



At the Beginning of the 21st-Century

Nowadays, one can collect an enormous amount of X-ray diffraction data, maybe more than 400,000 Bragg reflections, from a big protein crystal within a few hours, if an area detector diffractometer at a SR facility is used. It is even possible to collect such data using a laboratory X-ray source if the time of measurement is increased. We are also in a situation where it is not very difficult to analyze such a large data set on the basis of existing diffraction theory using a very modest computer. Hence, no one is surprised when crystallographers respond positively to the appeal to solve the structures of 5000 important proteins, which are strongly related to human genes, in the coming 5 years. This shows how rapid the progress of X-ray crystallography is, for it was almost inconceivable to a crystallographer of my age that such rapid progress of X-ray diffraction crystallography would occur in, say, the past two decades.

This is one of the recent topics that has captured our imagination. However, it is just one part of the progress seen in X-ray diffraction crystallography. The technique we have has many more wider applications; not only to protein science but also to many fields of materials science and technology, from physical, chemical, metallurgical, mineralogical, pharmaceutical and so on. If we look at the field of semiconductor technology, as an example, one can also recognize dramatic change of the characterization techniques, as thin films on some substrate materials get thinner and thinner due to the requirement of ULSI. The previous use of visible light is going to be replaced by X-rays, because of their shorter wavelength and the establishment of new technology using grazing X-ray incidence techniques.

Thus, it seems to me that with respect to X-ray diffraction technology we are standing at a turning point; from the development of X-ray diffraction technology itself in the 20th century, to the wide applications of our technology for more industrial use in the 21st century. However, we have to keep in mind that the need to have more fundamental knowledge of the science of X-rays will also be increased.

This is the first issue of the Rigaku Journal in the 21st century. It also happens to coincide with the year of the 50th anniversary of Rigaku Corporation. As the editor of this Journal let me say a few words on the significance of publishing this Journal to commemorate this occasion.

This Journal exists for the community of Rigaku users. Rigaku Corporation is an international manufacturer providing X-ray analytical instruments. It is always a great pleasure for us to see remarkable papers by users in well-established scientific journals, especially when it is recognized that the results that have been attained using Rigaku's products based on the user's original ideas. Those valuable papers should be compiled for the common knowledge of all the users and published by Rigaku in the form of this Journal. Hence your review articles will be greatly appreciated and we encourage you to submit them to this Journal. All the papers cited here will be included in Chemical Abstracts. This is the philosophy in editing this Journal. In addition, there is a column provided for the advertisement of Rigaku's new products. We welcome your ideas and suggestions for improvements to this Journal.

The following is my favorite poem "Youth" by Samuel Ullman. I hope it is your favorite poem, too, for I learned that this is well known to be a lifelong favorite poem of General Douglas MacArthur.

March 3, 2001

A handwritten signature in cursive script that reads "Jimpei Harada". The signature is written in black ink on a white background.

Jimpei Harada

(Professor emeritus Nagoya University)

The editor of Rigaku Journal

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Youth is not a time of life; it is a state of mind; it is not a matter of rosy cheeks, red lips and supple knees; it is a matter of the will, a quality of the imagination, a vigor of the emotions; it is the freshness of the deep springs of life.

Youth means a temperamental predominance of courage over timidity of the appetite, for adventure over the love of ease. This often exists in a man of sixty more than a boy of twenty. Nobody grows old merely by a number of years. We grow old by deserting our ideals.

Years may wrinkle the skin, but to give up enthusiasm wrinkles the soul. Worry, fear, self-distrust bows the heart and turns the spirit back to dust.

Whether sixty or sixteen, there is in every human being's heart the lure of wonder, the unfailing child-like appetite of what's next, and the joy of the game of living. In the center of your heart and my heart there is a wireless station; so long as it receives messages of beauty, hope, cheer, courage and power from men and from the infinite, so long are you young.

When the aerials are down, and your spirit is covered with snows of cynicism and the ice of pessimism, then you are grown old, even at twenty, but as long as your aerials are up, to catch the waves of optimism, there is hope you may die young at eighty.

