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4 October 1977

TRANSLATIONS ON EASTERN EUROPE
SCIENTIFIC AFFAIRS
No. 560

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INTERNATIONAL AFFAIRS

REPORT ON FORTHCOMING INTERNATIONAL SCIENTIFIC CONFERENCES

Sofia KHIMIYA I INDUSTRIYA in Bulgarian No 5, 1977 pp 227-228

[Text] International Colloquium on the Production and Utilization of Polymer Foils

Organized by the Chemical Technology Trade Union of the GDR Chamber of Technology and the combine FEB Chemical Works in (Buna), with its enterprise FEB Orbitaplast, on 5 and 6 September 1977, on the occasion of the Leipzig autumn fair.

You are invited with your associates to attend this colloquium. Participation in the colloquium and the visit of the Leipzig autumn fair will give you an overall view of economics and life in the GDR.

Professor Doctor of Sciences (Kotsik), chairman, chemical technology trade union.

Diplomaed Economist (Bervinkel), general director of the combine FEB Chemical Works in (Buna)

The following basic items will be considered in particular at the colloquium:

New aspects of the production, processing, and utilization of local polymer foils;

Utilization and processing of newly developed and special foils;

Modification and stabilization of polymer foils;

Condition and trends of development of installations for the production of polymer foils.

Organizational Information

1. Place

Leipzig-Information
DDR-701 Leipzig
Am Sachsenplatz 1

2. Organizational Bureau:

Before the opening of the Leipzig autumn fair the organizational bureau will be located at the premises of the presidium of the Chamber of Technology:

Fachverband Chmeische Technik
DDR-1086 Berlin
Clara-Zetkin Str. 115-117

Telephone: 2202531 (ext 224)

Telex: 0114841 techkammer

During the colloquium, directly at the colloquium's site--Leipzig-Information

3. Colloquium Languages:

German, Russian, English.

Simultaneous translation of reports and debates.

4. Participation Fee:

200 marks

No fee shall be charged to speakers (reporters only).

5. Announcement:

Please submit applications for participation before 31 May 1977 to the following address:

Kammer der Technik Prasidium, Fachverband Chemische Technik, DDR-1086 Berlin,
Klara-Zetkin Str. 115-117

Upon receipt of your advance request you shall receive the colloquium's program and forms on participation and subsequent rental of premises.

A 3-day visit of the fair by subject of exhibit shall be organized for foreign participants to the colloquium following its conclusion.

Third International Conference on Electroceramics and Magnetoceramics

To be held on 17 and 18 November 1977 at the "De Leeuwnhorst" Congress Center, Noordwijkerhout

Requests for reports

The Third International Conference on Electroceramics and Magnetoceramics, with the participation, this year, of the Work Group on Magnetism, will take place on 17 and 18 November 1977 at the De Leeuwnhorst, Noordwijkerhout, the Netherlands. The conference shall be sponsored by the Dutch Ceramics Association and the German Ceramics Society.

Papers in the following fields shall be submitted:

In selection materials;

Semiconductors (electronics and ion conductors);

Condenser materials;

Magnetic materials;

Related ceramic materials (such as pyroceramics, optoceramics, and others).

Monocrystals and high-tension insulators shall not be discussed at the conference.

The papers to be submitted must deal mainly with ties among the processes for obtaining, the structure, the physical effects, and the industrial utilization of ceramics.

German and English will be the official conference languages.

The conference is sponsored jointly by the German Ceramics Society and the Dutch Ceramics Association.

Requests for papers including the full name, title, and address of the speaker and his coauthors, the topic, and a summary of about 200 words in German or English must reach the German Ceramics Society no later than 1 May 1977. Such summaries (800 words maximum) of accepted papers must be received by the German Ceramics Society for the printing of advance copies by no later than 1 September 1977. The conference will be held at the De Leeuwnhorst Congress Center, Noordwijkerhout, the Netherlands. Noordwijkerhout is a small village on the coast of the North Sea, 35 km from Amsterdam and 20 km north of the The Hague.

The members of the Dutch Ceramics Association and the German Ceramics Society as well as the members of the Work Group on Magnetism will receive the conference program automatically in August 1977. It will be available to all others on request.

Detailed information may be obtained from Deutsche Keramische Gesellschaft, Postfach 1226, D-5340, Bad Honnef, telephone (0 22 24) 7 10 38/39.

The Third International Conference on Electroceramics and Magnetoceramics will be held immediately following the conference on The Science of Ceramics, to be held from 13 to 16 November 1977 at the same place.

INTERNATIONAL AFFAIRS

REVIEW OF CHEMICAL INDUSTRY ACTIVITIES IN VARIOUS COUNTRIES

Sofia KHIMIYA I INDUSTRIYA in Bulgarian No 5, 1977 pp 230-233

[Text] Colored "Mosten"

The new shop for the manufacturing of polypropylene, recently completed as part of the first stage of the Neftokhimiya 1 combine of the Khemitske Zavodi Cz SSR enterprise, in (Zaluzhi), Czechoslovakia, is already producing over 10 tons of powder polypropylene per hour. This important raw material extensively used in the production of plastics is known as Mosten and comes in several varieties. The workers were trained at the Slovnaft enterprise in Bratislava. The workers of the colors laboratory for polypropylene have already manufactured about 100 prototypes of polypropylene of different colors to be used by the plants for the manufacturing of thermoplast in Czechoslovakia.

Five-Year Plan Assignments Fulfilled

In the Fifth Five-Year Plan the production of chemical staples rose 40 percent while their variety doubled. The production of polyamide, polypropylene, and polyester staples developed at the fastest pace. In 1975 the volume of output of synthetic staples exceeded 76,000 tons, thus overfulfilling the assignments set for the chemical industry at the 14th Congress of the Communist Party of Czechoslovakia, by 13 percent. In the past 5 years the use of chemical staples rose over 50 percent within which the use of synthetic fibers rose 2.3 times. The task of increasing the share of processed synthetic staples within the textile industry by 20 percent was overfulfilled by 4.5 percent. As a result of the overall fulfillment of the plans the Czechoslovak textile industry was supplied with 12,000 tons of raw materials above the plan.

KHIMICHESKOYE REVYU, No 3, 1976

Shock Resistant Polyvinylchloride

The Borsod Chemical Combine has successfully completed experiments for the production of shock resistant polyvinylchloride. A new plant is being built for the manufacturing of chlorinated polyethylene--an additive which gives plastic materials their resistance to shock.

In the future 35,000 tons of shock resistant polyvinylchloride, 20,000 tons of which will be exported to Poland, will be manufactured on an annual basis in Kazincbarcika.

The enterprise has undertaken the production of shaped parts of shock resistant polyvinylchloride for the construction and automobile industries. The production of windows made of polyvinyl chloride based on licenses and know-how of the Kemmerling firm in the FRG, will be undertaken in 1977.

HUNGAROPRESS, No 1, 1977

Cooperation with a Japanese Firm

A contract has been signed between the Hungarian Aluminum Trust, the Metalimpex and Hemokomplex foreign trade enterprises, and the Interkooperatsion shareholding association for the development of trade, on the one hand, and the Japanese trading companies Tokai Metals Company Ltd., and Toyo Menka, on the other, by virtue of which, with Hemokomplex acting as an intermediary, the aluminum trust will purchase a rolling mill for the production of aluminum foil with a 5,000-ton annual capacity.

Within the framework of the contract for cooperated production the Hungarian output of aluminum foil will almost triple as it is in great demand. Furthermore the Toyo Menka trading enterprise undertakes to purchase almost \$2 million worth of foil manufactured with the Japanese-made mill. The technological installation will be made by the (Kebanyay) combine in Budapest in 1978.

In 1976 the Hungarian bauxite and aluminum industry celebrated its 50th anniversary. The development of Hungarian bauxite deposits was undertaken in 1926. It is of interest to note that in 1926 the world's bauxite output was slightly over 1 million tons whereas today Hungary alone produces nearly 3 times that amount.

HUNGAROPRESS, No 1, 1977

Ammonia production at the Borsod Chemical Combine

The chemical fertilizers plant of the Borsod chemical combine has been allocated 160 million forints for new technological installations with a view to increasing ammonia production.

This will raise the maximal annual capacity from 163,000 to 190,000 tons. The capacity of the atmospheric system for the separation of natural gas will be increased. Furthermore, a new compressor manufactured in the GDR, with a 22,000 cubic meter hourly productivity, will be installed in the synthesis shop.

Pressed Wood Warehouse for Chemical Fertilizers

The Agard Agrokomplex (Transdanubia), which acquired a good reputation with its hog farms and cow barns, has manufactured a prototype for a storage facility in which the contents on 1,000 freight cars of chemical fertilizers could be stored safely. The fertilizer will be kept in stacks up to 10 m high. The stacks are separated by dividers made of wood planks. The fertilizers are moved with the help of a conveyer belt controlled from an operator's area. The warehouse is made of pressed timber, for the active substances in chemical fertilizers are destroyed by concrete and steel structures.

HUNGAROPRESS, No 2, 1977

Expansion of the Egit Chemical-Pharmaceutical Combine

The Kermed plant sector of the Egit chemical-pharmaceutical plant has been expanded with the addition of a new shop for medicinal preparations. The first sector in which food preparations are manufactured has been in operation since 1974. Its annual output equals 1,600 tons of foods for children in 5 varieties. Subsequently the production of ice cream was developed with a 2,000-piece daily capacity. The recently completed pharmaceutical shop manufactures a variety of oil-based goods and syrups. A total of 360 million forints were invested for its construction. Its current annual output is worth 400 million forints. Soon shops for the packaging of pills and tablets will be transferred from Budapest and the production of some types of tablets will be undertaken.

HUNGAROPRESS, No 2, 1977

Evamin SS--A Universal Detergent

Researchers at the Joint Chemical Combine in Budapest have tested a new invention: a chemical compound which has no alkaline reaction and which favorably combines all physical and chemical properties required in the washing and cleaning of raw wool. The Evamin SS preparation removes the excess fat from the raw wool with neutral chemical action, insuring the best possible quality of the woolen yarn and its noncontraction. It facilitates its handling. The production of the preparation is relatively easy and profitable. Evamin SS is already extensively used by the Hungarian textile industry. Subsequent studies and tests confirmed that it could be successfully used in other areas as well. Thus, for example, its use in the cleaning of the fronts of public buildings and architectural monuments yielded very good results. The water solution of Evamin SS makes possible

the easy and profitable removal of soot accumulated over decades. Evamin SS is being successfully used in cleaning the walls of the tunnel below the Fortification Hill in Budapest

HUNGAROPRESS, No 3, 1977

Soviet-Hungarian Cooperation in the Pharmaceutical Industry

Currently, together with the traditional relations developed between the Soviet and Hungarian pharmaceutical industries, a new comprehensive form of cooperation has been developed within which the drug Sidnokarb has been developed and used: trade cooperation has been developed along with scientific and technical cooperation.

The active substance of the drug was synthesized at the All-Union Scientific Research Institute for Medicines. Research on the effects is being done partially at the Soviet research institute and partially at the pharmacological and toxicological laboratory of the Hungarian AO Gedeon Richter pharmaceutical plant. The tablets are produced in the Soviet Union while the packaging and sales in nonsocialist countries is the work of the AO Gedeon Richter pharmaceutical plant. Sidnokarb is a psychostimulating preparation acting on the central nervous system and intensifying intellectual activities. It is used to trigger mental activity and spiritual interest of patients suffering from mental depression and apathy, as well as for increasing the attention of mentally retarded children.

HUNGAROPRESS, No 3, 1977

Africa-Europe Gas Pipeline

In 1978 Algeria will begin to supply natural gas to Italy. The volume of annual procurements will reach 12 million m³ of gas to be transported along a gas pipeline 2,600 km long, from the extraction area at Hass er Mal in Algerian Sahara to Cape Bonne in Tunisia. From this point the gas pipeline will be laid on the bottom of the Mediterranean to the city of Mazara del Vallo, in Sicily and, crossing the Strait of Messina to Western Italy. The construction and structure of the gas pipeline will be very complex. The biggest technical problem is the construction of the part which must be laid along the bottom of the Mediterranean, 150 km long and at a depth of 500 m. The same types of problems must be resolved by the construction workers at the Messina straits. In the course of the preparatory operations for the laying of the gas pipeline midget submarines were used to photograph the sea bottom. The initial pipes were laid in the summer of 1975. Nine compressor stations will be built along the gas pipeline.

KHIMICHESKOYE REVYU, No 3, 1976

Use of Chemical Staples

According to the director general of the International Committee for Rayon and Synthetic Staples the share of the world's volume of use of chemical staples in textile raw materials will reach 55 percent in 1980 compared with 42 percent in 1974. The increased use of chemical staples has been triggered by a drop in their prices. Whereas in 1970 chemical staple was six times more expensive than cotton, in 1974 chemical and cotton staples fetched identical prices.

KHIMICHESKOYE REVUY, No 3, 1976, By D. P.

New Method for Chloralky Electrolysis

The Japanese company Asahi Chemical Industry has discovered a method for chloralkyl electrolysis based on the principle of ion exchange when passing through a membrane of polymer material, with very stable and durable results. Combined with the evaporation process, the method yields 48-50 percent caustic soda and uses far less steam as a result of which production expenditures are considerably lower compared with the conventional methods using mercury or a diaphragm.

New Instrument for Paper Production

The proper consistency of the pulp is the basis of the paper production process. If the pulp is thin the paper breaks. If it is thick the paper turns into a shapeless mass. The Swiss Eur Control company has resolved this problem by using the Lowconom electronic instrument installed along the belt, controlling the pulp concentration within a 1 percent tolerance. The instrument operates on the basis of measuring the depolarization of the light caused by the pulp fibers.

The instrument is produced by Eur Control Marketing SA, Avenue Fraisse 3, CH-1006, Lausanne, Switzerland. By L. P.

Italy

The Nigerian federal petroleum and energy ministry has placed an order for the building of a petroleum pipeline with the Snam Progetti company, part of ENI--Ete Nazionale Idrocarburi (Italian State concern for petroleum, natural gas, and atomic energy).

It will connect the port city of Escravos on the shore of the Atlantic with the city of Vari, located near the Niger River delta. The pipeline will be about 63 km long and will have a 24-inch diameter. It will be able to transport up to 20.6 million m³ of petroleum per year. Currently Snam Progetti is building the Vari refinery.

Albania

Between 1976 and 1980 the number of tractors will be increased by 20 percent (in terms of 15 hp); 65 percent of the needs of agriculture for chemical fertilizers will be insured while the size of irrigated areas will be expanded 18 percent. The investment program for transportation and communications for 1976-1980 will account for 6 percent of total investments, or 97 percent of the amount of the 1971-1975 plan. Between 1976 and 1980 freight haulage will increase by 30-35 percent, including freight transportation by rail, which will increase by about 62 percent; by 1980 the railroads should account for about 38 percent of the overall freight haulage. Freight will be trucked in the more rugged parts of the country. Coastal navigation will increase by about 50 percent, while overseas navigation will be increased by 35 percent.

Yugoslavia

The (Benichantsi) oil field is the first area in Croatia where crude oil with a pour point of +18°C is being extracted. Authors B. (Benchich), B. Delfin, (Y. Domes), and (Z. Zinger) (NAFTALPIN Zagreb, December 1976), have studied the possibility for its direct refining through a main pipeline. Taking into consideration the tripled output, the NAFTALPIN experts include in the cost of the product some additional expenditures related not only to extraction but transportation and refining for final use. A number of prerequisites reduce the overall outlays; through proper additives the pour point may be maintained at below 5°C.

Romania

The Krupp industry and Schalbau company and Romainian companies are building jointly 14 excavators with a productivity of 40,000 m³/day each as well as corresponding sedimentation systems at the Ravinari soft coal open pit. A cooperation agreement was signed in October 1973. The four excavators and two precipitators built in the first stage will begin operations soon. Another five excavators and three precipitators will begin operations before 1979 according to the contract for the second stage which has now become effective. Each of these excavators will be 130 m long and 35 m high and will have a productivity of 1,800 m³/hour. The precipitation systems are each 150 m long and 37 m deep and have an operating area (sterile stratum) of 6,500 m³ or a productivity of 10,400 tons/hour.

Hungary

So far the USSR has supplied 50 million tons of Soviet petroleum to the Duna refineries of the Szazhalombatta petroleum refinery along the Friendship Petroleum Pipeline through the pumping station at Fenyesslitke at the Hungarian border. According to concluded agreements petroleum deliveries began at the end of 1972 along the 400 mm pipeline. A new impetus was given to the deliveries following the completion of the Friendship II Pipeline (600 mm diameter) from Uzgorod via Fenyesslitke to Szazhalombatta, which was completed in November 1972. In 1975 alone the USSR delivered over 6 million tons of petroleum along it, or three times the amount of petroleum extracted in Hungary.

Soviet Union

Three pipe plants are being simultaneously completed in the Middle Urals. Two of them--in Polevsk and Kamensk-Ural'--will produce hundreds of thousands of tons of pipes per year for the petroleum and gas industry (320,000 tons/year were produced at the end of 1976). The Pervoural'sk plant, with its VBB complex, will be the most modern and more advanced producer of pipes for other industrial sectors. A second production line of a pipe-rolling mill is being completed in Sinara. It will supply high-quality pipes for the petroleum and gas industries of the areas of Western Siberia, Bashkariya, and Tatariya.

The Yu. Kazimov Machine-Building Plant in Baku is producing drilling equipment for Western Siberia. The serial production of three of the units operating under transpolar conditions was doubled. Currently the plant's technicians are focusing their attention on the development of units for the exploitation of wells using the gaslift method (extraction of petroleum through gas heating), in close cooperation with scientific personnel from the Bashneftemash Association. Recently M. Dzhebrailov, head of the best milling brigade, stated in the press that as of the beginning of 1976 the Yu. Kazimov has not received a single major complaint from Western Siberia.

OPEC (Near and Middle East)

In 1976 Algeria increased its petroleum extraction 9.4 percent totaling an output of 50.1 million tons; 45 million tons are exported as crude oil.

At the end of 1976 the Gabon government decided to limit petroleum extraction to 11 million tons, for with a 12 million ton annual extraction reserves will be exhausted in 20 years. This has led to the reduction of a number of investment programs as a consequence of which the implementation of several plans (the trans-Gabon railroad and ore mine points in Santa Clara and Port Gintil) will be postponed for 3 to 4 years.

Europe

The Western European commission would like to provide once again financial encouragement to thermoelectric power plants (using coal as fuel). A draft bill calls for investment aid totaling 1.5 billion West German marks to be invested over the next 15 years in the construction of new thermoelectric power plants using coal, and modernizing existing systems or reconstructing others to operate with solid fuel (the DG will absorb up to 30 percent of the expenditures). Estimated annual savings are a minimum of 26 million tons of liquid fuel or as much as 40 million tons.

Around the World

The first solar powered electric power plant will be built in the Mojave Desert in California. It will cost \$100 million (235 million West German marks). The installation will have a 10-megawatt capacity sufficient for a 10,000 population city.

ERDOL-DIENST, No 3, 1977. By Kar. T.

Benzene Alkylation with Propylene in an Aluminum-Zirconium Catalyst

One of the most familiar reactions most extensively applied in the past 40 years in industry is the alkylation of benzene with ethylene and propylene. A great variety of catalysts is used for such alkylation.

Soviet researchers Kozarevov, Ryabtseva, and others, have developed an entirely new type of catalyst for alkylation which, unlike the ones known so far does not corrode the reactors, is easily separated from isopropylbenzene and does not form industrial waters.

The basic raw material consists of two types of benzene--coke chemical (purified) and petrochemical--and 99.7 pure propylene. The aluminum-zirconium catalyst has pores with an average radius of about 55 Å. The alkylation was made in a pilot installation with a 0.6-liter reactor.

The alkylation took place at a temperature of 125°C, 5 atm pressure, and 8:1 benzene-propylene mole ratio.

Under such conditions the propylene conversion equalled 97 percent while the extraction of alkylate--isopropylbenzene--equalled 66.6 weight percent--age in terms of the theoretical figure. The thus obtained isopropylbenzene, based on petrochemical benzene (for synthesis) has the following properties:

Density d_4^{20} --0.862;
Refractive index n_D^{20} --1.4910;
a. Boiling Point--150.4°C;
b. 10%--151.6°C;
c. 90%--152.1°C;
d. End of boiling--152.3°C;
Ethylbenzene content--0.06 weight percent;
Bromium number--0.02.

According to the authors this isopropylbenzene has a good oxidation ability. It was determined that the new catalyst has good selectivity, on the one hand, and good stability, on the other. High results were obtained also with the use of coke chemically treated benzene. The catalyst is regenerated through oxidation at a temperature of 550°C over a 4-hour period on the basis of one volume of air per volume catalyst. Following the regeneration the catalyst's activeness is restored totally. It has been established that diffusion factors influence the new alkylation process. The authors believe

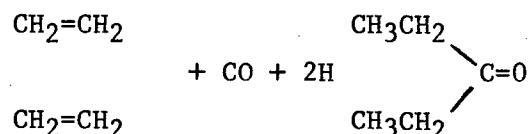
that possibilities exist to develop on the basis of such experiments an industrial process for the alkylation of synthetic benzene with propylene using an aluminum-zirconium catalyzer.

They have been granted USSR authorship certificate No 370825 for the process, published in the inventions bulletin No 11 for 1973.

KHIMIYA I TEKHOLOGIYA TOPLIV I MASEL, No 4, 1976

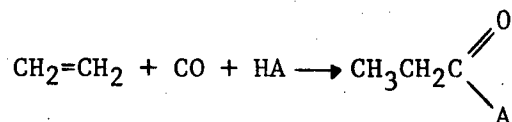
Synthesis of Diethylketone Based on Ethylene and Carbon Monoxide

As has been recently established aliphatic ketones have proved to be very effective organic solvents. Unfortunately, so far a technological process has not been developed to lower their production cost. On this basis, scientific associates M. Khokhlova and N. Imyaninov from the All-Union Scientific Research Institute of Petrochemistry in Moscow, studied the possibility to synthesize diethylketone directly from ethylene (C_2H_4) and carbon monoxide (CO) within a single stage on the basis of the following reaction:



They report that the hydrogen (H_2) needed for this reaction may be either molecular hydrogen (H_2) obtained through electrolysis, or used as water (H_2O), alcohol (CH_3OH) or other hydrogen-containing organic compounds which release hydrogen as they break down (H_2).

The authors assume that the second reaction may develop parallel to the first:



They believe that in all likelihood it would be best to use pure hydrogen. Experiments proved that in order for the synthesis to develop as required the purity of the carbon monoxide is not of great importance.

In other words, conducting their experiments, the authors tried to achieve oxosynthesis. Initial experiments indicated that the selectivity of the reaction in terms of the extraction of diethylketone was low.

Aldehyde propyne was obtained instead of diethylketone. That is why the authors were forced to add some modifiers to the reaction which largely avoided the formation of aldehyde propyne. Pyridine or α -picoline were among such inexpensive modifiers with whose help diethylketone extraction rose from 55 to 58 percent.

Most effective modifiers are now being sought. The authors report that selectivity in the production of diethylketone is better if alcohol is used instead of hydrogen, such as, for example, isopropylene or cyclohexane alcohol.

With the use of such alcohols extraction rose from 78 to 81 percent. They report that conditions for such a synthesis of diethylketone have been developed in which extraction ranges from 90 to 95 percent.

The thus obtained diethylketone yielded good results.

On the basis of such studies an installation with a capacity of 30,000 tons per year is being planned and the estimated production cost of diethylketone will be about 200-220 rubles.

NEFTEPERERABOTKA, NEFTEKHIMIYA I SLANTSEPERERABOTKA, No 1, 1976

Combined Hydraulic Cracking Process for the Production of Motor Fuels and Oils from Heavy Sulfur Distillates

As we know, the balance of sulfur types of petroleum is rising and the extraction of high-quality motor fuels and oils from them is a prime task. That is why extensive scientific research is being done by the USSR, the United States, Britain, and others.

The purpose of the researchers is to study combined hydraulic cracking under pilot conditions at the Ryazan' experimental plant. We know that vacuum distillates are used by many countries in the production of motor fuels in vacuum rectifying columns using sulfur types of petroleum: Romashkinskiy and Western Siberian. At 20°C the distillates of these two types of Soviet sulfur petroleum had high density ranging from 0.911 to 0.9339 g/cm³. Essentially, their density was that of the Tyulenovo petroleum. Aromatic hydrocarbons predominated in them totaling 65.3 percent whereas naphthene-paraffin hydrocarbons totaled no more than 34.7 percent.

This basic structure shows that these are heavy aromatic and sulfur distillates in which carbon predominates from 85.88 to 87.79 percent while sulfur ranges from 1.37 to 2.04 percent. These distillates were subjected to hydraulic cracking in a pilot installation under the following conditions:

Temperature--420-430°C;
Pressure--150 atm;
Volume raw material velocity--up to 1.5 hours⁻¹;
Catalyzer--Soviet type GK-8
Hydrogen--pure (100 percent)

Following the hydraulic cracking the product broke down into gasoline distillate, diesel distillate, and oil fractions at 360-400°C, and end of boiling at 400°C.

The oil fractions were deparaffinated with a double mixture of acetone-toluene at a temperature of 25°C. Through combined hydraulic cracking under the conditions indicated above the following products are obtained per 100 kg of vacuum sulfur distillate: gasoline--16-17 percent; diesel fuel--34-35 percent; deparaffinated oil (360-400°)--29-30 percent; paraffin [gach]--from 12.5 to 13 percent; hydrogen sulfide and ammonia--2 percent; gas--5 percent; losses--1 percent.

Depending on the chosen process conditions the vacuum distillate of Soviet West Siberian petroleum yields the following per 100 kg of raw material: 26 kg of gasoline and 45 kg of diesel fuel, or a total of 71 kg; in other words, this is the pure fuel variant of the process.

The gasoline distillate was submitted to additional treatment with catalytic reforming, whereas the diesel fuel was simply filtered.

It was proved that the quality of the oil following the deparaffination (365-400°C) and end of boiling (400°C) depended on the level of the destruction of the vacuum distillates in the hydraulic cracking process. If the hydraulic cracking takes place under a more intensive system the resulting oils have a high viscosity number. However, their extraction per 100 kg of raw materials equals only 15 kg.

The analysis showed that the oils have a high paraffin-naphthene hydrocarbon content (ranging from 67.5 to 94.6 percent) depending on the hydraulic cracking system.

In conclusion, the authors emphasize that these are preliminary studies and that oils with a high number base cannot be obtained from the vacuum distillates of the Romashkinskiy and West Siberian petroleum. They could be used as a base for various oils. In all probability experiments along this line will be continued.

The study is of interest to our country as well, for we too process Romashkinskiy sulfur petroleum from which huge quantities of fuel oil remain, currently used as boiler fuel and for gassification.

NEFTEPERERABOTKA, NEFTEKHIMIYA I SLANTSEPERERABOTKA, Moscow, No 1, 1976, by Vl. B.

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CSO: 2202

BULGARIA

EFFICIENT BULGARIAN-MADE OINTMENT AGAINST BURNS

Sofia POGLED in Bulgarian 1 Aug 77 p 2

[Article by Nadya Kharalampieva: "Univertan May Be Used Against Burns as Well"]

[Text] A great misfortune occurred to me while vacationing in Zlatni Pyasutsi: I burned my right wrist. I was taken to the public clinic where I was told that I had third and fourth degree burns. This was followed by difficult and unbearably painful manipulations for cleaning the burned areas and eliminating the blue and black rings. I was told that despite the physiotherapy that was necessary after a while to bring mobility to my fingers, my work efficiency will be reduced.

At that time I heard accidentally that the preparation Univertan is used for the treatment of burns as well. The effect was striking. After 5 to 6 minutes my pain disappeared entirely. I began to move my stiff fingers effortlessly. Two days later the line dividing the burned and the healthy skin disappeared and a normal color returned on my hand. Finding out that this preparation was Bulgarian and had a Bulgarian patent, and that it was discovered by Dr Tanchev I felt a surge of pride!

I thank our medicine and Dr Tanchev! Kapka Georgieva, Sofia.

We knew that the preparation Univertan is successfully used in the treatment of purulent skin processes, herpes, inflammation of the mucous membrane of the mouth and the gums, abscesses, and tooth gangrene. However, we were unaware of the fact that it is used in the treatment of heat burns as well. The letter we received from our reader led us to Dr Georgi Tanchev, author of the preparation. Following is his explanation:

"A suffering must be treated etiologically, i.e., we must attack the reasons for the suffering.

"I assumed that the toxins which produce microbes in inflammatory skin processes are similar to burn toxins. I was totally right. The preparation Univertan, the only preparation in the world today which could heal erysipela, one of the most terrible inflammatory processes of the skin,

is equally efficient in the treatment of heat burns. The effect is striking! The pain disappears immediately, the burn toxins are neutralized and, in second degree burns, should the preparation be used, no blisters are formed. Univertan has four very emphatic properties: disinfection-antitoxic, antistasic, and reanimating.

"How to treat burned areas?

"The burned area is sprinkled with Univertan in powder and covered with wet gauze or cotton. First degree burns are healed in 3 to 4 hours but must be well covered with the medicine. In second degree burns the blisters blend with the tissue under them and the semi-living cells are reanimated. On the fourth or fifth day we see in the area a slightly shinier dark violet colored skin. Third degree burns call for a lengthy treatment following the same method. Naturally, here we also use the conventional general reanimation and antishock means."

Before leaving Dr Tanchev we asked him another even more practical question:

"Since our family is getting ready to go to the beach, could we go in the sun without worrying if we carry Univertan?"

"Caution is necessary," said Dr Tanchev, smiling. "Nevertheless, should the skin redden apply the preparation. Both the redness and the pain vanish!"

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CSO: 2202

BULGARIA

QUALITIES OF NEW WHEAT VARIETY DESCRIBED

Sofia KOOPERATIVNO SELO in Bulgarian 14 Aug 77 p 2

[Article by Senior Scientific Associate Todor Rachinski: "Wheat No 1128-737"]

[Text] This strain is nameless. It has been left bearing its selection number composed of two groups of figures -- 1128, the number of the hybrid developed in 1962, and 737 -- the number of the line developed from it in 1966. The number is also its practical name. Occasionally it is referred to simply as "the number."

The fact that it was given no name reveals the slightly different road which led this strain to practical use or, speaking more accurately, which led to its confirmation through practical necessity. Included in production experiments conducted several years ago in many of the country's APK [Agroindustrial Combines], No 1128-737 stood out among the other strains by virtue of its great productive capacity and stable yield. Farms in Tolbukhin, Varna, Razgrad and several other okrugs began to grow it intensively. From some 15,000 decares in 1975 areas planted in this strain rose to 185,000 decares in 1976 and to 470,000 decares in 1977. By order of the minister of agriculture and food industry the strain was temporarily zoned for a 3-year period (1976-1978), which legitimized its growing in the country. Today 1128-737 is the main strain used in Tolbukhin Okrug. It is being rapidly introduced in the remaining okrugs in northern Bulgaria. Interest in the strain has been displayed in southern Bulgaria as well. Possibilities exist for its further expansion in the future.

The strain was developed by the Wheat and Sunflower Institute near General Toshevo by crossing the Italian strain Libelula with Bezostaya-1. This is one of the more successful combinations of the positive qualities of Italian and Soviet wheat strains. This is a red spike bold wheat with red-colored grain.

It has several qualities which determine its substantial advantages in mass practical use. Above all, it is highly resistant to diseases.

Whereas the current main strains Sadovo-1, Levent, Bezostaya-1, and others are sensitive to the powdery mildew and yeast rust which, in the case of Sadovo-1 may cover up to 75 percent of the leaf surface, the development of this disease on its leaves does not exceed 10 to 15 percent. Thanks to this feature the strain retains a fresh leaf system over a long period of time. This is of great importance to the fattening of the grain and its proper ripening. The strain is also considerably more resistant to fusarium and bacteriosis, qualities inherited from the mother strain Libelula.

This quality, which is becoming an ever more mandatory requirement facing contemporary wheat strains, is particularly important under the variable weather conditions of our country. The preliminary burning of the leaves, intensified by the harm caused by rust in the sensitive strains, quite frequently leads to accelerated ripening and undernourishment and shriveling of the grain.

The great advantage of 1128-737 lies in the grain, in its stable fattening. Even under very adverse ripening conditions, the grain may reduce its size but is always well filled. It is short, barrel-shaped, shining, and with a very thick endosperm.

No 1128-737 is equally safe in moist and droughty years. Such a remarkable elasticity of the strain has been well tested and has become well known. It withstood very well the lengthy drought which afflicted northeastern Bulgaria in 1974. It remained safe in the moist season of 1975. In the exceptionally favorable season of 1976 it did not fall behind the remaining strains -- it yielded over large areas an average of 550 to 650 kilograms of grain per decare.

It has a low stem (80-85 centimeters) with a good resistance to lodging. It is distinguished by its very good resistance to the winter and cold, resembling that of Bezostaya-1. Its tillage capacity is moderate. Its earing and ripening occur 3 to 4 days earlier than Bezostaya-1 and 1-2 days after Sadovo-1.

The ear is large, and well grained. It is 7.5-8.5 centimeters long. It has 16 to 18 spikelets in the ear and 40 to 44 grains. The grain has a heavy absolute weight -- 44-46 grams. The hectoliter weight exceeds 82-83 kilograms.

This is high quality grain classified among the strong improvement wheats. In this respect it is almost equal to Bezostaya-1. The glassiness of the grain is high -- usually exceeding 70 percent. Its wet gluten content is above 32 percent. Compared with Bezostaya-1 the main quality indicators of the flour which make it a strong wheat are the following; the sedimentation value of the flour is 59 milliliters compared with 61 milliliters on Bezostaya-1; the valorimetric figure for the two strains is, respectively, 66 and 69, while the resistance of the dough is 8.5 minutes for 1128-737

compared with 8.3 minutes for Bezostaya-1. The bread baked from its flour is voluminous and stable shaped -- 100 grams of flour yields 460 cubic cm of bread compared with 465 cubic cm for Bezostaya-1. The high productivity of the strain has been confirmed after a number of years of experiments conducted by the institute in General Toshevo. On a 5-year average (1972-1976) it produced 717.2 kilograms of grain per decare. A number of agroindustrial combines achieved high yields with this strain.

Today No 1128-737 is one of the main partners of Sadovo-1 within the wheat strain structure in the country. Its raising over large areas offers good possibilities for stable yields and for the production of more bread grain.

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BULGARIA

NEW WHEAT VARIETY DESCRIBED

Sofia KOOPERATIVNO SELO in Bulgarian 31 Aug 77 p 2

[Article by Senior Science Associate Todor Rachinski, director of the Wheat and Sunflower Institute at General Toshevo: "The Vratsa Wheat"]

[Text] In the variety Vratsa, our plant breeding is offering for use a bioecotype which is excellently adapted to the conditions of the country. And what is particularly important, it is a variety which best shows its advantages in Northwestern Bulgaria, a region which is difficult in creating a suitable varietal structure of the wheat and in which many of the previously raised varieties have not produced stable yields each year.

The new variety has been developed using the method of intervarietal hybridization at the Wheat and Sunflower Institute in General Toshevo by crossing the Yugoslav variety NS-313, the Italian Elia and Bezostaya-1. It is a white-ear, awnless wheat with a red grain. It has a short (75-78 cm) stem, which is very elastic and resistant to lodging. With very close sowing and mass lodging, as was observed in 1975, it showed great resistance, in being inferior only to Rusalka and Yubiley, and significantly surpassing Sadovo-1 and Levent, more than 90 percent of which lodged.

The variety possesses very good winter resistance, close to that of Bezostaya-1. From the autumn it develops comparatively vigorously, with a broader and lighter-green leaf system, in showing good taking capacity. Its resistance to cold is also very good.

Vratsa falls among the early varieties, forming ears 5-7 days earlier than Bezostaya-1 and ripening 3-4 days before it. One of its important advantages is its very good resistance to disease. The mature plants are highly resistant to brown rust. Infestations of yellow rust in it have not been observed up to now, and the protein in the grain is comparatively more resistant than Sadovo-1. It is also highly resistant to powdery mildew.

The significantly better resistance of the variety to bacteriosis and fusarial wilt has also been established. Also of important significance is its excellent resistance to the shattering of the grain.

With an optimum planting rate of 600 seed per square meter, the variety forms dense plantings of up to 750-800 ears per square meter. With such a density, heavily grained ears are formed with an average of 40-42 grains, that is, about 5-6 grains more than Avrora and Sadovo-1. The grain is well filled out, large and very heavy, with an absolute weight of 42-45 gms.

Vratsa is a high-quality wheat. The protein content in the grain is comparatively high, 14.1 percent. The quantity of wet and dry gluten is very large, respectively, 37.1 and 11.5 percent. Bread has a large volume and is of very regular shape. The baking value as a total indicator also affirms the very good quality indicators of the variety. The first data from its testing in a production laboratory of the State Varietal Commission indicate that it exceeds not only Sadovo-1 but also Bezostaya-1 in terms of quality and strength. The average of three testings of its sedimentation value was 72 milliliters with 51 milliliters for Sadovo-1 and 67 for Bezostaya-1. The number of the valorimeter was also very high, 76 units, with 48 for Sadovo-1 and 60 for Bezostaya-1. The stability of the dough, as one of the most important indicators for the strength of the flour, was significantly greater, 8.05 minutes, with 2.50 minutes for Sadovo-1 and 3.50 minutes for Bezostaya-1.

The variety produces very high and stable yields. As an average over the 4 years, at the institute in General Toshevo, from it we obtained 756.3 kg of grain per decare, with 625.4 kg per decare for Avrora, or 130.9 kg more and 20.9 percent more. Over the last 2 years, it has produced a yield of 826.2 kg, in exceeding Sadovo-1 by 58 kg of grain per decare. In the system of state varietal testing, the variety Vratsa for 2 years has been in first place in terms of yield among all the tested candidate varieties.

These high yields are also substantiated by results obtained from production testing. In 1976, the variety was in first place in terms of yield in the production testing constructed in Varna Okrug. Particularly impressive was the result obtained by the brigade in the village of Karamanite under the APK [agroindustrial complex] in Vulchidol, 857 kg per decare after a preceding crop of beans. The high productivity of the variety was also shown in tests conducted at the APK in Kavarna, where under dry farming and irrigated conditions, along with the new variety Trakiya, it was in first place in terms of yield.

As a representative of the modern, intensive short-stem wheat varieties, Vratsa satisfies important requirements of our wheat production for increasing the yield of cereals. At the last plenum of the State Varietal Commission, the variety was regionized preliminarily for the conditions of Northern Bulgaria. The first seed reproductions have already been made, and several APK in Tolbukhin Okrug have planted sufficient area which even this year will make it possible to move on to its accelerated introduction into production.

POTENTIAL OF 'SCIENCE' OF PROGNOSTICATION EXAMINED

Budapest MAGYAR TUDOMANY in Hungarian No 7-8, Jul-Aug 77 pp 609-615

[Article by Gyorgy Barna and Gabor Laszlo: "Development Aspects of the 'Science' of Prognostication"]

[Text] Articles dealing with matters related to prognostication have already been published in this journal [1]. For example, attempts have been made to review, if not to synthesize, those methods of prognostication which may be regarded as "scientific" [2]. Of course, we cannot expect that our views will be fully accepted on the basis of one or two articles, the less so since these views are not generally accepted. Obviously, they are not necessarily infallible either. In spite of this, however, we are firmly convinced that our views are realistic and potentially useful for the development of prognostication.

The Origin of the Suspicion with which Prognostication is Viewed

There are still many who question whether prognostication is a science; we feel that these questions do have some validity. It may be interesting to examine the reasons for this, especially in view of the fact that many of our outstanding scientists sometimes also express valid criticism of prognostication. We have mentioned earlier that prognostication is a new science. Thus, it is still in its infancy and has attracted not only serious scientists but also some soldiers of fortune. Few people realized fully the subject matter of the science of prognostication, and most people had unclear views about the methodology of prognostication. At the same time, most of the methods employed in practice required practically no advance study or basic knowledge.

The fact that prognostication is not defined precisely and that its methodology is disorganized made this discipline accessible to anyone with a spirit of enterprise and an interest in the subject. This in itself would be quite in order if only all prognosticators would be guided solely by unselfish scientific interests. Nobody can be blamed if he wants to change the results of his scientific activities into cash. However, one would expect an honest scientific approach. Unfortunately, prognostication was precisely the area where the practitioners could be easily corrupted — especially in the West — since the subject of prognostication is the future and we are all interested in the future. We could all be misled by promising outlooks and more or less cloudy statements, at least to some degree and for some time. This applies to outstanding experts just as much as to the public at large. Of course the experts could notice first that there is a void instead of a foundation under the promises, and that the scientific background is of no value. It was therefore understandable that prognostication as a discipline and its practitioners were rightfully condemned by many people.

In order to make prognostication into a scientific discipline we must give it an unchallengable system (one which may be justified with purely scientific methods). This system must define the subject, as all other scientific disciplines are defined. The system must also cover the criteria for the methods used and also the methods themselves.

In some instances, the names given to the methods used in prognostication were not the best; this added to the skepticism of the experts with a serious critical ability. One of the favored, and therefore most often used, methods of prognostication is the so-called Delphi method. Unavoidably, the name given to this method associates with the obscurity of the results, the subjectivity of the examiner, and the uncertainty of the findings, to name only a few such factors. Of course, we do not mean that the Delphi method is unreliable. There have been many forecasts obtained with the aid of this method which were valid or at least served the purpose. But it is evident that there is good reason for the fact that this method is called in the Soviet Union (in its slightly modified version) the method of collective judgment.

Of course, by just changing the name of the method we cannot change the fact that the Delphi method — or a version of it called the method of collective judgment — is of the verbal type, is subjective, and is not quite reassuring to those used to the strictly scientific character of the objective methods, even though it does employ objective mathematical methods, sometimes even electronic computers.

Until now we spoke about the deficiencies of prognostication; some people may perhaps think that we are disinclined to regard prognostication as a science in the strict meaning of the word. Let us state clearly that this is not the case. All we want to do is to start with outlining the deficiencies of prognostication with the aim of demonstrating the possibilities and necessity of its development.

Is There an Objective Prognosis?

The first question that arises is whether it is possible at all to prognosticate, to foretell the future. Then we may ask further: Are there such objective methods with the aid of which the expected processes and events can be determined at an adequate degree of accuracy, and are there ways for assessing the reliability of the forecasts?

The forecastability of the future is an obvious fact, which we know from experience. The leading experts in many fields, such as politics, economics, natural sciences, sciences in general, and in other areas often undertake to make forecasts or produce analytical assessments which are in fact forecasts. The question is this: is Gyorgy Lukacs right when he says that only the experts in the field should make forecasts since they are the ones who know the past best, who are familiar with the developments to date, and who know the momentary situation, the trends, and the expected future on the basis of these factors [3].

These statements by Gyorgy Lukacs are obviously sensible as far as they go; however, on the basis of our work so far we venture the statement that there are fully objective methods of prognostication which require specialized scientific procedures for their development, use, and upgrading. We are prepared to prove this statement. The methods may be made available to practitioners of other disciplines who may use them in the same manner as they use other mathematical disciplines or disciplines based on mathematics. If we view prognostication in this manner, we must go more or less along the road of cybernetics and operations research since these disciplines appear to be the most relevant in their approaches and methods. We may assume that prognostication will have mutual interaction with these disciplines, using the techniques of mathematical statistics, once it has reached the proper degree of development.

If there is such a thing as prognostication discipline, it must have a basic definition, a system of values, and so forth. The definition of prognostication may be prepared with the methods of mathematics. We must use the methods of group theory. From proper building blocks we may construct the

discipline of prognostication so that it meets the demands of the scientific approach and that is is not entirely verbal. This project is in progress and hopefully we will be able to report soon about its results. In the meantime let us stay with the more conventional methods of expression and let us try and define the field of prognostication.

Obviously the discipline of prognostication deals with events that will take place in the future, with events that may be expected to take place in the future. This factor in itself does not make it different from other natural sciences in the broad sense of the term since, for example, the law of gravitation also describes an event that will take place in the future. For example it states how many seconds later a marble dropped from the top of the leaning tower of Pisa at 0 seconds will reach the ground. This basic experiment of physics obviously is not part of prognostication, no matter how much it seems to be. Nor is the methodology of celestial mechanics part of prognostication in spite of the fact that it permits us to foretell major events that will take place far in the future.

The main difference between subjects dealt with by prognostication and subjects dealt with by deterministic physics and its associated areas is the fact that prognostication deals with stochastic phenomena, at least in its extremely idealized mode. In general, the functional relationships do not describe precisely the events to be expected in the field of prognostication. We must employ the techniques of mathematical statistics to study the processes and sequence of events. Even this definition will not distinguish fully prognostication and physics. Let us think, for example, of the general laws governing the behavior of gases and the fundamentals of these laws. The relationships characterizing the thermal behavior of gases are of a statistical character and — if we deal with a sufficiently small volume — we may indeed make use of mathematical methods applicable to prognostication. But other examples may be doubtlessly found also. It may be of interest to discuss the tedious problem of the fatigue-testing of machine components or assemblies. This involves the "prognostication" of the service life of the item being examined. The difference between the subject matter of prognostication and the other subject matters discussed is that the former deals with such systems — according to its definition — which cannot be examined by systematic experimentation. They require a study of the processes of the system from the outside. This is an important feature since even in an idealized case the subject of prognostication cannot be influenced by the person making the forecast, he can influence it only in a very insignificant manner insofar as human dimensions are concerned, if at all.

The definitions so far had an uncanny resemblance to the definitions of mathematical models; as a matter of fact, they appear to be the same. This should not surprise us since we must realize that various mathematical models — to the extent that they relate to events to take place in the future and processes which can be examined as a function of time — play a major role among the tools of prognostication. Accordingly, the field of prognostication may be separated from the broader subject area of the mathematical models (but not from the methods used with the mathematical models) by the fact that prognostication examines stochastic processes as a function of time. We will deal later with the developmental aspects of the methods themselves. But we should point out right now that if we accept the definition made so far, then we may assess the effects of the various needs of the forecast users on the prognostication process, the prognostication methods, and the expectations in general about the forecasts.

Planning and Prognostication

One of the major users (consciously today but partly subconsciously for a long time) is the area of economic sciences. Preparation of forecasts is inseparable from long-range economic planning. It makes therefore sense if we discuss briefly this important area of economics.

Those who prepare economic plans, always formulate the plans on the basis of their assumption of the future. It is therefore easy to understand why prognostication became a fashionable discipline when it became evident that some planning, including long-range planning, is important not only in socialism but also in capitalism. Although forecasts were already made during the early phases of socialist life, they were rather planning activities. One reason for this is the fact that the socialist economic order includes a degree of determinism.

The explosive growth that took place in the capitalist societies during the first few decades following World War II pointed out to the Western economists that the individual "freedom" which they regarded so highly must be curtailed if proper plans are made to avoid chaos in the economy.

It therefore appears that prognostication had a "western" tinge during the first years of its reemergence as a fashionable discipline. This made some socialist economists suspicious. However, prognostication features all characteristics of market economy. Under the conditions of capitalism — where economic planning activities are only very little deterministic — prognostication became closely entwined with planning in methods and subject.

Accordingly, the prognostic methodologies developed under the conditions prevailing in the west list the basically long-range planning methods in the category of the so-called normative forecasting techniques.

Once the deliberate utilization of the potentialities of prognostication has also started under the conditions prevailing in socialist societies, the definitions taken from the capitalist world — which apply to that world — were incorporated in socialist prognostication. It was proper to take these definitions since the determined character of long-range planning and the indeterminate character of prognostication (and also its applicability to stochastic processes only) are ideal cases, developed solely for the clarification of the definitions, and not encountered often in the real world. We cannot always draw the line — and we do not always need to draw the line — between long-range planning and prognostication; only on the basis of an analysis of the system which is the basis of the planning or prognostication can we decide about the type of method (the method of long-range planning or the method of prognostication) to be used.

Various Applications of Prognostication

Prognostic methods are often used in other areas of the economic sciences. Mention must be made in this connection of all branches of the economic sciences which involve the need for requirement study. The various areas of requirement study are indeed subject to prognostication techniques, as we defined earlier. The subject matter is also stochastic, and involves events and event sequences which cannot be directly influenced or can be influenced only to a very slight degree.

In addition to economic sciences, foreign policy is a field which needs prognostication badly. Although there have already been efforts to study the events of the future with the aid of methods involving mathematical models, the methods using verbal techniques such as the scenario methods and historical analogies are much better known. Insofar as I know, the experts dealing with foreign policy believe that the most dependable methods are those which are based on the analysis and synthesis performed by persons thoroughly familiar with the details of the subject matter and its various relationships. This high regard is justified for the additional reason that we know very little about the practical applications and their results with methods of prognostication considered objective.

The team working on the methodology of prognostication obviously encountered in the literature such methods which are specifically suitable for forecasting in the field of foreign policy. We are obviously right in assuming that other researchers also evaluate the various methods of prognostication. Thus, similar methods have been discovered and used elsewhere too. But for one reason or another the results and the successes or failures of the methods studied were not described. The same considerations apply to military and strategic studies.

It is obvious that the use of prognostication methods gained much ground in the sciences during the explosive expansion of science which took place after World War II. Scientific life looked with suspicion — not only during past centuries but also during the first half of the 20th century — at all attempts which tried to impose planning on scientists. This was justified by the valid consideration that the results of scientific work cannot be planned ahead. If the scientist can plan his work then there is no need for many trials and experiments since he should be able to foresee the shortest road that leads to the desired result.

This attitude became untenable after the scientific revolution has started. The reason for this is not only the fact that state jurisdiction over scientific research becomes stronger as time goes on; the reason also is the fact that many areas of scientific research require major investment expenditures. Such expenditures can be committed only after thorough planning. It may sound like a cliché, but let us say it nevertheless: this is an obvious fact not requiring justification. Let us therefore turn to the potentialities of forecasting science development.

Potentialities of Science Development Forecasting

If we consider the hierarchic transitional structure which has conventionally developed between science and real life, we find that since technological development utilizes the results of applied science, we might be able to demonstrate and evaluate the expected trends if we know the state of applied sciences. On the basis of this evaluation, we may prepare technical forecasts with a degree of reliability. The same thing should also apply in the field of applied sciences: these sciences, as we all know, utilize the results of basic research. Thus, to some degree the starting facts of applied science are the results of basic research.

The question now arises whether there is a possibility of forecasting the development of the basic sciences more than by just making some trivial conclusions. We know from the literature that the development of the basic

sciences is also subject to laws, although we do not know these laws too well at the present time, so that their evaluation so far has been restricted to some initial trials only. But everyone knows about those pronouncements, which we referred to earlier, by some outstanding personalities in scientific life, who bravely and sometimes with astonishing self confidence, discussed the expected developments in that field of science with which they are familiar. This confirms what we said before about foreign policy; the analysis of an individual familiar with the field is the most reliable method of forecasting. Although we may accept this as a fact, the need still remains for forecasting the developments in science by means of objective methods rather than by intuitive means if possible. If, in the course of developing the methodology of prognostication, we succeed in creating a set of tools which may be used in forecasting developments in basic sciences, we provide more reliable data for science organization and planning than exist at the present time.

One might make the counterargument that there are many instances of wrong, narrow-minded, and inaccurate forecasts, which are not borne out by subsequent events. But in our opinion this does not invalidate the need for science-development forecasts. As a matter of fact, it indicates the need for using better objective methods than we have now. Once we do have such methods, we could channel the forecasts made by outstanding scientists into the proper direction, and might provide better forecasts through prognostication experts.

The Standards To Be Imposed on the Methods

The possibility of preparing science-development forecasts is not an Utopia since we do know that there are proper science-development forecasts (we also know that there are wrong ones), and that not all proper forecasts can be ascribed to the genius of the forecaster. Development of science follows certain laws, as we know from earlier studies. But science development forecasts have one feature which is unique and found perhaps only in foreign policy forecasts too: the need for novelty.

Those interested in the development of scientific life do not want the preparer of the forecast to tell them about trivial trends and minor developments which are known to practically every expert, although, of course, there is a need for this too. What they do expect to learn is whether there are any discoveries in the cards which create a major change in the course of science development, especially discoveries which are not readily evident from the present trends and which affect, either way, the profitability of the resources which appear highly expensive by comparing the cost levels of the last quarter of the 20th century and the present period.

It is expected from the preparers of foreign-policy forecasts also that they draw the user's attention to the possibility of events that cannot be readily foreseen and are unexpected. It is obvious that this expectation is justified, and becomes especially evident if we consider the significance and consequences of any confrontations that may arise.

Is there a possibility of forecasting the occurrence of unexpected events in science (or in foreign affairs or in military affairs) by means of objective techniques? As we mentioned earlier, attempts to do this have been made already, and even today we do have mathematical methods which examine sequences of events rather than individual events. Obviously, even with these methods we must know about preceding events since an objective forecast can be prepared only on the basis of cause-and-effect relationships. However, if we continue the development of the methodologies, we must next introduce a criterion which is arbitrary in character. We have already hinted in this direction. If we accept the fact that the value of a forecast is especially great in the field of sciences (and also some other fields) if it points out the possibility of an unexpected major event, then we are justified in introducing a new criterion, namely the value of the information provided by the forecast.

The introduction of this criterion, arbitrary as it may be, gives us a useful evaluation yardstick for assessing the development of prognostication methods. In addition, it tells us how the various components of prognostication activity may be evaluated.

The basic data of forecasts are always the accessible data about the past and the present, in their totality. A valuable phase of the prognosticating activity therefore is the acquisition and organization of these data. The science of statistics is one tool used in this activity. In the large mass of high-entropy data, statistics, information services, documentation, and other related activities dealing with the collection and organization of data create a system with a lower entropy through their theoretical and practical contributions. This system is more valuable to us, and for some experts is already close to being a forecast. We therefore venture the purely quantitative opinion that the collection and organization of data in itself generates much of the informational value and reduces the entropy to a significant degree. Starting from the organized data, we obtain conventional extrapolating forecasts which already contain reduced entropy. But this reduction is not so major as that discussed above since many people regard an extrapolated factor for the short time as trivial, evident, and cliché.

The situation is entirely different with methods that may be used to forecast unexpected events. The results obtained with these methods can no longer be regarded as evident or cliches. The use of such methods provides important information to the preparers of scientific, economic, and foreign-policy forecasts even if they merely point out that an unexpected event not evident from obvious data evaluation may occur, without providing a quantitative probability for the occurrence of the event.

If we accept the foregoing considerations, even in part, then it may make sense to channel the activities of the prognostication methodology team so that they deal not only with extrapolating activities in the more or less conventional sense but that they try and develop methods capable of foretelling possible unexpected events. This would mean that the team will have to develop new methods in all their details in addition to improving the conventional methods.

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CSO: 2502

SCIENTIFIC RESEARCH FACILITIES EXPANDING

Budapest NEPSZAVA in Hungarian 22 Sep 77 p 3

[Excerpts] The investment program of the Hungarian Academy of Sciences for this year calls for the expansion or development of six sizeable research facilities. After 20 years of subletting, the Oil Mining Research Laboratory is moving into its own building in Miskolc. The 25 million-forint investment will provide better working conditions for about 50 persons. The Transdanubian Scientific Institute of Pecs has been expanded. Its researchers are concerned with regional problems ranging from geography to sociology in virtually all branches of science.

Work on the new headquarters of the Technical Chemical Research Institute is well advanced in Veszprem. The 10-story building will be shared on a fifty-fifty basis with the Chemical Industry University. The building has cost 85 million forints so far and is expected to be completed this month. On the 5 floors occupied by the Institute there will be 50 laboratories and the same number of work rooms.

A new organic chemistry laboratory for the Central Chemical Research Institute is being built in Budapest on the Pusztaszeri ut. This research facility has been expanding since 1961 and has now reached the final stage. The laboratory building is to be finished by the end of the year and will provide work quarters for an additional 150 persons. Only complementary work will remain for 1978. The work done here will affect the pharmaceutical industry primarily. In August, the first stage of the solid state engineering laboratory of the Central Physics Research Institute was completed. The second stage is already being planned.

The "science skyscraper" on the Budaors ut is partially occupied. Working here are the Natural Science Geochemical, Acoustical, Crystal Physics and Crystal Growing Research Laboratories, the Institute of Economics, the Industrial Economics Research Group as well as the Economic Information Group. By the end of the year service buildings such as library, lecture rooms and shops will be completed.

A number of new investments has also begun this year: the Biological Center of Szeged, the World Economics Institute in Budapest, the Nuclear Institute of Debrecen and the Agricultural Research Institute of Martonvasar are being expanded in the course of this year. The Instrumentation and Metering Technology Service is getting a new service house this year.

HUNGARY

U.S. SPECIALISTS ATTEND COMPUTER SCIENCE CONFERENCE IN HUNGARY

[Editorial Report] The July-August issue of the Budapest monthly, SZAMITASTECHNIKA (Computer Technology), p 6 reports that three U.S. specialists attended the second international conference on computer science which was recently held, probably in Szekesfehervar, since that was the site of the first such conference. The three U.S. specialists were Professor Wegner of Brown University and Professors Alton and Lee for whom no affiliation is given. The first two papers were presented by Professor Wegner who spoke on 25 years of development in programming languages and Professor Pawlak who dealt with Polish achievements in the area of the mathematical basis of information retrieval systems. Additional interesting foreign papers included: "Planning Shared Data Bases" by Professor Neuhold of West Germany; "The CDL Project" by Professor Koster of Holland; "A Taxonomy for the Syntax and Semantics of Programs" by Professor Lee of the USA; "System Pertaining To the Adjustment and Analysis of Programs" by Professor Bayakovski, USSR; "Semantics of Computer Science Tasks" by Professor Sirokov, USSR; "Optimal Selection of Control Points," Professor Gelenbe, France; "Algorithmic and Structured Systems," Professor Lindner, GDR; "Organization of Information Systems," Professor Radenszki, Bulgaria; "Program Structure," Professor Alton, USA.

Prominent Hungarian speakers participated from the KFKI (Central Physics Research Institute), SZTAKI (Computer Technology and Automation Research Institute), and SZKI (Computer Technology Coordinating Institute). They included Balint Domolki, Laszlo Varga, Miklos Havas, Geza Gerhard, Jeno Farkas and Gabor David. Their topic was Hungarian achievements in matters related to programming languages and systems. Tibor Vamos, deputy director of the Automation Research Institute, summarized Hungarian results in artificial intelligence research.

CSO: 2502

HUNGARY

CATALOGUE OF 1976 COMPUTER PROGRAMS PUBLISHED

Budapest HIRADASTECHNIKA in Hungarian No 8, Aug 77 pp 244-248

[Article by Dr Karoly Geher, Signal Technology Electronics Institute of the Budapest Technical University: "Catalogue of Computer Programs, 1976"]

[Text] The following compilation contains a catalogue of computer programs prepared in 1976 pertinent to electronics. The appropriate leaders of the institutions submitted data on the programs at the request of the Signal Technology Electronics Institute of the BME [Budapest Technical University].

In accordance with developed practices we have compiled programs pertaining to electronic instruments, electronic circuits, signal technology equipment and signal technology systems. The program catalogue gives the programs in the order of their arrival.

The "Catalogue of Computer Programs, 1977" will contain those programs sent to the Signal Technology Electronics Institute of the BME (Stoczek utca 2, Budapest 1111) by 31 January 1978.

[The remainder of the article is in tabular format with the following headings: Name; Content; Programming language; Programmer; Proprietary institution and expert; and Date of preparation of report. This table is converted to textual format below.]

HKRRESIST; defines statistical characteristics and failure rates from measurement results in reliability tests of resistors; ICL System 4-50, FORTRAN IV; the HIKI [Signal Technology Industry Research Institute] Circuit and Parts Testing Main Department, Istvan Varadi; HIKI, Albert Balogh and Istvan Varadi; special edition of HIKI KOZLEMENYEI, 4 April 1975.

HKRKONDI 1; defines statistical characteristics and failure rates from measurement results in reliability tests of condensers; ICL System 4-50, FORTRAN IV; the HIKI Circuit and Parts Testing Main Department, Istvan Varadi; HIKI, Albert Balogh and Istvan Varadi; special edition of HIKI KOZLEMENYEI, 4 April 1975.

HKTDVAVKONV; for processing the measurement results of model tests of digital-analog transformers manufactured by REMIX (linearity error, differential linearity error and distribution thereof); ICL System 4-50, COBOL; HIKI Circuit and Parts Testing Main Department, Istvan Varadi; HIKI, Imre Boblos and Istvan Varadi.

HKTKIERT 2; evaluation of measurement results of model tests of REMIX W 9045 resistor networks (statistical characteristics); ICL System 4-50, COBOL; HIKI Circuit and Parts Testing Main Department, Istvan Varadi; HIKI, Imre Boblos and Istvan Varadi.

HKTERMX 1; evaluation of measurement results of model tests of the TMX 18.8 channel multiplex switch manufactured by HIKI (statistical characteristics); ICL System 4-50, COBOL; HIKI Circuit and Parts Testing Main Department, Istvan Varadi; HIKI, Imre Goblos and Istvan Varadi.

MCS 8; the program carries out a real time simulation of an optional environment describable by flowchart for the INTEL 8008 micro-computer with various signal following possibilities; JAS/M assembler (ODRA-1204); BME Process Control Faculty, Gyorgy Tagany; BME Process Control Faculty, Gyorgy Tagany and Bela Lantos; "The MCS 8 Simulation System," mimeographed report, 1976 (internal faculty document).

Microprogram Translator; production of microprograms for microprogrammed control units on the basis of flowcharts for the control unit being planned; MOSZI-2 (ODRA-1204); BME Process Control Faculty, Zoltan Laszlo; BME Process Control Faculty, Zoltan Laszlo and Peter Arato; "Designing a Computer Development System for Microprogrammed Logical Networks" by Zoltan Laszlo, doctoral dissertation, 1976.

Tau-anal (tau corrector analysis); characteristics at a given carrier frequency, as compared to assumed values, of the running times deriving from a secondary RF tau corrector chain of various medium band frequencies with a maximum of 13 members; EMG 666 (simple); Signal Technology Cooperative, Tibor Hajder and Andras Back; Signal Technology Cooperative, Tibor Hajder; January 1977.

RCAL; a simulation program for repeated telephone calls with a single pause distribution and two sorts of persistence functions depending on the cause of error; CDC 3300, SIMULA; SZTAKI [Computer Technology and Automation Research Institute], Elod Knuth; BHG [Beloianisz Signal Technology Factory], Dr Geza Gosztonyi and Rozalia Nagy; a research report for the Postal Experimental Institute, VJ-070/75.

RCT 3; a further developed version of the above RCAL program, with three pause distributions and three persistence functions depending on the cause of error; CDC 3300, SIMULA; KFKI [Central Physics Research Institute], Gabor Szabo; BHG, Dr Geza Gosztony and Rozalia Nagy; a research report for the Postal Experimental Institute, VJ-077/76.

ITE 1; a calculation method based on solutions of equations of state for repeated calls, it contains a single persistence value and repeat intensity; CDC 3300, ALGOL, HP 9100 B, calculator; BHG, Mrs Ferenc Szentirmai; BHG, Dr Geza Gosztony and Rozalia Nagy; a research report for the Postal Experimental Institute VJ-078/76.

ITE 2; a further developed version of the above ITE 1 program with two repeat intensities and two persistence values depending on the cause of the error; CDC 3300, ALGOL, FORTRAN, R 20, FORTRAN; BHG, Mrs Ferenc Szentirmai and Rozalia Nagy; BHG, Dr Geza Gosztonyi and Rozalia Nagy; a research report for the Postal Experimental Institute VJ-078/76.

DEXP; approximation of the pause time distribution with two weighted sums of the exponential distribution; CDC 3300, ALGOL; BHG, Rozalia Nagy; BHG, Rozalia Nagy; a research report for the Postal Experimental Institute, VJ-078/76.

ITE 3; a further development of the ITE 1 program which contains two repeat intensities which we can calculate with the aid of the DEXP, the weighting factor obtained indicates the occurrence frequency of two sorts of intensity; CDC 3300, FORTRAN; BHG, Rozalia Nagy; BHG, Dr Geza Gosztony and Rozalia Nagy; a research report for the Postal Experimental Institute, VJ-078/76.

THM 1; economic optimum for dimensions of a remote calling network, given traffic and cost data the program defines the number of necessary line bundles; R-20, FORTRAN; BHG, Tibor Denes; BHG, Gyula Horvath.

BOVBFKR; expansion of a program system handling Boole functions with the inclusion of new operations--minimalization, simplification, constant substitution, function value calculation, superposition and simple Boole difference; FORTRAN; MTA [Hungarian Academy of Sciences] SZTAKI, Dr Mrs Endre Pasztor, Tibor Matavovsky and Jozsef Ivices; MTA SZTAKI, Dr Mrs Endre Pasztor; a description for internal use.

GICCS; an interactive graphic program for modification and improvement of wiring diagrams for printed circuit cards prepared for the GD 71/T system; TAL; MTA SZTAKI, Domokos Kerestely and Tibor Tolnay-Knefely; MTA SZTAKI, Domokos Kerestely and Tibor Tolnay-Knefely; a description for GICCS users, MTA SZTAKI Digital Technology Department.

PP; a post-processor for the ADMAP (photo-head, graphic-head and drilling head) and Mark Century NC drilling machine for the manufacture of printed circuit cards; R 10 ASS (operating system: OSCAR and IDOS), TPA 70 TAL; MTA SZTAKI, Arpad Vincze; MTA SZTAKI, Arpad Vincze; descriptions for users, MTA SZTAKI.

TESTAL translation program; the task is to produce, from a disk file containing a complete TESTAL language description of a test program for assembled circuit cards, a TESTOMAT-C machine coded program file, the

translator program can be run as a post-processor program on an R-10 computer using OSCAR or using IDOS as a SLAVE mode closed program with a memory requirement of 1A00 bytes; MITRAS Assembler; MTA SZTAKI, Lajos Szlavik; MTA SZTAKI, Lajos Szlavik; TESTAL Operators Manual, 1976.

LIDI; a data base manipulation system in which the manipulated information is a controlled graph of optional structure and into which the user of this information can link optional applications programs; FORTRAN; MTA SZTAKI, Dr Ilona Fildrich and Pal Szomor; MTA SZTAKI, Dr Ilona Fildrich and Pal Szomor; MTA SZTAKI Studies 1974/16, CAD Seminar 3-5 November 1976.

TAPMAP; prepares digitalized printed wiring diagram control punch tape on an ADMAP-2 graphing machine; FOKAL 16 KE, BME, Dr Zsolt Illyefalvi-Vitez; BME, Dr Miklos Szilagyi.

TAPNEG; prepares digitalized printed wiring diagram control punch tape on an ADMAP-2 graphing machine with reflection on the x axis; FOKAL 16 KE; BME, Dr Zsolt Illyefalvi-Vitez; BME, Dr Miklos Szilagyi.

TESTOP-10; the program provides measurement and diagnostics for logic cards containing TTL circuits with a maximum of 96 contacts, measurements are made by a TESTOMAT-C automatic meter, TGP-1 or TESTPROCESSOR programs running on a Siemens computer provide the data needed for measuring; R-10 Assembler; SZKI [Computer Technology Coordination Institute], Eva Paczolay and Zsuzsa Toth; OMFB [National Technical Development Committee]; Programmers Handbook for TESTOP-10, 1976.

TR-TN75; the TRANZ-TRAN 2 current analysis program augmented with a transient analysis segment, an alternative peripheral storage catalog and module bank for circuit modules and active elements expanded by function, ICL System 4-50, FORTRAN IV; BME Electronic Instruments Faculty, Dr Vladimir Szekely, Dr Kalman Tarnay and Marta Rencz and HIKI, Peter Bencsath; HIKI, Peter Bencsath; TRANZ-TRAN Non-Linear Circuit Analysis Program ICL-FORTRAN Version, user's guide, 1976, HIKI/BME Electronic Instruments Faculty.

HKSCATTER; a program which calculates the transmission of high frequency active and passive networks by prescribed frequency points on a reflex matrix base with four pole parameters; ICL System 4-50, FORTRAN IV; HIKI, Peter Bencsath; HIKI, Peter Bencsath; user's guide and reporter's announcement, 1976.

ERZ; the program calculates the values to be expected for various parameter sensitivities pertaining to circuit elements on the basis of transfer functions of various active RC circuits with the aid of statistical changes in a given frequency band as a function of optional quality factors and covariance matrix; ICH System 4-50, FORTRAN IV; HIKI, Peter Bencsath; HIKI, Peter Bencsath; user's guide and reporter's announcement, 1976, HIKI KOZLEMENYEK, 1977 (being published).

ODANEL; the distribution of a given investment sum among hypothetical network levels so that the cost for marketing each unit should be minimal; OS/8, BASIC-PDP; PKI [Postal Experimental Institute], Gyula Sallai; PKI, Gyula Sallai and Gyorgy Lajtha; description of a program titled "Optimal Distribution of a Given Sum Among Network Levels."

HAMAS 76 (RE0017) Utility of Telecommunication nets; loss or utility analysis of by-pass controlled telephone networks on the basis of preliminary estimates of traffic in certain relationships; OS/8, BASIC PDP; PKI, Zsolt Peregi, and BME HEI [Signal Technology Electronics Institute], Laszlo Jereb and Gyorgy Farkas; PKI, Zsolt Peregi and Mrs Gyula Nandorfi, and BME HEI, Laszlo Jereb; "Utility of Telecommunication nets, a Modified Program System," draft dissertation, BME-HEI, 1976.

LOCEX-DMC; a program package for optimal selection of location of a telephone exchange taking into consideration the suppression plan for the feed area designated and the reported values for changes in demand over time; OS/8, BASIC PDP; PKI, Agota Merenyi; PKI, Agota Merenyi and Gyula Sallai; a study titled "Network Design Programs, '76."

NESTRA Network structure test (RE0023); an economic comparison of various possible traffic structures for the upper two levels of by-pass telecommunication nets with optimal traffic size determination of circuit bundles; OS/8, BASIC PDP; PKI, Zoltan Dely; PKI, Zoltan Dely and Gyula Sallai; a program description titled "Network Structure Test."

MARS; modular circuit system simulation program; ALGOL-1204; BME-HEI, Gyorgy Pongor; BME-HEI, Mrs Geza Tassi and Gyorgy Pongor; user's guide, 15 Sep 1976.

ANATOL; calculating large change sensitivity for known changes in circuit parameters; ALGOL, RAZDAN 3, ESZK; BME-HEI, Marek Sieranski; BME-HEI, Laszlo Gefferth; draft dissertation, 1976.

BERTOLD; calculating large change sensitivity using the Butler interpretation, determining the changed value of circuit parameters for prescribed tolerance of the network function; ALGOL, RAZDAN 3, ESZK; BME-HEI, Marek Sieranski; BME-HEI, Laszlo Gefferth; draft dissertation, 1976.

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CSO: 2500

HUNGARY

MEASURING DEVICES DEVELOPED FOR INTEGRATED CIRCUITS

Budapest MUSZAKI ELET in Hungarian 26 Aug 77 p 6

[Article: "High Speed Measuring Technique of Integrated Circuits"]

[Text] Economical massproduction of modern, highly complicated integrated circuits (LSI), microprocessors, computer elements, "chips" which operate digital watches, etc., require continuous measuring control. During manufacture and at the final quality control, as well as by the users, automatic measurement and functional examination of the parameters of such circuits is indispensable. After 2 decades of consistent development, Hungary has reached such a high level that we have become the leading country in developing computer-controlled measuring systems among the CEMA countries. Janos Brauer, head of the science department of the Research Institute of the Telecommunications Industry gave us the following information in the Telecommunications Scientific Society, upon our request, about the newest and internationally recognized types:

Import of the necessary number of measuring equipment was a problem for us and for the friendly countries, therefore HIKI [Research Institute of the Telecommunications Industry] decided to begin development of such automated modern measuring equipment, based on their earlier achievements. Measurement speed of these automatic machines, which are worth several tens of millions of forints each, is today as high as 10-20 MHz, that is, they can evaluate 10-20 million items of data per second.

Within the framework of our goal program begun in 1969, we developed the ICOMAT family of automated measuring equipment. Its first member, SSI, is for the measurement of parameters of circuits of low degree of complication, the second one SSI and MSI, is suitable for evaluation the static and slow function characteristics of circuits of low and medium degrees of complication. With the third one, the ICOMAT-2F equipment, static parameters of digitally operating bipolar and MOS-type integrated circuits and memories of low, medium and high degrees of complication (SSI, MSI, LSI) can be measured, and the rapid function capabilities of these can be evaluated.

ICOMAT-2F

Our newest equipment is essentially composed of two measuring towers and peripheral equipment. It contains programmable feed units, time generators, sample signal generator and rapid acting miniature electronics. Its control is performed by a measurement oriented processor developed at HIKI. Measurement speed of static parameters is 100 per second, while measurement speed of the evaluations is determined by the rapid-acting units (the pin-electronics, the sample signal generator, etc.), and this reaches 2 MHz, that is, comparison and evaluation of 2 million data per second.

Equipment placed in the technological process of mass production excellently performs, for example, the selection of a pea-sized integrated circuit made of about 400 silicone carriers (slices) before sealing, and the continuous final quality control inspection of the finished circuits. Its economic significance is extremely great, since the manufacturers can screen out the defective elements during production, greatly decreasing the labor-demanding, expensive defective pieces of circuits obtained on final assembly.

The simple programming, versatility of operating modes of measurement, manifold, economical possibilities of use of the automated measuring equipment we built and delivered thus far, have earned recognition at United Incandescent, at HIKI and in the GDR alike. In the meanwhile, we have progressed with continued development of the ICOMAT family to such an extent that HIKI wants to complete the result of this, the prototype of the high-speed measuring system by the end of this year, with KGM's [Ministry of Metallurgy and Machine Industry] and OMFB's [National Technical Development Committee] assistance.

ICOMAT-200

Keeping step with the very rapid growth of integrated circuits, HIKI endeavored to increase measurement speed with the concentration of even greater intellectual capacities. The ICOMAT-200 designation measuring system was built upon the HP-INTERFACEBUS [expansion unknown] principle recommended by IEC, thus a wide scale of external units can be connected to it. Use of hybrid circuits, also developed by HIKI, in high speed pin-electronics, employing a system of feeding units built with switch-operated stabilizers are also new thing, and lastly, its great advantage is the possibility of using the measurement-oriented language that can be learned easily and which is now being worked out at HIKI.

This high speed measuring system of modular construction will be controlled by the mini-computer (TPA 11/40) currently under development at KFKI [Central Research Institute of Physics]. It will be suitable for the static and high speed functional evaluation of RAM, ROM memories and microprocessors produced by MOS, CMOS and bipolar technologies alike, as well as other LSI integrated circuits.

The ICOMAT-200 measuring system representing several 10 millions of forints will be introduced at the end of this year, but its news has already preceded its appearance in the most advanced industrial countries. The equipment represents an internationally acknowledged level of development. We also found out from Janos Brauer that they are already working on the development of still higher speed measuring systems.

HUNGARY

BRIEFS

SOLAR ENERGY RESEARCH--The Electrical Industry Research Institute is experimenting with utilization of solar energy. It succeeded in making long-lasting energy sources by putting together elements having a silicon basis. The experimental model of a 200-watt solar energy element is already operating in Transdanubia. It was developed by the Institute. Solar energy is being used in one instance to operate a water pump. [Budapest NEPSZAVA in Hungarian 12 Aug 77 p 1]

ION-SELECTIVE ELECTRODES CONFERENCE--Under the auspices of the Hungarian Chemical Association, the Federation of European Chemical Association and the Hungarian Academy of Sciences, an international conference on ion-selective electrodes is to be held in Budapest between 5-9 September. Hungary is among the first in the world to develop ion-selective electrodes and to manufacture them. The Radelkisz Industrial Cooperative makes the electrodes and sells them on capitalist and socialist markets. Specialists from 22 countries will take part in the 5-day conference. Papers will be delivered by outstanding Soviet, American, British, Swiss and Hungarian scientists. [Budapest NEPSZABADSAG in Hungarian 3 Sep 77 p 9]

CSO: 2502

AREAS OF COAL RESEARCH DISCUSSED

Warsaw TRYBUNA LUDU in Polish 9 Aug 77 p 6

[Interview with Prof Dr Jozef Obloj, deputy director for scientific affairs of the Institute of Industrial Chemistry, by Adam Hollanek]

[Text] Coal, which until quite lately was disregarded in the world as a chemical raw material, is beginning to experience a renaissance. We discussed this with Prof Dr Jozef Obloj, deputy director for scientific affairs of the Institute of Industrial Chemistry.

[Question] Let us first elucidate a basic question. Does our science want to substitute coal for petroleum in chemical processing? Are they to play the role of competitive raw materials?

[Answer] No. This is not the question. There is, however, quite a possibility of supplementing the ever more expensive petroleum with cheaper and equivalent coal products.

The point is simply to bring about a partnership in chemistry between petroleum and coal as sources of raw materials. This is what we are, in effect, beginning to carry out, notwithstanding the fact that the world indeed owes a great deal to petroleum raw materials. After all it would be difficult to imagine the development of motorization without gasoline and without tires manufactured from synthetic rubber, which is better than the natural one. Without detergents processed from petroleum the traditional methods of manufacturing soap from vegetable fatty acids would never be able to satisfy modern requirements. Finally, as is well known, synthetic fiber is likewise derived from the petroleum products.

After all, we must also realize that in the long run, according to actual data, the reserves of coal--in comparable units--exceed the world reserves of petroleum by more than ten times and almost ten times the reserves of petroleum and natural gas taken together.

In Poland this ratio is approximately 80 to 1 in favor of coal! This prompts our science to endeavor to better utilize our "black gold." In fact, we never gave up completely the production of chemicals from coal.

For example, in Oswiecim, derivatives of coal (carbide, acetylene) are used in the production of polyvinyl chloride. On the other hand, based on coal-derived benzene and naphthalene, in Kedzierzyn, maleic anhydride is being produced for the manufacture of plastics. Dyestuffs, softening agents, and varnish resins are likewise produced from coal derivatives. Fertilizers also constitute an important position.

[Question] No 1 (it is not by mere chance that this number has been assigned to it) of our government program envisages studies for production of motor vehicle fuels, among other things, from coal. Are these fuels to be in the remote future?

[Answer] The results obtained so far in the world, on a semitechnical scale, are only promising. From several tons of coal barely one ton of gasoline is produced. For the time being it is not profitable. Similar research work is also being conducted in Poland in the Institute of Carbochemistry of the Main Institute of Mining.

On the other hand, other methods of utilization of coal as a source of the engine fuel are about to be introduced. Interesting results were also achieved in Poland (alongside several other centers in Europe) at the Institute of Vehicles of the Warsaw Polytechnic, by mixing gasoline in motor vehicles with up to about 20 percent of methanol! Engines of the Fiat 125p experimental motorcars operate quite efficiently using such a fuel mixture. Thus we may state without exaggeration that we are one-fifth of the way toward an engine "running on coal."

[Question] Methanol, as far as I know, is being generally obtained from natural gas or petroleum. Are there any prospects for the creation of large industrial facilities for the production of methanol from coal?

[Answer] The projects of great methanol-production lines, in the order of 500,000 to 1 million tons annually, based on gas from coal, are already being worked out by our technology under the direction of the PROSYNCHEM Design Office in Gliwice. There is great likelihood that facilities with a capacity of 500,000 tons annually will be built between 1980 and 1985.

Trials of mixing gasoline with methanol are also being carried out in other European countries. In this field we are in the category of such countries as West Germany and Sweden. The use of coal-derived methanol is one of the new partnership roles of coal in relation to petroleum.

[Question] Is such a partnership with coal also possible in other fields, which seem to be at present an exclusive domain of petroleum?

[Answer] An original Polish technology for the production of pure benzene from coal on a large industrial scale has been developed in Polish scientific research units under the leadership of our Institute.

This benzene would serve, after corresponding processes, to convert it to caprolactam, to Steelon [Polish Synthetic fiber] fiber, to detergents, dyes, and many other industrial and market articles.

This is the project of the largest facility of this kind in the world.

It is likely that it could succeed as early as 1980. The verification is now being made of its technology, compared to foreign technologies which are pursuing identical goals.

[Question] The chemicalization of agriculture becomes of ever greater importance for our national economy. It is well known that a great need exists for an increase in the supply of fertilizers, both in a qualitative and quantitative sense. What is the status of this problem in light of scientific research?

[Answer] Methods of the production of nitrogenous fertilizer from coal derivatives are known. On the other hand the Warsaw Polytechnic and other scientific centers are at present engaged in the development of new types of fertilizers, in the first place humic fertilizers for horticulture and fruit-growing. Their experimental introduction into practice will probably also take place in the 1980's. As may be seen, the examples of innovations given here refer to the rather near future.

On the other hand, the University of Warsaw is engaged in a more far-reaching and interesting work on direct conversion of coal into chemical products. In the university laboratories these conversion processes are being conducted at the temperature of plasma. This means a temperature of several thousand degrees Celsius.

Experiments on a direct conversion of coal into chemical products by other methods are also being conducted by the Institute of Organic Chemistry of PAN in Warsaw, and for power engineering purposes--by the Silesian Polytechnic.

To make coal a partner with petroleum to be taken into consideration in the chemical industry is a wide and complex problem of great social importance. It has yet another interesting aspect. It is well known that one can assimilate methods of the preparation, refinement and further chemical processing of derivatives of both coal and petroleum. The more uniform these methods become the lower the cost of their production will be.

When in the 1950-1960's petrochemistry gained radical preponderancy over coal chemistry, many previous methods of coal processing were adopted by it. At present, in developing methods for coal chemistry, which is again becoming a partner of petrochemistry, coal chemistry utilizes in turn the latest production technology of the latter by adapting it to coal processing.

It is precisely this coupling of processing methods which is, in my opinion, the best way to unite in an integral, efficient whole the two hitherto different raw-material bases of the national economy.

1015

CSO: 2602

ROMANIA

MEASURES TO ASSURE ADEQUATE SUPPLY OF PHARMACEUTICALS

Bucharest ROMANIA LIBERA in Romanian 22 Jul 77 p 2

[Interview with Dr Radu Ozun, director of Medical Services in the Ministry of Health, by Dana Arbore]

[Text] The supply of pharmaceuticals to the health and pharmacy services was the subject of a brief conversation between our reporter, Dana Arbore, and Dr Radu Ozun, director of Medical Services in the Ministry of Health.

"Druggists have at their disposal increasing quantities of comprehensive medication, especially for the more frequent ailments such as hot weather ills, cardiovascular, hepatodigestive, respiratory, rheumatic, and other diseases, and so on," began Dr Ozun. "When special needs arise, they are met effectively from the reserves available in intercounty pharmaceutical offices, using both domestic and foreign products -- the latter of which are dissimilar to Romanian ones."

[Question] What measures have been taken when our plants do not produce certain drugs, or when they do not meet growing demands?

[Answer] For most diseases, our therapeutic inventory provides a range of products, for instance: for certain cardiovascular complaints, the temporary lack of Hipazin could be filled with the similar preparations Hipopresol and Hiposerpil; Digitalin can be replaced with Digoxin, Lanatozid, and Nidacil; Miofilin was replaced with an identical product imported under the name Eufilin, so as to be always available in pharmacies.

In order to complete the range of drugs indicated for certain cardiovascular diseases, we imported sufficient quantities of a pharmaceutical known under the name of Intercodin until it began to be manufactured here as Intensain. The same concern has existed and exists now in completing the drug ranges for other therapeutic groups such as respiratory, hepatoprotectors, and antacids, by importing sufficient quantities of similar products. Thus, in addition to the Romanian drugs which have demonstrated their excellent effectiveness, such as Asmofug, Dispezin, and Brohodilatin, our druggists also have sufficient quantities of imported Astmopent (spray and capsules).

In the case of antacid -- antiulcer -- medication, in addition to a range of products manufactured in Romania (Calmogastrin, Dicarbocalm, Gastrosedol, Peromag, Ulcerotrat, and Ulcomplex), we have also imported Gelusil and Phosphalugel for treating conditions which did not yield anticipated results with domestic products. The same situation applies for hepatoprotector medication, where in addition to our Romanian products (Aspatofort, Colisan, Mecopar, Aspametovit, and Tonozit) we have imported Purinor or Essentiale, according to case.

The application of suitable treatment to those injured by the earthquake was made possible by the existence of sufficient stores of Romanian first-aid drugs (antibiotics, chemical therapeutics, anesthetics, perfusable solutions, antiseptics, and disinfectants) which we were able to use with good results to solve the complex problems which arose at that time. The pharmaceuticals received as aid from various countries, and which were used to diversify medication in some ailments, represented approximately 0.5 percent of the our country's annual consumption of medication. These drugs were directed to the zones affected by the earthquake, through the health units which provide free treatment for the sick.

This ability to meet an increased consumption during periods of calamity in no way affected the supply of health units and public pharmacies in the period which followed the quake, because our pharmaceutical industry provides a sufficient number of items and has a large reserve of production capability. In fact, our ministry is intensely concerned with the continued qualitative and quantitative improvement of the pharmaceutical supply of the population.

[Question] How does the Ministry of Health supervise the supply of medication and what measures are being taken so that medication will always be available in all units?

[Answer] As I have said, the Ministry of Health has taken and is now taking steps to continue to improve pharmaceutical services, by introducing a system of bimonthly information regarding the supply of pharmacies and stores with therapeutically important drugs which are in high demand. And monthly checks are made on a large number (140 units) of pharmacies in all the counties of the nation, for nearly 200 items which are most frequently requested.

Most of the time, shortages in the units which have been checked are filled with immediate deliveries from local stocks in the stores of pharmaceutical offices. When the need cannot be filled from local stocks, the needed products are immediately delivered from central stocks, the the Central Pharmaceutical Office, or by increasing production plans. Doctors and pharmacists are in constant touch in order to assure judicious use of medication and awareness of needs and availabilities, including the daily participation of pharmacists at the report sessions from all health units. I might add that time has proven the outstanding effectiveness of Romanian drugs in therapeutic practice. We are also constantly interested in the production of new drugs, and in the adoption of others which have been shown to be good and are used in international medicine.

Our state's health policy, which seeks an increasingly better health condition for our people, and the assurance of pharmaceutical needs, represents a special area of the continuous effort which we make for the treatment and rapid recovery of the sick. All the necessary conditions thus exist for pharmacies to always have a complete range and selection of the drugs needed and made available to the population.

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