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Research in the Economics, Organization and Production Technology of the Engineering Industries...Czechoslovakia

The Research Institute of Engineering Technology and Economics, Prague

By František Taus

Background

Czechoslovakia, as a small industrial country, must adapt the structure of its industrial production to the requirements of foreign markets, relatively flexible, especially in the engineering industries. Thanks to planned management, production has been steadily accelerating in recent years. In such conditions, economics, production organization and industrial plant management research are of special significance. As far back as 1958 state research institutes were established for the engineering, metallurgical, chemical, consumer goods, and food industries in the country.

During the same period, a large network of specialized institutes for industrial research in new technological processes and equipment development was founded. The difficulties in co-ordinating the work of these institutes were especially apparent in the engineering industries. Therefore, the scope of the research institute's work in economics, production organization and management of the engineering industries has been recently extended to carry out complex technological tasks. Thus an institute that assists in co-ordinating the work of other specialized research institutes has been established.

The Research Institute of Engineering Technology and Economics in Prague consists of four branches: economics of the engineering industries; organization of plant management; organization of production processes; and production technology.

Aside from that, the Institute has a design department and a plant for building various special equipment.

Research Programme

In its study of the economics of engineering industries, the Institute analyzes long-term development trends in Czechoslovakia and in other industrialized countries and prepares forecasts of long-term development on the subject. These forecasts deal mainly with the development needs of the national economy, the possibilities of exporting and importing engineering products, the development of production structure and technological progress, production specialization, concentration and location of production facilities, use of producing power, financing and investments, and the development of manpower structure and labour productivity.

The methods used in economic analyses are publicized by the Institute, thus facilitating their use in plants. In this respect, the Institute co-operates with institutes in other fields as well as with research institutes dealing with similar problems in a particular industry on a nation-wide scale or within the national economy.

The Institute also assists plants in their efforts to find labour reserves and profitable investments. For this purpose, the Institute works out methodical instructions and provides assistance when needed.

Research Management

Research management concerns itself with the following problems: plant organization; use of modern management methods; economic planning and control and the use of exacting methods; and computer techniques in plant operation.

While the economic management system is being introduced into the national economy, the research programme is directing itself to the problems of remuneration, production profits, price and trade policies, and plant financing.

Research on *the organization of production processes* is mainly aimed at the creation of prerequisites of production efficiency, such as standardization of products and their elements, equipment, tools and production processes, as well as plant design and technological departments' working methods. Special attention is given to the prob-

lems relating to the technical improvement of products and quality controls.

Research on *production systems* within the framework of the Institute programme includes study of the use of efficient production methods and organization: mass and specialized production; use of new materials that facilitate the introduction of efficient technological methods etc. Its role is to work out technological variants for a given product and compare their economic value.

In order to fulfil the above-mentioned tasks the Institute co-operates with industrial research and technology institutes on the development of specialized machines and equipment, including machining, forming, casting, welding, surface treatment etc.

Technological processes developed by the Institute help plants which are unable to develop their own processes.

As in other research fields, the work on technological processes is aimed rather at type or model solutions. The co-operation with plants is most effective in this field. It leads to carrying out projects with the participation of the Institute's designers.

By development and production of special equipment, the Institute provides non-typical equipment for carrying out its own technological research projects. Apart from that, the Institute develops other non-typical equipment according to the demands of engineering enterprises.

The Institute's Work

The Research Institute of Engineering Technology and Economics is one of the largest research institutes in Czechoslovakia, and it is unique by its universality and wide range of professional activities. Its main purpose is economics, management, and the organization of production processes and technology so as to create favourable conditions for the solutions of complex problems on production effectiveness in the engineering industries. The Institute's usefulness has been proven by the results of numerous projects already undertaken. It has also shown unusual readiness to assist projects improving speed and efficiency. However, there is scope for a more effective and broader application of the results of research.

One of the proven principles of the Institute's work is the orientation toward type solutions and its co-operation with plants which serves as an example to other enterprises.

The Institute does not solve problems which the enterprises are capable of solving themselves, but rather teaches plant personnel creative work methods and acquaints them with the results by illustrative examples. At the same time, it provides them with useful suggestions for improvement of production management, economics, organization and technology.

The co-operation with plants must comply with certain requirements. One form of co-operation is the advisory function whereby plant workers meet our Institute personnel and personnel of other institutes concerned with both basic and industrial research.

A similar task is fulfilled by [illegible] within the framework of the Institute. Its aim is to organize postgraduate courses with specialists in engineering industries and thus to augment them with new knowledge.

Financial Status

The Institute is financed by an allocation of funds in the State budget. A small part of the Institute's expenses is paid for by the plants. The introduction of the economic management system in Czechoslovakia represents an attempt by the Institute to provide broader services, which will be paid for by the plants or other organizations requiring them. The Institute will start this experiment in the second half of 1966. The structural organization and statistics of relevant interest on the Research Institute of Engineering Technology and Economics in Prague can be found below and on the following page.

Budget for 1966
(in Crowns)

Investments	**1,500 000**
Wages and other personnel costs	**25,500 000**
Material costs	**11,000 000**
Other	**6,500 000**
Total expenditures	**44,500 000**
Income	**14,500 000**
Covered from state budget	**30,000 000**

Total number of employees: 1170

Structure

Research	**31%**
Application of research	**34%**
Information	**5%**
Administrative staff	**10%**
Manual workers, etc.	**20%**
	100%

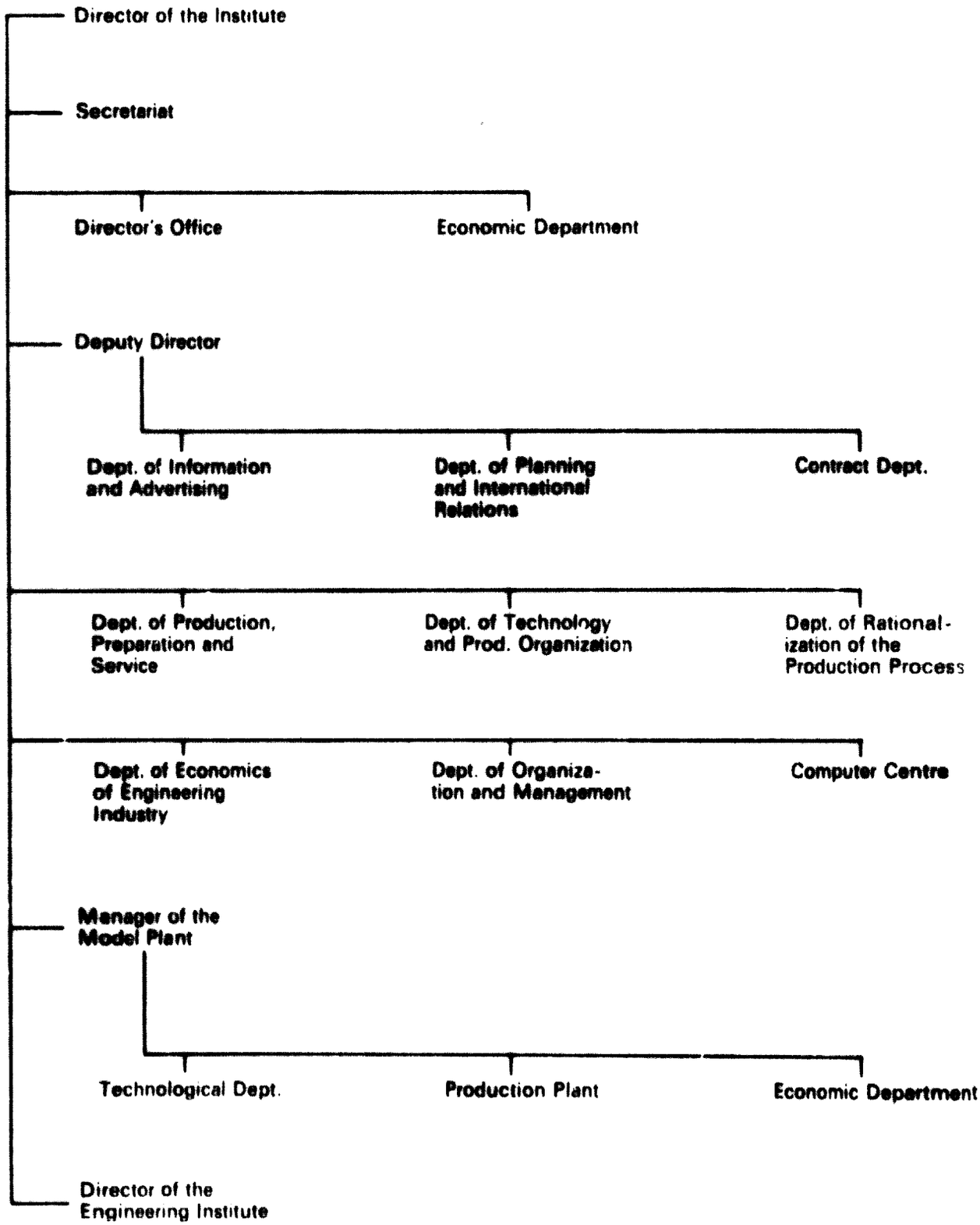
Educational Background of Employees

50% of the research workers are university graduates, either in technology, economics or a combination of these two branches.

A majority of employees are graduates from colleges of technology.

In the Organization and Management Department there is an overwhelming majority of graduates from schools of economics. On the other hand, employees in the Department of Economics for Engineering Industry are graduates from universities where both technology and economics are taught.

BASIC ORGANIZATION SCHEME OF INSTITUTE MANAGEMENT



Movement of United Nations Experts in Industrial Research

Since the first issue of *Industrial Research News* was published, some 50 United Nations technical assistance staff appointments were made in industrial development. Among these, a number were for industrial research institutes for which the Centre for Industrial Development is substantively responsible.

Mr. Léon F. Mercier, a French chemical engineer, assumed the post of senior technical adviser to the Director of the Central American Research Institute for Industry, ICAITI, in *Guatemala*. Mr. Mercier is assisting in supervising the work of the Institute's technical divisions and in maintaining contacts with the governments concerned and private industries in Central America. He also assists the Director in the formulations of policy on the Institute's work programme and financial management. Before taking up his present assignment, Mr. Mercier was a United Nations technical assistance expert in Laos. Earlier, he served as consultant and technical supervisor with various industrial corporations in France, the United States, and Japan. Mr. Mercier is a graduate of the Ecole Nationale Supérieure de Chimie Industrielle et Textile in Roubaix, France.

A production engineer is serving with the Management Engineering Division of the Industrial Research Institute in *Sudan*. The Institute is aiding and promoting the industrial and economic development of the country through the application of industrial research and technology and its adaptation to the country's conditions and resources. Mr. Harold J. Smith, the engineer, is specifically concerned with planning and troubleshooting for small and middle-size industrial enterprises on problems of factory layout; equipment selection; capacity balance; flow-line design; project planning, and the like. Mr. Smith, who is from the United Kingdom, for many years has been in the mechanical engineering industry, with responsibility for production programmes; operational planning; material control systems; time and methods study; and plant and factory layout. Since 1941 he has occupied managerial posts covering administration of manufacturing, machine shops, design offices, tool rooms, engineering groups, and purchases and stores, to name a few. He is a member of the British Institute of Production Engineers.

The Institute for Technological Research in *Colombia* wished an independent evaluation of its methods of promoting, developing, administering and executing research projects; suggestions on strengthening its links with industries, government agencies and others concerned with technological development; and recommendations on improving its current activities as well as on its future plans and programmes. For this vital assignment in furthering the growth of the Institute, the United Nations assigned Dr. Lawrence W. Bass as research administration expert. Dr. Bass received his Ph.D. in industrial chemistry from Yale University, and attended the Sorbonne and New York University. He has been a member of numerous technical societies and currently is on the Board of Directors of a number of professional societies, including the American Institute of Chemists and the United States Engineers Joint Council. Presently a management consultant in industrial research and its administration, he has been Vice President of Arthur D. Little, Inc. and of United States Industrial Chemicals Company; and also Director of New England Industrial Research Foundation and Assistant Director of Mellon Institute of Industrial Research. Dr. Bass is author of four technical books and of over 100 scientific and technical papers.

To fill the vacant post of Project Manager of the Sudan Industrial Research Institute, Dr. Mohamed El Halfawy of the United Arab Republic has been appointed and shortly will arrive in Khartoum to direct the continuing development of the project. He also will have the co-responsibility of directorship of the Institute. Dr. El Halfawy brings to the post broad experience in industrial research and its administration. Prior to his present appointment, he was Director General of the General Organization for Industrialization of the United Arab Republic, administering a large group of chemists and engineers concerned with implementing chemical and petrochemical projects in the Five-Year Plans. Earlier he supervised various engineering and research sections of the Planning Department of the Organization and held professorships at the University of Cairo; University of Baghdad; and Alexandria University. He was educated at Cairo University and the Imperial College, London, where he received his Ph.D. and D.I.C. in Applied Chemistry; he has published many technical papers; holds memberships in various scientific societies and participated in the Interregional Seminar on Industrial Research and Development Institutes held in Beirut in December 1961.

Interinstitute Co-operation

Interinstitute co-operation is an effective way of coping with deficiencies in developing countries and thus making maximum use of limited institutional facilities. These include exchange arrangements in such areas as fellowships, training programmes, information services, equipment and promotion of further co-operation with industrialized countries. We offer this section as an encouragement to such arrangements of mutual benefit.

Fellowships Available

*The Philips International Institute of Technological Studies** in Eindhoven, Netherlands, grants 30 fellowships each year to students who have completed a university course of training or its equivalent, are 30 years old or less, in good health and have a good speaking and understanding knowledge of English. The fellowships cover free tuition but the Institute also grants cost-of-living allowances of f.675,—at present in certain cases. Travelling expenses are paid by students.

Fellowships usually last a year, at the end of which time a diploma is awarded stating the time and subject of study. Students who stay less than nine months receive a certificate instead.

Study can commence at any time during the year but it is advisable to commence during the second half of September or the beginning of October at the latest. Applications should be submitted at least three months prior to the expected date of arrival at the Institute.

The subjects of study fall mainly under the general heading of electronics and allied subjects, including, for example: radio; television; telecommunication; measurement and control equipment and their industrial applications. But other subjects such as light and lighting, X-rays; electron microscopy; welding materials and techniques and some branches of applied chemistry also offer possibilities.

A new development in the affairs of the Institute now makes it possible to offer "above average" students a Master's Degree in Electronic Engineering. Hitherto, this has not been possible because the P.I.I., as an institution of private industry, lacked the independence on which academic awards must be based.

Co-operative action by the Netherlands Universities Foundation for International Co-operation (NUFFIC) and the professors of the Netherlands Technological Universities make it possible for P.I.I. students to obtain a Master's Degree in Electronic Engineering. Such a degree would be awarded by the authority of NUFFIC. Attainment of this degree is possible if a student works on through a third semester after completing two semesters, the necessary work for the usual P.I.I. Diploma. A Degree Examination is scheduled for the month of January.

The Institute also offers opportunities for undergraduates to do practical work with Philips for periods of two months. These fellowships are requested through the International Association for the Exchange of Students for Technical Experience, IAESTE, and applications must be submitted to the IAESTE's office in the student's own country.

Inquiries should be addressed to:

PHILIPS INTERNATIONAL INSTITUTE
Eindhoven, Netherlands

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* Supported by the Philips Concern, an International body with a world wide sales organization and manufacturing facilities in many countries. The Concern grew out of a small incandescent lamp factor founded in 1891 by Gerard Philips. Besides incandescent lamps, the Philips Concern now manufactures gas discharge and fluorescent lamps in an endless variety for indoor lighting, street lighting, lighthouses, airport runways, cinema projection and studio lighting, etc. The concern employs more than 211,000 people all over the world, about 78,000 of them at Eindhoven and 50 other places in the Netherlands.

The National Research Council of Canada will award approximately 120 one-year post doctorate fellowships for 1966-67 in the Council's and other government laboratories. Applicants should be 35 years old or less and hold a Ph.D. from a recognized university or expect to obtain it before taking up an award. Equivalent research experience will also be considered.

Fellows receive an income tax free stipend of $6,000 Canadian and a travel grant. Married fellows accompanied by their wives receive an additional 2/3 of the travel grant.

Fellowships are open to all countries, but successful candidates must meet Canadian immigration requirements.

The fellowships are tenable in the following laboratories: (number in parentheses)

National Research Council: (60) Chemistry, physics, biological sciences; and engineering research;

Department of Agriculture: (17) Animal science; plant science; microbiology; soil science; entomology and nematology; pesticides; and analytical chemistry;

Department of Forestry: (5) Forest land, tree biology, silviculture, entomology; forest pathology; and forest products;

Department of Mines and Technical Surveys: (17) Dominion Observatory; Dominion Astrophysical Observatory; Geological Survey of Canada; Mines Branch; and Marine Sciences Branch;

Fisheries Research Board: (2) Halifax, N.S.; St. Andrews, N.B.; Vancouver, B.C.; and Nanimo, B.C.;

Meteorological Service: (2) Physical meteorology; dynamic meteorology; and synoptic meteorology;

Research Laboratories of Food and Drug Directorate: (4) Toxicology and pathology; microbiology; biochemical pharmacology; nutrition; pharmaceutical chemistry; pesticide residues; Laboratory of Hygiene;

Atomic Energy of Canada Limited: (12) Pure and applied physics; reactor physics and engineering; chemistry; chemical engineering; metallurgy; and biology and health physics.

Applications may be obtained from:

AWARDS OFFICE
National Research Council
Ottawa 7, Canada

Fellowships Needed

The Department of Science of the Ministry of Industry, Thailand, is badly in need of well-trained research workers. Fellowships normally available provide for too short a time to permit acquiring the background and experience necessary to plan and carry out independent research work. Desirable fellowships are those that will enable the Department's personnel to obtain a formal education leading to a higher degree in a technically advanced country.

The duration of such fellowships should be two years or more.

Exchange of Scientists

Under the Scientific and Technical Co-operation Agreement between the Governments of India and the United Arab Republic, two scientists from the United Arab Republic are undertaking advanced research training in specialized metallurgical subjects at the National Metallurgical Laboratory in Jamshedpur, India, for a period of two years.

Similar Exchange agreements have also been signed by the Indian Government with other countries.

Technical Training

The Tropical Products Institute, Ministry of Overseas Development, London, England.

The Tropical Products Institute's function is to assist the less developed countries in the better utilization of their plant and animal resources. As part of its service the Institute arranges training for officers from less developed countries. These are usually members, or potential members, of the staff of government departments or public corporations concerned with agriculture, food, fisheries, forestry, trade, industry or rural development. Nearly all the trainees received at the Institute have a University degree or equivalent qualification, but this need not be regarded as an essential requirement. In certain instances, for example, training in the technology of pulp, paper and board production, an Advanced level of the General Certificate of Education or its equivalent would be considered satisfactory.

At the present time, training courses are planned on an *ad hoc* basis for individuals or small groups of trainees, the subject matter and the duration being selected to suit their particular requirements. In addition to practical work and programmes of reading in the Institute, visits to or periods of study in other governmental, university or industrial institutions are arranged. Certificates are given to the trainees on completion of the courses.

The following are examples of fields in which overseas officers may be interested.

a) Crop processing and food technology
b) Technology of pulp, paper and board production
c) Technology and microscopy of industrial fibres
d) Food and feedingstuffs analysis
e) Oils and fats analysis
f) Essential oil technology and analysis and study of spices
g) Pesticide assay and pesticide residue determination
h) Physical and physico-chemical methods of analysis
i) Fungal toxins-microbiology, chemistry and analysis
j) Market surveys of tropical crops and their products
k) Study of small industries based on vegetable or animal products
l) Documentation—library operations, technical indexing, etc.
m) Laboratory administration

Applications for training or requests for further information about training should be addressed to:

THE MINISTRY OF OVERSEAS DEVELOPMENT
Eland House, Stag Place, Victoria
London, S.W.1, England

or to the British Council, the British Embassy or the local office of the British High Commissioner.

Technical Information Requested

The Technological Research Institute of the Applied Research Corporation of Thailand seeks help in solving the following problems:

Castor Oil. Thailand produces over 40,000 tons of castor beans and could easily increase production. However, there is little, if any, crushing of castor beans in Thailand at present.

There is a great need for drying oils, to develop a paint

industry and a dehydrated castor oil is such an oil.

Information is needed on castor oil technology.

(1) Design of the minimum size efficient oil extraction mill for 50-100 tons of castor seeds per day, including the necessary refining.

(2) Process details and plant design for dehydrating castor oil to make a drying oil suitable for paint.

(3) General information on other industrial processing of castor oil (e.g. oxidation, sulfation, alkaline pyrolysis), and on the use of castor oil in urethan polymers.

Lime Oil and Lime Juice. The possibilities for a citrus processing industry in Thailand have been looked into and it was found that the only opportunity at this stage of development is the processing of limes for oil and juice. Plenty of limes can be grown if an outlet for them is found.

Due to the low cost of labour it may be economically feasible to produce a premium grade of hand pressed lime oil. Detailed information on this process is needed so that it can be tried out on a small scale and the resulting product evaluated.

Information is also needed on the most suitable method (considering local conditions) of producing a lime juice concentrate which could be exported; and on the formulation and production of concentrates, purées, syrups, etc., which could be used in the flavouring of fruit drinks, sherbets, ices, and soft drinks.

Silicate Moulds for Foundry. The carbon dioxide/silicate foundry moulding process as used in commercial foundries usually refers to the mould which is prepared and cast in the green state. In cases where thin section castings are cast at about 1200°C, it may be desirable to preheat the mould to enable the liquid metal to run. Information is required as to whether such a silicate mould can be preheated and if so, the maximum temperature at which this can be achieved before the mould material becomes friable, leading to casting defects.

Lost Wax Method of Casting. In the "lost wax" precision casting process the mould material is required to give surface quality to the casting and to possess adequate permeability for mould gas to escape during casting. Some practices use two types of mould materials, one for coating the wax pattern for the surface quality of the casting and the other for the preparation of the mould. Information is required on the details of this technique, particularly concerning the material which will coat and adhere to the wax pattern. If there is a mould material which can provide both the surface quality and permeability the information about it will be most helpful.

Manganese Dioxide. Manganese dioxide prepared artificially by electrolytic precipitation from a manganous sulphate solution has been used as a high quality depolarizer for dry batteries. The dioxide, however, can be formed by chemical precipitation from a manganous solution but little is known of the application of this method commercially. Information is required on the details of the two precipitation processes and the relative merits of the two types of manganese dioxide as dry battery depolarizer.

Institutions willing to help may contact:

TECHNOLOGICAL RESEARCH INSTITUTE
APPLIED SCIENTIFIC RESEARCH CORPORATION OF THAILAND
Bangkhen
Bangkok,
Thailand.
or:
EDITORIAL OFFICE
INDUSTRIAL RESEARCH NEWS
CENTRE FOR INDUSTRIAL DEVELOPMENT
United Nations
New York, New York 10017, U.S.A.

Establishment of Industrial Research Institutes Advocated by Hong Kong Business Man

The Chairman and Business Manager of the Hong Kong and Shanghai Banking Corporation, Mr. J. A. H. Saunders, in his address to shareholders at the Ordinary Yearly General Meeting of the Corporation on 18 March 1966, referred to the need for Hong Kong to undertake research on its own account instead of relying on imported design and technology. He recognized that a research unit in a large industry would require large resources and suggested that smaller industries could be served by an Industrial Research Institute. The institute could be commissioned to undertake testing, design and research and on its own initiative, investigate and develop promising products which could then be taken up by local industry.

Industrial Research Institutes perform an invaluable function in industrialized countries, and Mr. Saunders thought, could be equally valuable in Hong Kong.

InterDok, an organization servicing the fields of science, engineering and technology in the form of information and documentation was formed in 1965. A "Directory of Published Proceedings" is published monthly with the exception of July and August, covering Proceedings on a worldwide basis. A centralized acquisitions service for *Proceedings* cited in the DIRECTORY will be made available to its subscribers.

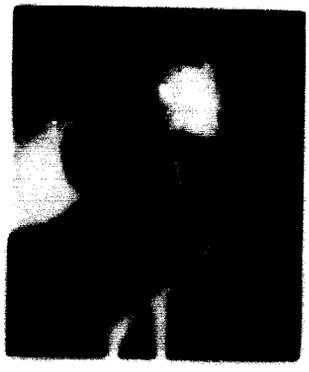
Plans are underway for expanding InterDok's science information services to include coverage of technical conference paper literature.

For further information, write:

INTERDOK
6 Kenneth Road
White Plains, New York, U.S.A.

Men in Research

. . . continues the series of biographic sketches started in the first issue of *Industrial Research News*. It will be a continuing section featuring Directors of Industrial Research Institutes throughout the world. The following countries are represented in this issue: Belgium; Canada; India; United Kingdom; United States; and Yugoslavia.



Louis A. M. Henry, Director, Institute for the Support of Scientific Research in Industry and Agriculture, Brussels, Belgium

Louis A. M. Henry earned his Doctorate in Chemistry at Brussels University in 1927. Immediately thereafter, he was awarded two fellowships in research, one at the Institut International de Chimie Solvay (1927-28) and the second as C.R.B. (Commission for Relief in Belgium) fellow at the California Institute of Technology and at Yale University (1928-30).

For five years, after his appointment in 1930, Dr. Henry held the post as Chief of the Department of physical chemistry at the Fondation Médicale Reine Elisabeth in Brussels. This was followed by an associate professorship in physics at the Institut Agronomique de Gembloux and the Associé du Fonds National de la Recherche Scientifique. He returned to the United States again in 1936 as a C.R.B. Advanced Fellow and in 1938 as a Columbia Research Fellow.

Dr. Henry has concentrated his research activity essentially in the field of low pressure gas reactions, primarily studying, through the use of various techniques of mass spectrography and light sensitive Geiger counters, reaction products resulting from the collision of low velocity electrons with molecular beams. His research career resulted in various publications related to this subject.

Dr. Henry has held the position of Director of the Institut pour l'Encouragement de la Recherche Scientifique dans l'Industrie et l'Agriculture (I.R.S.I.A.) in Brussels since 1946. During this period, he has also published numerous reports dealing both with the activities of I.R.S.I.A. and the subject of applied research.

Mihajlo Mautner, a chemical engineer, undertook his graduate training at the School of Engineering of the University of Zagreb. Between 1932 and 1941, he achieved a wide range of experience as production engineer and technical manager of various food processing factories in Yugoslavia, Rumania, Hungary and Sweden.

Following World War II, in 1946, Dr. Mautner was appointed Director of the Federal Planning Department, a position which he held for five years. At this point in his career, he became associated with the Institute for General Chemical and Food Technology at his alma mater, where he served as lecturer and then Director for more than ten years.

A three-year appointment followed in 1961 as consultant for food industries to the Government of the Republic of Croatia. Playing an active role in the founding of the Institute for Processing Techniques in Zagreb, he was subsequently appointed Director of this Institute in 1965.

In addition to having published many scientific and technical papers, Dr. Mautner has also written three books in applied chemical technology, the most recent of which is entitled *Unit Processes in Food Technology*. Further, he is the holder of a series of patents in Yugoslavia and abroad.

Mihajlo Mautner, Director, The Institute for Processing Techniques, Zagreb, Yugoslavia

B. R. Nijhawan, Director, National Metallurgical Laboratory, Jamshedpur, India

B. R. Nijhawan undertook his university education at the Government College, Lahore, and obtained his Bachelor degree in Metallurgy from Banaras Hindu University in 1936. Awarded a scholarship for advanced metallurgical research in the United Kingdom, Dr. Nijhawan spent three and a half years at the University of Sheffield where his original research on austenitic grain size control of steel earned him a Doctorate in Metallurgy in 1941.

From 1941 to 1948, as Metallurgical Research Officer to the Department of Supply, he served his Government by undertaking comprehensive investigations into deficient aspects of defence material, and the results of these endeavours were published in India and abroad after World War II.

In addition to research in the areas mentioned above, Dr. Nijhawan has also done substantial metallurgical work in the development of substitute austenitic nickel-free stainless steels, iron and steel technology, aluminization and production of ferro-chrome and pilot plant studies for the iron and steel industry, to mention a few. He is the author of numerous technical and research publications and has jointly taken several patents on different specialized metallurgical processes in India and abroad.

As Director of the National Metallurgical Laboratory at Jamshedpur, of which he has been a member since its inception in March 1948, Mr. Nijhawan has contributed much to nurturing its growth as one of the foremost international laboratories in metallurgical research and development. He is further a member of numerous technical committees and boards set up by the Government of India to act in an advisory capacity to mineral and metallurgical enterprises.

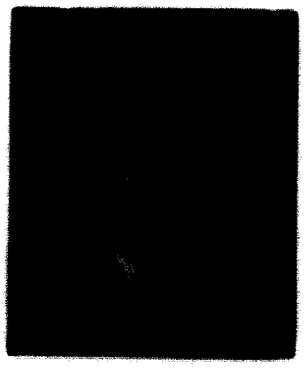
He is a recipient of many national and international awards for his contributions to metallurgical research and has travelled widely as lecturer and delegate in his field of specialization.

B. D. Thomas earned B.S. and Ph.D. degrees in chemistry at the University of Washington. He joined Battelle's research staff in 1934 and in 1939 established and headed the Division of Chemical Research. He was a key figure in the establishment of Battelle's research centres in Frankfurt, Germany and Geneva, Switzerland in the early 1950's, and the Pacific Northwest Laboratories at Richland, Washington, in 1965.

Since 1957 he has been President of Battelle, a research organization with a worldwide staff of 5,800 engineers, scientists and supporting personnel and an annual research expenditure in excess of $75 million. Battelle's research studies encompass virtually all fields of science and technology.

Dr. Thomas is a member of the executive committee of the Division of Engineering and Industrial Research of the National Academy of Science-National Research Council in the United States and of the National Council of the National Planning Association. He is a member of the Board of Distinguished Consultants of the Ohio Society of Professional Engineers.

His professional affiliations include the American Chemical Society, the American Association for the Advancement of Science, the American Institute of Mining, Metallurgical, and Petroleum Engineers, Gesellschaft Deutscher Chemiker, E.V. (Germany), Société de Chimie Industrielle (France), American Foundrymen's Society, the Geochemical Society, and the Ohio Society of Professional Engineers.



B. D. Thomas, President, Battelle Memorial Institute, Columbus, Ohio, U.S.A.

His interests extend beyond the professional and include the cultural and economic aspects of the community, state, and nation as well; he is a member of the Board of Trustees of the Ohio State University in Columbus, Ohio, and of Case Institute of Technology in Cleveland, Ohio; a vice-president of the Board of Trustees of the Columbus Gallery of Fine Arts; a director of the Columbus Area and the Ohio Chambers of Commerce; and a Trustee of the Pacific Science Center Foundation.

E. S. Hiscocks,* Director of the Tropical Products Institute, retired from public service on 31 March 1966. Dr. P. C. Spensley, Deputy Director, succeeded him as Director.

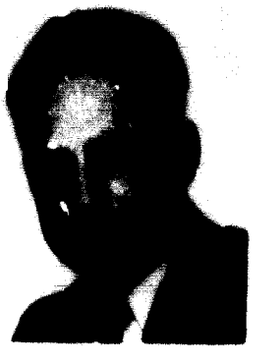
P. C. Spensley was a foundation scholar of St. Paul's School and of Keble College, Oxford, where he studied chemistry. His research after the Second World War in the Dyson Perrins Laboratory at Oxford was mainly concerned with the synthesis of organic compounds of possible therapeutic interest. Between 1940 and 1945, Dr. Spensley

* Mr. Hiscocks' biography was published in the January 1966 issue of *Industrial Research News*.

P. C. Spensley, Director, Tropical Products Institute, London, England

was on the staff of the Ministry of Supply, Royal Ordnance Factories, where he was concerned with explosives and ammunition production, smoke weapons development and standards. In 1950 he joined the staff of the National Institute for Medical Research and, in the course of a working visit to East Africa, discovered a method by which a valuable, but minor, component of the sisal plant—hecogenin—could be extracted economically as a by-product of the sisal fibre industry. This process he developed further with the National Research Development Corporation and it is now operated commercially in Tanzania and Kenya to provide hecogenin for the production of steroid drugs. Dr. Spensley received a major inventor's award for his work in 1963. In 1954, Dr. Spensley was appointed to the scientific staff of the Colonial Office in the Imperial Institute and became Scientific Secretary of the Colonial Products Council. With the then director he was closely concerned with the planning which led to the evolution in 1958 of the Tropical Products Institute and soon afterwards he was made assistant director in charge of administration and development. In this post he has travelled widely and attended a number of International meetings. He assisted Sir William Slater in the organization of the British contribution to the major United Nations Conference on the Application of Science and Technology for the benefit of the Less Developed Areas, held in Geneva in 1963.

Paul C. Trussell took his Bachelor of Science degree in Agriculture at the University of British Columbia in 1938. From 1938 to 1940 he worked with the Meteorological Service of Canada on a meteorological survey associated with smoke control.



Paul C. Trussell, Director, British Columbia Research Council, Vancouver, B. C., Canada

In 1942 and 1945 respectively, he earned a Master and a PhD degree at the University of Wisconsin School of Agriculture, majoring in agricultural bacteriology and biochemistry. In pursuit of his main interest, he acted in 1945 as Consultant Bacteriologist for the American Scientific Laboratories in Illinois.

Dr. Trussell was Chief Microbiologist in the Research Division of Ayerst, McKenna and Harrison Limited for the next three years. In 1947 he joined the British Columbia Research Council as Head of the Division of Applied Biology and in 1961 he was appointed Director of the Council.

As a researcher, Dr. Trussell has contributed over thirty scientific papers on antibiotics, marine borer control, treatment of industrial wastes and biological leaching of mineral sulphides. He is also the holder of several patents relating to production of antibiotics, chemical control of marine borers and underwater sonic testing of marine piling.

The Volunteers for Technical Assistance

"To help others attain a better standard of living" is the goal of the Volunteers for Technical Assistance, VITA, an American association composed of 1,000 scientists engineers and business people from 250 corporations and 65 universities throughout the United States.

Based on the premise that an enduring peace can be achieved only by eliminating the great disparity among the living standards of nations, the volunteers give their time and skills to assist those seeking help toward this end. The volunteers provide free advice as well as solutions for technical problems sent in by groups or individuals in various countries.

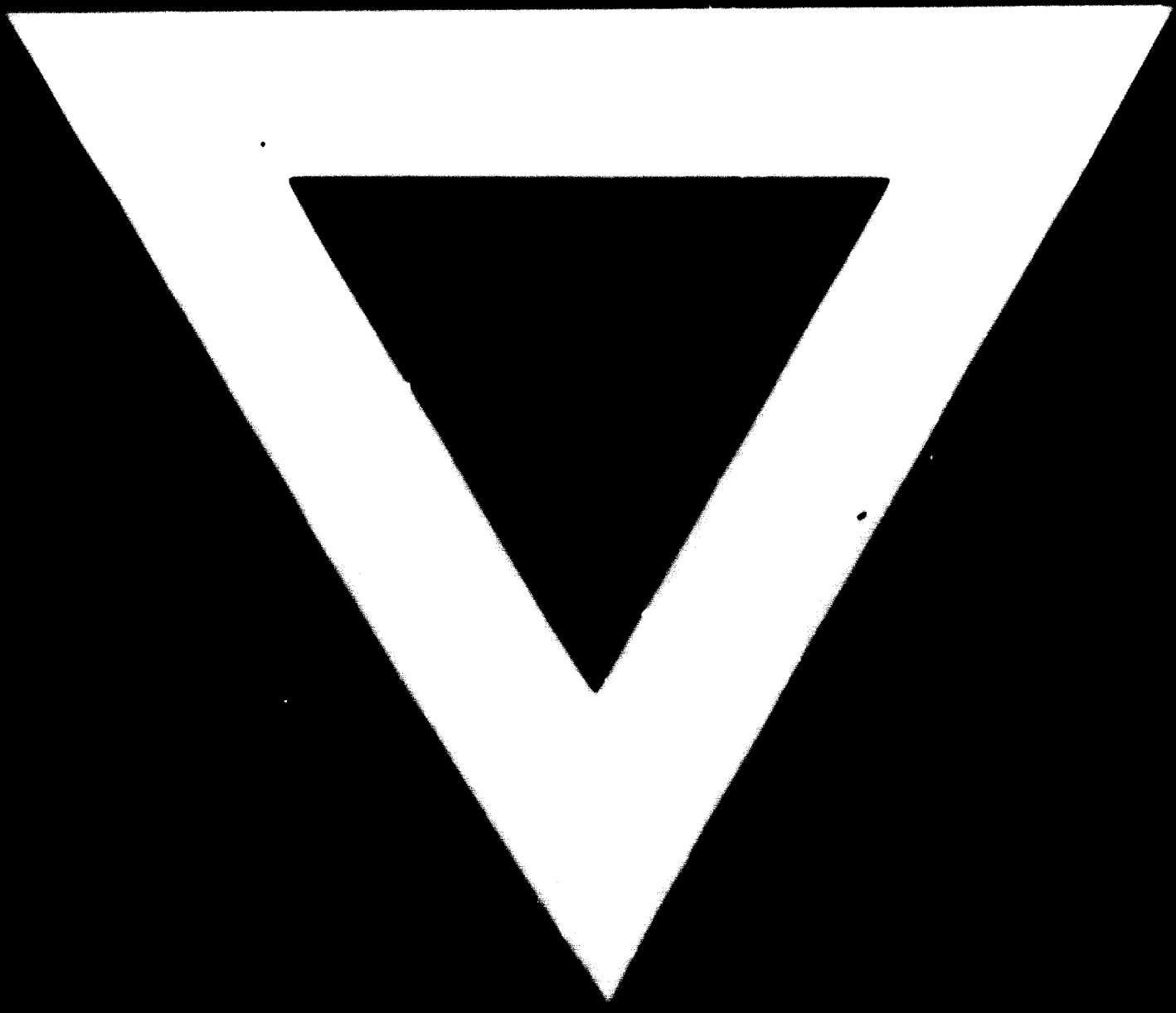
VITA was founded by Dr. Robert M. Walker, a General Electric physicist, who met in the Spring of 1959 with a group of scientists and engineers in the Schenectady area to discuss the appropriate way to export engineering techniques to help others. The idea grew and at present VITA has chapters in many cities of the United States. Among the impressive list of organizations supporting VITA are: the Detroit Edison Company; IBM World Trade Corporation; Johnson and Johnson; the Charles F. Kettering Foundation; the Rockefeller Brothers Fund, the Alfred P. Sloan Foundation and the CODE Foundation.

Benjamin P. Coe, the Executive Director, sums up the reason for VITA in these words: "People participate because they want to help—they feel a need to be involved in overseas work."

Up to the end of 1965, VITA had answered more than 1,100 calls for technical help from 81 countries.

Individuals wishing to participate in VITA activities and requests for technical help should be addressed to:

MR. BENJAMIN P. COE
VITA, *Inc.*
230 State Street
Schenectady, N.Y. 12305
U.S.A.



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