JPRS L/9266

22 August 1980

East Europe Report

SCIENTIFIC AFFAIRS

(FOUO 8/80)

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APPROVED FOR RELEASE: 2007/02/08: CIA-RDP82-00850R000300020038-5

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INTERNATIONAL AFFAIRS

GENERAL SMIRNOV SEES NEED FOR MORE PHYSICIANS SPECIALIZED IN BURNS

Prague CASOPIS LEKARU CESKYCH in Czech Nos 12-13, 28 Mar 80 pp 389-391

[Article by Docent Rajko Dolecek, M.D., doctor of science, on "Deep and Extensive Burns--Second All-Union Conference, Moscow, 29 and 30 November 1979"]

[Text] The conference took place at the A.V. Vishnevskiy Surgical Institute of the Academy of Medical Sciences of the USSR in Moscow. It dealt with three key topics: 1. the status and organization of specialized help to patients following thermal trauma (after suffering burns) in the USSR; 2. morphology, pathophysiology, endocrinology, and immunology of deep and extensive burns; 3. clinical treatment of deep and extensive burns and their complications. The significance of the conference was underlined by the presence of the first deputy minister of health, and the commandant of the Army Health Service, as well as, on the second day, the opening address by Academician Lt Gen E.I. Smirnov, a well known organizer of Soviet health services during World War II.

As guests of the Ministry of Health of the USSR, the participants from Czechoslovakia included Prof Dr M. Fara, doctor of science, Dr J. Moserova, candidate for doctor of science; and Docent Dr R. Dolecek, doctor of science, as well as Dr Z. Konickova, candidate for doctor of science; Chief Surgeon Dr R. Koenigova; and Dr J. Samohyl, candidate of science. Other participants in the conference were physicians from Bulgaria, Yugoslavia, Cuba, Hungary, the GDR, and Poland.

Academician Kuzin, Professor Sologub et al. (Moscow) reported on 20 years of operation of the All-Union Burn Center in Moscow at the A.V. Vishnevskiy Surgical Institute; its main objectives were and are planning and coordination of scientific research in the USSR, devising a uniform administration of aid to burn victims, training of scientific cadre and specialists for the entire country, and implementation of scientific research studies regarding pathogenesis, general and local treatment, rehabilitation, and complications resulting from thermal trauma. The studies in this regard included monitoring of changes in ultrastructures of cells, metabolic disorders, and immunity in burn victims. Particular attention was given to burns affecting the

respiratory tract and changes occurring in the digestive tract following burns (fibrobronchoscopy and fibrogastroscopy) and treatment of burns in environments free of bacteria. Clinical testing included many procedures for general and local treatment, various nutritive solutions for hyperalimentation, and various new rehabilitation processes to decrease the numbers of disabled. Over 5,000 beds are available in the USSR to burn victims in special burn treatment centers (which number 14) and in special wards for burn victims (which number 58). Every year, many surgeons participate in specialized courses in the treatment of burn victims.

Epidemiology and indexes of burn treatment in specialized departments of the Russian Soviet Republic [RSFSR] were the topics discussed by Professors Grigoriyev and Ponomarev from Gorkiy. Burns represent 6.2 percent of all accidents. The RSFSR (136 million inhabitants) has 43 burn wards (1,738 beds), so that the ratio of specialized beds for burn victims is 1.3 beds per 100,000 inhabitants. Of the total number of burn victims, 35.9 percent were children. Overall mortality at burn treatment wards ranged between 3.3 and 10.1 percent as a result of concentration of burn victims who, as a rule, suffered heavy burns. Otherwise, overall average mortality due to burns is 2.4 percent. In monitoring the results of treatment for 6,254 patients, only 2.3 percent were drawing disability payments following a burn trauma. Specialized wards have as their objective not only treatment, but also scientific research and training of cadre.

Professors N.E. Povstyanoy and I.M. Matyashin (Kiev) discussed monitoring of results and operational improvements achieved by regional departments for treatment of burn victims. According to the authors, general data regarding mortality, average number of treatment days, results obtained in the treatment of specific stages of burn traumas, and average treatment duration for victims of serious burns do not offer precise information regarding the work of combustiologists (this appellation was used at the conference by a number of authors in reference to specialists in burns). The data should always include also the number of aged and very old burn victims, as well as the number of children afflicted by burns, as the progress differs from the norm in these categories. In view of their presence, it is essential that the staff of burn treatment wards include pediatricians and internists as permanent cadre.

Professor Vozdvizhenskiy (Moscow) reported on peculiarities of organization of medical aid to children afflicted by burns, which still is not sufficiently comprehended by all concerned. Burn trauma in children has its peculiarities, calling for establishing special centers for child burn-victims, specialized wards, e.g., at interregional centers of pediatric surgery, which would make available not only pediatricians, but also psychologists, neurologists, orthopedists, etc. The need for burn treatment beds for children is estimated at 1.3 per 100,000 children.

Professor Vikhriyev and his group (chair of thermal traumas at the Military Medical Academy in Leningrad) shared their observations regarding the possibility of determining the prognosis for burn diseases on the basis of the seriousness of the progress of shock in burn victims. They analyzed 335 burn victims. Even though modern treatment methods make it possible to successfully guide out of a lighter shock all burn victims, about 29 percent of persons in this group die in the subsequent progress. Mortality in the case of severe shock while it lasts is 6 percent; however, approximately 78 percent of those guided out of their state of shock die later. Thus, it can be said that shock due to burns and the degree of its seriousness predetermine to a substantial degree the progress of the disease due to burns and the treatment results. The authors also introduced a special "prognostic" table based on basic indications of shock.

Colleagues J. Novak and M. Densy (Budapest) presented their findings with the use of a cybernetic method which can be used in selecting the manner of treatment for burn victims and is "capable" of forecasting a prognosis on the basis of a number of basic data regarding the victim. Professor Roeding (Potsdam) shared his extensive experiences with the use of the so-called probit-analysis in determining prognoses for burn diseases, comparing his results with those obtained elsewhere. Probit analysis bases the mortality of burn victims in direct relationship to the extent of the burned area.

The group of lectures on morphology, pathophysiology, endocrinology, and immunology of serious burns was opened by an excellent lecture presented by Academician Sarkisov and his group (Moscow), who monitored morphological changes in diseases due to burn trauma and their significance for the pathogenesis by electron microscopy, electron histochemistry, and autoradiography. They detected initial changes in ultrastructures (e.g., mitochondria, lysosomes, various membranes) during microcirculation disorders; disorders at the level of CNS synapses; afflictions of heart cells, digestive tract, kidneys, and liver; and how pathogenic microbes penetrate the body through damaged barriers. A correlation to these changes in general metabolism was the superbly documented study by Academician Kuzin and Dr Zayetsova about disorders in metabolic processes and their significance in the pathogenesis of diseases due to burns and their possible modification. The basis is formed by combined disorders of metabolism occurring at the site of the accident and the response to them by the entire organism; of importance herein are specific as well as nonspecific reactions, various triggering mechanisms, and various humoral factors (histamine, serotonin, prostaglandins, etc.) The authors pointed out the substantial significance of endocrine response (adrenal glands, the insulin apparatus, ADH, etc.) of various burn toxins. The disorder is precipitated by a change in microcirculation with all its consequences. Prevention as well as treatment represent a search for some means of influencing disorders of key metabolic processes, modification of disturbed endocrine relations (alpha and beta blocks, adrenal glucocorticoids anabolytes, insulin, etc.), administration of inhibitors of specific toxins, and supplementation of these by hyperalimentation. Professor Kochtygov and his group (Leningrad) presented a well

documented report on hemodynamics, microcirculation, and oxygen supply in cases of experimental shocks due to burns and their possible modification through treatment. Microcirculation disorders have serious consequences, such as adversely affecting mitochondria and their participation in energy metabolism, with manifestations of separation of phosphorylation from oxidation. The effect on mitochondria could have been caused by release of lysozymes due to lack of stability of their membranes as a result of hypoxia. Suitable infusion treatment, inhibitors of proteolytic enzymes, cytochrome C, etc., did noticeably rectify the above mentioned disorders.

The group from Kharkov (Professors Kaytsev, Pekarskiy et al.) reported on their experiences with acute toxemia in burns as the central problem of modern combustiology. They detected a toxic substance formed following the burn trauma and proposed a sensitive model for its monitoring (chick embryo). Acute toxemia can be monitored at the level of overall response, neurogenic-humoral responses of varying types, and at the level of organs or cells. Suitable treatment methods helped to reduce mortality in acute toxemia from 36 percent in 1966-1972 to 17 percent in 1974-1977. Professor Lifshits (Chelyabinsk) presented a well documented report on the pathogenesis of early burn toxemia. With his collaborators, he detected the presence of burn toxins of a protein character in a group of midmolecular peptides, a slight dosage (0.04 mg) of which resulted in immediate death of experimental animals (rats). A sublethal dose of this substance produced signs of a disease due to burns (shock, toxemia). Among alpha-globulins they detected in the experimental animals agents inhibiting the effects of the above-mentioned toxins, which certainly will be of importance in treatment of burn victims.

An endocrinological topic was presented on behalf of the indisposed Professor Shurygin and his group (Leningrad) by Dr Rakov on the status of selected trophic functions of the pituitary gland and endocrine glands in the dynamics of diseases due to severe burns. Levels of ACTH decrease before glucocortical levels do. Levels of testosterone in plasma register a general and substantial decrease; this decrease can be detected over protracted periods. Levels of FSH decreased similarly. Formation of insulin is not markedly affected in severe burn traumas; however, there appear resistances against insulin in the tissues. The above gives indications for possible treatment. Professor Kolker (Moscow) discussed the topic of infection and immunity in thermal traumas. Mortality due to infection remains to this day the central problem of combustiology. Diseases due to burns actually represent an immunodeficient state; both specific and nonspecific defenses are affected, and both B and T systems of immunity are seriously afflicted. This calls for use of active and passive immunotherapy methods. He cited positive results obtained with the use of preparations against staphylococci and Pseudomonas aeruginosa, along with other complex treatment. New pathogenetically oriented treatment of burn victims was discussed by Academician Emanuel and his group (Moscow), who presented their findings regarding disorders in cell membranes due to presence of peroxides which damage the membranes' lipides. Use of "antioxidants" (e.g., vitamin E) can do away

with a number of such changes and have beneficial effects on the progress of diseases due to burns. Docent Dolycek (Ostrava) shared his experiences with endocrinology of burns. He discussed changes in the level of insulin, tolerance of glucose, growth hormone, system renin-angiotensin II, ACTH, LH, FSH, testosterone, TSH, thyroxin, and tri-iodotyronin. He described the syndrome of affliction of the peripheral gland in burns of male gonads and the thyroid gland, tests with triggering hormones TRH and LHRH on burn victims, as well as a number of possible treatments derived from his observations. Docent Dolecek chaired and controlled all proceedings regarding morphology, pathophysiology, endocrinology, and immunology of diseases due to burns.

The second day of the conference was opened by Academician Lt Gen E.I. Smirnov, who underlined differences between peacetime and field surgery, citing Pirogov (not medicine, but organization). It is imperative to greatly step up training of physicians, primarily surgeons, in the treatment of burn victims. If there were to be a war using weapons of mass destruction, over 50 percent of all wounded would be burn victims. Academician Smirnov cited the case of Hiroshima with an estimated 40,000 burn victims, a number which would require at least 800 surgeons familiar with problems of burn trauma. Subsequently, the well known Professor Murazyan (Moscow) reported on transfusion therapy for burn victims in shock on the basis of treatment of over 1,200 burn victims. Due to substantial losses of erythrocytes on the first day following the burn trauma (in the case of severe burns, 20-30 percent of all circulating erythrocytes become destroyed), administration of blood is indicated mainly on the second and third day following burn trauma, as well as in later stages of a disease due to burns. A suitable combination of infusions and transfusions is instrumental in leading all young burn victims out of shock. The significance of burns affecting the respiratory tract was discussed by Gerasimova et al. (Moscow). The Moscow burn treatment center treated between 1976-1977 a total of 85 patients (from 1,383) with burns of the respiratory tract (a total of 6.1 percent). Incidence of respiratory tract problems increased with the degree of burns. Thirty-five of the victims were subjected to (repeated) fibrobronchoscopy. Nineteen burn victims died (22 percent). As a part of complex treatment, they were administered heparin, eufyllin, prednisone, antibiotics, and oxygen, both topically and in the form of inhalations. Tracheostomies were performed eight times. Treatment of burn victims in a bacteria-free environment was discussed by Academician Kuzin, Professor Sologub (head of the burn victim ward) et al. (Moscow). They used rooms (compartments) with laminar air flow at 30-34 degrees Celsius. Air in the compartment changed 12 times per hour, resulting in a conspicuous decrease in the presence of bacteria, lower energy losses in burn victims, and accelerated transformation of moist necroses into dry. To date, 60 burn victims have been treated in this manner. Burn victims in a bacteria-free environment showed rapid and distinct improvement; their temperatures decreased faster; and manifestations of toxemia also decreased. It goes without saying that even in this environment, provisions must be made for hyperalimentation, removal of necroses, etc.

Professor Yudenich, Docent Polishchuk et al. (Moscow, Donyetsk) presented an interesting report on local treatment of burn victims, wherein there are currently two key trends: removing necrotic tissue as expediently as possible with immediate grafting, using either the victim's own skin, or temporary grafting by allo or herero-transplants', or, thanks to modern surgery, by chemotherapy (mafenid, betadine, sulfadiazine of silver) eliminate local infection and perform then a "delayed" transplant once necrotic substances have been removed. The authors recommended timely excision in burns involving up to 40 percent of body surface, deeming the first two days following the burn trauma to be most auspicious. They use biological (to include Pig skin) or synthetic grafts. They achieve good results with local application of various chemotherapeutic means (see above) with a mash graph type transplant. Her experiences in this regard were shared in an interesting lecture by Dr J. Moserova (Prague), who discussed various surgical problems of necrotomy and various types of biological grafts, to include pig skin. The study showed the extensive experience of its authoress. Another lady author from Prague (Chief Surgeon Dr Koenigova) presented a well-documented lecture on face reconstruction following severe burns, various applications of plastic surgery, and the need for rehabilitation of burn victims (masks, massage, special bandaging). The lecture aroused considerable interest.

Significance of parenteral nourishment and enteral hyperalimentation (by probe) of burn victims was presented on behalf of a group from Kiev, Moscow and Sofia by Professor Povstyanoy (Kiev). Thermal trauma produces conspicuous increases in the energy losses of the organism (up to 209-335 kilo joules per kilogram of weight) and losses of nitrogen. Acquisition of energy is much less economical; often proteins are used as fuel. Potassium losses can result in decreased formation of macroergous bonds (ATP). This calls for supplying much energy in the form of enteral and parenteral hyperalimentation, e.g., per kilogram of weight, 209-251 kilo joules, 50 milliliters of water, 2 grams of protein. Eighty percent of the caloric demand is to be met by basic providers of energy (glycerides, fats, alcohols), and only 20 percent by amino acids. To achieve a positive nitrogen balance, at least 627 kilo joules of "energy" must be provided per gram of nitrogen. Hyperalimentation promotes not only healing, but also helps maintain the defense capabilities of the organism. Grafskaya et al. (Moscow) reported on acute changes in the mucous membrane of the upper part of the digestive tract of burn victims, which they followed by means of fibrogastroscopy, which was performed 58 times on 32 burn victims. Endoscopic pH measurements were also carried out. Achlorhydria was diagnosed is acute erosions. Indications for fibrogastroscopy (instrument Gif "K" Olympus) were acute bleeding and various dyspeptic impairments. Therapy took the form of diet, perfusions by hydrocarbonate solutions, antacids, etc.

Kazatseva et al. (Leningrad) discussed their experiences with treatment of 55 children with severe burns affecting over 20 percent of their body surfaces. There were 35 survivors; 20 children died. Thanks to improved shock treatment, administration of maximum doses of antibiotics, hormonal

preparations, active and passive immunization, and timely surgical treatment prognosis for child burn victims improved markedly over the past six years is comparison with 1955-1972. Nevertheless, serious burns covering over 40 percent of body surface registered even now 100 percent mortality.

Yudenich et al. (Moscow) presented the last lecture of the conference on modern concepts of rehabilitation of burn victims, prevention of functionally adverse scars, and preventing the formation of keloid scars. They also mentioned modifications of face changes (elastic masks, gypsum fillers, etc.). Complex therapy must thus include not only the survival of the burn victim, but provide for his functional capabilities to the extent possible.

The conference was closed by academician Kuzin who summarized practically all the findings presented at the conference.

The atmosphere of the entire conference was very friendly and informal. We obtained a number of new publications on burn trauma from our colleagues in the USSR. They are well familiar with our work, and our published book on changes in metabolism following burn trauma has been at least partially translated at a number of workplaces and is often cited.

The successful conference was terminated by a friendly social gathering at the Hotel Sputnik in the evening.

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SELF-SUFFICIENCY, HIGHER EXPORTS IN ELECTRONICS STRESSED BY MINISTER

Prague ELEKTROTECHNICKY OBZOR in Czech No 4, Apr 80 pp 145-196

[Article by Professor Engr Milan Kubat, DrSc, federal minister of electrical engineering: "Technical Policy on Power Electronics"]

[Text] Introduction, Brief Review of Past 25 Years

Soon after the invention of the transistor in 1948, the thyristor (a controlled p-n-p-n structure) was designed in 1956. During the past 23 years, the thyristor underwent further development. Its static and dynamic parameters have increased significantly. Thyristor currents are of the order of 10^3 A at voltages of (4 to 5)·10^3 V, and the dynamic critical parameters dU/dt and dI/dt are at a level of 10^9 V/sec and 10^8 A/sec. The thyristor turn-off time has been shortened significantly, and in the case of high-speed thyristors it is 10 to 15 μsec. All these (and a number of other) parameters permit the use of thyristors in the most demanding power circuits. Also a series of other thyristor variants, a number of new structures have appeared: the triac, quadrac, reverse-blocking thyristor, turn-off thyristor, power optothyristor, GATT thyristor, etc. Likewise noteworthy are the new transistors for heavy currents and high voltages (400 A at 400 to 800 V), and also the power FET structures. Even before many of these structures could be adequately tested in practice, information arrives about additional new structures (the static induction thyristor, beam-base thyristor, and VMOS structures for power applications). As evident, this power semiconductor technology is undergoing dynamic development.

To the mentioned power semiconductor structures we should add the advances in control circuits, which are becoming more and more digitalized. Microprocessor technology seems to be finding ever-wider application lately, offering new capabilities to automate all types of motor drives.

State of the Art in Czechoslovakia

The present state of the art in Czechoslovakia is determined by state technical policy and the results of the sectoral enterprises:

In 1978 we developed and assigned to production a new series of power semiconductor devices, diodes and thyristors comparable and equivalent to the products of the foremost multinational companies. Here we have attained a very respectable international level.

As we very well know, the situation is somewhat less favorable in the case of microelectronic elements for control circuits. Although we have a number of good analog microelectronic devices, we are lagging particularly in digital microelectronics. This shortcoming has been recognized, and a number of forceful measures are being introduced to remedy the situation. By 1980-1981 we will have available two systems of digital microprocessor circuits: the 8080 (unipolar) microprocessor system, and the 3000 (bipolar) microprocessor system.

The two systems are closely interrelated, and in microcomputors their integrated circuits are mutually complementary, and thus we should not regard them as entirely separate systems.

The first of the two, the 8080 (unipolar) system, is functioning somewhat slower, the microprocessor frequency is 2 MHz, and the system consists of 13 types of integrated MOS circuits (n-channel, Si gate).

The other, the 3000 (bipolar) system, is faster, operates at a frequency of 10 MHz, and likewise comprises 13 types of integrated circuits.

Using both systems, so-called single-board microcomputers (SBC), and single-board memory modules, interface modules, etc. will be constructed. The user will thus get a kit that he will be able to use universally for the most diverse applications, and hence also for various types of motor drives. The kit of such single-board modules also should be available in 1981.

To employ these single-board modules, of course, the user must be able to program. For this purpose we have already developed an apparatus to generate programs (at VUVT [expansion unknown] in Zilina and also at VUAP [Research Institute of Automation Equipment]).

In addition to power devices (diodes and thyristors) and microprocessor technology for control circuits, it is necessary to ensure a number of other components that for the time being are in short supply: power capacitors, special quick-acting fuses, windings and coils (transformers, choke coils), and assembly and connecting components and parts, etc. A number of these things are being ensured gradually. It is increasingly clear to our engineering ministries that engineering products cannot survive without electronics, cannot compete successfully on the domestic and foreign markets. To support the development of electrical engineering, the Federal Ministry of Electrical Engineering (FMEP) has been established as of 1 January 1980.

National Economic Interrelations

If we are to discuss at least briefly the national economic interrelations, then we must begin already with the strict order of the day: to drastically reduce the specific consumption of energy, fuel and material, particularly of metal. We know for certain, for example, that one ton of rolled steel represents 1.5 tons of standard fuel equivalent. It is likewise true that one ton of standard fuel equivalent cost 9 dollars in 1970, now costs 117 dollars and will unquestionably become more expensive in the coming years.

And how can the specific consumption of material be reduced in engineering, and thereby also the specific consumption of energy? In particular by increasing the utility value of engineering products while keeping their weight unchanged; in other words, by increasing the price per kilogram. The application of electronics to engineering products is the most effective way of achieving this.

Example: The Czechoslovak-made 3600 rolling mill supplied to the Soviet Union without electronic controls cost 108 million rubles. The latest variant of the same rolling mill, equipped with electronic controls, costs 275 million rubles, while the total weight of the equipment remains the same as before. With the use of electronics, the price per kilogram has increased 2.5-fold.

Another example: An electronically controlled circular knitting machine of small diameter weighs half as much and has twice the output of a mechanically controlled knitting machine of the same type, at the same price. Thus the application of electronics has increased the knitting machine's price per kilogram from 180 to 360 korunas.

The significance of thyristor rectifiers for industrial and traction motors becomes evident if we consider that already under the Seventh Five-Year Plan these rectifiers will save 200,000 tons of standard fuel equivalent per year, which corresponds to annual savings of about 25 million dollars.

Application of Microprocessors

If it is true that today microelectronics is penetrating deeper and deeper all areas of human activity, then this is increasingly true of electric drives. Further development of electric drives, and of their control and automation, cannot be imagined without the extensive use of microprocessor technology.

However, this places exceptional demands primarily on the engineers who design the motors. Their approaches to designing and the content of their work have undergone a qualitative change. Whereas in the past the electronics engineer's basic tool, figuratively speaking, was the soldering iron, his basic tool today is the apparatus for developing software. In

the past the engineer designed electronic circuits; today he gets a ready-made microcomputer, for which he must develop the software, on the basis of the given technology. Each day we receive reports from abroad that software programmers for microprocessor systems are being trained intensively everywhere. Higher educational institutions, large and small enterprises are providing such training, clubs are being formed for training in microprocessor technology, etc. The software is written not in computer language that is very different and not readily understandable to man, but in higher languages that can be mastered fairly easily. It is being reported that working with a microprocessor will gradually become as routine as driving a car. Even though this statement smacks somewhat of advertising, it probably comes close to the truth if we consider that gradually we will encounter microprocessors everywhere.

This entire process of the further application of electronics and cybernetics is unquestionably demanding, and this fact is fully evident particularly in the case of electric drives.

Preparations by State Organs for Wider Use of Electronics

The state organs are preparing for this process as follows:

We are ensuring the development of the necessary microelectronic component base, at home as well as through international cooperation--with socialist countries in particular, but also by purchasing licenses from nonsocialist countries.

The key question in developing microelectronics is the acquisition of the unique machinery and technology for microelectronics: photolithographic lines, exposure equipment, new types of lithography (electron and x-ray), equipment for diffusion, epitaxy and ion-implantation, contacting and encapsulating equipment, testing equipment for integrated circuits, etc.

We are striving to concentrate the necessary capacities for this purpose in our engineering, optical, watchmaking and electronics industries. Simultaneously we are striving to establish close cooperation with the other socialist countries whose state of the art is the same as ours, or sometimes more advanced.

Specifically this unique technological equipment is under strict embargo by the nonsocialist countries. Here, together with the socialist camp, we must learn to stand on our own feet.

We are striving to assign electronics a more active role also in foreign trade. It would be a mistake to assume that this is not feasible; examples indicate that it is. We are exporting a large volume of integrated circuits not only to socialist countries, but also to nonsocialist countries (for example, to France).

In accordance with the decision of the federal government, a program is being prepared for the wider use of electronics in the national economy.

The chief organizers of this program are FMTIR [Federal Ministry of Technical and Investment Development] and FMEP (the newly established Federal Ministry of Electrical Engineering), but every central agency will have to participate in the elaboration of this program and will have to prepare its own concept of the wider application of electronics, with specific substantive and economic targets.

The state target programs for the Seventh Five-Year Plan include also a program for developing the microelectronic component base. It has been separated from general electronics as a purposefully narrow circle of problems. Everyone today understands its importance, and it appears that also the resources for it will be available under the Seventh Five-Year Plan.

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CSSR PRODUCTION OF PESTICIDES IN 1980

Bratislava AGROCHEMIA in Czech No 6, Jun 80 pp 189-190

[Article by ob: "New Products for the Protection of Plants from the Czechoslovak Chemical Industry in 1980"]

[Text] On the occasion of the Symposium on Chemical Plant Protection Technology, it has become a tradition of sorts for representatives of individual plants of the J. Dimitrov Chemical Works [CHZJD] national enterprise, cooperating with the SVTS [Slovak Scientific and Technical Union] House of Technology in Bratislava to report on their production programs and new products in preparation for the coming year. This is also how we learned about the new pesticides which will be produced in 1980--at the 23rd Symposium on New Technologies of Chemical Plant Protection Agents held on 27 and 28 November 1979 in Bratislava.

At the CHZJD national enterprise in Bratislava the focus is on improving the quality of the pesticides produced. The enterprise participates in the comprehensive quality-management experiment and pesticide quality is part of this program. The urgent problem at this time is improving the quality of MCPA by reducing the level of chlorinated cresols in the active agent. In view of the emphasis on MCPA quality for the domestic and export markets, the general management of Slovchemia has commissioned the Research Institute of Agrochemical Technology in Bratislava with researching a proposal for the erection of a MCPA production unit of 3,800 tons annual capacity producing a product which is at least 95 percent pure. This large-capacity unit is to be erected at a new location outside Bratislava. But legal obstacles cited by the authorities stand in the way of overcoming existing production difficulties by the planned reconstruction. While minor improvements in production were accomplished in cooperation with the VUAgT [Research Institute of Agricultural Technology], reduction of the high content of the undesirable chlorinated cresols was not achieved. At the same time, the quality of Zeazine 50 is being improved by the introduction of a new milling technology. Beginning in 1980, Zeazine S-40, an aqueous suspension of Atrazine, will become the new herbicide for use on corn cultures. The purposeful cooperation of all interested departments of the enterprise resulted in the speedy erection of a pilot plant for the production of Zeazine S-40

which in October 1979 produced 200 tons of the new product with outstanding quality indicators. The program also includes improvement of the quality of Burex with the aim of securing stability of suspension of up to 83 percent. In addition, the existing ready-to-use preparations (Aniten Combi, Bandex N, Keropur N, Galinex and Totazine ZP-50), the new preparations Dual 500 EC (active agent metolachlor) and Teridox 500 EC (active agent dimethachlor) will be placed on the market. Further, the compounding of Bisidine EC 50 is under consideration. In 1979 the compounding of Gesagard 50 and Pyramine was successfully resolved. Currently the compounding of additional pesticides (Afalon special, Bradicaine, Bladex 50 WP and Avenge 200/300) has been resolved or is still in progress.

Spolana Chemopetrol-k p (concern enterprise) is likewise trying to improve the quality and packaging of its pesticides (Nitrosan 25, Nitrosan 50 and Arborol M). In 1980, this producer will continue to supply the assortment of its traditional pesticides such as the mercury-based dipping agent Agronal and the fungicidal preparations Sulikol K, Kuprikol K and Neroxon 50. In the area of finished products, the preparations Gramoxone, Gramoxone S, Reglone, Actellic 50 EC and new special insecticides Scolycid EC for the control of bark beetles in sylviculture will be produced under license of the ICI Co, PPD; the preparations Elocron 3 percent dust, and potentially also other products which may be needed in agriculture will be produced under license of the Ciba-Geigy Co; Phosdrin 24 EC and Super Barnon 20 EC will be produced under license of the Shell Co; Avadex BW and the new preparation Lasso N 40 EC will be produced under license of the Monsanto Co whose pesticide Roundup is being considered for future use. Another preparation, Altercid, a soil disinfectant based on alloisothiocyanate and lower chlorinated hydrocarbons is undergoing certification tests.

The third most important pesticide producer in the CSSR is the East Bohemia Chemical Works Synthesia national enterprise with production plants at Pardubice and Kolin. The new pesticides produced there are based on developmental products of phosgene. The traditional preparations are based on chlorotolurone and its combination with other herbicides (Dicuran special 60 WP, Lumeton forte 60 WP and Igran special 80 WP). Benatal and recently also Benatal AM-11 (active agents desmedipham and phenmedipham) serve as herbicides for use in sugar beet cultures. Other ready-to-use pesticides are Balan L.C. and Topogard 50 WP. In 1980 the assortment of compounded pesticides will be enlarged by the product Purivel (active agent metoxurone) produced in license of the Sandoz Co. It is a nontoxic dissecating agent used primarily to control weeds in flax cultures. This producer is interested currently in compounding the insecticide Decis 2,5 EC under license of the French Procida Co. The advantage of this insecticide is its low toxicity to warmblooded animals. In 1980, a new original product of this enterprise, the herbicide Synlox based on asulam, is expected to be produced at the Pardubice plant and merchandised.

The versatile VCHZ Synthesia branch enterprise national enterprise at Kolin specializes in compounding pesticidal preparations. In 1980, the systemic fungicidal preparation Bayleton 25 WP (active agent triadimefon) will be produced in license of the West German Bayer Co as a replacement for the old compounded fungicides Milgo and Calixin. Chlormequat, produced in our country under the trade name Retacel is to a large extent being exported to capitalist countries which, in view of the stiff competition, is a considerable success. Among the new products in preparation by this company is the insecticide Ambush 25 (active agent permethrin) in license of the British ICI Co, PPD. Another compounded pesticidal preparation will be Eradicane 6 E (active agents EPTC and R 25788) produced in license of the American Stauffer Co for control of annual dicotyledon and also meadowgrass weeds in corn cultures. Under consideration is the compounding of the herbicide Amiben (active agent chloramben) produced in license of the American Union Carbide Co.

The most recent development is the potential production of chelates of cobalt and molybdenum in concentrated emulsion form in cooperation with the Research Institute of Inorganic Chemistry at Usti nad Labem.

Another producer of pesticides in the CSSR is the Lachema national enterprise at Brno which has been cooperating very closely with the British May and Baker Co since 1974. Cooperation with this company resulted in the development of a number of different herbicidal preparations with Labuctril 25 (active agent Bromoxynil) and Loxytril 4 (active agent bromoxynil, dichlorprop, ioxynil and MCPA) in current production. In preparation is the production of the additional herbicide Labuctril MP (active agents bromoxynil and mecoprop) and under development is the preparation Loxytril CM (active agents esters of bromoxynil and ionoxynil). These are mostly contact and systemic herbicides used to control dicotyledon weeds in cereals. Labob, based on the active agent Dinoseb, is another herbicide this enterprise continues to produce. The possibility of producing some active agents from available raw materials or intermediary products is also currently being explored.

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