

## Preface

This volume consists of 100 papers contributed from among 264 paper and poster presentations at the Sixth International Symposium on Antarctic Earth Sciences held at the National Women's Education Centre in Ranzan, Saitama Prefecture, Japan from 9–13 September 1991. The 237 scientists which participated from 20 countries made this the largest Antarctic Earth Science Symposium ever held.

The invitation for hosting this Symposium in Japan was initiated in July 1986 at the joint meeting of the SCAR Working Groups on Geology and Solid Earth Geophysics which was convened in San Diego, California, during SCAR XIX. After the Fifth Antarctic Earth Sciences Symposium in Cambridge in 1987, these SCAR Working Groups decided the venue of the next symposium and concluded that it would be held in Japan in 1991, possibly in Tokyo. The four year interval was one year shorter than normal to avoid competition with the huge International Geological Congress in Japan in 1992.

The informal decision to hold the Sixth Antarctic Earth Sciences Symposium in Japan in 1991 was approved at another joint meeting of the two SCAR Working Groups at Hobart, Australia, in 1988. At the same time, it was decided that an "Extended Abstract Volume" would be published for the Symposium rather than the usual "Proceedings Volume." This decision was reached so that participants could publish their contributions in international journals and that the publishing of such proceedings often took much time. The proposal for the Sixth International Symposium on Antarctic Earth Sciences was formally accepted by the Delegates Meeting of SCAR XX at Hobart.

In response to the SCAR decision, the National Committee for Antarctic Research of the Science Council of Japan approved the Symposium, on the premise that the National Institute of Polar Research (NIPR) would take the responsibility as the primary host institution. The Local Organizing Committee was established in 1989 under the chairmanship of the Director-General of NIPR. The establishment of an International Steering Committee was sought as in the previous symposia and was approved at the joint meeting of the two SCAR Working Groups in São Paulo in 1990. During the same year, the International Union of Geological Sciences also decided to support the Symposium.

The scientific framework for the Symposium was one of the key discussions by the two Working Groups, and it was not an easy task to identify the appropriate topics. Taking into account these and the previous discussions which were

held in 1987, 1988 and 1990, we chose to have a wide range of topics for the Symposium. This traditional Symposium format was decided, rather than the one with a narrower and sharper focus, because of the increased number of participating countries and this would be the first occasion to host a SCAR symposium in Asia. The need to hold both large meetings every five years and more frequent smaller workshops with sharp research focus seemed to be recognized. The areas of research for the Sixth International Symposium on Antarctic Earth Sciences covered almost all of the Antarctic, including the sub-Antarctic islands.

The Sixth International Symposium on Antarctic Earth Sciences was preceded by two five-day field excursions (attended by 30 scientists) to the Abukuma Plateau, the metamorphic terrane, and the Izu Peninsula - Mt. Fuji - Kofu Basin, which was an area with typical active crustal movement. One hundred and one posters, three times as many as in any previous Antarctic Earth Science symposium, were presented in twelve sessions and provided good opportunities for discussion during the four-day Symposium. Despite the efforts to reduce concurrent presentations, 163 papers were read at three parallel sessions for the first two and a half days and at two parallel sessions for the remaining two days. The SCAR Earth Science Sub-Groups for Antarctic Offshore Acoustic Stratigraphy (ANTOSTRAT), Collaborative Geoscience South Shetland (COGS) and Lithospheric Investigations in the Ross Sea Area (LIRA) held workshops at NIPR during the 14th and 15th of September, attended by some eighty scientists. The seven day post-symposium excursion to the Hokkaido Hidaka-Kamuikotan metamorphic belts was organized from 15 to 21 September by a joint effort with the IGCP-304 (Lower Crustal Processes), and was joined by 20 scientists.

After the date of the Symposium had been fixed, the date of the Antarctic Science Conference at Bremen was changed from June to September 1991. It was unfortunate that some scientists could not attend the Symposium due to this conflict.

The Abstracts Volume of the Symposium contains 279 contributions, which are at most six pages in length. This volume was designated as the formal SCAR publication for the Sixth International Symposium on Antarctic Earth Sciences. Many of the participants, however, expected there to be a Proceedings Volume as with previous Antarctic Earth Science symposia. At the same time, NIPR needed to publish the Proceedings for the formal record. Finally, 100 full-length papers were selected for the contents of this Proceedings Volume.

The grouping and arrangement of the contributed papers were not always done on a rational basis. These Proceedings were organized into seven chapters according to major subjects, which in some cases were related to the characteristics of the study areas. Papers within each chapter were arranged mainly by geographical setting. Chapter 1 focused on the petrological and geochronological studies of high-grade metamorphism, and was the largest chapter because of the many scientists who studied East Antarctic bedrock geology. Chapter 2 includes, as conspicuous papers, four presentations about the basement geology of Marie Byrd Land. Pre-breakup rocks of the Transantarctic Mountain regions also were examined in light of new data. Papers in Chapter 3 deal with the events associated with the syn- and post-breakup of Gondwana, including the regional tectonic evolution as well as paleoenvironmental characteristics inferred from paleontological evidence. Papers relating to recent tectonic events in the Antarctic Peninsula regions are included in Chapter 4. New data on Deception Island were presented by fresh colleagues. Chapter 5 consists of papers on various geophysical investigations, including station geophysics, field explorations and geophysical techniques. Air-borne gravity surveys and absolute gravity measurements provide new insights about Antarctic geophysics. Several papers on marine geology and geophysics are presented in Chapter 6, representing the activities of several countries and their future research perspectives. Cenozoic geology and geomorphology are discussed in the last chapter and represent the traditionally important aspect of "Glacial Antarctica." The application of a new technique for time-scale determination seems noteworthy.

The title "Recent Progress in Antarctic Earth Science" was introduced for this Proceedings Volume, and we hope will gain general acceptance as it is simple and in line with the traditional naming. The editorial work of this volume was performed by an Editorial Committee which consisted of ten members, six from NIPR and four from other institutions. Most of the tasks were completed by NIPR members whose efforts were equally shared, but with important advice from other colleagues. The three members who placed their names as the editors of this volume, represent the Editorial Committee and the three fields of earth sciences. During the course of publishing this Volume, many colleagues from foreign countries as well as from our country (including non-Antarctic scientists) generously provided their time and efforts in the tedious tasks of refereeing papers.

Three things must be noted finally. We did not always attempt to be consistent with the place-names in Antarctica because we thought it was appropriate to follow the author's usage if it did not cause confusion. Therefore, alternative expressions for the same place-name may be found in different papers. However, to remove any doubts about a place-name, the reader can look at the index. Secondly, we would like to seek the reader's forgiveness for not unifying through all of the papers the spelling of English, which differs sometimes in British and American. This is particularly difficult for Japanese editors, and we tried to be consistent within each paper. Thirdly, other inconsistent usage of terms can be found. This was caused mainly by hasty editing, for which the editor-in-chief must take the responsibility.

Y. Yoshida, Editor-in-Chief