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China Report

SCIENCE AND TECHNOLOGY

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CHINA REPORT

SCIENCE AND TECHNOLOGY

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CONTENTS

PEOPLE'S REPUBLIC OF CHINA

ABSTRACTS

NATIONAL DEVELOPMENTS

SCIENCE, TECHNOLOGY PERSONNEL EXCHANGE PROGRAM

HK140428 Guangzhou Guangdong Provincial Service in Mandarin 1000 GMT 13 Jun 83

[Text] The provincial CPC committee and people's government recently instructed CPC committees and people's governments at various levels to energetically exchange people of talent and give full play to the role of scientific and technical personnel in the four modernizations.

The instruction said: We must know better the important role of scientific and technological progress and of qualified scientists and technicians in socialist modernization. We must deal with this issue from a strategic point of view and in a sense of sober-mindedness and urgency. We must continue to wipe out the "leftist" influence of despising talented people and scientific and technological progress. We must unfailingly depend on and make proper use of scientific and technical personnel in practical work and give full play to their initiative. Leaders at various levels must adopt an overall point of view and vigorously support the proper moving of scientific and technical personnel so that they will be able to display their abilities as much as possible. Leading groups at city, prefectural, and county levels and leaders of all departments directly under the province must center serious discussions upon and conduct investigation and study of the problem concerning people of talents. Through investigation and study, they must know well how to use and control the scientific and technical personnel in their districts or departments, work out plans for transferring in or out people of talent in the near future, and take effective measures to crystallize the plans.

The provincial CPC committee and people's government also called on local authorities to take action immediately to push forward the exchange of scientific and technical personnel in a proper way within the limits of the province. To meet the needs of the readjustment and development of the national economy, scientific and technical personnel who are held up in the work or are not properly used in some units must be rearranged in a planned way, and the right persons must be placed in the right jobs. Only by so doing will it be possible for scientific and technical personnel to give full play to their abilities and role. In addition to the transfer by organizations, scientific and technical personnel are permitted to move from one place to another under guidance and in an organized way. The principle of such movement must be: Scientific and technical personnel whose present jobs are not in line with what they were educated and what they are good at, and who are held up in the work in the units they are working may move

to the units where their abilities can be fully displayed; they may move from where there are more hands than are needed to where they are urgently needed, and they may move from large cities to medium-sized and small cities as well as border areas. Meanwhile, the movement of scientific and technical personnel might be carried out through public recruitment or personal application. Enterprises, institutions, and organs are permitted to advertise for the people of talent they require in the city where these people are located. Counties and towns are permitted to give public notice of vacancies to be filled in large and medium-sized cities. And scientific and technical personnel themselves are permitted to apply where they are needed. However, in any case, in the moving or transfer of scientific and technical personnel, consent must be given as a result of discussions by the scientific and technical personnel themselves, the units in which they are working, and the units in which they are going to work. Preferential treatment must be offered to the scientific and technical personnel who are going to be transferred to where they are urgently needed. For instance, those who are transferred to the forefront of agricultural production must be promoted with one grade of floating wages and be given other favorable considerations in accordance with the relevant document of the State Council and the provincial government. This document also includes some concrete measures concerning the employment of the scientific and technical personnel who now have no definitive jobs in society, the scientific and technical personnel who resigned their posts to go abroad or to Hong Kong or Macao, but who now intend to return to work, and the scientific and technical personnel who are recruited from other provinces.

CSO: 4008/145

NATIONAL DEVELOPMENTS

HENAN ALLOTS FUNDS TO PROMOTE SCIENTIFIC RESULTS

HK070740 Zhengzhou Henan Provincial Service in Mandarin 1100 GMT 4 Jul 83

[Summary] "In order to speed up the popularization of scientific and technological results, and to apply directly these results to real production, the provincial people's government decided to set aside 2 million yuan in funds for popularizing 35 items of major scientific and technological results achieved by the province. At present, these projects have been started one after another. And, as expected, they will have an effect in the first half of next year."

Of these 35 items, which need less investment and may produce prompt and conspicuous economic results, 23 fall into the category of industry, and 12 fall into the categories of agriculture and medicine. "Total economic returns will amount to more than 34 million yuan according to the plan."

This is the first time the provincial plan has covered projects of popularization of technological results. In order to correctly select items to be popularized, the provincial scientific and technological commission, the bureaus and departments concerned directly under the provincial government, and the scientific and technological commissions of the prefectures and cities concerned jointly conducted an investigation, the provincial scientific and technological commission called different units concerned to make a feasibility study in terms of technology and economics in February; the commission also sent its staff members to carry out a further investigation in the prefectures and cities concerned after April, and see that specific agreements were signed between responsible units and executive units. "The provincial financial department and the provincial scientific and technological commission also jointly promulgated the plan for popularization of technological results and issued a circular, demanding that the scientific and technological commissions and financial departments of different prefectures and cities, and the bureaus and departments concerned directly under the provincial government, would conscientiously carry out the plan, spend special funds on special purposes, and fulfill the tasks according to the schedule."

CSO: 4008/141

BRIEFS

NEW GEOLOGICAL JOURNAL--Beijing, July 3 (XINHUA)--Chinese geological workers, one million strong, now have a new newspaper devoted to their special interest. The "China Geological Journal" began publication July 1. It is part of the efforts to promote China's geological work--an important field in the country's economic construction. The folio is published by the Ministry of Geology and Minerals every Monday and Friday. While covering news of special interest, said a note introducing the paper in the frontpage of its first issue, the journal will also try to explain to other people the policies on and the importance of geological work. "We will try to win the understanding, concern and support from people of all walks of life for geological work," the note said. The first issue of the new journal frontpaged inscriptions written by Chinese leaders Fang Yi and Bo Yibo to mark its publication. Fang Yi's inscription reads: "Work hard to raise the level of China's geological sciences and technology." The journal has replaced the old "Geological Journal", a tabloid. [Text] [OW030351 Beijing XINHUA in English 0235 GMT 3 Jul 83]

SEISMIC SCIENTIFIC AWARDS--Beijing, 9 July (XINHUA)--The successful forecast of the 1975 7.3-magnitude Haicheng earthquake has received a first-class award for important seismic scientific achievement. The award was announced at the first meeting of the Academic Committee of the State Seismological Bureau, which closed here today. Altogether, the 6-day meeting cited 43 seismic scientific findings, of which 5 received first-class awards and 38 second-class. Among the second-class award winners was a set of the China Earthquake Intensity Division Maps, which predict earthquake danger zones in China and the maximum intensity of possible quakes in the coming 100 years. The newly-established Academic Committee of the State Seismological Bureau is a consultative and appraising academic organization. Gu Gongxu, a noted geophysicist, was invited to be the honorary chairman of the committee and seismic-geologist Ding Guoyu the chairman. [By XINHUA correspondent Yu Yuanjiang] [Excerpts] [Beijing XINHUA in English 0823 GMT 9 Jul 83 OW]

CSO: 4010/80

DEVELOPMENT OF AUTOMATION TECHNOLOGY DISCUSSED

Beijing ZIDONGHUA XUEBAO /ACTA AUTOMATICA SINICA/ in Chinese No 2, Apr 83 pp 157-159

/Article by Dai Xuyu [2071 4872 1946] of the Institute of Automation, Ministry of Mechanical Industry: Economic Promotion Cannot Depart From Automation/

/Text/ I. Automation Is an Objective Requirement for Production Development

It is well known that in a labor-intensive production process, the effectiveness of human labor is related to the human physiological capabilities such as speed of response, speed of motion, physical strength and endurance. Therefore, the speed of production is limited by the physiology of the human body. On the other hand, an increasing number of modern production processes use technologies involving extreme temperatures, high pressure, high vacuum, and radioactivity; under those conditions the human body cannot function at all. The development of modern science and technology greatly extended the functions of the human body. For example, television, video and audio recorders expanded the human vision; electronic computers improved the human memory and his capability in performing computation, analysis, judgment, and control; mechanical arms and robots further extended artificial intelligence. These advanced technologies can perform functions which greatly exceed human capabilities; they resulted in fundamental breakthroughs in production processes which otherwise could not be accomplished due to limitations in human physiology. Consequently, in today's world of material civilization, automation has become a necessity in the objective development in science and technology.

II. The Impact of Automation on Productivity, Quality, Cost, Profit, and Energy Conservation

According to a survey conducted by the Automation Association of the Mechanical Industry, automation has achieved the following results in the mechanical industry.

1. Ensuring Product Quality Control

Automation can achieve a high degree of quality control to yield products with repeated high precision or uniform precision. Based on a survey of 55

cast-form automated production lines in Shanghai, defects in the cast objects were reduced, and the precision on product dimensions and the degree of surface smoothness were increased by a factor of 1-2 compared with hand-made cast forms. As another example, a key part in the flow meter used in the petroleum industry--the noncircular gear--was produced by the gear shaping machine, and then it had to be filed by a skilled technician for 1 day to attain a product acceptance rate of only 60 percent. By using a digitally controlled noncircular gear insert machine, no filing is necessary, and the acceptance rate is increased to 98 percent.

2. Increasing Labor Productivity

According to analyses of typical automated production lines in mechanical processing, the labor productivity can generally be increased by a factor of 2-4 by using automation. For example, it takes 195 minutes to produce a tractor engine using manual processing, whereas automated production lines require only 3.5 minutes or even less.

3. Saving Operating Expenses and Lowering Costs

The use of mechanized and automated production methods can significantly reduce production cost. For example, at the Tianjin Radio No 9 Factory, the annual production of resistors in 1965 using manual operation was 1.3 million; in 1979 with the implementation of mechanized production, the annual production was increased to 85 million--a 60-fold increase in productivity while production cost was decreased by a factor of 8; in 1980, when single-unit automated production was implemented, the annual productivity increased by another factor of 2.2, to 190 million. Today, this factory produces high-quality resistors for large-scale export.

4. Improving Working Conditions and Production Safety

For example, employees of a heat-processing plant typically work under hot, dirty, and stressful conditions; they often suffer from diseases such as arthritis, heart disease, nervousness, tuberculosis and kidney infection; as a consequence, the typical operating life of a worker is very short and successors are difficult to find. According to a survey of the automated production lines and 51 automated units of the 9 heat-processing plants in Loyang City, both labor conditions and labor intensity were improved after automation; furthermore, production safety was also improved and productivity was at least doubled. It is estimated that the investment in technological reform can be recovered in 1-2 years.

5. Increasing Management Standards

Industrial management involves a large amount of tedious computations and statistical analyses. The accuracy and timeliness of these calculations, statistics and planning charts directly affect the standard of industrial management. For example, when the Bureau of Science and Technology of the Ministry of Mechanical Industry held a planning conference in 1981, a mini-computer system was used to process the data, and the documented plan was

printed by the computer as soon as the conference was adjourned; in the past, there would be a 6-month delay before the document could be compiled. The Bureau of Automation of the Ministry of Mechanical Industry developed a warehouse management system for the Beijing Automobile Factory, which used magnetic discs to perform bookkeeping functions for 1,508 storage racks containing 228 different items of merchandise; its operation was stable, reliable, timely and convenient. For example, to perform a warehouse inventory manually would require 3-4 days; with a minicomputer, it only takes 3-4 minutes, and a listing of the required information can be printed to provide a clear picture of the current status of the warehouse. Since this system was put into effect, the utilization rate of merchandise was increased from 60 percent to 85 percent; it can even be higher in the future.

6. Reducing the Design and Test Cycle, and Accelerating the Introduction of New Products

In the past, the introduction of a new product involved a lengthy process; design, model test, improvement, retest, etc. By using computer-aided design, it is possible to perform scientific calculations and numerical simulations on the computer, and display the design results pictorially. Thus, the design can be readily modified to accelerate the introduction of new products. For example, in designing a ball bearing series, the Research Institute of the Loyang Bearing Factory used a minicomputer to perform design calculations of 15 new product lines, from which 100 different configurations from each product line can be compared to make an optimum selection. In the past, it took 1 week to perform the calculations for each configuration; only 2-3 configurations were calcualted for each design, then they were enlarged and modified; clearly such a design was not of very high quality. To calculate 100 configurations by hand would take more than a year; on a minicomputer it took only 65 minutes, and the results were automatically tabulated on the printer. After being analyzed and certified by the technical agencies, the technical specifications of the bearings were shown to be comparable to those of the world famous SKF bearings. Therefore, automation not only increases design speed, it also improves the quality of design.

7. Conserving Energy Resources

In recent years, the automated instrument factories in Shanghai, Sichuan, Tianjin, Xian, and Dalien, have achieved outstanding results in carrying out technological reforms for several hundred furnaces of various industries. For example, the Tianjin Automated Instrument Factory installed an instrument package for the 10 ton/hour coal furnace at the Tianjin Ink Factory, which consisted of the DDZ-II electric instrument and the single-pulse water-level automatic control system. After 6 months the savings in coal consumption was 737 tons; the total investment in instruments was recovered from savings in coal after 1 year. Also, if an automatic control unit is used to cut off the power supply to an electric welding machine when it is idling, 15 percent can be saved in electricity.

III. Automation Is Essential for Economic Growth

It has been the goal of the Central Government to maintain continuous economic growth in this country and to double the national economic output by the year 2000. In order to achieve this goal, we must strive for maximum increase in productivity; the rate of growth in productivity must exceed the rate of increase in wages in order to achieve higher production as well as a higher standard of living. To increase productivity depends on several factors; the use of new technology, improving the technical skills of the work force and mechanization and automation of the production process. For example, at a small light-socket factory in Hunan which employed about 200 people, both the profit margin and the productivity were very low; the factory could hardly survive. Then, after the factory automated the more than 10 impact machines in the workshop, its productivity was increased by more than 10-fold, and product acceptance rate reached 86 percent; in 1980 alone, it contributed 450,000 yuan of its profit to the state.

Production development and economic growth are closely related to mechanization and automation. As a result of automation, productivity is increased, more capital is accumulated and the standard of living is improved. Higher productivity also stimulates consumption, promotes service industries, and provides wider employment opportunities. This creates a healthy economic cycle: with accumulated capital, the government can establish more factories and service industries; with a higher standard of living, the people will have higher demands for consumer goods; thus, the problem of unemployment will be essentially eliminated from society.

Of course, in developing automation, we should pay close attention to past experience, and proceed in accordance with specific economic objectives, technological conditions, available tools, labor skills and capital resources. By using advanced and economically proven automation technologies, we firmly believe that the science of automation will make its expected contribution to economic growth in this country.

3012
CSO: 4008/114

SICHUAN'S FIRST COMPUTERIZED EQUIPMENT FOR OPTOMETRY IN OPERATION

Chengdu SICHUAN RIBAO in Chinese 8 Jun 83 p 1

[Article by Wang Tong [3769 1749]: "Our Province's First Computerized Ophthalmometer in Operation"]

[Text] Our province's first imported model of the latest U.S. computerized ophthalmometer began operation today at Jingjin [2533 4737] Optics Plant, Chengdu. This computerized ophthalmometer, Model AOSR-N, not only is capable of examining presbyopia, myopia, and astigmatism, but also can check for pathological changes in cataracts and various post-operative eye changes. This computerized instrument has three great advantages: 1) Speed. Generally, it takes 30 minutes to check one's eyesight by the manual method. With this new instrument, it takes only 2 to 3 minutes to complete various complicated optical measuring procedures. 2) Accuracy. It uses a self-controlled [by patient] measuring system. It allows the patient to move the knobs to adjust the focal point. The result of the exam comes from the most sensitive source, the patient himself, hence, it is very accurate. 3) Comfort. The manual method requires the patient to wear a frame in order to change the lenses one by one and is time consuming. This procedure often makes the patient dizzy. With this computerized optical measurement it takes only a few minutes to achieve satisfactory results, and the patient does not have to wear any equipment.

CSO: 4008/138

NANJING AERONAUTICAL INSTITUTE DEVELOPS JDF-1 EDDY CURRENT-MINIVIBRATOR

Beijing GUOJI HANGKONG [INTERNATIONAL AVIATION] in Chinese No 5, 5 May 83 p 31

[Article by Ning Hang (1380 5300)]

[Excerpts] Among the new vibrator equipment used for frequency measurement in modern aeronautical research, the non-contact type eddy-current vibrator is considered the most promising. But this product is currently not available on foreign markets.

The Nanjing Aeronautical Institute has successfully developed a noncontact type eddy-current minivibrator whose model number is JDF-1. This vibrator can be used in static frequency tests of both magnetic and non-magnetic metallic parts such as engine blades, discs, plates, and tubes; it can also be used in laser holographic vibration tests. The main features of this vibrator are described below:

1. Since it is not in contact with the object being tested, there is no additional mass to corrupt the results of static frequency tests.

2. It has a high level of vibrational energy and a wide frequency response; it can generate vibration modes greater than 30,000 Hz.

3. It has a wide range of applications, such as performing static frequency tests on parts made of titanium alloy, aluminum alloy, stainless steel, or nickel-based high temperature alloy.

4. Its operation is highly efficient; in conducting frequency tests on blades in a mass-production line, each blade only requires approximately 1 minute.

5. It is small in size and has no moving parts. Because of its simple structure, it is easy to manufacture, operate, and maintain. It is also energy efficient and its noise level is quite low.

Currently, the first batch of JDF-1 eddy-current vibrators have already been delivered to several schools, research institutes, and factories, with favorable results.

Operating Principle

The JDF-1 eddy-current vibrator operates on the principle of electromagnetic induction. Specifically, when a conductor carrying electric current cuts across a magnetic field, a vertical electromagnetic force is exerted on it, which provides the source of vibration. The vibrator has no moving parts; it consists primarily of a pair of ac and dc magnetic circuits. The horizontal circuit is made of rare earth permanent magnet; in the vertical direction is an alternating magnetic field which cuts across the blade being tested to induce an eddy current within the blade. This generates an electromagnetic force F which is perpendicular to both the direction of the permanent magnetic field and the direction of the eddy current. The magnitude of F is proportional to the product of the induced strength of the magnetic field and the eddy current; its direction is determined by the left hand rule. If the horizontal component of the permanent magnetic field is B (Gauss), the eddy current within the blade is I (amp), and the effective length is L (cm), then the magnetic force, of the vibrational force acting on the test object is

$$F = 0.102 \times 10^{-6} \text{ BIL (kg)}$$

Method of Operation

In performing frequency tests on aircraft engine blades, the blade is placed horizontally on top of the eddy current inductor, beside the permanent magnet, with a certain gap in between. When an audio-frequency tunable signal current from the power amplifier is present in the induction coil, an eddy current of the same frequency will be induced in the blade, causing the blade to vibrate. When the signal frequency is tuned to the fundamental frequency of the blade, resonance will occur.

To achieve optimum effect of vibration in the frequency test, one can vary the relative positions between the vibrator and the blade according to the vibration modes until a good match between the ac and dc magnetic circuits is obtained. In addition, regulating the power supply is also an effective scheme for increasing the vibration. Under normal conditions, best effect can be achieved by placing the test object next to the permanent magnet and as close to the inductor as possible (but not in contact).

Technical Characteristics

Since 1976, the Nanjing Aeronautical Institute has developed three models of the vibrator: 76, 77, and 78. In order to further reduce its size and increase its efficiency, additional improvements of the vibrator have been made. During the development process, the following test were conducted: comparison of different types of magnetic poles, electrical simulation of the magnetic field, comparison of the air gap effect of magnetic poles, ac and dc magnetizing intensity test, test to determine the optimum positions of the vibrator and the blade, comparison of different types of permanent magnets, and test to determine the impedance match between the power amplifier and the eddy-current minivibrator was successfully developed. It was certified by government agencies and experts to have the following technical characteristics:

Range of frequency response	50-15,000 Hz
Input power	50 watts (long term operation)
	≯ 1 amp (operating current)
Noise index	≯ 70 dB (due to vibrator)
Operating time	8 hours continuous operation
Exterior dimension	79 x 76 x 73 mm
Weight	0.95 kg

3012
CSO: 4008/115

CONFERENCE ON ANTARCTIC RESEARCH HELD IN BEIJING

HK200915 Beijing RENMIN RIBAO in Chinese 17 Jul 83 p 3

[Report by Yang Shiguang [2799 2514 0342]: "China Scores Initial Results From Antarctic Surveys"]

[Text] Since 1980, 19 science workers from China have gone to Antarctica in succession, and have made on-the-spot researches there on meteorology, geological features, geochemistry, marine physics, marine organisms, marine geophysics, glaciers, architecture, and so on in the frigid zone. They have collected a number of rocks, and samples of plants and animals, and written over 40 treatises on their researches, providng scientific grounds for further exploration of the secrets of Antarctica.

Antarctica is notorious for its climate, but is rich in its natural resources, and has over 220 kinds of mineral resources. In its surrounding seas, aquatic products such as krill, which is rich in high protein, amount to form one to five billion tons. It is of great signifiance to carry out political, economic and scientific researches in Antarctica. At present, 13 countries including Australia, New Zealand, Argentina, Chile, the United States, Great Gritain, France, Japan, Poland, and West Germany have established over 40 full-time scientific research stations in Antarctica for large-scope scientific research.

To further know Antarctica, undercover its secrets, make it serve the four modernizations construction of our country, and make contributions to its peaceful utilization, our country established the National Antarctic Survey Commission in 1981, and formally joined the Antarctic Treaty in May this year. In order to sum up the initial results from the Antarctic surveys, the National Antarctic Survey Commission and the National Marine Bureau held a conference in Beijing from 11 to 15 (July) to evaluate the scientific treatises on Antarctica. Over 20 academic treatises were read in the conference, and some of them have reached a comparatively high level.

CSO: 4008/143

BRIEFS

DRILLING MACHINERY SYMPOSIUM--A symposium on technological development of vertical shaft drill machine, sponsored jointly by General Bureau of Heavy Mining Machinery, Ministry of Machine-Building Industry, and Capital Construction Department of the Ministry of Coal Industry, was held in Luoyang in late March 1983. The condition of development of vertical shaft drill machine, in China was reviewed and summarized before the delegation proceeded to evaluate the L-40 Drill Machine made in West Germany. It was acknowledged that vertical shaft drills made in China had provided meritorious service in the construction of coal mine shafts and the improving and renovation of these drill machines have made them even more obviously superior. It was resolved by the delegation that on the basis of the L-40, a light and highly efficient vertical shaft drill will be developed, however. It was proposed that Luoyang Institute of Mines will assign a chief designer and the Shaft Construction Institute will assign the chief engineer, while the Luoyang Mining Machinery Plant will be responsible as the general contractor for its manufacture. [Text] [Luoyang KUANGSHAN JIXIE [MINING MACHINERY] in Chinese No 4, Apr 83 p 40] 6248

CSO: 4009/180

RESERVES OF MEDICAL SUPPLIES, EQUIPMENT DISCUSSED

HK140702 Beijing CHINA DAILY in English 14 Jul 83 p 2

[Text] China's reserves of medicine and medical equipment are declining rapidly as the result of growing demand since the beginning of this year, the newspaper ECONOMIC INFORMATION reported.

The paper said present reserves will last only six months. Usually reserves for eight months are in stock.

During the first quarter of this year, domestic sales of medicine and medical equipment rose by 11.9 and 28.4 per cent respectively over the corresponding period last year, the paper said.

Some medicine is already out of stock. Fears in the past of overstocking and a consequent fall in prices have led some factories to cut production, the paper said.

Meanwhile, Chongqing City in Sichuan Province is preparing a Chinese traditional medicine centre to handle purchases and sales of herbs and medicine in co-operation with Guizhou, Yunnan, Tibet, Qinghai, Shaanxi, Hubei and other provinces, the paper said.

At this centre, all kinds of traditional medicine except musk will be traded, but only between domestic producers and customers.

Sichuan and its neighbouring provinces are the most important producers of traditional herbs and medicine in the country, and Chongqing City has a long history in handling transactions for these provinces. Last year the city's sales amounted to about 100 million yuan.

CSO: 4010/79

PUBLIC HEALTH MINISTER ON NURSING PROGRESS

OW081606 Beijing XINHUA in English 1257 GMT 8 Jul 83

[Text] Beijing, July 8 (XINHUA)--The number of nurses in China will increase at an annual rate of tens of thousands to augment the present contingent of 560,000 nurses, Cui Yueli, minister of public health, said here today.

Addressing the opening ceremony of the 19th National Congress of the Chinese Nursing Association, Cui Yueli said: Every year, the country's medical secondary schools enroll 70,000 to 80,000 students, most of whom are in nursing specialities.

He noted that it is imperative to strengthen nursing work, an important component of medical and health work.

Minister Cui called for more attention to scientific research in nursing and to the improvement of medical equipment and instruments. He also urged improvement in the quality of care and attitude toward patients.

Cui Yueli said that, while raising the nursing level in Western style medicine, efforts should be made to utilize nursing experience of traditional Chinese medicine in order to build a modernized nursing service with China's own style.

In modernizing her medical facilities, Minister Cui disclosed that China plans to concentrate on building small and medium-sized hospitals. This is aimed at serving most of the people, particularly the country's 800 million peasants, he said.

There are now in China nearly 10,000 hospitals at or above county level and 55,000 people's-commune hospitals, in addition to over 600,000 clinics, according to the minister. It is urgent to first improve nursing care at this level, Cui Yueli said.

"Our goal is to provide China's one billion people with nursing care as soon as possible," the minister emphasized.

CSO: 4010/79

BRIEFS

CARDIOVASCULAR DISEASE SURVEY--Hangzhou, 12 Jul (XINHUA)--Cardiovascular diseases are far more prevalent in north China than in the south, according to surveys carried out between 1979 and last year. According to data obtained from epidemiologic studies in recent years, deaths caused by cardiovascular diseases, mainly heart failures and strokes, account for almost half of all deaths in most areas of the country. Hypertension affected 4.85 percent of the population nationwide and 9.53 percent in Beijing, where the highest rates were found following a national blood-pressure screening program in 1979. The surveys showed that prevalence rates were also high in Tianjin, the northeastern provinces of Liaoning, Heilongjiang, Jilin and Shanxi, and the Inner Mongolian Autonomous Region. The lowest prevalence was discovered in Guangdong Province in the south, where 2.44 percent of those tested suffered from high blood pressure. [Excerpt] [Beijing XINHUA in English 1248 GMT 12 Jul 83 OW]

CSO: 4010/79

BRIEFS

XIZANG SCIENCE, TECHNOLOGY CONGRESS--The first congress of the Xizang Regional Science and Technology Association concluded in Lhasa City on 25 June. The congress elected the first committee of the regional science and technology association. Xuekang Tudeng Nima was elected chairman. Regional CPC committee secretary, Song Ziyuan, regional people's congress standing committee vice chairman, Peng Zhe, regional CPPCC committee vice chairman, (Banzeng Jiacuo), and regional military district deputy commander, (Liu Yunkang) attended the closing ceremony. The congress adopted the regulations of the regional science and technology association. [Lhasa Xizang Regional Service in Mandarin 2340 GMT 26 Jun 83 HK]

CSO: 4008/139

AUTHOR: ZHOU Wansong [0719 8001 2646]

ORG: Physical Therapy Department, Beijing Troop General Hospital

TITLE: "Progress in Research and Application of Ultrasonic Wave Therapy in China"

SOURCE: Beijing YINGYONG SHENGXUE [APPLIED ACOUSTICS] in Chinese No 2, Apr 83 pp 29-33, 22

ABSTRACT: Ultrasonic waves were first applied to treat certain forms of arthritis and neuralgia in 1939. Since then, the realm of application has been gradually enlarged but in China research and application did not begin until after the liberation. With the development of all fields of medicine, the development of ultrasonic wave therapy has also been very rapid. This paper reports the current condition of its clinical applications to treat cases of internal medicine, surgery, dermatology, and the medical area dealing with the five sense organs. With respect to techniques of ultrasonic therapy, the improvements include: 1) Proper increase of dosage to the level of tolerance; 2) Using ultrasonic waves to induce drugs to seep through skin or mucous membrane; 3) Ultrasonic wave mist; 4) Alternating ultrasonic wave with electric current therapy; 5) Applying ultrasonic waves at accupuncture points; 6) Ultrasonic wave weak DC current electrical therapy. Investigations into the action mechanism of some forms of ultrasonic wave therapy, such as its action on intracranial diseases, on the heart, and on the blood pressure, are also briefly reported.

AUTHOR: LI Changli [2621 2490 4539]

ORG: None

TITLE: "Academy Certification of KX-II Digital Voice Coder Using Microprocessors"

SOURCE: Beijing YINGYONG SHENGXUE [APPLIED ACOUSTICS] in Chinese No 2, Apr 83 p 43

ABSTRACT: Voice coder is a key equipment of confidential communication. Language analysis and synthesis theory is used to contract the rate of numerical code of 96000bit/s to 2400bit/s so as to transmit digital confidential telephone conversation on a voice channel of carrier wave, radio shortwave, or satellite communication. At the reception end, the signals are restored to 96000/bit/s and through modulus conversion reconstructed into voice signals. Due to the fact that its capability of contracting the numerical code rate to increase confidentiality, it serves a very important function in national defense and the national economy. The KX-II digital voice coder is composed of four 8085-microprocessors and some special hardware. Its certification conference was held on 12 Nov 82 in Beijing Youyi Hotel. It was organized by the Department of Mathematics of the Chinese Academy of Sciences. Following demonstration and discussion, the conference judged the coder to have reached the advanced level of similar products made in foreign countries. This fruit of research has been assigned by Institute of Acoustics of the Chinese Academy of Sciences to a certain plant of the Ministry of Electronics Industry byt the theoretical problems and microprocessor technology will be published in a related journal.

AUTHOR: XU Weiyi [1776 0787 5030]

ORG: None

TITLE: "The 3rd Meeting of the Annual Conference of the National Committee of Acoustics Standardization Technology Held in Hangzhou"

SOURCE: Beijing YINGYONG SHENGXUE [APPLIED ACOUSTICS] in Chinese No 2, Apr 83 p 42

ABSTRACT: The 3rd meeting of the First Annual Conference of National Committee of Acoustics Standardization Technology was held on 2-3 Nov 82 and attended by 27 persons. Absence of 6 committee members is acknowledged. The chief agenda of this meeting included: to summarize the work of 1982 and review the key items scheduled for 1983; examine the State's Standardization Document (draft); propose new items to be added to the State's document in 1983. Following discussion, it was agreed that the following items should be presented for the approval of State's Bureau of Standards: sound attenuation measurement of earmuffs, measurement of grade of acoustic power of noise, noise measurement in the air and assessment of its effect on humans, noise measurement of ships of inland waterways and harbors, measurement of radiation noise of locomotives and cars, and graphic symbols of acoustics. The essential work of the committee in the next 3-5 years and within the realm of enacting the State's standards was also discussed. Finally, it was resolved that the 4th meeting of the conference is to be held in Sep-Oct 83 in Beijing.

AUTHOR: LI Changli [2621 2490 4539]

ORG: None

TITLE: "Language and Communication Signals Processing Conference Held in Beijing"

SOURCE: Beijing YINGYONG SHENGXUE [APPLIED ACOUSTICS] in Chinese No 2, Apr 83 p 44

ABSTRACT: The Language and Communications Signals Processing Conference, jointly sponsored by China Society of Electronics, Society of Instruments and Meters, Society of Signals Processing, and Society of Applied Acoustics was held in Beijing on 26-29 Oct 82, and attended by 110 delegates and alternates. Prof DU Xiyu [2659 6932 6877] Vice President of North China Jiaotong University and Prof YING Chongfu [2019 1504 4395] Deputy Director of Research Institute of Acoustics Chinese Academy of Sciences delivered the opening speeches. The delegation was divided into 2 groups for the delivery of 60 papers; detailed abstracts of these were published. In his closing speech, Associate Prof YUAN Baozong [5913 0202 1350] Vice Chairman of Signals Processing Society talked about the current condition of language and communications signals processing, existing problems, and future development, etc.

6248
CSO: 4009/190

AUTHOR: LI Jiaxing [2621 1367 5281]

ORG: None

TITLE: "Activities in the Industry"

SOURCE: Tianjin GONGCHENG JIXIE [CONSTRUCTION MACHINERY AND EQUIPMENT] in Chinese No 5, 20 May 83 p 59

ABSTRACT: In response to a request of Ministry of Machine Industry, the Tianjin Research Institute of Construction Machinery cooperated with Xiamen Construction Machinery Plant and Shandong Yidu Hydraulic Device Plant to carry out an overall property test of the hydraulic system of the 2 loaders, ZL40 and ZL50 produced by Xiamen Construction Machinery Plant, in Dec 82. The static and dynamic properties determined by the test process have furnished the necessary data for optimal designing and improvement of the hydraulic system of loaders in the future. For the purpose of performing the test, Tianjin Research Institute of Construction Machinery conducted studies to produce a high pressure flowmeter, turn angle shift detector, vacuum sensor, etc. The test, in turn, has proved that these new instruments are basically successful.

AUTHOR: None

ORG: None

TITLE: "Certification Conference for the Prototype Y26 Hand-held Rock Drill"

SOURCE: Tianjin GONGCHENG JIXIE [CONSTRUCTION MACHINERY AND EQUIPMENT] in Chinese No 5, 20 May 83 p 62

ABSTRACT: A certification conference, under the direction of Liaoning Provincial Bureau of Machines, was held on 12-14 Apr 83 in Nanjing to examine the Y26 hand-held rock drill produced by Shenyang Pneumatic Tools Plant. Compared with the 01-30 hand-held rock drill, this new product is lighter, more efficient, and more generally applicable. Its rock drilling speed is fast, its gas consumption is low, it starts quickly, and operates smoothly. The standardization coefficient of its parts is high. Its 3 indices of impact strokes, idle rotation speed, and load gas consumption are tested according to ISO/DP2787-81. Following the successful testing, the conference sugested that Shenyang Pneumatic Tools Plant should organize as quickly as possible to produce it in small batches.

6248
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AUTHOR: None

ORG: None

TITLE: "Second Rock Blasting Conference"

SOURCE: Beijing LIXUE YU SHIJIAN [MECHANICS AND PRACTICE] in Chinese No 3, Jun 83 pp 60-61

ABSTRACT: The Second Rock Blasting Conference of China Society of Mechanics was held on 5-8 Nov 82 in Fuzhou, Fujian Province and attended by 190 delegates representing 122 units of the country. A total of 191 papers concerning blasting theories, experimental techniques, new engineering blasting technologies, blasting devices and materials and safe blasting, etc., were presented. Since the First Rock Blasting Conference of 1978, a great deal has been achieved in the field, including: (1) Further development and improvement in deep hole blasting technology achieved in metallurgical, mining, hydroelectrical, coal, railway, and construction systems; (2) Considerable development and application of controlled blasting technology; (3) New research results obtained in explosives and detonating materials; (4) Under all-out cooperation of various departments, the 77 engineering items organized by State's Planning Committee provided rich data on blasting efficiency to be used as the bases of enacting related regulations; (5) Definite advancement has also been obtained in the basic theory of earth blasting, rock mechanics relating to blasting, calculation of blast throw on different terrains and under different conditions, numerical computation of the process of blast action, tube effect during dynamite explosion, blast seismic effect, construction safety, etc. The direction of future development of earth and rock blasting technology and the major tasks were also discussed.

AUTHOR: None

ORG: None

TITLE: "Fourth National Conference on Blast Processing Technology"

SOURCE: Beijing LIXUE YU SHIJIAN [MECHANICS AND PRACTICE] in Chinese No 3, Jun 83 p 61

ABSTRACT: The 4th National Conference on Blast Processing Technology of China Society of Mechanics was held in Fuzhou on 5-8 Nov 82 and attended by 59 delegates representing research units, school of higher education, and plants. The conference received 47 papers and 40 of these have been included in the collection of abstracts. Contents of these papers involved foreign theoretical research on blast processing and the condition of its application, blast welding parameters, blast welding mechanism, application of blast processing technology, blast forming, explosives and testing. Concretely, the papers demonstrated the following achievements in China: (1) Research on blast welding parameters; (2) Research on blast welding mechanism; (3) Applications of blast processing technology; (4) In blast forming, the progress has been brought from theoretical study to practice to the stage of normal production; (5) Research on explosives and their blasting characteristics. Accomplishments under the above headings are briefly discussed to constitute a review of the work in the 3 years since the 3rd National Conference. The delegates believed that future emphasis should be on extension of blast processed products in industry, standardization, serialization, market survey and analysis, etc.

AUTHOR: JIN He [6855 0735]

ORG: None

TITLE: "National Symposium on Computation Structural Dynamics"

SOURCE: Beijing LIXUE YU SHIJIAN [MECHANICS AND PRACTICE] in Chinese No 3, Jun 83 p 63

ABSTRACT: The National Symposium of Computation Structural Dynamics, organized by China Society of Mechanics, was held on 24-27 Dec 82 in Chongqing. Participants included 50 persons representing 30 units of schools of higher education, production designing departments, scientific research units, civilian departments as well as national defense units. A Japanese professor who was lecturing in Chongqing was invited to report on random finite element. The discussion centered primarily on various effective methods of resolving problems concerning computation structural dynamics encountered in the process of engineering and scientific research work. It was the general opinion among the delegates that this is a very new field in China but there have appeared some new ideas and methods of treatment such as the time finite element method of the dynamic process of the variable parameter linear vibration system, structural dynamic optimization designing, analytical computation of structure dynamic response, antiseismic designing of structure, propagation of stress wave, etc. and some engineering problems have been resolved by these methods to demonstrate the extensive attention the field is receiving in China.

6248
CSO: 4009/191

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ORG: None

TITLE: "Metallurgical Equipment Specialty Group of Henan Provincial Society of Metals Established and Its First Symposium Held"

SOURCE: Luoyang KUANGSHAN JIXIE [MINING MACHINERY] in Chinese No 4, Apr 83 p 34

ABSTRACT: The Metallurgical Equipment Specialty Group of Henan Provincial Society of Metals was established in the middle of Mar 83 and its first symposium was held in Luoyang. Persons in charge of China Society of Metals and the Provincial Society of Metals attended. The director, deputy director, secretary, and members of the specialty group were selected and approved. Rules concerning the activities of the group were passed. The representative of Wuyang Steel and Iron Company delivered a scientific report and a summation of technological work. It was preliminarily resolved that the 2nd symposium will be held in Wuyang Steel and Iron Company during the first quarter of 1984.

6248
CSO: 4009/180

AUTHOR: LIU Ji [0491 0644]
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et al.

ORG: All of the Bethune Medical University

TITLE: "Study on the Role of the Hemopoietic Microenvironment on the Recovery of Hemopoiesis from Radiation Injury"

SOURCE: Beijing ZHONGHUA FANGSHE YIXUE YU FANGHU ZAZHI [CHINESE JOURNAL OF RADIOLOGICAL MEDICINE AND PROTECTION] in Chinese Vol 3 No 1, Feb 83 pp 29-33

TEXT OF ENGLISH ABSTRACT: This paper reviews and analyzes the investigation results of the five components of the hemopoietic microenvironment. It was determined that every component of the hemopoietic microenvironment could promote the recovery of hemopoietic function from radiation injury. It was found and preliminarily confirmed that fibroblastoid precursor cells of hemopoietic stroma played the chief role in the hemopoietic microenvironment behavior. These results can not only provide a new approach to the prevention and treatment of ultrasevere acute radiation sickness, but also be advantageous to the study of the pathogenesis of the diseases of the hemopoietic system.

AUTHOR: JIN Cuizhen [6855 3862 3791]
H. SHIMBA
A.A. AWA

ORG: JIN of the Beijing Radiological Medicine Research Institute; SHIMBA and AWA both of the Hiroshima Radiation Effects Institute

TITLE: "Cytogenetic Studies of A-Bomb Survivors with G-Banding Techniques"

SOURCE: Beijing ZHONGHUA FANGSHE YIXUE YU FANGHU ZAZHI [CHINESE JOURNAL OF RADIOLOGICAL MEDICINE AND PROTECTION] in Chinese Vol 3 No 1, Feb 83 pp 34-36

TEXT OF ENGLISH ABSTRACT: Chromosome aberrations in A-bomb survivors were analyzed by means of a G-banding method and the results were compared with those of the conventional staining method in order to verify whether the banding technique could improve the detection of stable aberrations. The present results showed that a significantly high frequency of aberrant cells was found by the G-banding technique as compared with that found by the conventional staining method. This may be due to the fact that some types of symmetric exchanges can only be detected by the banding technique.

AUTHOR: SUN Shiquan [1327 0013 4019]

ORG: Huabei Radiation Protection Institute

TITLE: "Pathologic Investigation of Principal Damage from Uranium Compound Intoxication"

SOURCE: Beijing ZHONGHUA FANGSHE YIXUE YU FANGHU ZAZHI [CHINESE JOURNAL OF RADIOLOGICAL MEDICINE AND PROTECTION] in Chinese Vol 3 No 1, Feb 83 pp 37-41

TEXT OF ENGLISH ABSTRACT: The renal damage of rats poisoned with different doses of uranyl nitrate was found primarily in the second segment of the proximal convoluted tubules. Experiments with long-term repeated injections of small doses of uranyl nitrate into rats and rabbits showed that the induced renal damage was not more severe than that caused by single injections of the same dosage. With the elapse of time, even though the injections were continued, the renal damage gradually became slighter or failed to appear. Due to the fact that chronic renal damage can only be caused by a dose level which would almost induce an acute damage, the occurrence of chronic renal damage in occupational workers exposed to uranium at normal levels is very improbable. A series of animal experiments were conducted with various kinds of animals, different uranium compounds, different routes and schedules of administration. The results showed that the hepatic damage, if any, was always slighter than the

[Continuation of ZHONGHUA FANGSHE YIXUE YU FANGHU ZAZHI Vol 3 No 1, Feb 83 pp 37-41]

renal damage. When the tetravalent uranium compounds were injected into the portal vein system and were made to flow directly into the lever, the renal necrosis was still dominant over hepatic injury.

AUTHOR: HAN Guoxin [7281 0948 7451]

ORG: Naval Medical Research Institute

TITLE: "Effects of Low Dose Rate ^{60}Co γ-Irradiation for 3 Years on Dogs"

SOURCE: Beijing ZHONGHUA FANGSHE YIXUE YU FANGHU ZAZHI [CHINESE JOURNAL OF RADIOLOGICAL MEDICINE AND PROTECTION] in Chinese Vol 3 No 1, Feb 83 pp 42-46

TEXT OF ENGLISH ABSTRACT: In this paper the effects of low dose rate ^{60}Co γ-irradiation lasting for 3 years on dogs have been investigated. The mean daily dose rates given to the experimental animals in two groups were 0.427 rad and 0.178 rad separately. The total accumulated doses were 315.2 rad and 131.4 rad. The observations during the course of 3 years showed that the frequency of chromosome aberrations in peripheral blood lymphocytes was increased, and the frequency of lymphocyte transformation was decreased. There was significant interrelation between these changes and accumulated doses. In the dogs exposed to radiation of 0.427 rad per day, spermatogenesis was inhibited obviously. Primary teratosperm was increased evidently, which indicated that the testes of these dogs were damaged. However, after 27 months of irradiation (accumulated doses of 249.2 rad, sperm count $10x10^6$/ml), they still had reproductive ability. The first filial generation had no hereditary defects. They grew up normally.

[Continuation of ZHONGHUA FANGSHE YIXUE YU FANGHU ZAZHI Vol 3 No 1, Feb 83 pp 42-46]

The data obtained from the above experiments are of practical value in evaluating biological effects of long-term irradiation at a low dosage rate and in revising radiation protection standards.

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TITLE: "Effect of Internal Irradiation by ^{131}I Combined with External γ-Irradiation on Adult and Young Rats"

SOURCE: Beijing ZHONGHUA FANGSHE YIXUE YU FANGHU ZAZHI [CHINESE JOURNAL OF RADIOLOGICAL MEDICINE AND PROTECTION] in Chinese Vol 3 No 1, Feb 83 pp 47-49

TEXT OF ENGLISH ABSTRACT: An experiment was carried out on adult and young rats. Both the adult and the young rats were divided into four randomized groups respectively; the first group was exposed to external γ-irradiation of 200 rads; the second exposed to internal irradiation of ^{131}I 27.5μCi; the third exposed to both γ-irradiation and ^{131}I irradiation; and the fourth group was used as the control.

The results showed that the frequencies of chromosome aberrations of lymphocytes from rats of each irradiated group were higher than those of the control, and those of the third group were the highest, being higher than those of the control by a factor of 18. The leucocyte counts in the third group decreased rapidly

[Continuation of ZHONGHUA FANGSHE YIXUE YU FANGHU ZAZHI Vol 3 No 1, Feb 83 pp 47-49]

but recovered slowly. However, there was no significant difference in the decrease of leucocyte counts between the first group and the third group. That demonstrated that external irradiation from γ-ray played an important role in the decrease of leucocyte counts. Absorbed doses of the thyroid of adult and young rats were calculated after receiving 27.5 μCi ^{131}I. They were 8.7×10^3 rads and 1.4×10^4 rads, respectively. As shown by pathological findings at such dose levels, the growth of the thyroid was inhibited, but the weight and pathological changes of the thyroid of the young rats were more serious than those of the adult rats.

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ZHOU Lihua [0719 4539 5478]
et al.

ORG: WANG and ZHAO both of the Radiological Medicine Research Institute, Chinese Academy of Military Medicine; ZHOU of the National Defense Science Council Hospital No 546; et al.

TITLE: "Determination of Plutonium-239 in Urine and Air"

SOURCE: Beijing ZHONGHUA FANGSHE YIXUE YU FANGHU ZAZHI [CHINESE JOURNAL OF RADIOLOGICAL MEDICINE AND PROTECTION] in Chinese Vol 3 No 1, Feb 83 pp 52-54

TEXT OF ENGLISH ABSTRACT: An improved procedure is described for the determination of plutonium-239 in urine and air samples. It mainly consists of wet ash, rapid co-precipitation of plutonium with bismuth phosphate, anion exchange separation and purification, and electro-deposition. The advantages of the modified procedure are: the time of operation is much shorter, taking about 8 hr for the urine samples and 6 hr for air and aerosol samples. The plutonium-239 average recovery is as high as (80 ± 5.7) percent for urine samples (with 3.49 dpm plutonium-239), and (80.4 ± 4.4) percent and (82.4 ± 3.3) percent for air and aerosol samples (with 9.14 dpm plutonium-239) respectively. The electro-deposition prevents the release of irritative gas. The lowest detectable limit

[Continuation of ZHONGHUA FANGSHE YIXUE YU FANGHU ZAZHI Vol 3 No 1, Feb 83 pp 52-54]

is 0.04 dpm/1.5 l urine (confidence limits 95 percent) with a counting time of 24 hr for urine samples and 2 aCi/l for 10 m^3 of collected air samples. The decontamination effect for common α-radionuclides, such as uranium, polonium, etc., is quite good, but not so for neptunium.

The procedure can be applied to the routine assay of urine samples of the occupationally exposed personnel and air samples from different plutonium plants. It is also useful for surveying natural background radioactivity.

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