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CENTRAL INTELLIGENCE AGENCY
INFORMATION FROM
FOREIGN DOCUMENTS OR RADIO BROADCASTS

REPORT

CD NO.

COUNTRY	Hungary	DATE OF INFORMATION	1951
SUBJECT	Economic; Scientific - Geology, metallurgy, electric power, machine industry, building materials, coal mining, manpower		
HOW PUBLISHED	Book	DATE DIST.	3 FEB 1954
WHERE PUBLISHED	Budapest	NO. OF PAGES	25
DATE PUBLISHED	1951		
LANGUAGE	Hungarian	SUPPLEMENT TO REPORT NO.	

THIS IS UNEVALUATED INFORMATION

SOURCE Oteves Tervunk Anyag- es Energiakerdesei

PROBLEMS OF MATERIAL AND POWER SUPPLY IN HUNGARY

[Comment: The following report is based on an 841-page volume entitled "Problems of Material and Power Resources Under Our Five-Year Plan in the Light of Lectures Given on the Occasion of the 125th Anniversary of the Hungarian Academy of Sciences," edited by Gyula Hevesi and published by the Department of Technical Sciences of the Hungarian Academy of Sciences (hereinafter the Academy) in 1951.

Abstracts of all lectures and comments included in the above document are given, with special emphasis on the names and identification of all Hungarian persons and organizations mentioned in the text.

The material is divided into eight sections, namely, Introductory Addresses, Geodesy and Geophysics, Geology, Mining, Metallurgy, Energy Production and Economy, Engineering, and Building Construction.

The comments follow in the order given in the original document; they refer, in a few cases, to previous lectures. The numbers in parentheses indicate the number of pages of each lecture or comment.]

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I. INTRODUCTORY ADDRESSES

Opening Address, by Gyozo Mihailovich, Regular Member, President of the Department of Technical Sciences

The People's Democracy has liberated the workers engaged in the cultivation of technical sciences, has rebuilt the obsolete laboratories of the universities, has created a number of research institutes, has built three new technical universities, and has introduced a reform of the curricula. It is true that the importance of socialist planning in scientific research has not yet been understood by some of the Hungarian researchers; however, this is due merely to lack of experience.

The Department of Technical Sciences, during the short period of its existence, has solved numerous problems, such as steel production by (oxygen-enriched-) air blowing, rapid cog-wheel manufacture, precision casting, anode grinding, the electrical methods of geophysical research, rapid drying of concrete, the use of lightweight concrete, the use of cement for soil hardening, bitumen-grading, the use of insulating materials, etc.

The chief aim of the department is to bring about close cooperation between scientific work and production. Inspection trips in the field brought to light the fact that the plants are not acquainted with many results of scientific investigations, on the one hand, and that the scientists are not sufficiently familiar with the problems of industry, on the other.

Along with the positive results, certain defects should also be pointed out. It is necessary to eliminate the existing aversion against planning; the research tasks of technical development must be formulated; and a national research plan must be prepared.(3 pp)

Scientific Research and Production, by Gyula Hevesi, Corresponding Member

Many Hungarian researchers still consider planning a necessary evil which stifles initiative. That this attitude is wrong has been demonstrated by the development of the chemical industry, the introduction of the manufacture of synthetic rubber, and the invention of the atomic bomb in the USSR. Planning in scientific work is also vitally important in the defense of the country against imperialistic aggression.

The Department of Technical Sciences has established eight committees, one for each of the following branches of research: geology, mining, hydrology, metallurgy, engineering, building, electricity, and geophysics. The committees are composed of scientists and production experts. In addition, several subcommittees have been organized; for example, the subcommittee for support of the building of the Budapest subway, and the subcommittee on mechanization. The department was also instrumental in creating a new section of precision mechanics and precision instruments, and in doubling the number of first-year students at the Budapest Technical University.

Besides systematic personal contacts between scientists and industrial plants, little has been accomplished in the popularization of science except on individual initiative, as, for example, by academician Imre Razso in agriculture, and by Prof Sandor Geleji in certain industrial plants.(13 pp)

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Comments

Marcel Prenant, Member of the French Academy

After removing Frederic Joliot-Curie and G. Teissier from the guidance of France's scientific institutions, the French government cut budgetary appropriations for research. Since 1947, it has become obvious that all scientific research, except for war purposes, is to be stifled in France. French science cannot show important results, because the researchers are compelled to work under capitalistic methods. ($1\frac{1}{2}$ pp)

Prof Sandor Geleji, Corresponding Member

Although it is true that certain Hungarian scientists are not convinced of the fact that research can be planned, the problem has already been solved, as demonstrated by the brilliant results achieved in the USSR. It is necessary, however, to distinguish between basic research and specific application. Basic research is theoretical and precedes experimental research. (2 pp)

Bela Zentai, Technical Manager, Csepel Automobile Factory

Scientific results can be utilized only if the theoretical level of the engineers and technicians is raised. In this respect, however, serious shortcomings exist. The factory councils, organized according to the example of the USSR, are of considerable value. Each council is composed of 8-9 senior technicians. Cooperation between councils and research institutes or universities usually results in an increase in production and a reduction in cost. (1 p)

Prof Imre Razso, Corresponding Member

The mechanization of agriculture is one of the basic tasks of the Five-Year Plan. New types of machines are being designed, preparatory research for which is being performed by the Mezogazdasagi Gepkiserletezesi Intezet (Experimental Institute for Agricultural Machines). The researchers of this institute have received substantial help by means of direct contact with farmers in public meetings. ($3\frac{1}{2}$ pp)

Prof Pal Selenyi, Corresponding Member

The number of researchers who are skeptical about planned research is very great. ($\frac{1}{2}$ p)

Istvan Visi, Mechanical Engineer

Cooperation between scientists and technical personnel has produced good results at the Ganz Shipyards. The enterprise established cooperation with the aerodynamics department of the Budapest Technical University on problems of towing. It also desires advice from the scientists on substitute materials, economy in power consumption, etc. ($\frac{1}{2}$ p)

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Arpad Konyi, Stakhanovite, Ganz Electric Factory

Support extended by scientists to the enterprises should be more systematic than in the past and should concern actual manufacturing processes. The enamel insulation of electric wires is still an unsolved problem at the Ganz Electric Factory. The wires are too soft and the enamel melts under high voltages, causing a short circuit. Another important problem is procurement of ball bearings, which are currently imported from the west. The establishment of a ball-bearing factory is an urgent necessity. (2 pp)

Rezso Tarjan, Physicist

Scientific research in the US is devoted largely to military projects, as exemplified by the OSRD (Office of Scientific Research and Development), which employs the laboratories of 140 large American trusts, and the Office of Naval Research, which conducts experiments in the 14 largest American universities. Such leading scientists as the French Joliot-Curie and the Hungarian Professor Janossy lost their jobs in capitalistic countries by refusing to work on military projects. Real scientific research exists only in the USSR and in the People's Democracies. Hungarian scientists must study dialectical materialism and fight against imperialistic and cosmopolitan science. The Department of Technical Sciences should arrange a debate on these ideological subjects. (3½ pp)

Prof Emil Bass

Cooperation between scientists and the industries has already begun. However, much research work is still needed in the agricultural machine industry and in chemical engineering. (½ p)

Andras Domonyi, Chemical Engineer, Aluminium- es Konnyufemipari Kutato Intezet (Research Institute for the Aluminum and Light Metals Industry)

Free criticism of new methods and processes worked out by the research institutes is a prerequisite for the coordination of science and production. Such cooperation already has been fruitful in Hungary. (2 pp)

Ferencz Herczeg, Manager, Diosgyor Metallurgical Works

On 19 May 1950, the Department of Technical Sciences inspected the Diosgyor Metallurgical Works. On this occasion Prof Laszlo Gillemot gave a lecture on the oxygen blowing method in metallurgy. The importance of this method meanwhile has been fully recognized. Because there is a shortage in domestic scrap iron, raw iron received from the USSR has been used as a substitute and the oxygen blowing method has been employed. Soviet experience has been of great value. In the past, 28 days were required for the construction of an open-hearth furnace. After the liberation, the required time was reduced to 14 days, and the method introduced in Hungary by Soviet Engineer Budilkin (fnu) reduced it further to 4½ days. However, Hungary's metallurgical industry still has many shortcomings to overcome as, for example, the extraction of hydrogen from generator gases and the desulphurization of gases. (2½ pp)

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Istvan Koncz, Mechanical Engineer

A research project cannot be considered completed when it is theoretically solved; it is completed only after the results have been successfully introduced in production. For example, experiments on the spark grinding method had been completed 2 years ago, but the method was put into practice only recently, on the initiative of the Academy. (½ p)

Sandor Ferjencsik, Metallurgical Engineer, Ozd Steelworks

Cooperation between science and industry has been extremely beneficial. Sometimes a new production method originates with the workers and is perfected by scientific research. This was the case when the Ozd Steelworks experimented with one of the furnaces by increasing the charge 50 percent. The experiment was carried out with the approval of the Kohaszati Akademia (Metallurgical Academy). (½ p)

Laszlo Vari, Mechanical Engineer

Cooperation between research and industry is illustrated by the application of the spark grinding method to the manufacture of crystal platecutters at the Egyesult Izzolampa es Villamossagi R. T. (United Incandescent Lamp and Electric Corporation). The method was suggested by the Academy and was put in practice by a complex brigade composed of members of the Engineering Department of the Budapest Technical University, research institutes, and workers. (½ p)

Prof Ferenc Horusitzky

It is advisable to establish in the Foldtani Intezet (Geological Institute) a laboratory for the study of the best uses of domestic materials. (½ p)

Jozsef Szilagyi, Technician, Hofherr-Schrantz Tractor Factory

The members of the Department of Technical Sciences have repeatedly visited the Hofherr-Schrantz Tractor Factory and have helped to solve many difficult problems. These problems included, for example, cylinder head breakage, tool breakage, the anode grinding method, the design of an air filter for diesel tractors, the introduction of synthetic foundry sand, etc. (1 p)

II. GEODESY AND GEOPHYSICS

Report on Current Investigations in Surface Geodesy, by Antal Tarczy-Hornoch, Regular Member, Professor of Geodesy and Mine Surveying, Sopron

Preparation of an up-to-date geodesic survey has become necessary in Hungary. For this survey, the Geodesic and Geophysical Committee of the Academy has adopted the international ellipsoid and the Gauss-Kruger coordinate system. For several decades, geodesic triangulation has been performed by means of the Jaderin invar wires, which permit a precision of over 1:5,000,000. In association with Prof Peter Eszto, I have been engaged in geodesic studies with the Jaderin wires since 1934 and have worked out a method which the OFI

(Orszagos Foldmerestani Intezet, National Geodesic Institute) has accepted for use in the future. Additional studies were made by Zoltan Eszto and Prof Istvan Hazay, chief engineer of the OFI.(21 pp)

Application of the Gauss-Kruger Projection in Hungary, by Prof Istvan Hazay, OFI

The older Hungarian triangulation grid was based on the Bessel ellipsoid. However, on the recommendation of the International Geodesic and Geophysical Union, the Hayford ellipsoid has been introduced in most countries. Since the Hayford ellipsoid is best suited to the geographical conditions of Hungary, it was decided to base the new Hungarian triangulation grid on this international ellipsoid.

Currently, the stereographic method of projection is in use in Hungary. However, the OFI, in collaboration with the Sopron Geodesic and Mine Measurement Department of the Budapest Technical University, is making preparations for the introduction of the Gauss-Kruger projection based on the international ellipsoid. I have performed the calculations in cooperation with Prof Antal Tarczy-Hornoch.(9 pp)

Comments

/Comments were made by Antal Tarczy-Hornoch, Emil Regoczi, and Prof V. K. Khristov of Bulgaria.(1½ pp)/

Theoretical Principles and Possibilities of Developing Electric Research Methods in Geophysics, by Prof Karoly Kantas

/This paper deals with methods of geophysical exploration by the utilization of earth currents.(17 pp)/

Comment

Prof Vladimir Khristov, Member of the Bulgarian Academy of Sciences

Since the Bessel ellipsoid was obsolete, the 7 October 1924 conference of the International Geodesic and Geophysical Union at Madrid adopted, in the absence of USSR representatives, the Hayford ellipsoid. Subsequent investigations were conducted by the Central Scientific Research Institute of Geodesy, Aerial Photography and Cartography, Moscow, under the supervision of Docent A. A. Izotov and Prof F. N. Krasovskiy, and it was found that the Krasovskiy ellipsoid is better than the Hayford ellipsoid. Consequently, the Council of Ministers USSR adopted the Krasovskiy ellipsoid for the territory of the USSR on 7 April 1946. A working panel of the Bulgarian Academy of Sciences, under the supervision of the lecturer, has calculated the values of the Krasovskiy ellipsoid for each arc-minute from the equator to the North Pole. The tables containing the results of these calculations were published recently. As to the Gauss-Kruger geodesic coordinates, these are the best and are used everywhere, following the example of the USSR.(3 pp)

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III. GEOLOGY

Exploration of Hungary's Mineral Resources, by Elemer Vadasz, Regular Member, Director of the Institute of Geology of the Lorand Eotvos University of Sciences, Budapest

Hungary is 50 years behind the times in the classification of geologic research data. Classification of the results of deep borings is unsatisfactory. Exploratory borings for coal deposits are often carried out haphazardly, without expert knowledge. Basic data, maps, measurements, and observations on water, gas, pressure, temperatures, etc. are lacking. Exploration for oil and natural gas also has been conducted without regard to the interests of the country.

Recently a start has been made toward coordination of activities in these fields. Exploration for ores must be centralized under the jurisdiction of the Foldtani Kutatasi Kozpont (Geological Research Center). Exploration for other minerals should also be unified. In establishing new quarries, needless destruction of natural resources must be avoided and the resolution of the Orszagos Termeszetvedelmi Tanacs (National Council for the Protection of Natural Resources) must be carried out. Exploration for subsurface water resources is also in a highly unsatisfactory stage and must be entrusted to a central agency under the supervision of competent personnel.

Geophysical investigations are of particular importance in the field of ores, bauxite, and water. The regional magnetic, gravimetric, and seismic mapping of the entire country is an indispensable prerequisite for the exploitation of geophysical investigations. For this purpose, a special geophysical mapping department should be established. Unification of all exploration for mineral resources has been assured by the creation of the Foldtani Banyaszati Kutato Kozpont (Geological Mining Research Center). In this connection, the role of the Academy and the OFI, which directs the explorations, is still to be clarified. To offset the lack of experts, practical courses of instruction should be organized. The work to be performed may be summarized briefly as follows: (1) inventory of known deposits; (2) exploration for new deposits of known materials; and (3) exploration for new materials.(9 pp)

Comments

Docent Sandor Vitalis

During the capitalistic era, exploration was conducted haphazardly. For example, borings were stopped at a depth of 300 meters in the Esztergom brown coal basin, because mining below this depth was unprofitable. In recent years considerable progress has been made in prospecting for coal. Eighty percent of Hungary's coal regions have been mapped in detail, classification of the data has been completed, a resident geologist has been assigned to each coal district, and investigations have been started on the geological formations (by Szadeczky) and the radiological properties (by Foldvari and Szalai) of coal deposits. During the Three-Year Plan, a total of 70,000 meters of borings was made; at the same time, total coal resources increased 14 percent and coal deposits found by borings increased 37.5 percent. During the Five-Year Plan, 1,500 additional borings (a total of 300,000 meters) will be made. Exploration will be conducted mainly in the Mecsek Mountain; in the area of Tatabanya, Oroszlany, Kisgyon, and Dudar; and in Zala and Somogy megyek. Exploration for peat deposits was started in 1948 and will be completed in 1950; 25,000 borings (a total of 30,000 meters) have been made.(3 pp)

Gabor Panto, Geologist

The irregular formations of ore deposits make prospecting for ores an extremely difficult task. With the exception of bauxite and manganese ores, all other ore deposits are of hydrothermic character. Since very little is known of the magmata which produced the ores, the extent of ore deposits can be estimated only for a wide area. Another difficulty is that ores are often found in vertical deposits which cannot be discovered by borings, and which require extensive tunneling. As a result, prospecting for ores is a very risky and long-drawn-out procedure. There is no known ore deposit in Hungary which has not been investigated during the last 20 years. Prospecting, however, usually stopped when quick results were not obtained, and the data were kept a secret. Currently, prospecting is being carried out in cooperation with the Foldtani es Banyaszati Kutatasi Kozpont, but hardly any results have been obtained thus far. Practically all domestic iron ore is mined at Rudabanya and recent exploration for nonferrous metals has been fruitless. (5 pp)

Magma Formations in Hungary, by Ferenc Pap, Geologist

The distribution of minerals in Hungary according to origin of formation, as compared with the whole of the earth's surface, is shown (in percent) in the following table:

Origin	Earth's Surface	Hungary
Volcanic	95	2.5
Sedimentation	1	97.2
Crystallized minerals	4	0.3

Magmatic minerals have been found in the following places in Hungary:

Mineral	Location	Area (sq km)	Volume (cu km)	Weight (million tons)
Granite	Szarvasko; Sopron; Baranya Megye	132	4,000	10.40
Gabbro	Szarvasko	5	0.543	1.64
Rhyolite	Hegyalja, Bukk, and Matra mountains; Sarszentmiklos	1	0.610	1.52
Dacite	Matra, Borzsony, and Velence mountains	5	0.048	0.12
Andesite	Hegyalja, Matra, Borzsony, Dunazug, Velence, and Mecsek mountains: Cserhat	382	36,000	95.50
Basalt	Salgotarjan; Transdanubia	85	8,117	22.70

Mineral	Location	Area (sq km)	Volume (cu km)	Weight (million tons)
Diabase	Szarvasko	18.5	0.213	0.62
Phonolite	Mecsek Mountain	2	0.018	0.05
Total		630.5	49,548.432	132.55

(4½ pp)

Utilization of Hungary's Subsoil Water Supply, by Jozsef Sumeghy, Chief Geologist

The utilization of Hungary's subsoil water supply has been neglected. Although good drinking water is accessible in sufficient quantity, 75 percent of the population is compelled to drink foul water. Hungary is also rich in mineral and medicinal waters; however, these have not been developed. Exploration of the subsoil water supply has already been started by the Hungarian Geological Institute in the Great Hungarian Plain; that is, in that part of the country which has the worst drinking water.(3½ pp)

Oil and Natural Gas Exploration in Hungary, by Docent Gyorgy Kertai

Deep borings in various Hungarian basins have yielded hydrocarbon gases and traces of oil from Pliocene and Quaternary sediments in both Transdanubia and the Great Plain. About 90-95 percent of domestic oil deposits was found in Transdanubia between 1935 and 1941. In 1942, moist gases containing high pressure carbon dioxide were discovered in the Great Plain near Totkomlos and Korosszegapati. More recently, Lev Petrov, geophysicist of the Ministry of Petroleum Industry USSR, visited Hungary and gave impetus to oil exploration. (5 pp)

Geophysical Exploration for Raw Materials, by Prof Laszlo Egyed

While geological exploration is based on immediate observation, the object of physical methods is to explore deep strata which are inaccessible to the geologist. At present, the measurement of ground currents is being introduced in exploration for oil. Karoly Kantas was the first in Hungary who called attention to this method. In exploration for coal deposits, the gravimetric method was proposed by Dr Antal Tarczy-Hornoch in 1949.(2½ pp)

Progress and Methods of Geophysical Exploration in Hungary, by Janos Renner, Director of the Lorand Eotvos Geophysical Institute

After the pioneering work performed by Lorand Eotvos, the Hungarian physicist Hugo Bockh showed the practical application of geophysical research. Currently, Hungary has both the equipment and the specialists to make use of the gravitational, magnetic, seismic, electric, and radioactive research methods. Gravimetric or torsion-balance stations are now in operation in most parts of the country. The gravimetric apparatus in use have an accuracy of 0.04 milligal. Seismic measurements have been made in Transdanubia and the Great Plain in recent years, partly for foreign enterprises. Since 1948, the Geophysical

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Institute has made systematic seismic measurements by a 12-channel and a 24-channel apparatus. Both the refraction and reflection methods are used in these measurements. For earth magnetic measurements a permanent observatory is needed; unfortunately, the temporary earth magnetic observatory which was established at Budakeszi a few years ago is inadequate. In the field of carbohydrate research, the equipment and personnel of the Geophysical Institute are limited.(3 pp)

The Role of Deep Drilling in Mineral Exploration, by Geza Szurovy, Geologist

Hungarian drilling equipment is obsolete and the reliability of drilling-masters is unsatisfactory. Also, samples taken are not examined promptly and are often mixed up.(2 pp)

Other Mineral Resources, by Laszlo Majzon, Director of the Geological Institute

Exploration for dolomite containing over 20 percent of magnesium oxide disclosed satisfactory deposits in the Bakony, Vertes, Pilis, and Buda mountains. Quartzite was found at Felsotarkany, Erdobenye, Sima, and Fony. A gypsum deposit 30 meters wide was located at Perkupa and Alsotelekes. Fluorite is mined in a hill between Patka and Csalavar, and recently was found also at Sukoro. Trass is mined at Lorinci, and has been found also near Ratka and Satoraljaujhely. The largest amount of sand is obtained from the Mecsek Mountain, especially at Kovagoors, Kisors, Monostorapati, Hegyesd, etc. Quartz suitable for the manufacture of especially fine optical lenses and prisms is found in small amounts in the Csepreg Mountain. Foundry sand is plentiful in the Bakony, Mecsek, Velence, and Buda mountains. Argillite is found at Kisgyor, Felsotarkany, and Visnyo in the Bukk Mountain; kaolin, in the Tokaj Mountain; refractory clay, at Bank, Felsopeteny, and Romhany; ocher suitable for the purification of gases, at Telkibanya and Regec; flint, at Szurdokpuspoki, Gyongyospata, and Erdobereny; bentonite, at Budateteny, Band, Szentgal, Herend, Gyulafiratot, Osku, etc.; perlite, at Telkibanya, Gonc, and Palhaza in the Tokaj Mountain; aplite, in the Velence and Mecsek mountains; and talc, asbestos, and serpentine, at Felsocsatar and Sopron.(5 pp)

Connection Between Magmata and the Formation of Ores, by Miklos Vendel, Regular Member

This report supplements a study published by the lecturer in 1947. The study contained the results of an investigation of the composition of Transdanubian magmata, with special emphasis on their acidity. This report outlines the lecturer's theories on the relationship between ore-producing and rock-producing magmata. Investigation will be conducted on the following three factors: (1) chemical composition of rock-forming magmata, (2) possibilities of ore formation in the course of the composition, separation, and crystallization of the magmata, and (3) evaluation and application of the data. Since the subject covers an extremely large area, preliminary investigation will be restricted to the formation of gold and tin ores.(66 pp)

Comments

Prof Aladar Foldvari

/The speaker pointed out the vast importance of Professor Vendel's investigation of the chemical relationship between the two magma varieties, and stated that Vendel's pioneering work will equip the geologists with an analytical method by which the occurrence of certain ores can be tested.(1 p)/

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Prof Laszlo Tokorody

/The speaker stressed the great importance of Professor Vendel's investigation of the chemistry of ore formations.(1 p)/

Mineral Transformation and Coal-Containing Minerals, by Elemer Szadeczky-Kardoss, Corresponding Member

/This paper contains a theoretical dissertation on the formation of coal. (20 pp)/

Comments

/Comments were made by Gyorgy Kertai, geologist (2 pp); Laszlo Muller, mining engineer (3 pp); and Elemer Vadasz, geologist ($3\frac{1}{2}$ pp)./

IV. MINING

Problems of Mine Modernization, by Bela Vargha, Mining Engineer, Head of the Technical Department of Banyatervezo Iroda (Mine Designing Bureau)

The amount of coal mined is governed by the coal requirements of the country. Domestic iron ore mining falls considerably short of requirements, both in quantity and quality. Manganese is mined in sufficient quantity to permit export. The mining of precious metals is insignificant, and that of kaolin, quartzite, flint, industrial limestone, feldspar, glass sand, trass cement, bentonite, talc, and refractory clay is still in the stage of technical organization. Peat mining is being reorganized and, at present, cannot satisfy even the requirements of agriculture.

The most important mining product in Hungary is coal. Deposits are estimated as follows: anthracite, 11.6 percent of the total; brown coal, 50.3 percent; and lignite, 38.1 percent. Coal production in 1949, however, was as follows: anthracite, 12 percent; brown coal, 82 percent; and lignite, 6 percent. These figures indicate that lignite production lags, while brown coal production has forged ahead. Within the brown coal category, there is heavy overproduction of the best grade.

It is planned to readjust the production of the various kinds of coal in accordance with the size of existing deposits. Accordingly, the Five-Year Plan provides for an increase in lignite production to 14.7 percent of total coal production, and for an increase in the production of poorer-grade brown coal. Unfortunately, the rebuilding of firing installations in industry for the use of lower-grade coal has not kept pace with the change in the coal production plan, a fact which has resulted in complaints and confusion among the consumers.

Under the Five-Year Plan, the entire amount of cokable anthracite will be coked, while the lower-grade brown coal will be assigned to industry, transportation, and agriculture. The transportation of lignite, in view of its low caloric content, will be avoided. Lignite will be fired in industrial establishments to be located at the mines.

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Deep drilling for coal has been neglected in Hungary. The equipment is 30-40 years old. Only 1-7 percent of the equipment of the Banyaszati Melyfuro Vallalat (Deep Drilling Enterprise for Mines) may be considered up-to-date, while 52 percent of the equipment of the enterprise should be scrapped.

During the Three-Year Plan, ten new, large-capacity coal mines with an ultimate total capacity of 15,000 tons per day were opened. In the course of the Five-Year Plan, 14 additional mines with a total estimated capacity of 19,000 tons per day are to be opened. The Five-Year Plan provides for the following breakdown of coal production for 1954 (in percent of total):

From existing mines	40.8
From the expansion of existing mines	30.8
From mines opened under the Three-Year Plan	16.8
From mines to be opened under the Five-Year Plan	11.6
Total	100.0

Two important problems must be solved to fulfill the plan: (1) increase in the number of workers and (2) mechanization of the mines.

(1) Mine personnel was insufficient even at the beginning of the Five-Year Plan, mainly because of the migration of workers from the mines to industrial establishments. Realistically, a 5 percent annual reduction in mine personnel due to voluntary separation may be assumed. This contrasts with the opinion that, despite the mechanization provided for under the Five-Year Plan, mine personnel must be increased 23 percent by 1954, and 48 percent in the course of the Five-Year Plan.

(2) Most of the coal mines to be opened under the Five-Year Plan will be of medium or large capacity, producing 1,000-3,000 tons per day. Only 25 percent of the new mines will produce less than 1,000 tons per day. The Five-Year Plan also provides for the division of 28 existing mines into four groups, each with a central point connected with the mines of that group by railroads and cableways. Each point of concentration will handle 3,000-10,000 tons of coal per day. Also, 50 mines will be equipped with eight grading establishments, which will do the work of 3,200 workers.

Transportation, in which 13.3 percent of the total mine personnel is engaged, will be mechanized considerably. The shaft elevators now in use are running at a speed of 7.5 meters per second and the load varies between 0.8 and 8 tons. The shafts will be sunk to greater depths and the elevator speed will be increased to 12-16 meters per second.

The use of compressed air will be reduced, because its operating cost is 6-7 times greater than that of electric machines. In hard rocks, where electric drills cannot be used, the use of compressed air drills and cutting hammers will continue. In such cases, however, the cost will be reduced by installing 3- to 10-cubic-meter compressors.

Cutting, the most important phase of mining, employs 32 percent of the total mine personnel. This operation will be mechanized to a great extent by various machines, including combines, which will replace the face-breaching machines. In 1949, 12.6 percent of the total mine personnel was engaged in maintenance, as compared to 3 percent in anthracite mines abroad. The cost of maintenance is increased by the fact that 80-85 percent of the timber used in the mines has to be imported. To reduce this expenditure, wood impregnation will be expanded, and reinforced-concrete and brick shoring will be introduced. As a result of the mechanization program, power consumption in mines containing mine damp will be reduced from the present 7-40 /sic/ kilowatt-hours to 20 kilowatt-hours per ton by 1954.

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Since the production of lower-grade coals will be stepped up during the Five-Year Plan, productivity in terms of heating value per unit weight is expected to fall. By 1954, this index will show an increase of only 29 percent, as compared to an increase of 51 percent in the quantity produced.(15 pp)

Comments

Geza Krupar, Mining Engineer

/The speaker devoted his comments, illustrated by 18 diagrams, to technical details of coal mining operations.(24 pp)7

Jeno Ladai

/The speaker discussed the theoretical performance of combines and other heavy coal-mining machinery, of both Soviet and Hungarian manufacture. (4½ pp)7

Zoltan Ajtai, Mining Engineer

Mine-opening and preparatory operations in the domestic coal mines are progressing at the rate of 75-100 meters per month. Cutting operations are progressing at the rate of 50-60 meters per month by the face-cutting method, and at the rate of 75 meters per month by the pillar-working method. On the basis of these figures, it is clear that production of 800 tons of coal per day requires the working of a very extended coal field. If both the opening-preparatory and the cutting operations can be speeded up by only 100 percent, the advantages will be obvious. To attain this goal, heavy mining machines must be used. /The speaker then enumerated the various kinds of heavy machinery used in coal mining.7(3 pp)

Karoly Martiny, Mining Engineer

Processing methods (grading and washing) cannot be adopted without adapting them to Hungarian conditions. Improvement in coal quality is expected, however, from the regrouping of mining and transportation provided for under the Five-Year Plan. This regrouping will also help to develop uniform coal grades.(6½ pp)

Sandor Torok, Mechanical Engineer

Hand trucks are still the predominant means of transportation in the Hungarian coal mines. The trucks are pushed by hand to a collecting point, from where they are carried to the surface by locomotives or shaft elevators. These hand trucks have a capacity of 600-1,000 liters.

The electric locomotives now in use are generally satisfactory, although there is considerable demand for dampproof diesel locomotives. Recently, two diesel locomotives were received from Czechoslovakia. It is hoped that domestic production of such locomotives will begin shortly.

The Koepe and drum machines made in Hungary are very good and are exported in large numbers. A Koepe and a two-drum machine, each of 1,100 horsepower with a transportation capacity of 14 meters per second, are now under construction. Four shaft transportation installations equipped with 8-ton buckets are also being built.

In the new mines, conveyer belts will replace the hand trucks. For shorter distances, 150-meter-long and 650-millimeter-wide belts, driven by 15-horsepower motors and having a capacity of 100 tons per hour, will be built. For medium-long distances, the belt will be 250 meters long and 800 millimeters wide; it will be driven by a 40-horsepower motor and its capacity will be 200 tons per hour. For long distances, the specifications are: belt, 500-1,000 meters long and 1,000 millimeters wide; motor, 75-100 horsepower; and capacity, 300-600 tons per hour. The underground transportation of lignite in the mines will also be radically modernized. In the past, the lignite has to be brought to the surface in pieces at least 200 millimeters long. In the future, the lignite will be broken up underground and, as a result, 800-meter-long belts with a capacity of 300 tons per hour can be used. (4½ pp)

Istvan Pal, Mechanical Engineer

/This comment was based on the report of the committee which studied the mines in the Ruhr Basin and Wales in 1949, and the Soviet mines in 1950. The speaker discussed the theoretical power requirements in coal mining, technical details of electric equipment, safety measures, and organizational problems. The following Hungarian agencies were mentioned: Szenbanyaszati Ipari Kozponti Kutato Laboratorium (Central Research Laboratory for the Coal Mining Industry), Magyar Elektrotechnikai Egyesulet (Hungarian Electrical Engineering Society), and Szabvanyugyi Intezet (Standardization Institute). (13 pp)/

The Karst Water Problem in Mining, by Ferenc Vigh, Mining Engineer

The greatest enemy of Hungarian coal mining is the karst water, which is endangering the Dorog, Tatabanya, Pilis, and Ajka coal basins. These are the most valuable coal fields of the country; they furnish the bulk of Hungary's coal output. It is estimated that 51 percent of the calorie production is endangered by karst water.

The cement-filling method of prevention has disclosed the extent of the caverns. Most caverns were about 3,000-4,000 cubic meters in size, but some absorbed as much as 240,000 cubic meters of cement sand. So far, 242 cases of karst water flooding at a rate of 781 cubic meters per minute have been recorded. The danger from flooding is also indicated by the fact that the volume of water pumped out of the mines was 13-21 times the amount of coal produced.

In no other country has the karst water presented as serious a problem as in Hungary. For this reason, Hungarian research is carried on without help from foreign sources. Karst water appeared in the largest volume at Dorog. The Szenbanyaszati Ipari Kozpont is engaged in research on the prevention of karst water damage. It is using, temporarily, the short-wave apparatus constructed by Dr Tarczy-Hornoch and Dr Kantas, the Laday-Reguli electric resistance measuring instrument, and the Mehes and Tari apparatus based on the reflection of ultrasonic sound waves. Experiments were also made with the Wenner resistance meter. Drilling data and geological observations at Dorog were mapped and evaluated by chief geologist Dr Ferenc Szentes, while Dr Meinhardt collaborated in determining the Dorog protective covering. /The author then discusses in detail the geologic structure of Dorog, mentioning Dr Sandor Vitalis, Dr Ferenc Szentes, E. Schmidt, and Dr Ferenc Kassai among his sources./

The three methods of prevention and protection against karst water flooding are damming, draining, and cement filling, of which the last is the most important. Experiments with a synthetic filling material will be made at Tokod according to the method of Tassonyi and Dr Kassai. Experiments have also been made with the use of local loess instead of cement, on the initiative of B. Varga. These experiments have been proved practical in the laboratory by Ferenc Albel and Dr Kassai. The problem of karst water exists also in bauxite mining, in which the drainage method of prevention is used.

The financial aspect of the problem is illustrated by the fact that between 1927 and 1950, at Dorog alone, 6,200 tons of cement, 791,000 cubic meters of sand, and 220,000 liters of hydrochloric acid were used at a cost of 50 million forints. /The paper is accompanied by four diagrams and a list of sources, including Sandor Schmidt, Dr Ferenc Kassai, Gero, Pogany, Vargha, Zoltan Altai, Peter Eszto, Laszlo Csanady, Miksa Kalman, Bela Vargha, Ferenc Vigh, Dr Ferenc Szentes, Rozlozsnyik, Schreter, Telegdi-Roth, Dr Sandor Vitalis, Dr Elemer Szadeczky-Kardoss, Dr Karoly Kantas, Dr Robert E. Schmidt, Dr Gyula Vigh, Dr Elemer Vadasz, Dr Henrik Horusitzky, V. A. Obruchev (USSR), Alfred Grund (Vienna), H. Hoefer (Germany), Dr Miklos Vendel, Dr C. A. Heiland (Germany), and Dr Bruno Kunz (Germany). (See 00-W-20961.)7(25 pp)

Comments

Miklos Vendel, Regular Member

/The speaker discussed his theories on the origin and direction of flow of karst water in Hungary. He mentioned among his sources Ferenc Schafarzik, Moric Palfy, Karoly Sarlo, Ferenc Pavai Vajna, and Ferenc Albel. (5 pp)7

Dr Ferenc Kassai, Mining Engineer

/The speaker discussed the behavior of karst water.(3½ pp)7

Pal Mazalan, Mining Engineer

/The speaker discussed the possible utilization of karst water. He stated that the volume of water pumped out of the Dorog mine alone amounts to 50,000 cubic meters per day, whereas the drinking water supply of Budapest amounts to 250,000 cubic meters per day. He discussed the degree of purity, the temperature, and the chemical composition of the karst water.(5 pp)7

Prof Karoly Kantas

/The speaker discussed the application of geophysical methods in karst water research. He stated that research is being conducted with the support of the Karst Water Committee of the Academy. The following researchers were mentioned: Dezso Pekar, Bela Pogany, Miklos Vendel, Lorand Gero, Bela Vargha, Karoly Simonyi, Kalman Mehes of Sopron Technical University, and the Dunantuli Tudomanyos Intezet (Transdanubian Scientific Institute).(4 pp)7

V. METALLURGY

Utilization of Domestic Ores,
by Mihaly Szele, Metallurgical Engineer

/This paper contains a survey of Hungarian iron ore and manganese ore deposits, the composition of these ores, and their preparation for metallurgy. The author mentions Robert Eligius Schmidt, according to whom the ore deposits

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form a southwest-northeast line in Hungary. He also refers to the Finkey-Szarvasi laboratory experiments of extracting iron from bauxite, and the experiments of Bela Vecsey in the Vasipari Kutato Intezet (Research Institute for the Iron Industry), which were based on Jozsef Finkey's studies.(11½ pp)7

Comments

Bela Vecsey, Metallurgical Engineer

/The speaker presented the results of a thorough investigation of the estimated deposits, composition, and properties of the iron ore mined at Rudabanya, together with the history of the mine from the 16th Century. He referred to experiments and analyses performed by the Vasipari Kutato Intezet, the Foldtani Intezet (Geological Institute), Karoly Hahn, Moric Palffy, Gabor Panto, Karoly Papp, Kallai (mine director), and Gusztav Tarjan of Sopron Technical University. (13½ pp)7

Prof Laszlo Gillemot, Corresponding Member

/The speaker discussed the utilization of various by-products of bauxite: vanadium, titanium, iron, cerium, chromium, etc.7 Not more than 4-5 percent of the domestic bauxite supply can be refined into aluminum by the Bayer method. As a result, the price of aluminum produced in Hungary is above world market prices. Hungarian bauxite has a high vanadium content. The amount of vanadium extracted from bauxite by the method developed by Lanyi, Papp, and Dunay in the Aluminium Kutato Intezet (Aluminum Research Institute) is 2.5 times the amount required for the country's steel industry. Hungarian red mud has a low iron content and the Aluminium Kutato Intezet, therefore, places the emphasis on the extraction of aluminum oxide and sodium oxide by the method developed by Bela Lanyi.(6½ pp)

Prof Gusztav Tarjan

Manganese, which is produced only at Urkut in Hungary, is treated by washing and precipitation by the Excelsior machine. Investigations for improved production methods at Urkut were performed by Jozsef Finkey and by the speaker. Finkey is the author of a paper entitled "Preparation of Urkut Manganese Ores," published in Magyar Tudomanyos Akademia Matematikai es Termeszettudomanyi Ertesitoje (Mathematical and Scientific Bulletin of the Hungarian Academy of Sciences), 1936, Vol LIV. The speaker has also experimented with manganese ore found near Eger, but the results were uneconomical. Refining of domestic manganese ores can be improved only by metallurgical methods. One of these methods was described by Zoltan Horvath, of the metallurgy department of Sopron Technical University, in Banyaszati es Kohaszati Lapok (Mining and Metallurgical Journal), No 5-6, 1949.(2½ pp)

Laszlo Visnyovszky, Mining Engineer

Except for bauxite and the Rudabanya iron ore, no important ore deposits are known in Hungary. Some iron ore is found at Bagamer, Regec, Pecsvarad, Mad, and Aggtelek, but it is poor in iron content and, therefore, uneconomical. /The speaker reported in detail on the composition of this ore.7 As to the extraction of iron from red mud, a method based on the Bejna-Visnyovszky patent has been put in operation on a large scale at Diosgyor. /The speaker also discussed in detail the extraction of iron from Martin slag.7(7 pp)

Robert Forbath, Chemical Engineer

[The speaker devoted his comments to the problems of the utilization of Martin slag, and recommended the Thomas refining method. (1 p)]

Laszlo Jakoby, Mechanical Engineer

[The speaker recommended that the Department of Technical Sciences of the Academy set up a permanent metallurgical committee. ($\frac{1}{2}$ p)]

Prof Viktor Zsak

[The speaker suggested the use of the black-mud by-product of alumina to supplement scrap iron, which is in short supply. (1 p)]

Imre Veres, Chemical Engineer

[The speaker agreed with Laszlo Gillemot that a vanadium works should be built in 1951, and suggested that the Department of Technical Sciences set up a mixed committee, composed of metallurgists, chemists, etc., for the investigation of the problems of vanadium production. (2 pp)]

Endre Szucs, Metallurgical Engineer

[The speaker discussed technical details in connection with the preceding comments. (1 p)]

Laszlo Gillemot, Corresponding Member

The technology of vanadium production has been worked out and no longer presents a problem. Five different methods of extracting vanadium from black mud are known, but it has not yet been decided which method will be employed in Hungary. ($\frac{1}{2}$ p)

Alajos Claus, Metallurgical Engineer

[The speaker discussed the properties of certain nonferrous metals used as alloys. (1 p)]

Steel Production by the Oxygen and Air Blowing Method, by Kalman Kerpely, Metallurgical Engineer, Vasipari Kutato Intezet

[This paper presents the results of experiments by the oxygen and air blowing method in two Hungarian steelworks. Several tables and diagrams, together with mathematical analyses, are included. (23 pp)]

The Hydrogen and Nitrogen Problems of the Air Blowing Method in Steel Production, by Jozsef Vero, Regular Member

[This paper presents a detailed technical report, with mathematical analyses, on whether the air blowing method introduces a large amount of impurities into the steel charge.] Experiments failed to justify the apprehension that the method introduces a large amount of impurities into the steel charge. However, to avoid unpleasant surprises, it appeared necessary to carry out a thorough investigation on its effect on the composition of the steel charge. In the course of the writer's investigations, the following conclusions were reached:

(1) The hydrogen content of the finished product made by the air blowing method is generally lower than that of steel made by the Siemens-Martin method. As a result, it is not necessary to dry the air to be introduced. In the summer, because of the greater humidity, a larger amount of hydrogen may be introduced into the charge, but subsequently the excess moisture evaporates.

(2) Because of the air blast, the nitrogen content of the charge reaches its maximum in the Siemens-Martin process. For this reason, the nitrogen content and the aging of steel to be produced by the air blowing method must be tested. The method cannot be used in the production of steel containing a large proportion of chromium.(14 pp)

Comments

Tibor Wilhelmb, Metallurgical Engineer

/The speaker pointed out that the difficulties of calculating the absorption of gases in the air blowing process are extremely great, and that Professor Vero's equations must be received with some skepticism. He described his own observations in experiments with the method, and recommended caution. ($4\frac{1}{2}$ pp)/

Endre Szucs, Metallurgical Engineer

/The speaker explained that the air blowing method is still in the experimental stage, and warned against its introduction on a large scale before further tests are made.($3\frac{1}{2}$ pp)/

Mathematical Solution of Theoretical and Practical Problems in Steel Rolling, by Prof Sandor Geleji, Corresponding Member

/This paper examines the problems of designing steel rolling mills, especially the problems of motive power and load. After reviewing the more important theories, the author presents his own. The treatment of the subject matter is mathematical throughout the paper. A bibliography is appended, including several books published by the author of the paper.(37 pp)/

Comments

Imre A. Pattantyus, Metallurgical Engineer

/The speaker developed further the calculations presented by Professor Geleji, and mentioned the research performed by Karman and Madai.(10 pp)/

Frigyes Arkos, Metallurgical Engineer

/The speaker supplied additional calculations and mentioned those performed by Mercader.(3 pp)/

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VI. POWER PRODUCTION AND ECONOMY

Problems of Hungary's Power Production and Distribution, by Laszlo Heller, Mechanical Engineer

[This paper presents a general survey of Hungary's potential energy resources (coal, water power, natural gas) and of the most economical coal-firing installations.(20 pp)]

Comments

Laszlo Olle

[The speaker summarized the results of his original research in the use of the heat pump. He referred to a paper published by Haidegger under the title "A Hoszivattyu Szerepe Az Energiagazdalkodasban" (Role of the Heat Pump in Power Economy).(17 pp)]

Laszlo Forgo, Mechanical Engineer

[The speaker discussed air-condensation problems in connection with the construction of steam power plants. He mentioned the work of Dr Laszlo Heller; experiments conducted under the supervision of the speaker in the Hotechnikai Intezet (Institute of Heat Technology); and the patents of Istvan Beck (1937) and Jozsef Beck (1948), under which aluminum instead of copper is used as a cooling element.(13 pp)]

Prof Emil Mosonyi

[The speaker stated that the Danube and Tisza rivers represent 75 percent of Hungary's potential water power supply, which may be estimated at 2 billion kilowatt-hours, the equivalent of 200,000-250,000 ten-ton carloads of coal. He presented a detailed study of the most economical water power sites on the Danube and Tisza.(25 pp)]

Problems of Production and Distribution of Electric Power in Hungary, by Karoly Pal Kovacs, Corresponding Member

[This paper contains a detailed technical discussion and mathematical analysis of Hungary's electric power grid. It refers to an article by E. Hajdu in Elektrotechnika (Electrical Engineering), Vol 42, No 4-6, 1950, and to T. Sztacho's work "Felsobb Mennyisegtan" (Higher Mathematics). Part of the calculations included in the paper were made by Istvan Racz.(36 pp)]

Comments

Ferenc Palos, Mechanical Engineer

[The speaker discussed the technical problems of stability and short-circuit protection in power networks.(13 pp)]

Vendel Bottlo, Mechanical Engineer

/The speaker pointed out that every power network must have a load distribution organ which directs the distribution of power during consumption peaks and breakdowns in operation. He discussed the technical problems and measurements of these factors.(10 pp)/

Andras Levai, Mechanical Engineer

The high temperature gases of open-hearth furnaces, which represent an enormous potential source of power in Hungary, have not been exploited. Utilization of these gases would save 300,000 tons of coal per year, a sufficient quantity to operate the Banhida electric power works.(1½ pp)

Miklos Vajda, Mechanical Engineer

/The speaker presented a systematic technical examination of the typical sources of breakdowns in power distribution, and described the small-scale network models used for the detection of breakdowns.(20 pp)/

Ferenc Ronkay, Mechanical Engineer

Hungary's 100-120 kilovolt directly-grounded national power grid will shortly have a carrying capacity of 10,000 amperes. An increase in voltage of several thousand volts, caused by a short circuit to ground, may damage the low-voltage measuring and safety instruments of a 120-kilovolt station. The technical literature of the world is beginning to call attention to the ground danger in power transmission, but the recommendations proposed are still tentative. On the other hand, experiments conducted in Hungary, both on small-scale models and in the actual networks, have produced practical solutions. /The lecturer outlined the results of research in this field and announced that details would be published shortly. He stated that the forthcoming publication will present the methods of research, the underlying theoretical principles, calculations, a report on the experiments conducted, and a description of instruments recommended. He explained that the research was conducted under the guidance of the Villamos Kutatasi Bizottsag (Committee for Research in Electricity)./(12 pp)

VII. ENGINEERING

Possibilities for Material Conservation in Hungary's Machine Building Industry Through Modern Technological Methods, by Ferenc Biro, Corresponding Member

/The paper points out the sources of waste and methods of material conservation in the machine building industry.(15½ pp)/

Comments

Laszlo Frank, Mechanical Engineer

/The speaker reviewed the history of the steel casting industry.(12 pp)/

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Nandor Hajto, Metallurgical Engineer

[The speaker described the properties and behavior of cast iron containing globular graphite, which is little known in Hungary.(5 pp)]

Laszlo Gillemot, Corresponding Member

[The speaker reviewed the various methods of steel casting and discussed in detail the technique of powder metallurgy and precision casting.(5 pp)]

Prof Bela Zorkoczy

[The speaker described the advantages of welding technology in the machine building industry.(8½ pp)]

Andor Hornung

[The speaker outlined the principal methods of rapid machining by hard-metal cutters.(8 pp)]

Gyula Korponai, Mechanical Engineer

[The speaker reviewed the main sources of economy in the machine shop. (8½ pp)]

Material Conservation in Machine Designing, by Prof Imre Voros

[The paper outlines the methods by which the machine designer can achieve economies in material, the operation of the machine, etc. It points out that the Hungarian machine designers are aiming at an unnecessarily high degree of safety, and are employing steel casting where gray casting would be sufficient. It calls attention to the fact that the Gepipari Tudomanyos Egyesulet (Scientific Society of the Machine Building Industry) has collected material on economic casting construction.(9 pp)]

Comments

Endre Ritter, Mechanical Engineer, Manager of Mintagepgyar (Machine Model Factory

[The speaker pointed out the sources of economy in machine tool design, and illustrated his talk with three diagrams.(8 pp)]

Imre Razso, Corresponding Member

[The speaker reviewed certain types of agricultural machines (mainly tractors) used in Hungary, from the viewpoint of economic operation, and summarized the findings in three tables. He mentioned experiments conducted by the Mezogazdasagi Gepkiserleti Intezet (Institute for Experiments With Agricultural Machinery) with various types of tractors under different soil conditions. (9 pp)]

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Istvan Lindner, Mechanical Engineer

The following economy measures in the construction of steam boilers are suggested: (1) reduction of the unnecessarily high safety factor in the material used; (2) reduction of the heating surface by the use of tubes of smaller diameter; (3) reduction in the weight of boiler bases; (4) reduction in the dimensions of fire-resistant walls and replacement of fire-resistant material by a much thinner and lighter insulating material which is currently used in the USSR; (5) use of welded steel instead of cast iron in the construction of coal-grinding mills; (6) substitution of vanadium for molybdenum as an alloy in the steel tubes used in high-temperature boilers; (7) construction of large boiler units; (8) periodical replacement of heating surfaces exposed to corrosion.(5½ pp)

Prof Zoltan Komondy

[The speaker reviewed the more important industrial fuels from the viewpoint of economy.] Data on the firing qualities of domestic coals and on feed water have not yet been collected. The types of firing installations are too numerous and must be standardized. In industry, damage due to dust amounts to 100-200 million forints per year. Recently, Istvan Koncz constructed an ultrasonic apparatus for the elimination of this damage.

Another serious problem is the shortage in fire-resistant brick material. This problem should be solved by the development of domestic fire-resistant concrete.

In the field of refrigeration, Hungary lags far behind in modern developments. A great step forward would be made by the manufacture of the refrigerator recommended by Farago.

In heat technology, insulation materials are of very great importance. In Hungary, only cork has been used for this purpose in the past. Recently, the Hotechnikai Intezet (Institute of Heat Technology) invited researchers to participate in a prize contest for domestic insulation materials. In this connection, mention should also be made of a wild grass, growing in Hungary, which has proved to have good insulating qualities.

In the field of heat exchangers, Laszlo Forgo has constructed a heat exchanger, which is suitable for the condensers of gas motors, refrigerators, steam turbines, etc.(7 pp)

Istvan Melkuhn, Mechanical Engineer

[On the subject of material conservation, the speaker proposed changes in the construction of locomotives and the materials used.(8 pp)]

VIII. BUILDING CONSTRUCTION

Modern Building Structures and Methods, by Gyozo Mihailich, Regular Member

[The paper reviews current trends in Hungary's building industry as follows:]

(1) The Stakhanovite movement under the leadership of Zoltan Pozsonyi and Jozsef Fabik, Kossuth Prize-winning Stakhanovites, has made great progress in the building industry.

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(2) The mechanization of the building industry has begun; cranes, floating cranes, excavators, crushing and grading machines, conveyer belts, loading installations, etc., have been put in operation.

(3) Since it is not expected to establish new cement factories, portland cement is mixed with trass, metallurgical slag, etc., to increase the quantity. Cement production has been diversified by the development of four grades. Production of bauxite cement is also under consideration. Experiments have been conducted by the Epitestudomanyi Intezet (Scientific Institute of the Building Industry) in the heating of moist concrete mixtures by electricity, as well as in the use of plastics in the building industry.

(4) Important results have been obtained in the manufacture of prefabricated building materials, partly in factories and partly on the building sites. Sandor Major is manufacturing prefabricated frames and the Epuletelemgyarto N. V. (National Enterprise for the Manufacture of Prefabricated Building Materials) has completed a two-room model home. In the field of prestressing, Hungary is still in the stage of experimentation. Experiments have been conducted by the Nagybatony-Ujlaki Teglagyar (Nagybatony-Ujlak Brick Factory), the Ganz Works, and the Kozuti Hidfenntarto N. V. (National Enterprise for the Maintenance of Highway Bridges).(25½ pp)

Comments

Prof Jozsef Pelikan

The main obstacle to an increase in the number of steel roof structures is the extremely difficult calculation, which includes the solution of series of differential equations.(3 pp)

Istvan Menyhard, Engineer

The speaker submitted information on the following types of reinforced-concrete bridges being built in Hungary: (1) structures made on the building site; (2) a reinforced-concrete structure combined with a steel structure; and (3) prefabricated reinforced-concrete structures.(3 pp)

Ferenc Rathing, Engineer

The 1950 plan of the Hungarian State Railroads provided for the procurement of 1,400,000 crossties. Domestic production could provide only 300,000 wooden and 350,000 reinforced-concrete ties, or less than 50 percent of the required number, and the rest had to be imported. As a result, the 1949 capacity of the reinforced-concrete railroad tie factory at Nyergesujfalu increased to double its previous capacity. Reinforced-concrete ties, which have been used for several years, now represent one eighth of the total number of railroad ties in use. Hungarian production of reinforced-concrete railroad ties holds a leading position in Europe, both in quantity and quality. Experimental manufacture began in 1948, and samples were sent to the EMPA material-testing institute at Zurich, Switzerland. /The speaker gave a detailed description of the materials and the technology used in the manufacture of reinforced-concrete railroad ties./

In connection with the electrification of the Budapest-Miskolc section of the Hungarian State Railroads, the Vasbetonipari Vallalat (Enterprise for the Reinforced-Concrete Industry) studied the manufacture of reinforced-concrete power line poles abroad, especially in France, and has developed a prestressed pole suitable for domestic purposes. [The speaker gave technical data on this pole. The lecture was illustrated by numerous diagrams, including the test results prepared by EMPA.](19 pp)

Karoly Szechy, Engineer

[The speaker discussed at length the materials and the technology used in the building of Hungarian steel structures, with special emphasis on bridges. He referred to the work performed by engineers Pal Tanto, Elek Hilvert, Istvan Bajo, Laszlo Lebenyi, Pal Palagyi, Karoly Savos, Istvan Zimanyi, Janos Fekete, and Erno Bors; by Prof Imre Koranyi; and by the Highway Bridge Department of the Ministry of Transportation and Postal Affairs. The speaker presented diagrams and technical data on about 14 bridges in Hungary, including the Szabadsag Bridge, the Margit Bridge, the Lanchid (Chain) Bridge, the Sztalin Bridge, the Baja Bridge, and the Budapest, Szajol, and Tokaj railroad bridges.(29½ pp)]

Prof Laszlo Palotas

[The lecture was devoted largely to a detailed discussion of the qualities of the concrete used in Hungary, with special emphasis on its defects. The speaker referred to the experiments of Nagypal and Weisz in the electric heating of the concrete.(9 pp)]

Rezso Ocsvar, Engineer

[The speaker discussed the machines to be used in subsurface construction work.] It is estimated that the planned mechanization of subsurface construction will add 200,000 horsepower to the existing stock. Mechanization in subsurface construction is measured by horsepower per worker. At present, the work of one man equals 1.37 horsepower, which will be increased to 3.80 horsepower by 1954. During the same period, the productivity of the machines will be increased 100 percent. Much depends, however, on the ability of the domestic machine plants to fill the needs of the subsurface construction industry. Another factor in this connection is that Hungary's electric industry lags. For this reason, it is planned to build 73 percent of the machines for diesel motor drive, 22 percent for gasoline motor drive, and only 5 percent for electric motor drive. The manpower which will be released from the subsurface construction industry as a result of the mechanization program can be roughly estimated on the basis that one horsepower equals 0.4-0.5 manpower-hour.(4 pp)

Mate Major, Corresponding Member

[The speaker described the various Stakhanovite methods in bricklaying. He referred to a paper by Gyula Sebestyen and Lajos Fundak on the performance of certain bricklayer brigades, and also to Zoltan Pozsonyi and Janos Reti, bricklayer Stakhanovites.(8 pp)]

Gyula Sebestyen, Building Engineer

[The speaker called attention to the role of work norms in the socialist economy, and made several references to Stalin's exhortations.(5 pp)]

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Jozsef Jarky, Regular Member, deceased (paper read by Karoly Szechy)

/The mechanization of heavy labor in earth moving was discussed, and a mathematical analysis of the performance of earth-moving machines was given. (7½ pp)/

Modern Methods of Calculation in Structural Architecture, by Prof Pal Csonka

/The paper contains a theoretical study of statics. It mentions the following: Dr Gyozo Havlar's work, "Methods of Calculation and Construction for the Solution of Statically Indeterminate Frames," published in Technika, No 15, 1934, pp 14-17; Dr Havlar's course of lectures at the Mernoki Tovabbkepzo Intezet (Engineering Post-Graduate Institute) in 1942; and Dr Istvan Menyhert's mathematical studies on architectural statics.(23 pp)/

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