METALLURGY

Silver May Substitute For Copper in Electrical Wiring

Metal Would Be as Safe in New Magnesium and Aluminum Plants as in Government Vaults and Would Aid Defense

SILVER, now lying idle in government vaults, could be economically substituted for copper in the electrical equipment of the new aluminum and magnesium plants now being built and thus help to relieve the present acute shortage of copper, declared Robert E. McConnell, chairman of the Engineers Defense Board, New York City, in an address to the American Institute of Chemical Engineers in Virginia Beach.

The Government owns 100,000 tons of silver, Mr. McConnell continued. Silver is an even better conductor of electricity than copper. It would cost very little to convert the government ingots into bus bars and wire.

The silver would be as safe as in the vaults. The plants will operate 24 hours each day. They will be guarded. Besides the wires will be alive all the time.

When the emergency is over the silver conductors can be replaced by the more conventional copper ones, and the silver put back into the vaults.

Twenty-five thousand tons of copper could be saved in this way in the new aluminum and magnesium plants, and another 50,000 tons could be saved in the same way in other plants requiring large conductors of electricity, Mr. McConnell stated.

"The shortage of copper will cause more inconvenience and dislocations than will be caused by any other shortage," he said. It has become acute in the last six months and the prospects are that it will become worse. Recent estimates are that the total productive capacity of the Western Hemisphere south of Canada will be required for military purposes alone.

Current production of new copper in the Western Hemisphere is 1,600,000 tons a year, an all-time peak. Non-defense needs run about 1,000,000 tons a year. But 1,300,000 tons are wanted for defense, leaving only about one-fifth for the normal non-defense needs.

And for many uses there is no substitute for copper. Practically the only metallic substitute is steel. In some cases glass, plastics, wood or fabric can be substituted. Mr. McConnell believes that substitutions should be made wherever possible, and further that many economies can be made in the use of copper both in defense and in non-defense industries.

Science News Letter, November 22, 1941

Make Aluminum from Clay

UTILIZING a technique never before employed in metallurgy, a new process for the manufacture of aluminum from clay instead of the mineral bauxite, of which only about three years' supply remains in this country at the present rate of defense consumption, was announced to the American Institute of Chemical Engineers, by Prof. Arthur W. Hixson of the chemical engineering department of Columbia University.

The new process is expected to make this country independent of imports of foreign bauxite. It was developed at Columbia under the direction of Prof. Hixson, assisted by Ralph Miller and Ivan J. Klein.

All processes for the production of aluminum today use only high grade bauxite ores, Prof. Hixson declared. About 3,143,000 long tons will be required annually for the defense program alone. The total reserve in the United States at the present time is about 11,000,000 long tons, according to geological estimates. Half of this has been imported. Without a method of using some other ore than bauxite, the United States would soon have to import all of its aluminum ore.

The new process uses selected high-silica clays, digests the clay with hydrochloric acid and decomposes the resulting product to get aluminum oxide. From this, the metallic aluminum is extracted by electrolysis in the usual manner. The hydrochloric acid is recovered for further use. The materials and chemicals used are abundantly available because they are by-products of other processes.

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After a number of failures to grow *Turkish tobacco* in Canada, a Turkish born Greek chemist reports success in western Ontario.

SCIENCE CLUBS OF AMERICA

Sponsored by Science Service

NEWS OF CLUBS

JACKSON, Mich.—The Jackson Junior Science Club of East Intermediate High School got a great kick out of its visit to the Ford Motor Company and the Ann Arbor Observatory last year and expects to be able to repeat the trips again this year. This group held a Science Fair and also produced an assembly program, both of which were so successful that similar events will become permanent features of this club's activities. Bertha E. Slye, Science Instructor, sponsors this club.

MOUNT OLIVE, Ill.—An extremely active group is the Research Science Club of Mount Olive Community High School. Under sponsorship of Sherman Sparks, Science Instructor, this group produces material which will be of permanent value to science classes in the school. In addition, the club sponsors and underwrites nine programs including a radio quiz; a play contest, in which original plays are produced; a health and conservation feature, and holds an Open House, at which projects and hobbies are displayed. A Chemistry Show, open to the public, is given every year. The club also holds a banquet for prospective new members in the spring.

LAS VEGAS, N. M.—Radio, photography and the building of models are the topics which interest members of the Phy Chy Science Club of Las Vegas High School. According to reports they are doing excellent work under sponsorship of Charles W. Wolfe, Science Instructor.

BROOKLYN, N. Y.—Members of the Radio Club of the Abraham Lincoln High School are engaged in the study of theories and in the construction of devices to fortify belief in those theories. Included also in the club's program is the building of novel electronic devices. This club is sponsored by William Marcus, Laboratory Assistant.

NEW YORK, N. Y.—The Biology Club of Julia Richman High School, under sponsorship of Frieda Lichtman, Biology Teacher, is engaged in the laboratory study of microscopic animals and the tissues of larger animals. At the present moment the members are actively engaged in preparing for the Science Fair held annually by The American Institute of the City of New York with which Science Clubs of America is closely cooperating. Up to $3,000 in science grants is awarded annually for outstanding exhibits at this Fair which has become a national function of the Institute.

CLARKSBURG, Calif.—The County and State Fair will be enriched by exhibits from the Wheeler Science Club of Clarksburg High School. The members of this group are busy preparing assemblies, program material, science congress demonstrations, and are engaged in following various hobbies, including photography. The club is sponsored by Deane K. Smith, Vice-Principal and Science Teacher.

MERIDEN, Conn.—The Penturson Science Club which meets in the Y. W. C. A., under sponsorship of Mary I. Turner, retired teacher and tutoress, is also affiliated with the Meriden Nature Club. Activities for the forthcoming year are now being discussed.

PROPHETSTOWN, Ill.—All places of scientific interest within a radius of 40 miles are covered by members of the Science Club of Prophetstown High School. Additional explorative work is carried on in the school laboratory. The club is sponsored by Ellen Smith, Science Teacher.

BLOOMFIELD, N. J.—Chemistry, astronomy and mineral collecting at present captivate the interests of the Junior Scientists of Bloomfield Junior High School. Andrew J. Peters, Teacher of Science, is the club's adviser. Members of this club decided upon the type of program they would like to follow and each week one or more of the members produces the subject matter decided upon at a previous meeting.

PHILADELPHIA, Pa.—Tagging frogs for science, studying water birds, and experimenting with sundews are among the amateur science activities reported in the October issue of the Journal of the Philadelphia Council of Amateur Scientists. A few copies can be made available to other areas upon application to W. Stephen Thomas, American Philosophical Society, 104 South Fifth St., Philadelphia, Pa., enclosing 10 cents to cover mailing costs.

Clubs are invited to become affiliated with SCA for a nominal $2 for 20 members or less. You can become an associate of SCA for 25 cents, which includes a copy of the 128-page Science Handbook for 1942. Address: Science Clubs of America, 1719 N St., N.W., Washington, D. C.

Guinea Pig Soldiers Thrive on Blitz Ration

GUINEA-PIG soldiers fed on the Army's new light-weight blitz rations are actually in better shape after four days than their buddies in camp who go right on eating three square meals a day.

Hope of trying out the newly invented ration with an entire battalion is in prospect, says an enthusiastic report by Dr. Ancel Keys, University of Minnesota physiologist, who is taking a leading role in testing the compact food.

The problem of blitz rations for parachutists and for delivery by air to troops engaged in mobile assault operations is not entirely solved, Dr. Keys says cautiously in a progress report to the *Quartermaster Review*. The ration is yet to be tested in tropical Panama and in Far Northern Alaska.

With the United States' agricultural wealth, he feels that the U. S. Army should have the world's best specialized ration of this tight-packed type that can be devised.

The ration, which packs about 2,000 calories of nutritive energy to a pound, could be packed as three meals of 1,200 calories each for combat troops, so that each meal would weigh 11 ounces including the packaging.

Special attention is being given to making the new ration tasty. A soldier in an armored division still has unarmored digestion, says Dr. Keys. So-called "pemmicans" made of mixtures including kidney knobs, shredded coconut, vanilla and other ingredients failed entirely as candidates for Army feeding. Troops and hired subjects simply could not take them when they tried to eat several successive meals—as they would have to do if isolated from base supplies with only the tight-packed rations to eat for days at a time.

Success has been achieved with biscuit formulas which include good concentrated meat products, with such added "dishes" as malted milk tablets and lemon powder to round out the meal. Stressing soldier psychology, Dr. Keys declares: "A ration that will not be eaten is worse than useless." Nausea might completely incapacitate men for duty. Variety is essential in these rations, the physiologist insists. Vitamins are important, but supercharging with vitamins "offers no advantage whatever."

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