Solid State Ionics is a scientific discipline of steadily increasing importance in three respects:

i) It is the science that is concerned with charge and mass transport in ionic solids. Moreover, it also connects ionic and electronic carriers, and as such is of great unifying power. It deals with the general case of the mixed conductor (electrons and ions being mobile) and hence includes semi-conductors as limiting case.

ii) It provides the scientific basis for technological processes in which ion transport or ion transfer is to the fore.

iii) It is implicitly significant for defining composition and stoichiometry of solids and hence for electronic, optical and many other applications.

As far as the first point is concerned, solid state ionics explores the mechanisms of ion transport or ion transfer and in turn puts scientists in the position to optimize materials in terms of transport and transfer issues. Such considerations are key for a wide range of processes ranging from preparation to application. As far as electrochemical energy technology is concerned, solid state ionics is the relevant fundamental discipline. It explains how solid electrolytes or solid electrodes can be conditioned for fuel cells. It explains how and how fast Li or Na is stored in modern battery electrodes. It also provides powerful sensing or switching principles based on mass transport and is hence also of direct relevance for information technology. The fact that many catalysts are good mixed conductors directly reflects the importance of the field for heterogeneous catalysis. Last but not least ion transport in soft matter intimately connects with bioelectrochemistry.

It is becoming more and more obvious that Solid State Ionics is indispensable for defining semiconducting, superconducting or photo-active materials. This is due to the stoichiometry sensitivity and hence to the sensitivity to ionic point defects. Here a major point is the connection between high temperature and low temperature defect chemistry.

The steadily increasing importance is not only due to the fact that more complex materials are used in which questions of stoichiometry are decisive, it also has to do with the great advantages that have been achieved in terms of size effects and heterogeneous systems. In this context the novel field of nanoionics is expected to play a similarly central role for energy technology as nanoelectronics does for information technology.

It is a pleasure to set all out these aspects in the journal Electrochemistry of The Electrochemical Society of Japan as it has been Japanese scientists who contributed and still contribute a great deal to the scientific success of Solid State Ionics.