METALS, METALLURGY AND THE INSTITUTE

by

Zay Jeffries*

Roughly three out of each four of the elements are metals. A few such as iron, copper, aluminum, lead, zinc, tin, nickel, gold, silver, etc., are so well known that even children are familiar with them. Others like hafnium and rhenium are less well known and are generally classed among the "rare" metals. However, these seventy odd metals may be put together to make thousands of alloys. The metallic elements themselves have great differences in properties. The high melting point of tungsten, the low melting point of mercury and the many values between these cover a range of more than 3000°C. Other properties of the metallic elements vary between wide limits too. But the many alloys have still wider ranges of properties and it is a source of wonder how well some of the alloys can be "tailored" to fit the great variety of man's needs. These metals and alloys constitute one of the most important classes of materials known to man.

Metallurgy deals not only with these metallic substances but with all known materials. In processing the metals and winning them from their ores all materials—metallic, non-metallic, gasseous, liquid or solid, organic or inorganic, alone or in combination—are or may be utilized. Consider for example, fuels, refractories, materials for instruments of various kinds and even the Xenon gas formed within a mass of uranium when an atom of fissionable material splits in two.

Modern metallic substances and their production and treatment are much more complex than they were even twenty years ago. They are becoming more complex year by year. The advent of the isotopes, whether radioactive or not has added several new facets to the complexity. Whereas during my early years we dealt mainly with about twenty readily available metallic elements we now must deal with around fifty of the elements in their natural state and with several hundred isotopes many of which are radioactive.

Because of the importance of metals and because of this great and growing complexity, it becomes necessary to have special science and engineering dealing with metals and metallurgy. These must keep pace with the development of our industrial revolution which itself is so complex that several other special disciplines are also required. Each one of these disciplines must be so organized that it can cooperate with the whole to render useful service to society. Part of this organization is taken care of in the establishment of the special fields of endeavor as reflected in the educational institutions. Another part, as experience has shown, is best taken care of by forming and supporting institutes.

The Japan Institute of Metals is one such organization. When properly organized and operated it provides a priceless service to metal science and engineering, to the individual members, to industry as a whole and to the nation. There is no substitute. The Institute has become a necessary part of modern civilization. It provides a forum for discussion, a medium of publication, an opportunity for the cross fertilization of ideas, a means of recognizing achievement which no amount of financial reward can match and in general it gives the participants in the great forward movement enhanced satisfac-

* Honorary Member of the Japan Institute of Metals.

tion in living.

When I visited Japan in 1948 it gave me personal pleasure to note that my former friend and your great savant Dr. Kôtarô Honda was high in the councils of Japan's statesmen of science. Furthermore, what I saw in Japan then left no doubt in my mind that you would do important things in the metals field in the future.

In 1951, when, as Director General of the First World Metallurgical Congress, in Detroit, I found that the Japan Institute of Metals had made me an honorary member I felt pleased but humble. Receiving the honorary membership scroll from the hands of Dr. T. Mishima, whose inventive genius benefits people the world over, was an added pleasure.

In saluting the Japan Institute of Metals in commemoration of its 20 th anniversary may I remind the membership that they owe much to the small group of men who have labored long and hard for the benefit of all. The members can reciprocate by bringing into the fellowship the younger men of the profession who in turn can be depended upon to carry forward the splendid results of these first twenty years.