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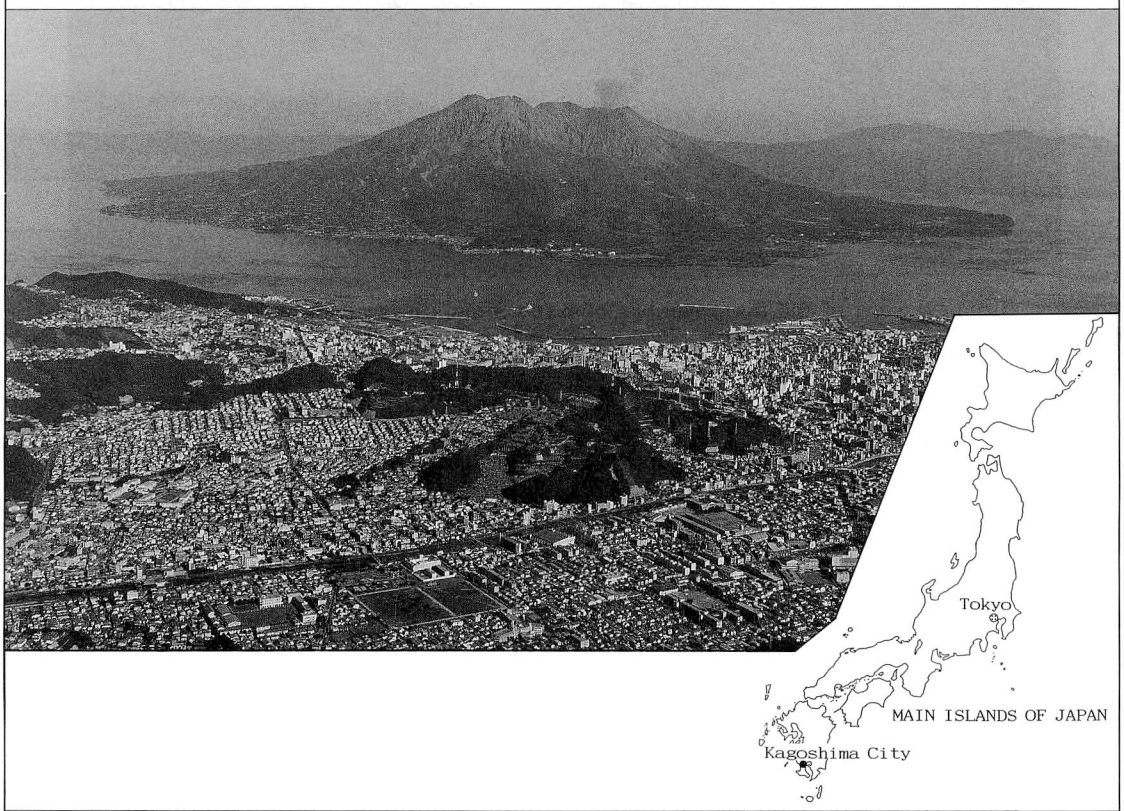


KAGOSHIMA UNIVERSITY RESEARCH CENTER FOR THE SOUTH PACIFIC

Birds-eye view of the main campus of Kagoshima University, the home base of the Research Center.

Announcement:

This "Newsletter" has been published once a year since 1990 (No. 1) up to 1992 (No. 3) by the Kagoshima University Research Center for the South Pacific. The title of the Newsletter is henceforth changed to "South Pacific Newsletter", the first issue is not No. 1 but No. 4.

CONTENTS

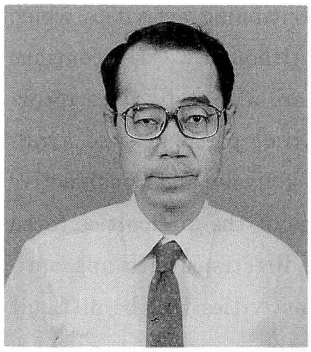
Cover photograph:

Aerial view of the active volcano, Sakurajima, facing the City of Kagoshima.

An Address from the New Director of the Research Center

Kazutaka NAKANO

Kagoshima University Research Center for the South Pacific



In April 1992, I took office as the Director of the Kagoshima University Research Center for the South Pacific and, with this position, responsibility for providing leadership. The 1990s presents the challenge of finding new directions in a rapidly changing world in which the old equilibrium of international power in place since the end of World War II has become history. The mass media tell us that Japanese universities are also profoundly influenced both directly and indirectly by these changes.

Nearly five years have elapsed since the Research Center was reorganized. According to plans agreed to at that time, we now have slightly more than five years left in which to complete our research projects.

It is very difficult to decide on a future direction that will reward our efforts with good results. The best way to arrive at a plan is to open the matter for broad ranging discussions between all those engaged with our Research Center.

So far we have completed, using the Keiten-maru, a boat belonging to the Faculty of Fisheries of Kagoshima University, a research project entitled Man and the Environment in Papua New Guinea. This project, supported by a Special Grant from the Japanese Ministry of Education, Science and Culture, was run over three academic years 1989–1991. Several scientific reports have been published on this work. Our bulletin, South Pacific Study, provides evidence of the increasing number of papers contributed by co-operating researchers working at institutions other than Kagoshima University. This confirms the impression that researchers in various fields increasingly hold the reputation of the Research Center in high regard.

Since the 1991 academic year when the Center was given the means to invite Foreign Visiting Researchers, the first research fellow has come and gone. Dr. Simon M. SAULEI of the University of Papua New Guinea, who conducted a field survey with us in Papua New Guinea collaborated on the writing up phase of this work. It is hoped that a relationship has been established which, over the years to come, will serve the mutual professional interests of both the Kagoshima University Research Center and the University of Papua New Guinea. The cordial relations which were set up over the period of Dr. SAULEI's appointment provides an excellent foundation for continuing work in one of our target regions.

In this academic year (1992), Dr. John M. MCKINNON, the immediate past chairperson of

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the Geography Department of Victoria University of Wellington, New Zealand, will take office as Visiting Professor for four full months commencing from November 24, 1992. The Geography Department of this University is one of the world centers of the Pacific Studies. Our invitation to a first grade researcher of the caliber of Dr. MCKINNON will do much to enhance the international reputation of the Research Center.

The development of our international activities through regional studies identified in this publication and along lines advocated in the report issued, on July 23, 1992, by the Advisory Council for Academic Policies will considerably raise the status of our Research Center in Kagoshima University as an institution engaged in substantial and continuing activities which contribute both to knowledge and furthering international relations. Although we will continue to make every effort possible to accomplish our assigned tasks, we are also obliged to recognize that our activities are limited by the inadequate number of fulltime personnel and available funds. Therefore it by no means just a polite request that I seek lively and constructive discussions at both formal and informal meetings, rather, it is because of the difficulties faced by the Research Center that we must secure strong support and new directions with appropriate potential. Without this support, the further development of our activities will be difficult and I will welcome any suggestions readers and colleagues are able to provide.

New Zealand Geographer Working at the Research Center

In response to an invitation Dr. J. M. MCKINNON a geographer from the Victoria University of Wellington recently took up the position of Visiting Foreign Researcher at the Kagoshima University Research Center for the South Pacific. Dr. MCKINNON welcomed the opportunity to consolidate the growing links between researchers in the South Pacific and the chance to share information and experience.

Over the period of his four month appointment running through December 1992 to the end of March 1993, Dr. MCKINNON will be working with Professor Kazutaka NAKANO, Director of the Center on problems of tenure and human ecology in swidden cultivation and other aspects of resource use in the Solomon Islands.

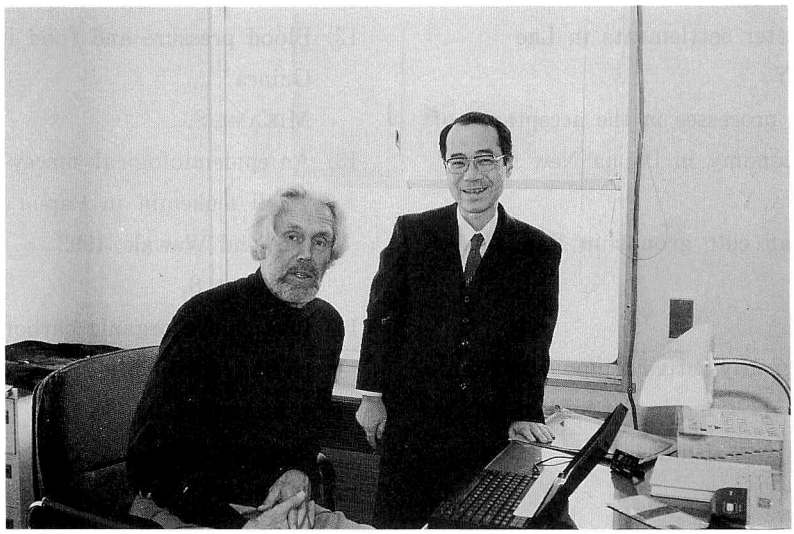
Dr. MCKINNON is particularly interested in the current status of land and marine tenure systems in the Western Province, especially Vella Lavella and the Marovo Lagoon. He will bring together material collected over three periods of fieldwork in 1969/70, 1985 and 1991.

High rates of population increase combined with the wish of land holders to improve their standard of living often results in conflicting demands being brought to bear on resources. The need to maintain both a reliable supply of food for domestic consumption and a continual flow of cash income

makes it necessary to plan for sustainable development. However, land holders with different priorities often find themselves in opposition to each other and unable to agree on how to settle their differences. The traditional fabric of conflict resolution is often not strong enough to bring the matter to a satisfactory conclusion and yet what needs to be undertaken cannot be imposed either by outsiders or the courts. The question is then "Can research contribute to clarification of the problem and promote a fair outcome?"

This work will pool the results of research carried out in the Solomon Islands by both the Kagoshima University Research Center for the South Pacific and the Department of Geography at Victoria University of Wellington carried out over the past twenty years.

Plans are also being laid for further collaborative work including a review of Japanese research in the South Pacific to be published in a special issue of the journal Pacific Viewpoint. The network of links built up by the Kagoshima University Research Center for the South Pacific with the National Museum of Ethnology in Japan and other universities and institutions will be used to enable the editors to make a comprehensive survey of the best work undertaken over the past fifty years.



Dr. John M. McKINNON (Left), Foreign Visiting Researcher for the 1992 academic year, with Prof. Kazutaka NAKANO (right), the Director of the Research Center.

ABSTRACTS FROM WORKSHOP AND SYMPOSIUM

Workshop on Papua New Guinea Survey

April 20, 1992

A workshop was held on the results obtained from the 1991 Research Project "Man and the Environment in Papua New Guinea" which was carried out in close cooperation with scientists from the University of Papua New Guinea, the Papua New Guinea University of Technology, other research institutes, and governmental organizations between November 1st and December 6th.

The titles of reports prepared and the names of authors were as follows:

1) The attitudes of people toward the dilemma of whether to keep to traditional life or modernize
MINAMURA, T.
2) The squatter settlements in Lae
TAJIMA, Y.
3) Symbolic processes in the acceptance of a cash economy in Papua New Guinea
KARAKITA, Y.
4) Melanesian cult groups in Papua New Guinea
ISHII, M.
5) Physiologically active compounds in marine animals living in the coastal waters of Papua New Guinea
IWAGAWA, T.
6) Screening and chemical study of bioactive metabolites from sponges and gorgonia in Papua New Guinean waters
UCHIO, Y.
7) Green algae along the northern coast of Papua New Guinea
ENOMOTO, S., JEBB, M., and OHBA, H.
8) Marine algae around Motupore Island off the southern coast of Papua New Guinea
OHBA, H., and ENOMOTO, S.
9) A ciguatera-causing dinoflagellate in coastal waters around Madang
INOUE, A.
10) A survey of the distribution of nautilus in the sea southeast of Port Moresby, Papua New Guinea
TANABE, K., TSUKAHARA, J., OKI, K., and SHINOMIYA, A.
11) Management strategies in subsistence fisheries
USUDA, K., MATSUOKA, T., and KAWAMURA, G.
12) Blood pressure and food in Papua New Guinea
MIKAMI, S.
13) An epidemiological survey of anti-adult T-cell leukemia in Papua New Guinea: Lae and Wewak, 1992
TERASHI, S.
14) Particulate organic carbon and chlorophyll from latitude 28° to 2°N in the western Pacific Ocean
ICHIKAWA, T., and KAMIYA, K.
15) Meridional hydrographic sections and planktonic foraminiferal assemblages in the western Pacific Ocean
HATTA, A., YUWAKI, Y., SHIMADA, K., MASUMITSU, S., and HIGASHI, M.
16) A case study of some aspects of agricultural production in the survey areas
SARABIA, A., and HAYASHI, M.

17) The vegetation in swidden fallows around Lae
SAULEI, S. M., NAKANO, K., KUDUK, M., and WIAKABU, J.

18) Isotopic ratios of oxygen and hydrogen taken from some samples of: ore fluid, hotspring, and river water in Papua New Guinea
NEDACHI, M.

Kazutaka NAKANO
(Kagoshima Univ. Res. Cent. South Pac.)

Symposium on New Images of Ancient Southeast Asia

November 21, 1992

The symposium on New Images of Southeast Asia was organized by the Kagoshima University Research Center for the South Pacific at Kagoshima Prefectural Museum of History on 21 November 1992. Prof. HAKARI Hiromitsu of Sofia University, former president of the Archaeological Society for Southeast Asian Archaeology, was invited as keynote speaker. Assoc. Prof. FUKAMI Sumio at Setsunan University acted as chairperson. Assoc. Prof. IMAMURA Keiji at the University of Tokyo, Mr. SAKAI Takashi at the Gunma Prefectural Research Institute of Archaeological Properties, Mr. NISHITANI Masaru at National Museum of Japanese History and Prof. NITTA Eiji at Kagoshima University were the speakers at the symposium. More than two hundred people attended.

In recent years Japanese archaeologists began to conduct archaeological projects and excavations in Southeast Asia and South China. New images of the ancient history of Southeast Asia are now being built on the results of their research. The symposium was well timed to contribute to new directions in Southeast Asian archaeology. All the speakers are leaders in this field.

After the opening ceremony, Prof. HAKARI presented his keynote lecture entitled "The Development of New Images of Ancient History of Asia". He stressed that Southeast Asia was not an undevelopped area which depended on China and India for its civilization, but had its own history. At the beginning of the Christian era historical parallelism in surrounding China including Japan and Southeast Asia accounted for most changes.

Assoc. Prof. IMAMURA's paper was entitled "The Excavation of Lan Vac site in Vietnam and Dongson Culture". Lan Vac is situated in Nghe Tinh province. A joint Japanese-Vietnamese team excavated the site over two seasons from 1990 to 1991. IMAMURA, Vice-Director of the Japanese side, excavated a cemetery which revealed many of the funerary aspects of Dongson culture. Some tombs included bronze daggers and bracelets as well as other bronze goods. The motif of battling animals which ornamented the hilt of a dagger suggests the existence of a cultural relationship between Dongson culture and the cultures of Siberia and Mongolia. The people of Dongson culture placed high value on bronze musical instruments such as drums, and bronze weapons such as the *ko* dagger as

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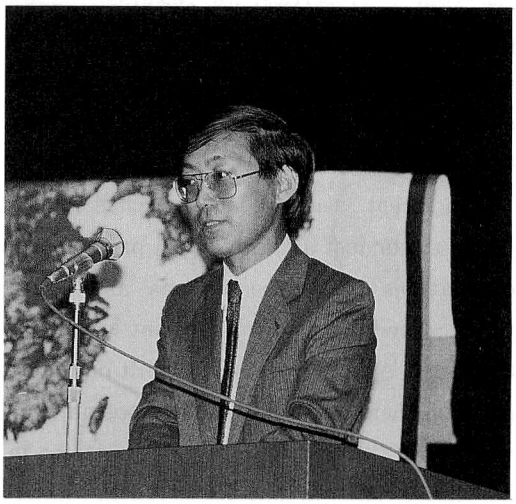
well as Japanese in Yayoi period who also placed high value on a bronze musical instrument such as the *dotaku* (bronze bell), and bronze weapons such as the *ko* dagger, spearheads and daggers. The resemblance between Dongson and Yayoi cultures is a good example of historical parallelism.

The NITTA lecture on "Ancient Industries and Social Development of Northeast Thailand." He reported on the excavations of settlement and work sites. He emphasized the fact that northeast Thailand was now the poorest part of the country, but his excavations reveal that it had a rich and splendid history. After the third century BC. iron and salt were the main products which were exported to outlying communities and provided the economic basis for the society. In the Khorat Plateau people lived together on artificial mounds around which they constructed ditches, moats, fences and earth works to protect themselves from attacks. Stratified communities existed in the northeast in the second half of the first millennium BC.

Mr. SAKAI gave a talk on the topic of "Indonesian Society just before the Birth of the Ancient Nations." He emphasized the importance of understanding the relationship between the coastal and mountain regions of Indonesia. Dongson bronzes are distributed in the western part of Indonesia, and large bronzes of local style are found in the eastern islands. They were bartered for trade commodities such as spices. The first Indianized state was found along the river valleys in the western part of Indonesia when moated cities were constructed as political and trade bases. Religious monuments were constructed in inland areas such as Borobudur which served as a religious center for both Srivijaya and Shairendra empires. Ancient states in Indonesia were founded on local prehistoric cultures strongly influenced by trade with India and China.

Mr. NISHITANI addressed the gathering on "The Formation of the Ancient World in South China." The wide distribution of shell middens along the coastal regions of South China indicates that these areas were not suitable for rice cultivation in the neolithic age and that the hunting-and-fishing economy continued for a long time. The regions' rapid economic and political development did not come until after the third century BC. Maritime trade between China and Southeast Asia played an important part in this development. Guangzhou is one of these important ports. The kingdom of Nam Viet founded in South China and North Vietnam in the third century BC. was based on regional trade. He stressed the importance of trade in the founding of ancient state in South China.

NITTA Eiji
(College of Liberal Arts, Kagoshima Univ.)



Prof. NITTA delivering his paper to the symposium.

ABSTRACTS FROM SEMINARS

Monitoring the Kuroshio in the Tokara Strait

January 13, 1992

Heat carried by atmospheric and oceanic circulation systems homogenizes atmospheric temperature. Oceanic circulation in the upper layer plays an important role in the horizontal transport of heat. The oceanic circulation is driven by large scale wind systems which in turn are maintained by heat energy released from the ocean. By studying the Kuroshio, the western boundary current of the subtropical circulation system of the North Pacific Ocean, it is possible to monitor related phenomena. Any variation of the circulation, which may result from a change in the large scale wind system, will be amplified on the western boundary current, such as the Kuroshio. So, to better understand weather patterns and the climate system it is useful to monitor the volume and heat transported by the Kuroshio.

Successful monitoring depends on selecting an area where there are clear boundaries to the Kuroshio and small changes in its path. The Tokara Strait area is most suitable for the monitoring because here the Kuroshio is hemmed in on the north by Satamisaki and on the south by Amamiohshima. Furthermore, it can be monitored by five tide gauge stations which are suitably deployed to measure the volume transport of Kuroshio. We studied fluctuations in the volume transport through the strait, using sea level records at the tide gauge stations and took time series record of changes in sea surface temperature from aboard of a ferryboat which regularly crosses the strait. We also commenced observations of flow velocity over the strait from another ferryboat equipped with an Acoustic Doppler Current Profilor.

Using the sea surface temperature and data collected from expendable bathythermograph casts and velocities at depths of 20, 75, and 150 m measured from a research vessel en route of the ferry, it was found that temperature front of the Kuroshio extends down to about 150 m. We found from analysis of the sea level records and the sea surface temperature that there was a good correlation over periods ranging from half a month to two months between the front migration and changes in the volume transport through the northern strait between Nakanoshima and Satamisaki. The northward migration of the front intensifies inflow into Kagoshima Bay as well as the Ohsumi Branch Current. There was also a good correlation between the velocity measurements made by the Acoustic Doppler Velocity Profilor and the temperature data observed by the casts of expendable bathythermograph. The results suggest that even more fruitful results will be forthcoming from future monitoring of the nature of volume transport of the Kuroshio through the Tokara Strait.

Akio MAEDA
(Faculty of Engineering, Kagoshima Univ.)

The Problems of Managing Tropical Forests in Papua New Guinea

March 16, 1992

The purpose of this talk is to present to you a number of pressing problems which we in Papua New Guinea have in our attempts to manage our forest resources in a sustainable manner for the future, instead of treating them as a wasting asset. Since independence in 1975, we are faced with the dilemma of achieving both economic and social developments and at the same time trying to conserve and manage our natural resources for future generations as enshrined in our National Constitution. This problem, coupled with the ever increasing pressures for the use of the resources have made the situation much more critical than before, especially at this stage of the country's development.

In order to have an appreciation of the forest management problems we have, some background information about the country will be presented. This is because the problems are not only related to international commerce, but importantly, they are also interwoven with the very diverse physical and socio-cultural aspect of the country.

Six major problems associated with forest management in the country have been identified and are discussed. These include the land tenure and conflicts of usage, high costs for establishment and maintenance of managed forests, problems related to logging operations, environment, lack of sufficient database and information about the country's forest ecology and dynamics for application to forest management and the problems related to marketing the very diverse timber species in international markets.

A number of remedial measures for approaching these problems are proposed and discussed, of which one such measure could be of interest to this University and the Research Centre for the South Pacific. This is the proposition for collaborative research between the country's institutions and individuals as well as with international Institutions and individuals. This is important in a country like Papua New Guinea which lacks adequate well trained and qualified manpower as well as funds to embark on extensive and detailed research programmes over a long period of time.

Simon M. SAULEI
(The Univ. of Papua New Guinea)

Chemistry under the Sea-Studies in Marine Chemical Ecology

April 14, 1992

The lecture reviewed the authors research in the field of marine chemical ecology, especially in relation to soft corals on the Great Barrier Reef, Australia.

Firstly, the presentation discussed the way in which soft corals use their chemical constituents to defend themselves against fish predation by use of toxins, feeding deterrents, and physical defense.

Secondly, the lecture discussed ways in which chemistry is used by soft corals to compete for space on reefs. This section discussed the possible roles of Secondary Metabolites in antifouling and allelopathy. The

soft coral *Sinularia flexibilis* was used as a case study for these two areas.

Thirdly, the role of small organic molecules was discussed in relation to coral spawning studies. The structures of sperm attractants used by the hard coral *Montipora digitata* and the soft coral *Lobophytum compactum* were revealed.

The lecture concluded with observations about the importance of interdisciplinary research programs in the Marine Sciences.

John C. COLL
(Univ. of Central Queensland)

Induction of Mutants Resistant to Bacterial Blight in Rice and Their Genetic Analysis

May 25, 1992

Bacterial blight (BB) of rice caused by *Xanthomonas oryzae* pv. *oryzae* is one of the most destructive diseases in rice-producing areas. There are no effective and economic bactericides and the development of disease-resistant cultivars is emphasized as a means of controlling the disease.

To increase the genetic resources for resistance to BB, a mutation treatment was conducted to induce mutants with resistance to the pathogens. Fertilized eggs of IR24, a cultivar susceptible to all Philippine BB races were treated with N-methyl-N-nitrosourea (MNU) at a single-cell stage of embryogenesis. The panicles of F_1 plants were bagged before flowering to avoid any outcrossing. M_2 lines, derived from each M_1 plant, were inoculated with a Philippine race 5 (isolate PXO 112) using the clipping method at the seedling stage. As a result, out of 2,739 M_2 lines tested, two mutant lines were found and designated as XM5 and XM6. Both mutant lines showed resistant to all Philippine races. To clarify their inheritance of resistance, they were crossed with IR24. The reaction of the F_1 and F_2 plants to BB races suggested that both mutant lines have a single recessive gene for BB resistance. Allelism tests were conducted with the three known recessive genes *xa*-5, *xa*-8, and *xa*-13 and the recessive genes of both mutant lines. The results revealed that mutant genes were not allelic with three recessive resistance genes, neither were they allelic with each other. Thus it was concluded that the mutant genes of XM5 and XM6 resistant to the Philippine races are new, and were respectively designated as *xa*-19 and *xa*-20. To determine their chromosomal location, trisomic analysis was carried out. The results showed that the *xa*-19 gene was located on chromosome 7. The *xa*-20 gene was analyzed on seven trisomics; Triplo 1, 4, 6, 8, 9, 10, and 12, but could not be located on the extra chromosome of any of them. It was concluded that MNU mutation treatment was successful and produced genetic resources resistant to BB.

Satoru TAURA
(Faculty of Agriculture, Kagoshima Univ.)

The Establishment of "Centers of Intellectual Excellence" for the Future Development of the Economy: Research and Development in Kagoshima

June 22, 1992

Japan is changing the structure of its economy. As part of restructuring, the government is promoting research and development work, designing new software, data processing, and design industries. These "think tanks" tend to be concentrated either in or close to big cities such as Tokyo.

In June 1988, as part of a nationwide program to promote regional growth, the government passed legislation to establish prefectural research and development centers. Such a Center was set up in Kagoshima as a join-stock company with a capital of ¥1,305,000,000 (now ¥1,361,000,000). This money was raised from the treasuries of national, prefectural, and lower-level local governments with some investment from private companies.

The four main objectives are:

1) Research and development of sophisticated technology;
2) Vocational training of those employed in the field of technological development;
3) The generation of advanced information systems on business strategies and the transfer of this information to the community;
4) Building of dynamic communication networks through which information can be spread to cooperating universities, research institutions, and the business community.

Hiromasa ITO
(Kagoshima Research and Development Center)

HTLV-I Associated Myelopathy (HAM)

July 6, 1992

The association of tropical spastic paraparesis (TSP) and human T-lymphotropic virus type I (HTLV-I) was first demonstrated in 1985 when a serologic study in Martinique found that 59% of patients with TSP had antibodies to HTLV-I. In Japan we also found an association of HTLV-I with spastic paraparesis, but because these patients reside in a temperate zone we proposed the term HTLV-I-associated myelopathy (HAM).

A subgroup of cases with HAM has been identified, which was related to a previous history of blood transfusion. The existence of another subgroup with mother-to-child transmission was also reported. The identity of the viruses of HAM and ATLL was shown through DNA blotting and DNA sequence analysis from an established cell line taken from the CSF of a HAM patient. HLA-haplotype-linked high immune responsiveness against HTLV-I has also been reported.

The mean age at onset of HAM was 41.2 years (range 5–75 years), and gait disturbance was the most common initial complaint. Onset of HAM was gradual in 92% of patients but the disease progressed more rapidly in older patients than in younger ones. Examination of cerebrospinal fluid frequently showed abnormalities and ATL-like cells were seen in the peripheral blood smear of 49% of patients. Favorable response to corticosteroid therapy was reported in 74% of patients.

Mitsuhiro OSAME
(Faculty of Medicine, Kagoshima Univ.)

Some Problems in Waste Water Disposal Systems at Food Processing Industries —The Situation in Kagoshima Prefecture—

September 21, 1992

Food processing is one of the leading industries and exceeds in number the factories of other kinds of industries in the Kagoshima Prefecture. The waste water discharged from food processing factories does not normally contain any noxious substances, but the great amount of water including a considerable quantity of organic material gives high BOD (Biochemical Oxygen Demand) values which frequently lead to several environmental problems.

A main waste water disposal system adopted in this industry is based on an activated sludge process. Several problems are associated with this process. 1) Precipitation of the sedimentary sludge in tanks is often retarded by the excess growth of filamentous fungi. 2) When the nitrification process in aeration tanks advances too far it induces both the production of gaseous nitrogen which produces a buyoant sludge in sedimentation tanks and the lowering of pH above the standard of dischargeable waste water.

Solving these problems in the activated sludge process depend fundamentally either on reducing the excess BOD loading or on eliminating the supply of unsuitable amount of air to the tanks. It is essential to maintain steady operating conditions and to avoid modifying the system suddenly while it is working without any trouble. Sometimes the immoderate extraction of sludge from tanks accelerates the growth of filamentous fungi.

The batch reactor activated sludge process is economic and recommended for processing waste water containing the organic substances above 1,000 mg/ℓ of BOD. The activated sludge process is recommended after anaerobic digestion for water with a ratio of more than 10,000 mg/ℓ BOD. Previous experiments to measure both effectiveness and economic efficiency of the process are required. Factories which discharge less than 30 m^3 of waste water a day are currently excluded from the application of environment protection laws at present, and normally discharge waste water without any special treatment. It is, however, a matter of urgency to develop more effective and less expensive equipments for waste water treatment systems so that small scale factories can reduce their discharge and follow environmentally sound conservation practices.

Michio MINOWA
(Create Co. Ltd.)

Developing a Precise Metrology by Very Long Baseline Interferometry (VLBI) —Detections of Plate Motion and Sea Level Rise in South Kyushu, Japan—

November 2, 1992

To develop precise metrology using very long baseline interferometry (VLBI) for astronomical and geodetic purposes for the 21st century, the 6mVLBI telescope, formerly

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sited at Nobeyama Radio Observatory of National Astronomical Observatory, is moved to Kinkowan Park, Kagoshima City, in December, 1992.

Future work will be focussed on the detection of various global changes in the earth's environment which are predicted to take place in the near future.

In this report, the following geophysical phenomena concerning mainly the abovementioned contents are treated in detail, stressing the role of space technology such as VLBI and GPS,

(1) Subducting plate movement in South Kyushu

Kyushu district is geologically located on the edge of the NW part of PHS plate and the SW part of the Nankai trough along which great earthquakes periodically occur every 100–150 years. The subduction zone is characterized by plate motion dipping to the land at a high angle and splitting into three blocks in the north, middle and south along lines perpendicular to the Nankai trough. Active volcanism and intermediate earthquakes related to volcanism are evident. The geomorphological volcanic front runs parallel to the isopleth at a depth of about 100*km* along the PHS plate.

(2) Sea Level Rise

Long term increases in sea level recorded at Aburatsubo tidal station in south Kanto district are found to be at rates of 1.0*mm*/yr and 1.6*mm*/yr for the periods from 1923–4 to 1988 and 1950 to 1988, respectively. As the rate accelerates after the 1950's, special attention should be given to future changes caused by global climate warming due to increasing CO_2.

(3) Geocatastrophe

In about 800–1000 years, the earth's magnetic dipole moment is estimated to show a value of 0!. Magnetic polar wandering or field reversal is expected to commence in the future. Sea level rise and expanding desertification are likely to increase.

Minoru TANAKA
(Faculty of Science, Kagoshima Univ.)

PUBLIC LECTURE SERIES

The South Pacific — the Sea and People —

The public lecture series of the Kagoshima University Research Center for the South Pacific was held in the campus of Kagoshima University for two days, on the 1st and 2nd of August, 1992. These public lectures were supported by a special grant from the Japanese Ministry of Education, Science and Culture. Five two hour lectures were given. Twenty three participants from a wide range of occupations and interest groups listened intently to the presentations on the nature of the sea. The schedule, subjects and abstracts of the lectures are as follows:

1. August 1, 1992

(1) Akio MAEDA, Professor, Faculty of Engineering, Kagoshima University,
"The Kuroshio Ocean Current and the Environment".

(2) Akio INOUE, Professor, the Kagoshima University Research Center for the South Pacific,
"Primary Production in Coral Reef Regions".
(3) Yoshiko KAKINUMA, Professor, Faculty of Science, Kagoshima University,
"The Domain of Living Things Creating the Sea".

2. August 2, 1992

(1) Yasuto UCHIO, Associate Professor, School of Allied Medical Sciences, Kagoshima University,
"Metabolites of Marine Organisms: Their Role in Infuencing the Ecology and Application in Health-Related Fields".
(2) Tomoya AKIMICHI, Associate Professor, National Museum of Ethnology,
"Maritime Life in Oceania".

The Kuroshio and the Environment

The Kuroshio, one of strongest ocean currents, circulates in a clockwise direction along the western boundary of the subtropical circulation system of the North Pacific Ocean. This system is made up of four currents, the North Equatorial Current of the Pacific Ocean, the Kuroshio, the North Pacific Current and the California Current. The system, like that of all subtropical circulation systems, is driven by equally large scale wind systems and strengthened on the western boundary, such as the Kuroshio and the Gulf Stream. Both currents are generally referred to as the western boundary currents.

The Kuroshio originates from the North Equatorial Current and flows into the East China Sea through the passage east of Taiwan. The main stream of the Kuroshio in the East China Sea generally flows along the continental slope. The Kuroshio leaves the slope west of Yakushima and eventually flows through the Tokara Strait into the southern sea of the mainland of Japan. The Kuroshio then continues along the slope south of Japan until it reaches an area east of Chyoshi. Somewhere along the continental slope in the East China Sea, southwest of the Yakushima, the Kuroshio forms the Tsushima Current which flows into the Japan Sea through the Tsushima Strait.

The Kuroshio carries large amounts of water and heat which it releases into the atmosphere around Japan. The warm water has a considerable effect on the environment and climate of Japan. Although by latitude Satamisaki is classified as falling within the subtropics, tropical plants grow there. The high rainfall of Yakushima is fed by evaporation from warm Kuroshio. Heavy snowfall on the coast of the Japan Sea is also generated by heat stored in the water of the Tsushima Current which is an extension of the Kuroshio.

The supply of heat not only effects the environment and climate of Japan but also has an impact on the global environment and climate. Heat carried by the Kuroshio homogenizes atmospheric temperatures in the temperate and subarctic zones. The heat carried by the Kuroshio plays an important part in maintaining the wind system of the North Pacific Ocean.

Akio MAEDA
(Faculty of Engineering, Kagoshima Univ.)

Primary Production in Coral Reef Regions

Primary production in tropical and subtropical coral reefs is dominated by two environmental factors, light intensity and inorganic nutrients. Some phytoplanktons, inhabiting these reefs, produce several toxins which are transferred to herbivorous and further to carnivorous animals which, when ingested by humans, can result in food poisoning.

In the daytime in tropical areas incident solar radiation reaching on the surface of the water is generally too strong for plants to survive. Phytoplanktons avoid this hazard by moving downward, hiding themselves beneath suitable substrate or congregating to reduce damage caused by photosensitivity. Light intensity at depths of several meters was measured to be above 30,000 lux at high noon. Laboratory experiments, using the epibenthic dinoflagellates collected at these depths, showed that they could not survive at artificial light of 7,000 lux or more.

The contents of inorganic nutrients, such as Ammonia-N, Nirate-N, Nitrite-N, Phosphate-P and Silicate-Si, are generally low in the coral reef environments. Nevertheless primary production is unexpectedly high. Because of this reefs are sometimes compared to desert oases. High rates of primary production may well be based on the quick turnover of nutrients, vitamins and other essential elements.

Akio INOUE
(Kagoshima Univ. Res. Cent. South Pac.)

The Domain of Living Things Creating the Sea

The sea is a gigantic aquarium, the mother of life and cradle of organic evolution in which we find the full diversity of living things. Living things construct their own biological world, and when confronted with sudden environmental changes can survive because of their homeostatic capability to restore themselves and respond in a flexible manner to the environment. The more complex the symbiotic relation between living things, the more stable the mechanisms which preserve the marine ecological system. From birth to death the constant and unceasing activity of living things is part of extensive circulation in the sea. It is true to say that living things recreate and rejuvenate the oceans.

Within this conceptual framework, this lecture dealt with the following topics: the way in which the external and internal environments affect the mechanisms of species survival; interspecific relations and bio-linkages; the way each species in its ecological niche plays a role in the oceanic matrix; and the input and output materials in the marine environment illustrated with reference to symbiotic species such as coelenterates, scyphozoans, hydrozoans and anthozoans.

Yoshiko KAKINUMA
(Faculty of Science, Kagoshima Univ.)

Metabolites of Marine Organisms: Their Role in Influencing the Ecology and Application in Health-Related Fields

Marine organisms living in oceans pro-

duce a variety of unique secondary metabolites, many of which are unknown in terrestrial natural products. The majority of oceanic metabolites are novel in both chemical structure and biological activities. Because of the diversity of aquatic fauna and flora metabolites also play an important role in the ecology of their natural environment. Small organic molecules defend themselves against predators (antipredation, antifouling), compete for space (species dominance), engage in interspecific interactions (chemical signals), and reproduce. Because of their potential applications as pharmaceutical agents (for example, antibiotics, antifungal agents, and antitumoral agents) unique bioactive compounds produced by marine organisms are of interest to chemists investigating natural products. In this lecture, a variety of biologically active compounds from marine sources are chosen to illustrate the multifunctional nature of secondary metabolites and their applications to health-related fields.

Yasuto UCHIO
(School of Allied Medical Sciences, Kagoshima Univ.)

Maritime Life in Oceania

Since ancient times, the sea has provided the people of Oceania with their basic needs. The dispersal of the Austronesian people into the Pacific (and across the Indian Ocean to Madagascar) clearly demonstrates the efficacy with which they have adapted to the maritime environment. Most significant is the use of marine resources. Using data of my own fieldwork in various parts of the Pacific, the present status of Pacific islanders' life is examined with reference to their perception and use of marine resources.

In general, food in Oceania is made up of a combination of vegetable staples (root crops and tree crops) and animal proteins derived from fishing, hunting, gathering and domesticates (pig, chicken and dog). This dichotomy is reflected in folk-models of food categorization, daily food consumption and food taboo observance. Fishing plays an important role not only in providing food but also in maintaining social and ritual life. Where fish is exchanged for vegetable staples or cash, it also enables people to communicate with each other through barter trade, gift exchange and local marketing. Food exchange between fishermen and agriculturalists encompass the domain of social exchange.

The introduction of new fishing technology and modern marketing, commercial fishing for sea cucumber and Trochus shell has stepped up the rate of exploitation which in turn raises serious questions concerning the appropriate use of marine resources. The contemporary transformation of marine resource use is a key to understanding the present-day life of Pacific islanders.

Tomoya AKIMICHI
(National Museum of Ethnology)

KAGOSHIMA UNIVERSITY RESEARCH CENTER FOR THE SOUTH PACIFIC

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The Research Center is engaged in interdisciplinary research activities concerning tropical Oceania and surrounding regions, and the staff carries out comprehensive studies under the common research subject, "Man and the Environment". Every year until 1997, the Center will host one Visiting Researcher with a distinguished record of publications on some aspect of regional studies of the above-stated areas. Once selected, the candidate will be appointed as a Visiting Professor or Associate Professor and take office for 3 months to one year (not less than 6 months is preferable).

The candidate should undertake, during the term of their appointment, collaborative research with the staff concerning one of the following themes :

1) terrestrial environments,
2) organisms and resources in marine environments,
3) conditions of health, and
4) history and/or cultural studies.

As a rule, the applicant should hold a Ph.D. or M.D.

An appointee can be granted a salary and research expenses equivalent to a corresponding staff member of Kagoshima University and round-trip travelling expenses as well as the right to use an office, equipment, library, and other facilities and services.

Detailed inquiries are always welcome and should be addressed to the following :

Kagoshima University Research Center for the South Pacific
1-21-24, Korimoto, Kagoshima, JAPAN 890
Facsimile : (81) 992-56-9358 (Inquiries by telephone are not accepted.)

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EDITORS' NOTE

Editors hope that our South Pacific Newsletter will link Japan into the flow of information available in the South Pacific. Letters to the editors are invited. We hope to publish some of these in the next South Pacific Newsletter. The address is shown on the back cover of this Newsletter. All contributions will be welcomed.

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