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EDITORIAL

Memorial to Xuesen Qian

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Xuesen Qian

Xuesen Qian (Hsue-Shen Tsien), the father of China's rocketry and space technology, was born in Shanghai on 11 December 1911. He graduated from the Shanghai Jiaotong University in 1934 and received a degree in mechanical engineering there. He then spent an internship at Nanchang Air Force Base. Qian left China for the United States in 1935 to study mechanical engineering and earned Master's Degree of Science from MIT 1 year later. Then he went to the California Institute of Technology to pursue his studies in aeronautical engineering and aerodynamics under the supervision of Theodore von Kármán. Qian obtained his doctorate in 1939. When remaining to stay in the United States, he was promoted to the positions of lecturer and professor. As soon as he decided to come back China, he was persecuted by the US Administration during the McCarthy era in 1950s and then led 5 years' life without freedom in California. It was not until 1955 for him and his family to return to the motherland. Qian finally founded China's rocketry and space industry in such a country technologically still in the stage of agricultural society.

Qian established the Institute of Mechanics, Chinese Academy of Sciences in 1956 and held the post of director. Then he founded the Chinese Society of Theoretical and Applied Mechanics and was elected as the first president in 1957. In the same year he started publishing the first mechanics journal Acta Mechanica Sinica (Chinese series) as the first editor-in-chief. He set it as a journal of engineering science and determined its aims and scope. Up to now, 41 volumes of Acta Mechanica Sinica (Chinese series) have been published. In 1985, Acta Mechanica Sinica (English series) came out. Since then, 25 volumes of Acta Mechanica Sinica (English series) have been published. Qian made remarkable contributions in promoting the development of mechanics in China. In order to commemorate Xuesen Qian, we republish the foreword "Our Goals" from the initial issue of Acta Mechanica Sinica (Chinese series).

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Our Goals

Xuesen Qian · Liangru Pan

We know that mechanics is an engineering-science, so the journal of mechanics no doubt is a journal of engineering-science.

Engineering-science in nature is something in-between basic sciences (as mathematics, physics and chemistry) and engineering technology. On one hand it absorbs the achievements of basis sciences, and does research work on those general problems happening in engineering technology on the other hand. Therefore, engineering-science is a combined product of basic sciences and engineering technology. Nevertheless, can engineering-science be completely developed from basic sciences? The answer is no, we think, because basic sciences are the results of researches in the problems after being abstracted, Therefore no matter how substantial its contents are, it is impossible for basic sciences to cover comprehensively and perfectly the whole nature. Consequently it can not be directly applied to engineering technology with an object so extremely complicated. Having this understanding in mind, we can see that the work of engineering-science is really one of basic sciences combined with engineering technology. It is a highly creative work. The research methods are equally important both theoretically and practically, never have partiality. Just as the name implies, engineering science is basically to serve engineering technology.

The objects of mechanics are mainly problems extracted from engineering technologies. Due to the constant improvements and developments of engineering technologies, and productivity improvements, mechanics still remains in an active status. Actually it has kept being the most active engineering-science over the past decades, as well as the spearhead of engineering-sciences. Admittedly, the situation of classical mechanics is otherwise. Classical mechanics is a part of physics and a part of basic sciences. Only in recent decades has mechanics become an engineering-science. In other words, mechanics has gradually transformed into an engineering-science over the past decades. It can be said with certainty that mechanics is closely related to engineering technology, that it is rooted in practice, and that it is a part of the general theory of engineering technology. Therefore, mechanics will certainly push engineering technologies forward; also, it will be pushed by the new development of engineering technology. It will develop very rapidly, and its research emphases will change with time. Twenty years ago, mechanics was limited to branches of general mechanics, elastic mechanics, plasticity and fluid mechanics. However, in recent years, the content of mechanics has been greatly enriched in response to urgent needs in aviation technologies. New branches such as supersonic aerodynamics, rarefied gas dynamics, and high-temperature elasticity have taken shape. Recently, we are able to develop new branches of research, such as chemical fluid dynamics and physical mechanics. The constant exploitation and development of new areas will continue. Newer research fields will surely spring up in the future. We should put emphasis on those new developments and encourage relevant research efforts. However, the mature mechanics branches should not be ignored. After all, the new born branches can not grow without the nutrition of the matrix. New-born and mature branches are interrelated and mutually facilitating. Has not general mechanics bred a set of automatic control and modulation theories with the impetuses from automation? Have not elasticity and dynamics integrated to give birth to aseismatic theory? Therefore, due attention should be paid to established and mature branches of mechanics, which should be applied to the economy development, so as to embrace new changes and new developments, and stay flexible.

Previous theses on mechanics have been mainly published in journals of physics. We hope that the publication of mechanics journal will better promote the development of mechanics. It goes without saying that the journal will belong to mechanics researchers from China. We hope that it will be able to contribute to the improvement of mechanics research in China. To achieve this goal, we will not only publish creative theses, but also introduce review articles, summarizing advances in certain branches of mechanics and orienting directions for future research. It will be helpful for young mechanics researchers by doing so. We sincerely welcome theses in those categories. In addition, theses from other relevant disciplines without dedicated journals, such as operations research, are also welcome.

We are convinced that, if this journal can realize the above-mentioned undertakings, it will promote the growth of mechanics research in China, so that it will be able to do its part in the socialist construction of China. That is our goals.

From Vol. 1, No. 1, 1957 of Acta Mechanica Sinca (Chinese Series).