



# SCIENCE BULLETIN

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## NSC Establishes an EC Documents Center

With the announcement by the European Community that it would establish a single market by the end of this year, products, labor services, personnel and capital will be able to flow unimpeded within the borders of the twelve member nations of the EC. The EC will demand that outside nations open their markets to EC nations before it will open its market to them. The individual import quotas of EC nations will be replaced by a general quota; protectionist measures of each member will give way to Community protectionist measures, and disparate boycotts by member nations will be superseded by collective retaliation. With this enormous economic and trading power as a negotiating condition, the international community shall have to pay greater attention to the future trade development of this region. The ROC has not had a great deal of contact with EC nations in the past, and lacks official relations, so obtaining information is not easy. Domestically, the Board of Foreign Trade under the Ministry of Economic Affairs, the China External Trade Development Council, the Euro-Asia Trade Organization, and the European Studies Institute of Tamkang University have gathered information concerning those in charge of business there. However, in terms of comprehensiveness, information about the administration of the EC is not complete.

In May of this year (1992), Mr. Ma Tao-hsing, Director of the Science and Technology Information Center of the NSC made a special trip to Luxembourg and the Bureau No. 13 in charge of EC information, as well as the European Community Administrative Publishing Office, and obtained information about the administration of the EC with which to set up a domestic European Community Documents Center to provide service to all sectors. Arrangements have gone fairly smoothly, and it is estimated that the center can be realized in a short period of time.

The documents issued by the EC administration generally fall into two categories. The first is basic material, such as EC organization, laws, regulations, etc. The second concerns research and analysis materials concerning such areas as technology, energy, environmental protection, medicine, finance, markets, society and culture in the EC. Not only are there printed documents for both these categories, but in addition, a database has been set up, as well as the ECHO computer network to connect EC member nations for queries.

EC internal data transmission has matured rapidly over the past two years. The number of databases set up by the EC itself has already risen from 33 last year to 44 this year. Use of the computer network by EC member nations is already widespread. Last year there were only 5000 plus user codes on the ECHO network, this year that figure has already risen more than 15,000. The Science and Technology Information Center joined this network four years ago for use by all sectors here in the ROC.

In order to set up the EC Documents Center, the Science and Technology Information Center talked to the Board of Foreign Trade under the Ministry of Economic Affairs, the China External Trade Development Council, the Euro-Asia Trade Organization, and the European Studies Institute of Tamkang University and observed how they gathered EC documents. Most of the materials in hand now are lists of industrial and commercial concerns in EC member nations, trade regulations, and the like, but there are few documents published by the EC administration. Most lacking is

analysis and research information about technology, energy, environmental protection, medicine, finance, markets, society and culture. Most of this analysis and research information for the entire European Community has been published over the last year or two, so it has high reference value but is not expensive, nor great in volume, and thus is suitable for importing en masse and is presently in great demand domestically.

Furthermore, materials about Europe are scattered over various domestic government units and need to be brought together and classified by computerization to build a catalogue database which can be put on a computer network for the convenience of domestic users in making inquiries to understand the present state of materials on Europe here in the ROC and their distribution. Once the EC Documents Center is set up, the Science and Technology Information Center plans to combine materials from the Board of Foreign Trade under the Ministry of Economic Affairs, the China External Trade Development Council, the Euro-Asia Trade Organization, and the European Studies Institute of Tamkang University to jointly provide service to all domestic sectors so that they may understand the EC and thereby improve our relations with the EC.

The Science and Technology Information Center has indicated that it will first bring in EC administrative documents, then it plans to negotiate with the relevant EC organizations to add data about ROC scientific research, national development projects, engineering and markets to the EC data system in order to expedite bilateral data exchange and raise international understanding of the ROC via the connection between the EC and other nations.



# Summary of the "Adhesive Technology for Tropical Woods Symposium"

The "Adhesive Technology for Tropical Woods Symposium," jointly funded by the NSC and the Council of Agriculture of the Executive Yuan, and sponsored by the Forestry Research Institute, was held for four days during May 25 through 28, 1992 in the Conference Room of the Institute. In all, 102 foreign and domestic scholars attended, among them 46 from the ROC, 21 from Japan, 12 from the US, 11 from Malaysia, 7 from India, and the remainder from Canada, the Philippines, France, Singapore, and South Africa. They presented a total of 71 papers.

The purpose of this symposium was to seize upon improvements in tropical wood adhesive processing techniques in hopes of more effectively utilizing tropical wood materials to achieve the perpetual operation of tropical forests. Although forest timber is a renewable resource, rapid growth in population has led to a large reduction in the amount of natural high-quality timber reserves. Furthermore, the quality of man-made forests is vastly inferior to that of natural ones, thus using all sorts of processing technologies to improve low-quality wood materials for producing superior products is indeed a task of the greatest urgency.

In view of the recent large-scale destruction of tropical rain forests, the first part of the agenda for this symposium had as its topic technological development and the perpetual operation of tropical forests. The opening principal address, titled "Forest, Entropy and Humankind" was delivered by the long-famous Dr. Peter Koch of the United States. Three discussion topics were discussed completely in one day, including wood technology and the perpetual nature of tropical forests, tropical forest resources and

environmental influences, and worldwide cooperative research and technological transfer. A total of 12 papers were published, describing in detail the development of tropical forest resources and its impact on the environment.

The official agenda of the "Adhesive Technology for Tropical Woods Symposium" began on the second day with ten agenda items, including tannic acid adhesives for tropical wood materials, extracted materials and plywood, wood properties and plywood, adhesives for adhering tropical wood veneers, biologically developed adhesives, the durability of plywood products, recent developments in hardening techniques for adhesives, combined tropical wood and non-wood boards, board manufactured products, and other relevant topics – adhesives commonly used on tropical wood, and adhesive techniques and special characteristics of adhesion were discussed and described in detail.

This symposium was a grand occasion for the ROC forest products sector to meet with over fifty foreign scholars and specialists from tropical wood consumer nations (such as the US, Japan and the ROC), and more than 20 people from Southeast Asian timber resource nations (such as Malaysia, Indonesia, etc.). Thus it could be said that this symposium combined discussions on tropical wood resources and utilization. Besides inviting scholars and specialists from various nations to publish symposium papers, this symposium also provided an opportunity to allow the scholars at the meeting to exchange ideas gain from their research in order to open up new avenues of research and increase international cooperation. The ultimate goal was to bolster research on processing techniques for tropical wood materials, and pro-

vide the most effective means for utilizing tropical wood materials. After the conclusion of the symposium, all the present techniques and data relevant to the processing and utilization of tropical wood materials will be edited into a volume by the end of September for academic and industrial reference. Its contents will include research results and new information on adhesive techniques for tropical wood materials.

After the conclusion of the symposium, a tour of the Sunrise Plywood Corporation and the Nantou Handicrafts Research Institute on May 29th and 30th was arranged in response to the requests of more than ten Southeast Asian scholars. This tour allowed these symposium scholars to better understand processing use of tropical wood in Taiwan, and received consistently excellent reviews by symposium scholars.

The greatest successes of this conference were: 1) the greatest single attendance of foreign specialists at a symposium sponsored by the forest product sector, including the attendance of two long-famous scholars: Peter Koch and Hikaru Sasaki; 2) although Japan and the ROC do not presently have diplomatic relations, the attendance of more than 20 prominent scholars can be considered a singular success of people-to-people diplomacy; 3) the fact that the conference stressed adhesive techniques for tropical wood materials and environmental protection, it could be said to have covered all the most recent pertinent research findings and adhesive discoveries; 4) the participation of more than 20 specialists from timber resource nations completely combined the symbiotic relations between upstream resources and downstream users.

## Industrial Growth and Environmental Protection – The Petrochemical Industry

Taiwan's petrochemical industry has been extremely important part of the economic infrastructure of the ROC since the 1970s. It not only employs more than one quarter of the manufacturing industry's work

force, but also more than one-fourth of its total manufacturing value. It is also the most complete part of the vertically integrated system in Taiwan's capital-intensive industry. Therefore, it is not an exaggeration

to say that the so-called "Taiwan Miracle" has been essentially built upon the growth of the entire petrochemical industry. Analyzing the growth of the petrochemical industry will be helpful in providing some

preliminary insights into the Taiwan experience and possibilities for future growth.

With respect to the growth of the petrochemical industry, at present that which is attracting the most attention and is the most controversial is none other than the proposed Formosa Plastics Number Six Naptha Cracker. In addition to its importance for the upstream petrochemical industry itself, this project also has two characteristics: First, it is a case where the nation first gave permission to a private business to invest in upstream basic materials production in the petrochemical industry, a naptha cracking plant. In the past, the structure of the petrochemical industry was such that the upper stream was monopolized by the state-owned China Petrochemical Corporation, while the mid-stream was controlled by a ten or so privately operated large-scale enterprises. Lower stream plastic textile product manufacturing industries

consisted of countless small- and medium-sized companies. In comparison to the 1970s when the Number Three Naptha Cracker Construction Project was rejected by the Ministry of Economics, the Number Six Naptha Cracker, without a doubt under the national policy of "privatization" and relations between government and business, has indicative significance. Second, when Formosa Plastics was choosing the site for its Number Six Naptha Cracker, its choice of Ilan County's Li-tse, which it preferred at first, encountered environmental opposition from the local government and local civic groups, and so the company was forced to abandon plans for the site. Thereafter there were reports of plans to build the cracker in the Kuan-yin Industrial Zone of Taoyuan, and then in Mai-liao near Chiayi and Yunlin, and even plans to invest in a site at Haitsang on the Chinese mainland. This process of locational runaway is suffi-

cient to explain the mutually influencing relationships between local governments, the central government, and capital investment projects, which are the crux of the decision about how the petrochemical industry will develop in the future and what sites it will choose. And among them, the seeming conflict between environmental protection and economic development, how supportive an attitude local and central government have will be a primary consideration for the petrochemical industry in making its choices.

From the foregoing rudimentary description, we can see the importance of the petrochemical industry for Taiwan's economic development and therefore, the direct and indirect influences its development and transformation have on the structure of our economy and on related changes in our political situation.

## **R.O.C. has Signed a Sci-tech Cooperative Document with Russia**

On March 18, the National Science Council (NSC) signed the Cooperative Document on science and technology with the Russia's Ministry of Science, Advanced Education and Technology Policy. The document includes the establishment of a representative office and technological unit which will found a technological transfer foundation and cooperate on technological advances in five areas.

Hsia Han-Ming, the Chairman of the NSC stated that two years ago the NSC had already begun to meet with officials from Russia. This cooperation agreement signed in March includes four technological fields: (1) import of high efficiency,

low polluting engines; (2) import of electric vehicles which use high energy batteries; (3) development of electronic materials as well as high and low temperature super conducting materials; (4) development of lasers for medical use. In addition, the agreement specifies that cooperation on electro-optics, satellite technology, and airplane production technology will continue. The NSC will also invite related scholars and experts in each field to form groups and to collect relative technology deemed necessary for the advancement of those projects. After this has been organized by the NSC, according to the cooperation agreement, the developed technology will

be shared with Russia and Russia will arrange the establishment of an appropriate institution. Then, the NSC will select one to three scholars to be sent to the institution to study the circumstances and evaluate the proper level of cooperation. All of this will be done within three months.

Simultaneously, the NSC has invited Russian technologists to Taiwan to study related science departments and to discuss in greater detail the establishment of concrete research plans. After evaluation by the NSC, those plans will be implemented with the subsidies of the technological transfer foundation.

## **Summary of the Seminar on Office Automation by the Year 2000**

The Seminar on Office Automation by the Year 2000 was sponsored by the Information Science and Technology Exhibition Center operated on consignment from the NSC to the Institute for Information Industry, government agencies connected with technology, and the Taiwan branch of the Wang Computer

Company. It was held June 23, 1992 on the first floor of the Information Science and Technology Exhibition Center. It involved separately carrying on the part of the seminar and a live business exhibit. In all, over 150 outstanding members of publicly- and privately-run organizations participated in the seminar. The

opening ceremony was hosted by the vice director of the Information Science and Technology Exhibition Center, Hu Tzu-yin and the vice president of Wang Computer Corporation, Lin Kuo-pen. During the seminar, many specialists from the Executive Yuan's Research, Development and Evaluation Commission,

The Information Science and Technology Exhibition Center reached a tacit cooperative understanding with the departments of education in Taipei County and Taipei City, and set up channels for school organizations to make extracurricular educational tours of the

Starting in July of 1992, the Information Science and Technology Exhibition Center not only expanded its services, but also its operating hours, and created a new image of "being open all year," as well as combining the resources and professional personnel from the Ministry of Education, NSC, and the Institute

Confronted with rapid changes and developments in our information society, the methods used by the Information Science and Technology Exhibition Center in carrying out the appropriate emendations and adjustments to the missions and obligations it shoulders are worthy of being noted by all segments of society.

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