

The Dawn of a New Nuclear Age

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After Röntgen discovered x-rays in 1895, it was not until nuclear reactors appeared in the mid-20th century that release of nuclear energy became possible as an additional application of radiation. Its first power was, unfortunately, demonstrated in the form of an atomic bomb. On the other hand, human wisdom has prevented subsequent repetitions and allowed for continuous research and development of nuclear energy toward its peaceful uses. This has led to establishment of the position of nuclear power generation as a key power supply and to the use of nuclear energy among more extensive fields from the world of scientific technology to society. It is, however, to be regretted that society has not yet acknowledged clearly that nuclear power can coexist with the society itself. This is possibly in part because nature, which we live together with, is made up of ecosystems. It is almost impossible to catch a glimpse of nuclear reactions, although it is possible to see chemical reactions.

Our civilization, based on chemical reactions since the Industrial Revolution, has changed over a period of 200 years from a society that allows us to enjoy a comfortable lifestyle to a society in which we are on bad terms with the environment as represented by global warming. It has come to a turning point in its development. The 21st century society is expected to renounce the amenities based on mass consumption of resources, and pursue environmental conservation as a loftier philosophy. There is growing recognition of a recycling-based society and a recycling-based civilization. Be that as it may, would it be possible from a social viewpoint to abandon what our civilization has produced to strive to create such a society? Instead, could we have no way to build a recycling-based civilization while saving resources and ensuring environmental conservation? Could a great conversion of energy resources allow for it? With the conversion from chemical to nuclear reactions, what would be required for nuclear energy and what would be the conditions that nuclear energy must meet? There would be two conditions: firstly, presentation of the overall picture for and development path of nuclear energy, which would become the keystone of civilization; and secondly, fulfillment of the accountability to nature and realization of the safe performance that is essential for