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SCIENCE BULLETIN

National Science Council
2 Canton Street
Taipei, Taiwan, Republic of China

Sixth Board Meeting of Advisors for Science & Technology Concludes

The Sixth Board Meeting of Advisors for Science & Technology, Executive Yuan, was held in Taipei April 2-6. Topics discussed include (1) general policy, manpower and basic sciences, (2) health and environment, (3) chemical industry, (4) energy, (5) agriculture, (6) telecommunications, and (7) electronics & information industry. The advisors outlined their suggestions as follows:

Dr. Frederick Seitz and Dr. Pierre Aigrain, who were in charge of the first topic, suggested that the central government make more research and development funds available to concerned departments.

They also called the government's attention to the problem of the shortage of high level scientists and technicians, the solution of which, they said, will be crucial to proceeding smoothly in other basic science development programs.

With regard to the problem of environmental pollution, the advisors jointly proposed that the government should establish the schedule for achieving the environmental quality goals for various control areas.

Meanwhile, they said, the provincial/municipal governments should propose a long-range implementation plan, including pollution control standards and an investment timetable within three years, to achieve the goals.

The implementation plan should give the economic development a maximum allowance, they added.

The central government on its part should also provide the guidelines for implementation planning and amend the existing laws to increase annual revenue for pollution control expenditures and to facilitate effective enforcement, the advisors said.

Dr. Kenneth G. McKay, reporting for the group on telecommunications, pointed out that the installation fee for telephones is rather too high. "As

long as the potential exists for further subscriber growth, as it now does, it would seem wise to reduce the installation fee," he said.

In connection with the digitization of the telecommunication network, he suggested that the government prepare a plan to introduce common channel interoffice signalling.

In the field of health and environment, Dr. Ivan L. Bennett, Jr. presented some important recommendations concerning a medical care network in the Republic of China and improving medical education here.

Dr. Carl A. Gerstacker, who was responsible for the chemical industry group, suggested that the government here should import more in raw materials and commodity chemicals while exporting high value-added products.

Minister K.T. Li addressed the closing session of the meeting as the featured speaker. Excerpts of his speech are given below:

At the opening session last Monday, I remarked that the Republic of China is at an important turning point. Politically, we are beginning another presidential term, with a new vice president and with a new cabinet beginning in late May. Economically, we face major decisions in investment, training and management, as we increase the emphasis on high technology and restructure our traditional industries to upgrade quality and efficiency. Socially, we must use our resources more effectively to improve the quality of our urban and rural environment. It is important to improve our thinking and planning, in order to prosper in the



Minister K.T. Li (standing) addressing opening session of the Sixth Board Meeting of Advisors for Science and Technology, Executive Yuan, on April 2. Eight foreign advisors attended the five-day meeting.

complex, competitive world of tomorrow.

Our universities must continue to improve the quality and quantity of postgraduate programs, to prepare our most capable young people for positions of leadership and achievement in research, systems management, and high-technology enterprises.

In recent years, there has been a great improvement in public health. We must maintain this progress by extending and strengthening our medical care networks, and preparing more doctors for clinical research.

The chemical and petrochemical industries occupy an important place in our economy. It is encouraging to note that several companies are now spending close to 1% of their revenue for research and development. Future expansion should be based on low-cost imported petrochemical intermediates. We can then concentrate on greater-

added-value products for export and local demand. Continued purchase of foreign technology, supplemented by increased research in Taiwan, should keep us competitive in the world market for high-technology, high-value chemical products.

The world energy shortage is over, but we cannot be complacent about the supply and use of energy in our economy. We import more than 85% of the energy consumed in Taiwan. Further diversification of types and sources is essential to assure a reliable supply.

Our present inconsistent energy price structure distorts the economics of development and results in the waste of precious resources. Electric rates which encourage excessive peak demand are increasing the cost of power for everyone.

Electronics and telecommunications provide the framework of the im-

portant and fast growing information industry. But software is the vital connecting link which enables this industry to serve and stimulate all other economic activities. Our Telecommunications Laboratory must become an efficient, state-of-the-art "software factory".

It is important that the hardware, software and procedures of the Republic of China be standardized and coordinated with the world information network, so that we may contribute and benefit as a full-fledged participant.

Agriculture will always be basically important to our economic strength and social stability, although its contribution to total GNP has been declining for many years. Our total capabilities in agricultural technology and extension services are impressive, but they must be integrated and coordinated to serve this sector with maximum effectiveness. We must also recognize the importance of our large forest areas not just for production of commercial timber, but also to stabilize our soil and water resources, and provide recreational areas.

Pollution problems are difficult to analyze and solve. We need to improve our data collection and classification, in order to better determine and coordinate the efforts now being made by various organizations in environmental improvement. We must also adopt a broad, practical approach, and in so far as possible make use of existing proved technology. Every individual and organization has an obligation to protect our land, water and air. A large part of our task is to create an active awareness of this responsibility.

In this free society, we must assume the ultimate responsibility for the ways in which we allocate our resources and spend our money. Today we find it easy to raise funds to expand the output of textiles and TV sets for export. Perhaps our society would gain more real benefit by spending the same amount to improve the quality of our environment.

During the five years since the Advisory Board was organized, I have had the opportunity to discuss your ideas and recommendations with many officials in government and industry. I have consistently found a sincere interest and willingness to cooperate. For this reason, I am convinced that our leaders will make the right decisions if they are frankly and adequately informed. But all of us must be willing to communicate — to speak, to listen — and to work together in carrying out decisions which will truly benefit our society. —CENS

Sino-French Seminar On Earth Science Held

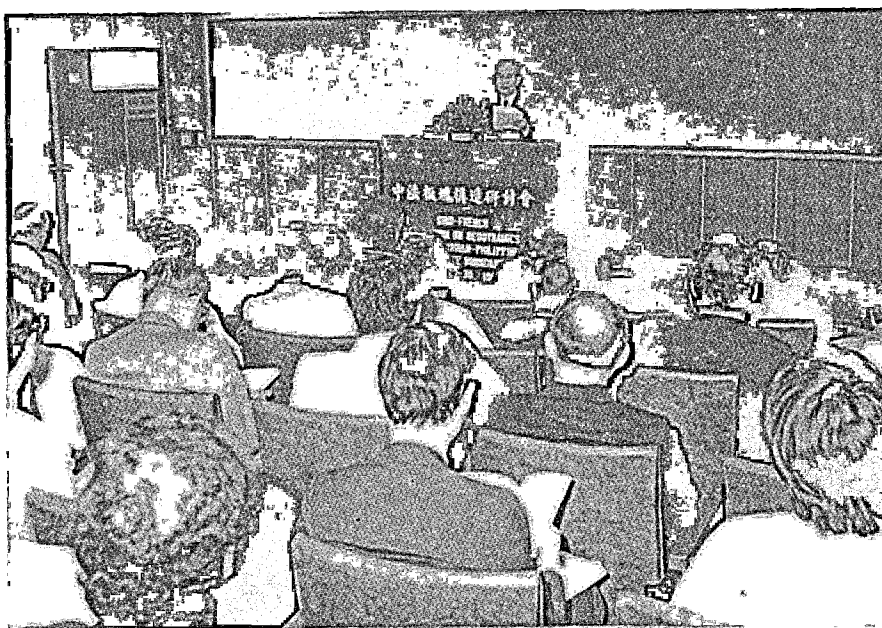
The Sino-French Seminar Earth Science Seminar, jointly sponsored by the National Science Council under the Executive Yuan and the Association Francaise pour le Development Culturel et Scientifique en Asie, Representation Permanent a Taipei, opened April 24 at the Academia Sinica's Institute of Earth Science in Taipei.

Over 200 experts and scholars in geology from this country and abroad, including twelve French geologists and specialists from the United States, Japan, Britain, the Philippines and Indonesia, attended the seminar which

lasted through April 30.

During the first three days of the meeting, a total of 48 papers were read and discussed. The participants proceeded to the Central Mountain Range, Heng Chun Peninsula and the Coastal Mountains of the island on a five-day tour to investigate the geological phenomena peculiar to this area and study Taiwan's earthquake problems.

Photo shows NSC Chairman Chang Ming-che preside over the opening session of the seminar.



ROC's Manpower and Financial Input In Research/Development in 1982

The following charts show the major findings of a survey conducted by the National Science Council on science and technology activity in 1982. —Ed.

* FTE = "Full-time equivalents" refers to part-time researchers who are counted on the basis of full-time work as distinct from head counts. For example, if a researcher spends half of his working hours doing research work, he is counted as ½ full-time equivalents.

1. R/D expenditure

- A. Total amount: NT\$12.859 billion
- B. As percentage of GNP: 0.7%
- C. Source: (Figure 1)

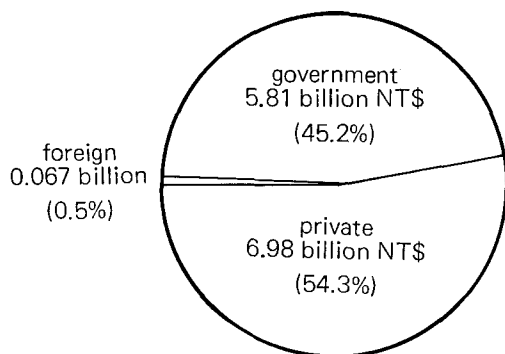


Figure 1 Source of R/D funds

2. R/D Manpower

- (1) Head Counts
 - A. Total number of researchers: 23,262, including
 - Research fellows 7027
 - Assistant research fellows 6401
 - Research assistants 9834
 - B. Number of researchers per 10,000 people: 13
 - C. Distribution of researchers: (Figure 2)

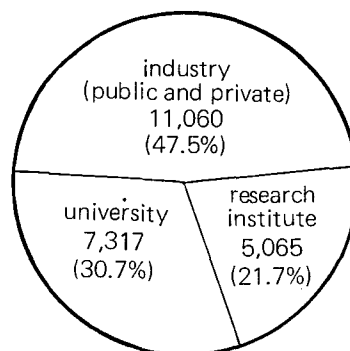


Figure 2 Distribution of Researchers

D. Outlay (Figure 3)

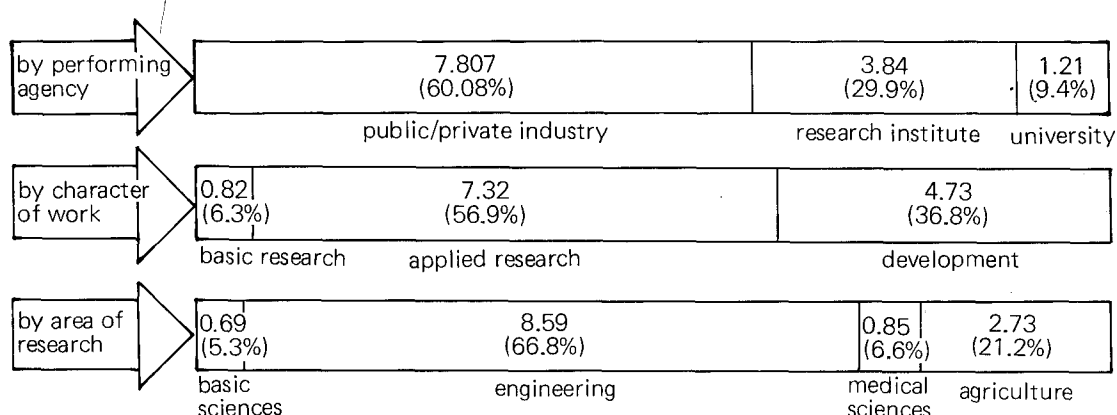


Figure 3 R/D Expenditure (in billion NT\$)

* (2) Full-time equivalents (FTE)

A. Total (including researchers, technicians and supporting personnel): 21960 full-time equivalents

B. Composition & distribution of manpower: (Figure 4)

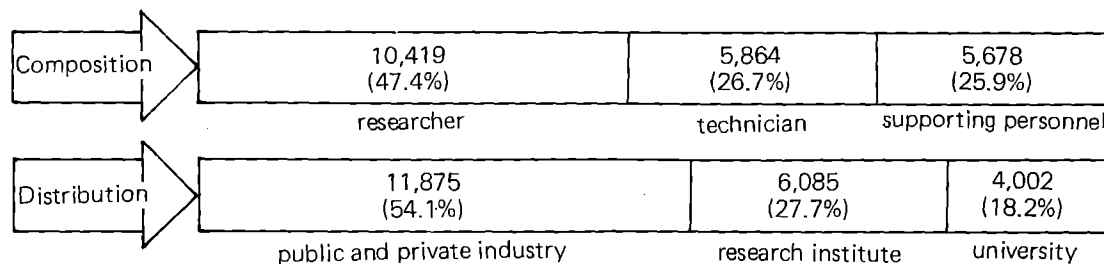


Figure 4 Composition and Distribution of R/D Manpower (in FTE)

(3) Researchers: 10,419 FTE

(4) Distribution of researchers (Figure 5)

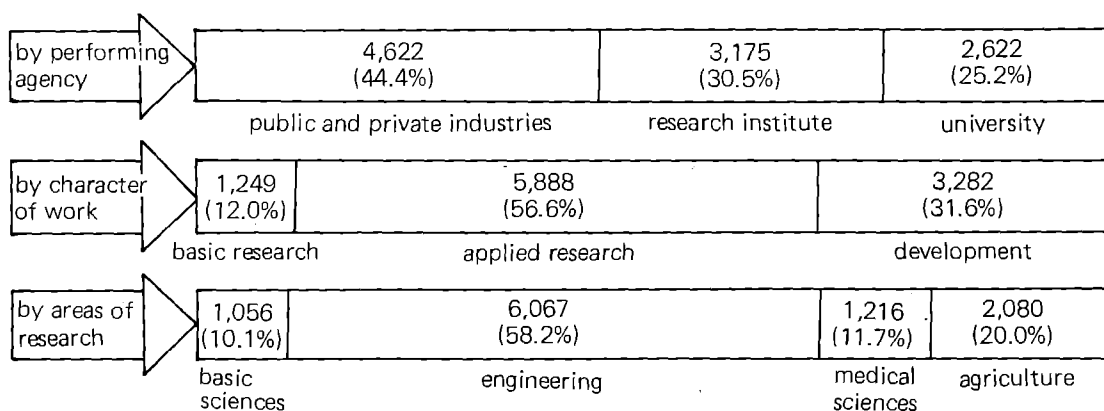


Figure 5 Distribution of Researchers (in FTE)

3. Financial & Manpower Input for Eight Strategic Areas of Research

Table 1 Financial & Manpower Input for Eight Strategic Areas of research

area of research	input of resources		order	
	funds (NT\$ million)	manpower (FTE)	According to Funding	According to Manpower
Information	1420	1,192	1	1
Automation	1000	671	2	2
Materials	800	574	3	3
Energy	540	280	4	5
Electro-optics	530	210	5	7
Food processing	260	321	6	4
Biotechnology	120	223	7	6
Heptatitis control	80	55	8	8

