

## Preface

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## Preface

I am very much pleased to congratulate the publication of the Anniversary Issue of the Science Reports of the Research Institutes of Tôhoku University, Series A to commemorate the fifty years' jubilee to the Research Institute for Iron, Steel and Other Metals, Tôhoku University.

Half a century has passed on May 21, 1966 since the establishment of the Second Part of the Temporary Institute for Physical and Chemical Research, which was the former name of the present Institute. During these fifty years the achievements of the research members of the Institute have been mainly distributed to our colleagues by the Science Reports of Tôhoku Imperial University, the First Series as well as the Science Reports of Research Institutes of Tôhoku University. During this period our colleagues all over the world have also kindly rendered continuous cooperation and assistance for the development of metal science in this country.

Prof. Honda, the founder of the Institute, started his research as a physicist and later led an active life as an authority on the technological fields in iron and steel industry. The combination of fundamental science and industrial technology was the chief object of his research and such is the viewpoint on which all the researchers of this Institute are now standing.

In 1916 our knowledge on metal and its technology was extremely meager. At that time the fundamental concept of matter was based solely on the classical quantum theory. In other words, there was not yet developed the electron theory of metals, nor the theory of plastic flow based on the dislocation theory of crystals; only some intuitive models or mechanisms prevailed for the understanding of the nature of metals and metallic materials, by which the essential points in the material sciences of the present time could hardly be pursued. The experimental procedures were also confined to develop metallurgical techniques in a very restricted range of experience. At that time it was beyond the scope of possibility to anticipate the new phenomena in extended experimental conditions such as under very low or high temperature, high pressure and high magnetic field, and also the visualization of the micro-mechanism in metalworking and the detection of impurities in high purity materials by use of the equipment of chemical analysis.

In 1916 the iron and steel industry in this country was in quite a low level and the output of steel was a few hundred kilo-tons, with almost no industrialization of light metals.

Under such circumstances, however, the researchers of this Institute have exerted all possible efforts whose outcomes have mainly been published in succession in the Science Reports of Tôhoku Imperial University, the First Series and later in the Science Reports of the Research Institutes of Tôhoku University, Series A. During this half a century, we have been greatly indebted to the various kinds of

material aid and moral support from all of the quarters, nationally and internationally.

With the elapse of half a century since the establishment of this Institute, we are now facing with a new phase which requires the systematization of scientific knowledge for the contemporary technological innovation. The scientific knowledge is a common, but supreme property of mankind and at the same time technology should serve to promote the welfare of all the nations in the world. From this point of view, we would like to continuously seek the exchange of scientific information from the scientists and technologists of all the countries in the world.

It is a great pleasure for me to be able to express my belief on the occasion of publishing the Anniversary Issue in commemoration of the fifty years' jubilee of the Research Institute for Iron, Steel and Other Metals, Tōhoku University.

November, 1966

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