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FEBRUARY—1984

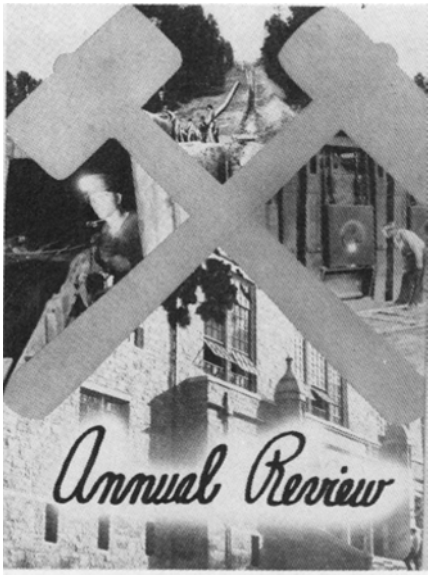
PLASMA TECHNOLOGY in iron- and steelmaking is the topic of the cover and of a thorough treatise by K. Upadhya, J.J. Moore, and K.J. Reid. They describe the physics of the plasma and cover the application of plasma in the reduction of various metal oxides. The Plasmared gasifier process and the Plasmasmelt process, which are both procedures based on nontransferred arc plasma systems, are presented and illustrated schematically. The Plasmared process produces sponge iron; the Plasmasmelt process yields pig iron. A plasma system based on a transferred-arc plasma is also described.

News & Update announces the organization of the Titanium Development Association (TDA). The TDA's purpose is to work with other industries and government to improve and expand the use of titanium. The formation of the association was long overdue.

Important aspects of aluminum production are the topics of two papers. E. Keul and A. Tokerud evaluate SO_2 scrubbing technology in regard to regulation of SO_2 emissions in primary aluminum smelters. Larger, modern smelters are a significant source of sulfur-dioxide emissions at the local level because high-sulfur petroleum coke is used in the manufacturing of anodes. Dry technologies for SO_2 control, such as the Flakt system, are reviewed for their potential application in aluminum smelters; however, the most proven solution noted by the authors is still some form of wet scrubbing. Addressing the problem of increased energy costs, S. Tanji, O. Fujishima, and K. Mori report on a method to reduce d.c. power consumption. They found that the prebaked cell voltage can be reduced by the application of a lithium bath. Also, reducing heat loss by using an alumina covering and controlling the anode-effect power input by computer contributed to substantial energy savings.

FEBRUARY—1964

RAPID CARBON determination for open-hearth steelmaking control is reported by W.G. Hines, R.L. Addinall, and J.P. Orton. They describe how samples of molten steel can be taken, prepared, analyzed, and their carbon content reported within three minutes. Pin samples are collected by reusing sealed, evacuated tubes. A sample of about 15 mm long with a 3.3 mm diameter is needed to obtain enough volume to accurately determine the carbon level. A one-gram sample slug is transferred to a combustion crucible, which is then placed in a Thermocarb analytical unit for determination of carbon content. The authors note that while the installation of Thermocarbs on the pouring deck to avoid off-analysis material is technically feasible, economic aspects still require additional study.



The cover of the February 1944 *Mining and Metallurgy* portrays four branches of the then-American Institute of Mining and Metallurgical Engineers' (AIME's) activities: mining, petroleum, metallurgy, and education. The illustration was designed and rendered by AIME staff member Grace McDonnell Reid.

The pilot production of tantalum alloy sheet is described by D.J. Maykuth, G.S. Root, and H.R. Ogden. They report on fabricating two alloys—Ta-10Hf-5W and Ta-30Cb-7.5V—into sheet by extrusion, forging, and rolling. Their mechanical property data show an increased strength-to-weight ratio as compared to pure tantalum for test temperatures from ambient to 1,093°C and beyond. Tungsten inert gas welds performed on recrystallized samples of each of the alloys showed that the Ta-Cb-V alloy retained excellent bend ductility and changed little in room-temperature strength and elongations. The Ta-10Hf-5W alloy, however, became embrittled by welding.

An article by F.D. Richardson describes an interdisciplinary metallurgy program for students of the Imperial College of Science and Technology at the University of London. He emphasizes that the teaching of metallurgy should be accomplished in an engineering context and be balanced among chemical, physical, and process engineering.

FEBRUARY—1944

THE COVER identifies this as an annual review issue. Encompassing a wide subject area from mineral economics to geophysics, 40 articles are divided almost evenly among metals, coal, and petroleum. A.B. Parsons' editorial, on the other hand, focuses on petroleum, coal, and liquid fuel. He is concerned that the United States' petroleum reserves are only sufficient for 13 years' consumption at present rates and that an immediate shortage of crude oil looms. He also notes that the virtually nonexistent production of liquid fuel from coal for internal combustion engines must be substantial within 15 years.

There are many technical gems contained in the numerous articles. For example, a new method is described for the satisfactory arc welding of magnesium sheet or other metallic sheet. It utilizes a tungsten electrode with a matching filler rod in a neutral atmosphere such as helium—an early application of gas tungsten arc welding.

F.T. Sisco's Preview and Review of Metallurgy contains two interesting items. The first is an announcement by Fansteel Metallurgical Corporation on the use of tantalum wire, foil, and plate for surgical implants and plastic surgery. He also notes another surgical material—a Co-30Cr-5Mo alloy with the trade name Vitallium—that has been employed in major surgery and used in dental applications since the 1930s. The second article addresses concerns of the Can Manufacturers' Institute about anticipated competition resulting from wartime developments in alternative nonmetallic packaging materials. The institute's plan calls for those in the steel industry who are concerned with tin and tinplate to spend several million dollars on ambitious advertising campaigns and a two-year analysis of consumer likes and dislikes. Glass, cellophane, and plastics are the targets.

A final gem is L.W. Kempf's report on nonferrous physical metallurgy discussing work by R. Mehl and coworkers on a new hypothesis of precipitation hardening in metals. They concluded that the major factor in hardening by precipitation results from stresses in the matrix that keep the precipitate in a strained, coherent condition.