

The Growth of Scientific Communities in Japan*

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1. Introduction

The first university in Japan on the European system was Tokyo Imperial University, established in 1877. Twenty years later, Kyoto Imperial University was founded in 1897. Among the graduates from the latter university can be found two post World War II Nobel Prize winners in physics, namely, Hideki Yukawa (in 1949), and Shinichiro Tomonaga (in 1965). We may say that Japan attained her scientific maturity nearly a century after the arrival of Commodore Perry in 1853 for the purpose of opening her ports. Incidentally, two scientists in the U.S.A. were awarded the Nobel Prize before 1920, namely, A. A. Michelson (physics in 1907), and T. W. Richard (chemistry in 1914). On this point, Japan lagged about fifty years behind the U.S.A.

Japanese scientists began to achieve international recognition in the 1890's. This period coincides with the dates of the establishment of the Cabinet System, the promulgation of the Constitution of the Japanese Empire and the opening of the Imperial Diet, 1885, 1889, and 1890 respectively. Shibasaburo Kitazato (1852-1931), discovered the serum treatment for tetanus in 1890, Jiro Kitao (1853-1907), made public his theories on the movement of atmospheric currents and typhoons in 1887, and Hantaro Nagaoka (1865-1950), published his research on the distortion of magnetism in 1889, and his idea on the structure of the atom in 1903. These three representative scientists were all closely related to Tokyo Imperial University, as graduates and latter, as professors. But we cannot forget to mention that the main studies of Kitazato and Kitao were made, not in Japan, but in Germany, under the guidance of great scientists of that country, R. Koch and H. von Helmholtz.

2. Scientific Revolution in JAPAN

During the fifteen years of turmoil, beginning in 1853, when Commodore Perry entered Uruga Harbour, and ending in 1868, when the Meiji Restoration was accomplished, three great men of science came into existence in Japan, namely Kitazato, Kitao and Nagaoka, mentioned in the introductory section of the present

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