



Japan Society of Civil Engineers
International Activities Committee

Newsletter

No. 7 February 2002

Greetings from the New Chair of International Activities Committee



Miki Chitoshi, Chair of IAC

Until last year, the International Activities Committee (IAC) has been reviewing the internationalization strategies of Japan Society of Civil Engineers, and the roles of the International Activities Committee. The result was compiled into "JSCE 2000," JSCE's Reform Policy. They can be summarized into four points:

- 1) correspondence with Agreement of Cooperation Societies; strategies for internationalization
- 2) dissemination of scientific information; public relations
- 3) global integration of education, standards / qualifications
- 4) global contribution; funding

Upon assuming my post as the Chair of IAC, I would like to evaluate the activities to date, based on the above. In line with the changes in the international community, I intend to redevelop the international strategies to explore a more efficient and more practical means of activities. Also, through united efforts with the Organization for Promotion of Civil Engineering Technology (OPCET) which commenced its activities in 1999, I am determined to draw up measures to revitalize the international activities of JSCE.

JSCE presently holds Agreement of Cooperation with 18 Societies / Institutions. The

signing of these agreements merely marks the beginning of the relationships, and how these exchanges and cooperating relationships take form, and are developed, is the most important. Deepening the friendship between members, and organizing joint seminars in fields of common interest are a few tasks lying ahead. It is indispensable for us with a neutral standpoint to establish a system under which we can actively provide technological support to those Societies / Institutions in the developing countries. The Taiwan, Korea, and U.K Sections of JSCE engage in collecting and exchanging information as well as organizing various events in coordination with the JSCE Headquarters. They shall play a key role in the JSCE international activities through their links with the Agreement of Cooperation Societies / Institutions.

The English website has been greatly improved and will be updated on a regular basis. This shall become the main tool for disseminating information worldwide. The new site contains a Professional Registration system, Professional Advisor Search function, and Technical Paper Search function. Digital information will not just be limited to introducing the JSCE activities overseas, but can also assist domestic engineers to widen their appeals to the international community.

To increase overseas members, I aim to consult with related divisions concerning the appropriate level of overseas membership fees, distribution method of JSCE magazines, and to realize any possible improvements. Credit card payments have newly become available for overseas members. I strongly feel that there should be some alluring factors for those who studied in Japanese universities to continue their membership even after they have returned to their home countries. JSCE is holding a 50,000-member campaign, but with less than 200 overseas members at present, it is far from becoming "global." Words shall no longer be considered as barriers. Those days are now behind us. The word "global" itself may even become out-of-date. Let us envisage the ways in which to make the overall activities of JSCE truly global.

56th JSCE Annual Meeting

The 56th JSCE Annual Conference was held Oct. 2 – 4 at Kumamoto University. It featured annual academic lecture presentations (including 2 English sessions), Panel Discussion, International Roundtable, and Special Lectures. Participants included delegates from overseas Agreement of Cooperation Societies / Institutions, and members of JSCE Korea and Taiwan Sections. The 2nd International Section Meeting was also held.

ASCE Annual Conference and Exhibition



*The Kansai International Corporation
Exhibition Booth*

“The Houston 2001 Civil Engineering Conference and Exposition” was held by American Society of Civil Engineers (ASCE) from Oct.10th to 13th in Texas, USA. The Kansai International Airport exhibited technologies for large-scale, swift construction of airport islands on deep underwater soft grounds. In addition to displays of working craft models (hopper barge and sand piling barge), it provided precise information through audio visuals, panels, and pamphlets, in effort to publicize the Kansai International Airport and the Kansai region to the international community, and the receipt of the Monument of the Millennium Award as well. The booth attracted a total of over 500 visitors during the two-day exhibition, proving to be a big success.

KSCE 50th Anniversary

President Tambo attended the International Symposium for the 50th Anniversary of Korean Society of Civil Engineers (KSCE) held Nov. 1 - 2 in Seoul. In regard to the International Symposium on “Civil Engineering for the Unification Era of The Korean Peninsula in the 21st Century,” President Tambo expressed Japan’s willingness to provide support in the infrastructure development following the unification.

PICE 27th National Convention

Philippine Institute of Civil Engineers (PICE) 27th National Convention took place in

Cebu City, Nov. 29th -Dec. 1st on the theme “Harnessing Information Technology towards the Academic of the Civil Engineering Profession.” Prof. Hanamura of JSCE International Activities Committee attended the event, and participated in the international roundtable to discuss “Disaster Preparedness.”

CICHE Annual Conference

Executive Director Mr. Furuki attended the Chinese Institute of Civil & Hydraulic Engineering (CICHE) Annual Conference held Dec. 7 – 8th in Taipei. The International Roundtable was given on “Engineer’s Mobility” in which he took part.

JSCE Signs Agreement of Cooperation with TCCE

JSCE concluded its 18th Agreement of Cooperation with the Turkish Chamber of Civil Engineers (TCCE) in October 2001. Both being a country with many earthquakes, Turkey and Japan have strengthened bilateral ties in dealing with such disasters. The Agreement aims to contribute to further development of such constructive relationships.

JSCE’s Third International Section Founded in London



Founding of U.K. Section

The U.K. Section of JSCE was established in London on October 19, 2001. The 3rd international section of JSCE following Taiwan and Korea Sections, consists of 19 members. President Tambo and Prof. Miki (Chair of IAC) represented JSCE at the commemoration ceremony. Mr. Sugiyama (Nishimatsu Construction Co., Ltd., London Branch Office) was elected as the 1st President.

As many as 100 members and invitees attended the inaugural reception that took place in the Institute of Civil Engineers (ICE) building. President Tambo and Mr. D. Oakervee (Vice President of ICE) gave cordial greetings and exchanged memorial presents.

After 30 Years –Active History of Committee on Environmental Systems in JSCE –

More than thirty years have passed since the present “Committee on Environmental Systems” started as a small “Subcommittee on Environment Issues” under the “Committee on Sanitary Engineering” in 1970. This Subcommittee actively held “Annual Symposium on Environmental Issues” since 1973 followed by “Annual Symposium on Environmental Systems”, and “Workshop on Environmental Problems” since 1980. This Subcommittee was approved in 1987 as the “Committee on Environmental Systems” to be one of the permanent research committees in JSCE. At that time, the Committee recognized that the spatial scope of traditional pollution problems expanded to a global scale and that new civil engineering approaches were necessary from the perspective of its socio-economical roles and aspects in dealing with these problems. It promoted originally such new studies as “formation of the analysis of the relationship between human activities and environment” and “new expansion including soft control measures.” The mission of the Committee was described as grasping environmental issues comprehensively and systematically in the synthetic context of technology, economy, and society. In 1992, “Annual Meeting on the Environmental Systems Research” took over the former “Annual Symposium on Environmental Systems.” The Committee has been the advancing outrider in the research field of the system approach on the wide-range of environmental issues which encompass the conventional specialized individual studies. We can see the historical development of the cross-cutting-type environmental studies in the accumulated editions of the Proceedings of the Annual Meeting and Selected Papers of Environmental System Research.

The Subcommittee on Self-Evaluation (Chaired by Dr. T. Futawatari) inside had reviewed the history. The report was published in 2001 as “Self-Evaluation of Committee Performance and Viewpoints of Environmental Systems Research” in the JSCE Journal of Environmental Systems and Engineering (No.685, VII-20) 2001-08. The review was based on the keyword analysis, hearings, and the presented papers in the past Proceedings.

The number of papers presented at Annual Meeting or Annual Symposium has been increasing, especially in these 13 years from around 30 to 100-120 per a year. The “call for papers” is announced in the JSCE Journal as; “We welcome research and/or proposal papers which

focus on understanding an environmental issue as a system with people and society, or try to introduce a system of social/environmental foundation. Topics will include; principle of environment system, environment ethics, environment planning, structural analysis of environment, environment dynamics, environment conservation, environment evaluation, regional environment, global environment, environment and social system, supporting measures, regional awareness, environmental education.”

In the research field of atmospheric environment, interdisciplinary researches have been significantly expanded combining meteorology, geography, urban planning and botanical physiology. In the aquatic environment field, the following researches have been preferably discussed recently: a) watershed systems, b) interdisciplinary research with landscape or energy budget, c) application of the environmental economy/policy, and d) independent self-circulation systems. In the ecological researches, the Proceeding of Environmental Systems Research is unique with a wide variety of the subjective field and species, with a good balance of basic science and restoration/rehabilitation methodologies. In the global environment and climate change issues, first-step researches have been conducted in these ten years including a) GHG emission inventory, b) urban energy analysis by LCA, c) household accounting book on CO2 and energy, d) regional planning, e) coastal impacts of sea level rise, f) Chinese food/water balance, g) international relations of environmental resources, h) GCM global climate prediction models, and i) combined models of global warming. Policy discussions and proposals for prevention and adaptation are to be stimulated next. In the field of environmental policy and philosophy, convergence from and diversion to the neighboring disciplines have been intentionally repeated. Innovation of environmental management and/or planning with new social objectives is to be proposed through the in-depth investigations of value/meaning/principle of environment. Basic principles will include finiteness, sustainability, uncertainty, circulation, and capacity.

Hearing survey suggested the expansion of the Committee’s future activities into the fields of “urban environment, risk management, environment policy, environmental economics and ethics/philosophy” through holistic approaches.

Yasushi Hosokawa
Environmental Systems Committee

The Metropolitan Area Outer Discharge Channel Project - Giant Scale Storm Water Drain Tunnel System -

1. Project Background

Situated in a low and flat basin approximately 30 km north of Downtown Tokyo, the City of Kasukabe and its eastern neighbor township, Showa-machi, have been suffering from repeated severe flooding. Surprisingly, major portion of the basin is lower than the beds of area's rivers. Once flooded, the area does not easily drain due to the area's topography with low and very gradual ground.

2. Project Scheme

In order to reduce the risk of flooding in the area, the Ministry of Land, Infrastructure and Transport is constructing a giant storm water drain system across the basin. The drain tunnel, the largest in the world of this kind, has inner diameter of 10.6 meters and total length of 6.3 kilometers at the depth of approximately 50 meters from the ground surface. There are five vertical shafts with inner diameter of about 30 meters and depth of some 70 meters. They are currently used as construction access. Once completed, they will function as storm water collection pits as well as reservoirs, connecting the nearby rivers to the discharge tunnel. All the collected storm water will be pumped out to majestic Edo River at the maximum capacity of 200 cubic meters per second and eventually flow down to the Tokyo Bay.

3. Project Schedule

Construction of the first three sections of the

drainage tunnel started in 1993 and completed in 2000. The main pump station adjacent to Edo River, which is one of the Japan's largest, is complete. Fourth section of the tunnel was started its construction in 2000 and is scheduled to finish in 2004.

4. Tunnel Construction Method

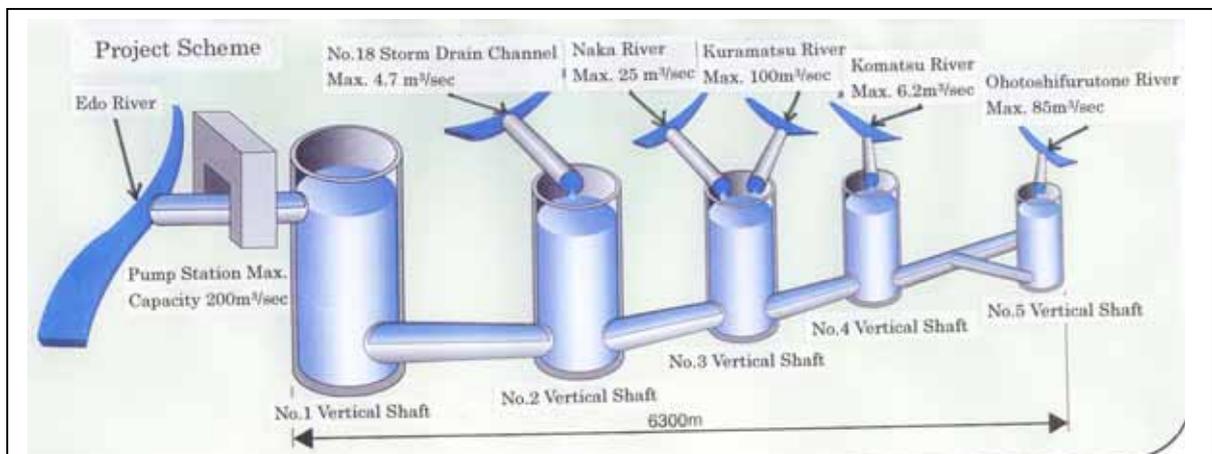
This storm drain tunnel is being built by the state-of-the-art slurry shield tunnel method. Typical size of the shield machines used here is outer diameter of 12.04 meters, length of 11.75 meters with middle bent body capacity and weight of 2,300 metric tons. The tunnel is constructed in such depth in order to take advantage of stable diluvial sand and clay layers situated around the tunnel alignment. As a result, the ground settlement has been minimized.

Shield tunneling operation is highly systemized and mechanized. Actual excavation and the shield segments placement are monitored and controlled in a central control room situated just behind the shield machine, letting large special equipment handle most of the physical work.

Excavated soil out of the tunnel is in a slurry form being pumped through the piping and lifted to a slurry processing plant built on the ground adjacent to a vertical shaft. The slurry is dewatered and processed there and hauled to a riverbank improvement project as recycled fill material.

The tunnel has high watertightness thanks to segments with dual seals. The "DRC" type segments are now being used for the fourth tunnel section (DRC stands for Ductile iron encased Reinforced Concrete).

These segments of the future have higher strength and rigidity, and can be assembled in place much faster than other types. New



Overall Project Scheme



Tunnel Section with Segments Hauler

connecting and locking devices on the segment edges do not require bolting which is normal for other types of segments. Further, the hybrid structure can make a segment piece thinner than other segment types due to higher strength and stiffness, allowing reduction in tunnel excavation volume.



DRC Segments

5. Ending

The project is progressing toward overall completion with aid of the latest tunneling technology. Once completed, more than 3 million people living in the area will have no more fear of overflowing river water and all tragedies experienced in many past years could be forgotten as nothing happened.

For more information, there is a project visitor center called "Sairyuu-kan" in the City of Kasukabe and the Ministry's project website is as follows (in Japanese only).

<http://www.ktr.mlit.go.jp/edogawa>

Takefumi Takuma

Kajima Corporation

The Volcanic Eruption of Miyake Island - Damages & Restoration -

1. Volcanic Activities and Evacuation of Miyake Island

Mt. Oyama began showing signs of volcanic activities on the Miyake Island, a circular island located 180 km offshore to the south-southwest of Tokyo with a diameter of approximately 8 km, so the Tokyo Metropolitan Government established a disaster countermeasure office on June 27, 2000. On August 18th, the volcano shot up fumes that reached up to 14,000 m in height from its mouth on the summit of the mountain, covering the entire island with ash for the first time in the history of Miyake Island. Low temperature pyroclastic flow was observed on August 29th. Under such circumstances, the Miyake-mura village headman ordered the evacuation of all 38,000 villagers on September 2, 2000. Evacuation life is still continuing.

According to the Earthquake Research Institute of the University of Tokyo, the amount of ash fall on Miyake Island is estimated to be around 11,000,000 m³. Each rain carries the accumulated ashes downstream, gathering scoria, and turning into a large mass of mud and debris flow. As it moves toward the foot of the mountain, it erodes away the bottom and the sides of the mountain streams. On level ground, it will spread out and accumulate into the shape of a fan. Although there are no significant eruptions observed since October 2000, the amount of sulfur dioxide released into the air remains high around 1,000,000 to 5,000,000 tons/day even today.



Damages on Todo



Damages on Households

2. Damages on Miyake Island

There are 16 major damaged areas to the 33 km-long loop line or “TODO” managed by the Tokyo Metropolitan Government. The 500 m interval between ASHIANA and TATSUNE in the TSUBOTA area is impassible due to a great deal of accumulated sediments and wiped out roads. The debris washed down from the mountainsides stacked up 1.0 – 0.5 m thick on top of the roads between SHITORI Shrine and AKABAKYO. The roads were completely destroyed around SANHICHIZAWA in the SANHICHIYAMA area and in HOTOKEAWA. In OOSAWA, KARAKURIBASHI, and HIRAYAMABASHI, the sidewalks and the shoulders were washed out.

There are nine damaged lines within the “RINDO” or the paths through the forest. The most devastating was the Mt. OYAMA Loop Line along the mountainsides, which is ruined and buried in various places.

In harbor facilities at MIIKE and OOKUBO ports, TUBOTA, AKO, IGAYA, and YUNOHANA fishing ports, the quay walls and breakwaters sank a maximum of 50 cm and became slanted. Earth and sand piled on the

anchorage area and in the waterways. Every time the volcano erupted, ash fell on the runways of the Miyake Airport.

Water facility damages include 13 ruptures in the water pipes, and the KANASO Second Water Source was buried by the mudflow. 26 electric utility poles were washed away, torn down, or slanted, and electric cables across 40 traves were washed away, cut, or slacken.

Sabo facilities were damaged at ANEKAWA, MAGAWA, and CHIKUANASAWA dams, which filled with volcanic ashes and rock. Coastal revetments were greatly damaged along TOMBISAWA, MICHINOSAWA, IGAYASAWA, and KAWADASAWA mountain streams.

3. Disaster Countermeasures and Restoration Progress

The restoration of TODO is the base to restoration activities. Accumulated earth and sand were removed, and the restoration work on roads was repeatedly carried out. In the TATUNE area where the roads were ruined by the mudflows and were impassible, a temporary bridge was constructed and opened for use on April 18, 2001. Other temporary bridges were built in the four severely damaged areas of HOTOKEAWA, ASHIANA, SANHICHIZAWA, and KARAKURIBASHI, securing roads for restoration vehicles.

For harbor facilities, the key to restoration, temporary mooring facilities were set up in TUBOTA and YUNOHAMA fishing ports in January 2001 for tentative use, and the waterways and anchorage areas were dredged in MIIKE port and AKO fishing port to be used as a base for transporting restoration equipment, machinery, and crew since March. Three heliports are secured including the temporary heliports, and MIYAKE AIRPORT is also available with the mud cleared away from the runways.

Restoration work was carried out for damaged water sources, distribution basins, and the seven ruptures in the pipelines to secure the Western water route from OJI source to TOSA distribution basin. Water is supplied to MIYAKE village office, regional administrative offices, desulfurization lodgments (clean-houses), concrete plants, and other bases for activities. Power distribution was resumed along the TODO since mid-February, and presently, power is being supplied 24-hours through remote operation from the city center in line with the nighttime stationing arrangement.

Sabo work is an extremely effective countermeasure against mudflows. Flow channels were secured by removing driftwoods and sand that clogged the culverts. In addition, sandbags were piled up to prevent proliferation of mudflow, and channelization and creation of temporary channels

across the roadway were carried out, and bed protection blocks were also set. In addition, to prevent further mudflow damage to houses, wire sensors and log booms were placed along 16 streams in need of immediate attention, and earth and sand that accumulated in the existing sediment control dams were removed. Ten sediment control dams are currently being constructed in the streams including SANHICHISAWA, KAWADASAWA, and IGAYASAWA.

4. Full Fledged Infrastructure Restoration and Execution of Countermeasures Against Mudflow

For efficient restoration of Miyake Island facilities, the Tokyo Metropolitan Government has put together the "Mudflow Measures / Infrastructure Restoration Project Team of Miyake Island" composed of eight related bureaus: Bureau of Construction, General Affairs, City Planning, Public Health, Labor and Economic Affairs (currently the Bureau of Industrial and Labor Affairs), Housing, Port and Harbor, and Waterworks (presently enhanced with the addition of Bureau of Environment and known as "Miyake Island Restoration Measures Technology Conference") plus Miyake Village, TEPCO, and NTT East. The project team is selecting the best restoration order and methods taking into account the regional benefits, and is making adjustments with the related organizations.

Further restoration activities over the next three years include constructing eight new bridges over mudflow paths, and alignment improvement of roads in two places in order to fully restore the TODO. "Disaster Related Emergency Sabo Works" will be carried out immediately through construction of 16 sediment control dams, and creation of flow channels on 16 streams having many villages nearby. Work on 51 sediment control dams and flow channels further began along 27 streams in "Volcano Sabo Quake-Stricken Disaster Measure Special Emergency Works" and are to be completed by fiscal 2005. At present, desulfurization lodgments (clean-houses) have been set up on the Island to provide safe working conditions against toxic volcanic gases, and a restoration work force of over 300 crews are actively engaging in full-scale restoration of each Island facility.

Hiroki Furukawa
Tokyo Metropolitan Parking Corporation

Innovation of Procurement System (CALs/EC) by Ministry of Infrastructure, Land and Transportation

The big wave of innovating procurement system is coming through the world. The procurement system must be open to the world and the wave is also rushing into the construction market in Japan. The agreement on government procurement of World Trade Organization was brought out in 1996. The Ministry of Land, Infrastructure and Transport (MLIT) officially agreed to open Japan's construction market to the world and will encourage the use of the electronic tendering system. Nihon Keizai Shimbun reported that MLIT expects to save time and cost of procurement procedures by adopting the system.

The "Construction CALs Service Basic Plan" was presented by a working group in August 1996 and "the Construction CALs/EC Action Plan" was formulated in September 1997. The electronic procurement system started in the beginning of October 2001, and procurement of 94 public works projects are to be effected through the system by the end of 2001 fiscal year. The system will simplify the process of giving out notices of projects and application qualifications, tendering, and notice of award. Meanwhile, the system enhanced fairness in the competition and the transparency of procurement in public works projects. Finally, MLIT has a plan to employ the electronic tendering system in 44,000 of public works projects by the 2003 fiscal year and hopes the system will spread to local governments by 2010. It will save 20 to 30 billion yen per year in costs.

There still remain a lot of challenges for MLIT in the electronic procurement system. The virtual tendering studies performed by MLIT suggest that there are issues such as the slowness of responses on network lines, lack of satisfactory manual in system failures and the security risk of the electronic systems and tendering functions. Each local government will also develop and improve the system independently and tenderers are likely to be confused in dealing with the various types of electronic tendering system. In order to solve these problems, it is necessary to make an integrated standard for these launched systems.

The development of electronic procurement system provides the benefits of competition fairness and cost reduction of procurement. When the electronic procurement system based construction market is accomplished and recognized as an innovated Japanese procurement system by international tenderers, it then means that the Japan construction market is truly open to the world.

Hiroataka Hiyama
CTI Engineering Co., Ltd.

JSCE Study Tour Grant



The Vietnam Construction Association (VCA) and Japan Society of Civil Engineers (JSCE) have entered into the Cooperation Agreement in April 2000 in Hanoi, Vietnam. This important event was highly appreciated by VCA and its members, especially Vietnamese civil engineers as all of them well understand the advanced civil engineering technologies of Japan. These civil engineer members have been working with Japanese engineers and specialists in Vietnam in various fields such as transport infrastructures, urban development, environmental protection, manufacturing facilities, office buildings, etc.

It was pleasure for me to receive an invitation from JSCE in May 2001 to visit Japan under a Study Tour Grant 2001 provided by JSCE as a representative from VCA. Due to the limited time, a tight itinerary was arranged from 8 to 16 July 2001 in Tokyo, but the visit was not focused on a particular subject at that time.

I am a civil engineer and have been working as a Business Development Consultant for the Vietnam Consultant Corporation for Industrial and Urban Construction, under the Ministry of Construction from 1984 and I was elected as Vice Secretary General of VCA in 1999.

The proposed visits were excellently arranged and adjusted including urban development, environment facilities, transport facilities and equipment for construction works, which Japan has much advanced technologies and experience. The main purpose of my visit is to try to get a view of civil engineering development in Japan and to of its experience in management skills and technology application as much as I can.

This report presents my experiences and my thoughts during my visit in Tokyo. (see the details in JSCE website: <http://www.jsce.or.jp>)

I would like to express my sincere thanks to JSCE for giving me this fantastic chance to visit Japan. Although my time in Tokyo was limited, it was a unique and most valuable opportunity in my life, not only to be in Japan to get a real view the civil engineering of Japan but also to see the beautiful country and meet hard-working and

friendly people and to learn more about the Japanese culture and traditions.

Finally I am grateful to all participants of the Tour as they were all extremely accommodating without exception, and their cooperation made the Study Tour a success.

Nguyen Duy Thang
(Vietnam Construction Association (VCA))

Upcoming Events

88th General Assembly

Date: May 31, 2002
Place: Hotel Edmont

4th Summer Symposium

-Call for Abstracts-

Date: Aug. 3, 2002
Place: Kyoto University
Abstracts due: Apr. 19, 2002 (Details on website)

57th JSCE Annual Conference, 2002

Date: Sep. 25 – 27, 2002
Place: Hokkaido University

English Publications

ARTICLES (From July 2001 to January 2002)

Concrete Library International No.38,
JSCE, December 2001, 236 Pages,
Price: ¥2,625 (US\$35.00), ISSN 0913-4913

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