of the mountains is Denver's new open-air amphitheater in the Park of the Red Rocks, 14 miles southwest of the city in the foothills of the Rocky Mountains. The park is formed of the gigantic, upthrust, ledges and crags of the old red sandstone, called Morrison sandstone locally, heaved up all along the eastern side of the Rockies by the gigantic forces that formed the mountains.

A slope, in a natural horseshoe between two of the great crags, Creation Rock and Ship Rock, descends to another crag that lay athwart its foot. The weathered convolutions of the latter, eroded and shaped like some gigantic marine shell, soften sound and send it swelling in golden notes up the slope, an effect that has long been noted.

At the base of this gigantic natural sound-board a giant stage has been built, about 175 by 75 feet, and up the slope have been constructed seats for 10,000 people—so wide apart that 20,000 can be seated by bringing in camp chairs between.

Original planner of the theater is George E. Cranmer, manager of parks and improvements in Denver. CCC

NATURAL

Nature built the scenery for the stage of Denver's new mountain amphitheater in the Rocky Mountains, as shown in this photograph by Harry M. Rhoads.

company Ma-lc, has labored for four years at the theater, under direction of National Park Service officials—Edward Teyssier, supervisor of all Denver Mountain Park projects, and Albert C. Dice, in direct charge of the theater.

It was an immense job. Between 40,000 and 50,000 cubic yards of dirt had to be moved; the whole structure is of reinforced concrete or natural stone. Colorado evergreens are planted in stone boxes on the side; there are elaborate dressing and preparation rooms, an elaborate lighting system.

"If there are people here 3,000 years from now, the theater will be here for them to enjoy," said a national park official.

Science News Letter, July 5, 1941

ASTRONOMY

New Van Gent Comet Won't Be Seen With Naked Eye

Will Be Brightest in Early September When It Can Be Seen With Small Telescope Moving Toward Dipper

HOPES that the new Van Gent Comet (*See SNL,* June 21), which is moving into the northern sky after its discovery by an astronomer in South Africa (not in Java, as first reported), will become visible to the naked eye are not to be realized.

This is shown by a calculation of the comet's path made by L. E. Cunningham, of the Harvard College Observatory who discovered Cunningham's comet which did reach naked eye visibility last winter.

Dr. F. J. Bobone, of the Argentine National Observatory, calculated the comet's path in space. These data, transmitted to the Harvard College Observatory, clearing house for such astronomical news, were released by Dr. Harlow Shapley, director of the Harvard Observatory.

Dr. Bobone's orbit brings the comet closest to the sun on Sept. 3, when it will be about 89% as far from that body as the earth's distance, 93,000,000 miles. Seen from the sun, at that time, it would be in our northern constellation of Draco, the dragon. However, from earth we will see it in a different direction.

When discovered, the comet had a short tail, and was of the eleventh magnitude, far below the fifth magnitude, the minimum for naked eye visibility. On June 16, according to Mark Howarth, New South Wales astronomer who radioed to Harvard, it had increased to the tenth magnitude.

Mr. Cunningham's figures, based on the data computed by Dr. Bobone, reveal that in mid-July the comet will pass just below the bright star Arcturus, visible in the southwest in the evening in the constellation of Bootes. Then it will move towards the figure of the Great Bear, and in October will be a short distance below the bowl of the Big Dipper.

At the present time it is approaching the sun, which increases its real brilliance, but it is moving away from the earth, which partly counteracts the rise in brightness. On July 1 it will be about two-thirds of the sun's distance from us, or 60,000,000 miles. It will be about 130,000,000 miles distant on Sept. 3, when closest the sun. After that, it will get closer until Dec. 8, when it will be 74,000,000 miles away, but by that time it will be well outward bound from the sun.

In early September it will appear brightest, Mr. Cunningham finds, when it will reach magnitude 7.5, not enough to be seen with the naked eye, but visible through small telescopes if one knows just where to look.

Astronomers at the Yerkes Observatory, Williams Bay, Wis., and the U. S. Naval Observatory in Washington have observed Van Gent's comet. Dr. George Van Biesbroeck, at Yerkes, picked it up on June 18.

Using the 26-inch refracting telescope at the Naval Observatory, U. S. Lyons found it on the night of June 19 in the constellation of Libra, the scales, which is visible in the south about midnight. A photographic record of the comet was also secured by G. M. Raynsford, with the 10-inch star camera.

Science News Letter, July 5, 1941

Plastic fly screens are being tried out, and are said to resist corrosion.