FIFTY YEARS OF THE DEPARTMENT OF ORGANIC CHEMICAL TECHNOLOGY OF THE TECHNICAL UNIVERSITY BUDAPEST

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1. Foundation of the deparment and development of its educational activities

The first record related to the foundation of the Department can be found in paragraph 107 of the minutes taken at the 4th ordinary session of the academic year 1936/37, held on June 25, 1937 by the Council of the Royal Hungarian Technical and Economic University Palatin József:
The dean of the Faculty of Mechanical and Chemical Engineering, presents to the Faculty headed by him the memorandum submitted to the Royal Hungarian Minister of Religion and Public Education on the subject of the organization of the Department of Textile Chemistry to be installed at the Section of Chemical Engineering of the Technical University."

The Corporation Goldberger Sám. F. and Sons, and Dr. Leó Buday-Goldberger de Buda, the president—general manager of this enterprise, endowed a foundation for establishing a University Department of Textile Chemistry. In the deed of foundation and the document of donation the following is to be read:
"The aforenamed endow the foundation described in the deed of foundation and which serves the purposes of a University Department, together and under joint auspices and liability, and put the donation as specified in the donation document to the disposal of the experimental and research institute functioning beside the Department to cover the costs of its establishment and maintenance."

"I. Name of the foundation: Foundation by Goldberger Sám. F. and Sons and Dr. Leó Buday-Goldberger de Buda for establishing a University Department of Textile Chemistry."

"II. Objective of the foundation: establishing and maintenance of a Department of Textile Chemistry at the Royal Hungarian Technical and Economic University Palatin József. The task of this Department will be the training, particularly in the field of dyeing chemistry, of specialists of Hungarian university qualification able to develop domestic textile industry and to maintain the textile industry on an internationally competitive level: on the other hand, the task of the Department will be also the advancement of the science of textile chemistry by independent theoretical and practical research work and experiments on Hungarian soil."

"III. The fortune of the foundation consists of shares of the Hungarian Bank of Commerce to a nominal value of 50 000 Pengoes as well as of shares to a current price of 100 000 Pengoes, to be handed over within two years. The foundation will be administered by the Minister of Religion and Public Education. Moreover, the founders will donate 50 000 Pengoes for the expenses of the laboratory of textile chemistry to be set up by the Department of Textile Chemistry to be established, and put at their disposal, from July 1st, 1937, for a period of ten years, a yearly due sum of 15 000 Pengoes each, for covering the legal salaries of the two assistants' appointments to be introduced at the Department and the other personal and materials needs of the Department and the Laboratory.

The founders jointly oblige themselves, as long as all the shares will be handed over, to complete, from their own funds, the income of the foundation to a yearly 9700 (nine thousand seven hundred) gold Pengoes and to put this sum every year, not later than July 1st at the disposal of the Royal Hungarian Minister of Religion and Public Education."

The deed of foundation and the document of donation were dated Budapest, June 30, 1937. Also dated June 30 was the declaration of acceptance by the Minister of Religion and Public Education, and this was followed, on July 24, 1937, by the approval of the head of state.

On April 29, 1938, the Minister of Religion and Public Education invited applications for the vacant Department of Textile Chemistry belonging to the Section of Chemical Engineering:

"It will be the duty of the professor to be appointed to lecture on his special branch of science every semester, according to the current program of the Technical University, to give the necessary laboratory practice, to hold the examinations ("colloquium" and "rigorosum"), and to direct the collection of tools and chemicals and the laboratory, respectively, entrusted to his leadership.

The following duties belong to the program of the Department:

A) During the first term an encyclopedic, reduced course in 2 hours a week which would give a summary of the chemical technology of artificial filamentous materials, with the object to make this course, in the new chemical engineering program under elaboration, compulsory to all the students of chemical engineering.

B) During the first term in 2 hours a week, and during the second term in 3 hours a week, a comprehensive and systematical lecture on textile chemistry, dealing with the natural and synthetic filamentous materials used in the textile industry, with the preparative operations for their coloration, with the dyes applied, the methods of their recognition, with the different dyeing processes, printing, the finishing operations and all the subsidiary materials of the textile industry.

C) During the first term in 2 hours weekly a lecture on plastics. Synthetic resins and plastic materials. Cellulose derivatives important from an industrial aspect. Plastics and filamentous materials to be obtained from proteins.

D) During the second term in 2 hours weekly a lecture on lacquers. Characterization, subdivision of lacquers, the development of their manufacture. Natural and synthetic raw materials of lacquer manufacture. Solvents of the lacquer preparation, preparation of varnishes, linseed oil and its transformations, siccatives. Different types of lacquers.

Number of weekly hours of lectures: 6 hours in the first term and 5 hours in the second term.

Moreover, the new professor is obliged to hold practical exercises in textile chemistry for those who register for it, in a number of weekly hours to be established later."

The session of the Council of the Royal Hungarian Technical and Economic University Palatin József held on June 23, 1938, dealt with the judgement, classification and forwarding of the applications in order to appoint a professor to the Department of Textile Chemistry. Some excepts from the minutes read as follows:

"...In answer to the invitations for application for the appointment as Head of the Department of Textile Chemistry recently established within the Section of Chemical Engineering of the Faculty, a total of 3 applications has been submitted to abovenamed Faculty till the dead-line of May 31st, this year, namely on the parts of
Dr. Zoltán Csürös, private docent of the technical university, assistant professor;
Dr. Tibor Keresztes, professor at the state college of technology and
Dr. Aladár Vajdafy, titular associate professor and private docent at the technical university."

The Section of Chemical Engineering decided "to place first Dr. Zoltán Csürös, private docent of the Technical University, assistant professor, to place second Dr. Aladár Vajdafy, titular associate professor and private docent at the Technical University as candidates for the recently established Department of Textile Chemistry, and to omit Dr. Tibor Keresztes, professor at the state college of technology, from the proposal as candidate."

From the minutes of the University Council:

"...The Council of the Technical University unanimously decided to support the decision of the Faculty of Mechanical and Chemical Engineering in relation to the candidature for the appointment as Head of the recently established Department of Textile Chemistry and forwards it to the Minister of Religion and Public Education with the suggestion that he should make his proposal to His Grace the Governor, on the basis of this suggestion, as to the appointment of the professor of the Department of Textile Chemistry."

On the basis of the suggestion of the Council of the Technical University and the proposal of the Minister of Religion and Public Education, the Head of State appointed Dr. Zoltán Csűrös, as extraordinarious professor to the Department of Textile Chemistry of the Section of Chemical Engineering. He took the oath of office on August 31, 1938, at the session of the rector's council.

The educational activity of the Department started in the academic year 1938/39 with lectures on the subjects textile chemistry (3 hours a week) as well as lacquers and plastics (2 hours a week) (for third-year and fourth-year students of chemical engineering as non-compulsory lectures). Laboratory courses of textile chemistry (10 and 5 hours a week, respectively) as well as of lacquers and plastics (5 hours a week) are to be found in the program for the first time in the academic year 1939/40.

Dr. Zoltán Csűrös was appointed university professor ("ordinarius") as from December 30, 1940.

Apart from minor changes, the educational work of the Department was carried on in a similar way until the period after the second World War. The first Budapest air-raid of World War II, on September 7, 1942 heavily damaged

the equipment of the Department. However, the losses suffered by the Department during the siege of Budapest from December 27, 1944 to February 12, 1945, were much more detrimental. As a results of a number of bomb hits and artillery marks, the central building was heavily damaged and so were the equipment and the instruments of the Department. Part of the chemicals in store were hidden in the apartment of the laboratory assistant Mihály Gál. It was due to this fact that, after disposing of the ruins of the buildings and partial rebuilding of the damaged premises, educationsal work could be started again, on April 8, 1945.

At the regular session of the Section of Chemical Engineering, on October 30, 1946, professor Csűrös asked in a petition for the permission to alter the name of the Department:

"...the name of the Department of *Textile Chemistry* belonging to the Section of Chemical Engineering should be, from now on, Department of *Organic Chemical Technology*."

In his letter of December 20, 1946, the Minister consented to the name of the Department being changed and to the new name being used from the second semester of the academic year 1946/47. In the program of the academic year 1947/48 we can find already the courses Organic Chemical Technology I and II.

With the academic year 1947/48 the elaboration of the reform of university education has started, involving reshaping programs and plans of tuition. The name of the university has been changed in 1949 into Technical University Budapest and the Section of Chemical Engineering which functioned since 1934 as part of the Faculty of Mechanical and Chemical Engineering, has regained independence as Faculty of Chemical Engineering. Strong specialization has started at the Faculty of Chemical Engineering (Speciality A: Inorganic Chemical Technology; speciality B: Organic Chemical Technology; speciality C: Agricultural Chemical Technology and Food Industry). At that time tuition of the entire speciality B as well as the course "Technological Encyclopedia" given for the students of the other two specialities, were the duties of the Department of Organic Chemical Technology.

In the course of the reform introducing specialization, during the academic year 1948—49, the course "Unit processes in Organic Chemical Industry" has been introduced as compulsory lectures for the students of speciality B, in order to improve the attitude of the students towards technology. The lecturer of this course was Dr. Zoltán Földi, the excellent researcher and chemical engineer of the pharmaceutical factory Chinoin (whose director he had been at a time), who later became titular university professor and member of the Hungarian Academy of Sciences. His lectures made a great impression on the students. Later on this course was given by

professor Csürös who was followed in this task by his co-workers. Although the weekly number of hours devoted to this course often changed with progressing time and changing plans of tuition (the general trend was decreasing), it still remained one of the principal courses, even in the eighties (and was compulsory for all the students of the faculty).

After frequent modifications in the early fifties, the plan of tuition of the Faculty of Chemical Engineering, and within it the charges of educational work the Department had to bear, were stabilized in the academic year 1955/56. However, towards the end of the fifties new reform efforts were started. As a result of these the education of chemical engineers without specialization and based on strong courses of basic natural sciences and technology was reinforced and the so-called system of branches introduced. From the academic year 1963/64 on, the basic education was followed by sectorial education in five branches: 1) organic synthetic chemical industry, 2) pharmaceutical industry, 3) light chemical industry, 4) plastics industry and 5) food industry, biological and fermentation industry. The Department was in charge of the entire education in the branches of the pharmaceutical and light chemical industries. The education in the branch of the organic synthetic chemical industry was carried out jointly with the Department of Chemical Technology. In the frame of the reform—in order to improve the attitude towards the plants—the system of practical production courses in plants were introduced for longer periods; the duration of 6 months at the beginning was more and more reduced later on. Towards the end of the sixties, the experiences of the nearly decade-old reform showed that part of the graduated chemical engineers worked in the fields of technical development, research and planning, while the other part directed the daily production of plants. Therefore it seemed expedient to start the education of the chemical production-engineers so called two-stage training of chemical engineers. The training of production engineers maintained the structure of the farmer sectorial training.

In the two-stage education introduced at the Faculty of Chemical Engineering of the Technical University Budapest in the academic year 1969/70, there was, for two years, a joint training of the production engineers and the certificated chemical engineers. The production engineering students obtained in the 3rd year, beside closing down the general basic training, a specialized technological training according to the branches formerly established, and the last step in their education was the preparation of a thesis. The students of the certificated engineers' course obtained, from the 5th semester on, a basic training of the second stage, and from the 8th semester on, a sectorial technological training. Their education was completed by practical designing exercises and optional compulsory courses, then followed the preparation of a thesis. The education ended for both stages by state examinations. This kind od two-stage education is the so-called 2 + 3 (partly

parallel) system. On the basis of the analysis of the experiences, this system was substituted in the mid seventies, by a superimposed, 3 + 2 system. According to this, all the students obtain a production engineering training in 3 years. In the semesters 3 to 5 the foundations of the certificated engineers' training are laid with the aid of the so-called criteria-course system, and the students who attain a satisfactory result obtain a further 2-year training of certificated engineers. This system is still operative—with minor improvements—today at the Faculty and this determines the educational tasks of the Department.

At the beginning, in the academic year 1938/39, the educational activities of the Department involved two—non-compulsory—courses (3 hours a week and 2 hours a week). In the academic year 1947/48 (the first academic year after changing the name of the Department) we can find the courses Organic Chemical Technology I and II(6 hours a week each) as well as the laboratory courses Organic Chemical Laboratory Exercises (10 + 6 hours a week).

In the mid fifties, in the academic year 1955/56 the Organic Chemical Technology can be found in the program with 5 hours lectures a week and 14 hours laboratory courses a week. (At that time the Department of Plastics and Rubber Industry had been already established and part of the subjects were taught by them).

Parts of the program:

"*Organic chemical technology*. (Department of Organic Chemical Technology) 5 hours lectures a week during *5 semesters*. Unit processes, production of intermediate products, chemical technology of mineral oil and natural gas, pharmaceuticals, production of dyes, production and application of pesticides and plant protecting substances, photographic materials, industrial explosives. Chemistry and chemical technology of cellulose, wood degradation, paper industry, cellulose-based synthetic fibres, chemical technology of the textile industry, protein chemistry, protein-based synthetic fibres, technology of the leather and fur industry, glue manufacture, auxiliary materials, surfactants, processing of synthetic fibres, analytical procedures applied in the cellulose and protein industries, analyses and methods for quality determinations, knowledge of commercial goods of the light industry. In the 7th *semester* laboratory courses, 14 hours a week. Dyes, important pharmaceutical formulations, surfactants, plant protecting substances and pesticides, production of industrial emulsions, catalytic oxidations and reductions, continuous esterification, continuous halogenation. Reactions under pressure. Wood pulping, cellulose coloration, bleaching, dyeing, washing and dyeing of wool, analysis of dyes, separation of synthetic fibres, separation determination of wool-cotton, wool-synthetic fibres, cotton-synthetic fibres, removal of stains, determination of auxiliary substances, misroscopic determinations."

The general subject "Labour safety" belongs, at this time, also to the Department, and titular university professor Dr. Dénes Kiss gives the lectures in two hours weekly to all the students of the faculty.

The program of this course is as follows:

"*Labour safety*. (Department of Organic Chemical Technology) 2 hours weekly in the 9th semester. Statistics of industrial accidents, labour safety and hygienic aspects related to the

construction of industrial plants, industrial accidents in the chemical industry as caused by electric current, enumeration of the principal toxic chemicals, description of the particulars related to the physiological symptoms of poisonning and to the prevention and curing, respectively, of poisoning, ventilations equipment of industrial plants, basic knowledge of labour safety and first aid; accidents occuring in, and caused by the chemical industry; use of equipment for gas- and fire protection.

From the 1956/57 academic year on, the lectures and laboratory course "Organic chemical technology" held for the daytime and evening students of the branch of mechanical engineering for the chemical industry of the Faculty of Mechanical Engineering, entered the educational duties of the Department. From the academic year 1975/76 this was the case for the lecture course "Chemical technology" given for the daytime and correspondent students of the branch of organizing chemical engineering of the University of the Chemical Industry Veszprém.

In the 1950-ies the teachers of the Department regularly participated in teaching the subjects of the Workers' Technical Evening School of the Chemical Industry. Likewise from the first half of the 50-ties they have taught at the course for chemical laboratory assistants jointly established in 1946 by the Trade Union Committee of the Technical University Budapest and the Faculty of Chemical Engineering. Since 1975 the director of above course has been a teacher of the Department.

By the mid eighties, the educational tasks of the Department have changed as follows:

Courses compulsory for all the students of the Faculty:*	
Unit processes of the organic chemical industry	(N.* III.)(2+4)**
Unit processes of the organic chemical industry	(E.*** IV.)(3+5)
Labour safety	(N. III.)(2+0)
Courses compulsory for the students of the pharmaceutical branch:	
Pharmaceutical chemistry and technology	(N. III)(3+6)****
Pharmaceutical chemistry and technology	(E. IV)(3+7)
Basic processes of pharmaceutical chemistry	(N. II)(2+0)
Basic processes of pharmaceutical chemistry	(E. IV)(1+0)
Pharmaceutical chemistry	(N. V)(3+0)
Pharmaceutical chemistry	(E. VI)(2+0)
Synthesis of biologically active substances	(N. V)(2+5)
Chemistry and technology of plant protecting substances	(N. V)(2+0) v
Chemistry and technology of plant protecting substances	(E. VI)(2+0) v
Basic processing of the chemistry of pharmaceuticals and plant protecting substances	(E. VI)(2+0)
Methods of pharmaceutical research	(N. IV)(2+0) v
Methods of pharmaceutical research	(E. VI)(2+0) v
Formation of biologically active compounds	(N. V)(2+0) v
Formation of biologically active compounds	(E. V)(2+0) v
Methods of the chemistry and synthesis of plant protective agents	(N. V)(2+0) v
Designing practice	(N. V)(0+4)
Designing practice	(E. VI)(0+6)
Thesis (for production engineers)	(N. III)(240 h/term)
Thesis (for production engineers)	(E. IV)(290 h/term)

* Explanation of symbols and abbreviations at the end of the enumeration.

Thesis (for certificated engineers)	(N. V)(0 + 32)
Thesis (for certificated engineers)	(E. VI)(370 h/term)
Production practice I	(N. II)(4 weeks)
Production practice II	(N. IV)(4 weeks)
Courses compulsory for the students of the light industry branch:	
Chemical technology of the filament and fibre industry I	(N. II)(4 + 0)
Chemical technology of the filament and fibre industry II	(N. III)(5 + 8)$^{+ + + +}$
Basic chemical processes of the filament and fibre industry	(N. V)(3 + 5)
Basic chemical processes of the filament and fibre industry	(E. VI)(2 + 0)
Physics of filamentous and fibrous materials	(N. V)(2 + 0)
Chemistry of filamentous materials	(E. IV)(2 + 0)
Textile and paper chemical technology	(E. IV)(3 + 6)
Technologies of tensides and dyes	(E. IV)(2 + 0)
Selected chapters of the technology of the paper industry	(N. III)(2 + 0) v
Structure investigations on filament forming polymers	(N. IV)(2 + 0) v
Operations of the filament and fibre industry	(N. IV)(2 + 0) v
Operations of the filament and fibre industry	(E. VI)(2 + 0) v
Theory of coloration	(N. IV)(2 + 0) v
Theory of the cellulose and paper manufacture	(N. IV)(2 + 0) v
Textile mechanical technology	(N. V)(2 + 0) v
Technologies of surface treatment and glueing	(E. V)(2 + 0) v
Designing practice	(N. V)(0 + 4)
Designing practice	(E. VI)(0 + 6)
Thesis (for production engineers)	(N. III)(240 h/term)
Thesis (for production engineers)	(E. VI)(292 h/term)
Thesis (for certificated engineers)	(N. V)(0 + 32)
Thesis (for certificated engineers)	(E. VI)(370 h/term)
Production practice I	(N. II)(4 weeks)
Production practice II	(N. IV)(4 weeks)
Courses compulsory for the students of the organic synthetic chemical industry branch:	
Organic chemical technology I	(N. III)(3 + 5)$^{+ + + +}$
Organic chemical technology II	(E. IV)(3 + 5)
Development of technologies in the organic chemical industry	(N. V)(3 + 3)
Development of technologies in the chemical industries	(E. VI)(2 + 0)
Industrial catalysis	(N. VI)(2 + 0) v
Industrial catalysis	(E. V)(2 + 0) v
Chemistry and technology of surfactants	(N. VI)(2 + 0) v
Chemistry and technology of surfactants	(E. V)(2 + 0) v
Designing practice	(N. V)(0 + 4)
Designing practice	(E. VI)(0 + 6)
Thesis (for production engineers)	(N. III)(240 h/term)
Thesis (for production engineers)	(E. VI)(292 h/term)
Thesis (for certificated engineers)	(N. V)(0 + 32)
Thesis (for certificated engineers)	(E. VI)(370 h/term)
Production practice I	(N. II)(4 weeks)
Production practice II	(N. IV)(4 weeks)
Courses given to students of other faculties and universities, respectively:	
Organic chemical technology	(N. V, mech. eng. chem. ing.) (2 + 0)

Chemical technology	(N. III, VVE)(3+0)
Chemical technology	(E. IV, VVE)(3+0)

$^{+}$, N = daytime students
$^{++}$ = hours weekly (in brackets): theory + practice;
$^{+++}$ = evening courses;
$^{++++}$ = in the frame of education transferred to a plant
v = optional compulsory course;
VVE = University of the Chemical Industry Veszprém
E = evening students

From the aforesaid it can be clearly seen that the educational tasks have multiplied during the five decades elapsed since the foundation and that they constitute a considerable part of the educational work of the Faculty of Chemical Engineering.

With the increase of the tasks the number of teaching and research staff increased, of course, too. The changes in the numbers of teaching and research staff can be seen in Fig. 1, while the changes in the numbers of scientific degrees held by staff members are shown in Fig. 2.

The present structure of the Department dates from the 1970-ties. The teaching, research and technical auxiliary personnel carry on their work in four sections. These sections are educational units, however, they are not rigorously separated from each other. The section "Unit processes" is the host of the course "Unit processes of the chemical industry", while the sections of the pharmaceutical industry, the light industry and synthetic materials are the hosts of the tuition in the branches belonging to the Department. The sections comprise 8 to 16 graduates and 7 to 10 technicians or laboratory assistants each. The heads of the sections are the professors of the Department.

The different bodies of the Department assist the head of the Department in his directing activity, ensure the impartment of informations and support the democracy at the working place.

The leading body of the Department consists of the head of Department, the deputy head of Department, the leaders of the sections, the party group steward, the leading trade union steward, the secretary of the local organization of the Young Communist League and the elected representative of the non-graduate employees. At its weekly sessions, the body deals with actual problems.

The members of the teachers' conference are the graduates of the Department; the conference takes place every semester, before the beginning of the tuition.

The members of the Department conference are all the employees of the Department. This conference takes place every semester and has, in general, the character of a forum, i.e., the leaders answer to the questions raised.

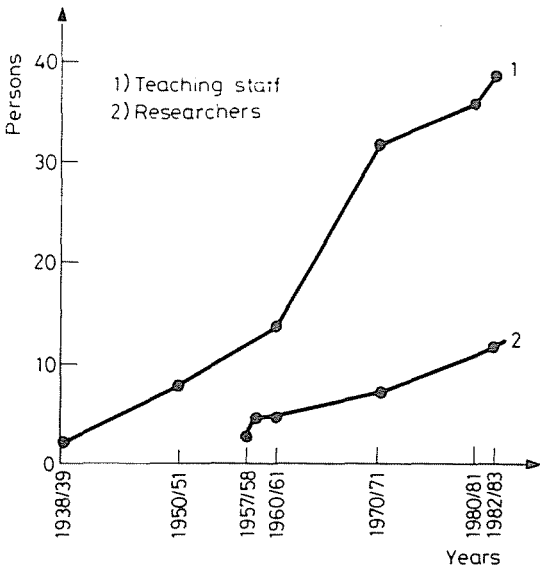

Fig. 1. Changes in the number of the teaching staff and the researchers

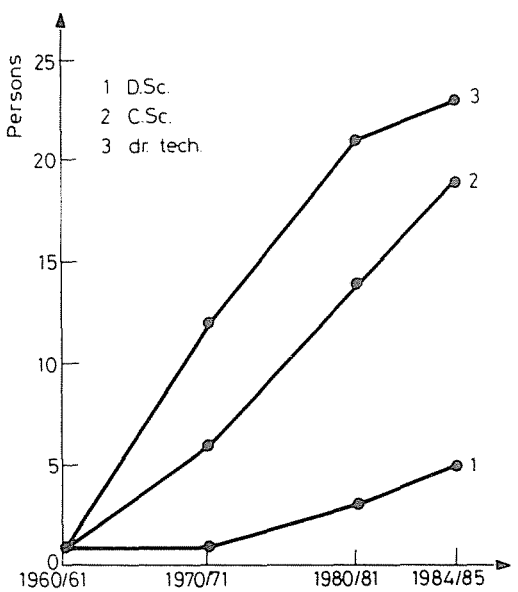

Fig. 2. Changes in the number of scientific qualifications

The section conference whose members consist of the graduated of the section and, from time to time—depending on the subject—the technical auxiliary personnel, is called together monthly. Beside discussing the actual tasks and problems, they regularly evaluate the educational work, and accounts on the research work are also given. This is where diploma work students have to report on their progress and candidates for the degree of doctor give an account on their work which then will be discussed. Professional refresher lectures are also given monthly, separately for the individual sections.

The area of the Department was, at the foundation, 235 m^2 (51m^2 of it was a corridor). During the years after the war it was enlarged several times and of—in 1968 its total area amounted to 1775 m^2 (out of this, 893 m^2 were teaching and research staffs laboratories, offices and library; 538 m^2 were students' laboratories; 42 m^2 were workshops and 302 m^2 store- rooms). Since that time the area of the Department has not changed.

The co-workers of the Department aided education also by writing lecture notes. From 1950 until today 40 different lecture notes have been published.

2. Evening courses for the training of Chemical Engineers

In order to serve the systematic and dynamic development of the industry, upon a governmental regulation the State Technical College (ÁMF) was organized in 1947, where in numerous evening extensions, in 6 to 7 terms "specialized" engineers were trained. These corresponded to today's production engineers. The training of the specialized chemical engineers was performed, after the evening courses had been introduced at the Technical University Budapest, together with other departments, by the Department of Practical Chemistry, created in 1951 within the Faculty of Chemical Engineering. In 1959 this Department merged in the Department of Organic Chemical Technology.

From this time on, together with the Faculty's other Departments, the teaching staff of the Department have carried out the training of the students of chemical engineering in the evening extensions, too, and similarly to the daytime training—after several reforms—within the frame of a two-stage education, where the stages are superimprosed to each other.

3. Training of specialized engineers, the seminars of the institute of refresher courses for graduated engineers, University Doctor Degree

The teachers of the Department have participated from the first half of the 1960-ties also in the education of the specialized engineers. The enumeration of the various branches of specialized engineering is shown in Table 1.

The first refresher seminar at the Department was given in the mid 30-ties by Professor Csűrös under the title "Plastics and varnishes". Later on (especially from the 50-ties on) the co-workers of the Department have given 76 seminars, thus contributing to a considerable extent to the extension training of the experts of the industrial branches which formed the background of the Department. The co-workers of the Department equally assist their graduate colleagues in acquiring the degree of university doctor. While until 1950 only a few, from 1959 until today 113 persons chose one of the subjects of the Department as main subject and thus acquired their doctorate at the university.

Table I

Specialized engineers' branches (specialities) at the Department

	Year of the state examination	Number of graduate specialized engineers
Engineering specialization in textile chemistry	1964	22
	1970	13
	1976	18
Engineering specialization in pharmaceutical chemistry	1965	23
	1967	20
	1970	25
	1972	15
	1975	20
	1982	23
	1986	18
Engineering specialization in production and application of tensides and intermediate products	1974	12
Engineering specialization in the chemistry of plant protecting agents	1975	16
	1981	14
Engineering specialization in organic chemical technology, branch: development of technologies of organic chemical industry	1988	8 (in process)

4. Scientific activities of the Department

In the first decade of the Department Professor Csürös has dealt with research projects on textile, varnish and plastics chemistry, together with some of his co-workers. Such subjects were: coloration of artificial silks, urea—aldehyde condensations, reactions of proteins with aldehydes, decarboxylation of resinic acids, determination of nitrogen in azo-, nitro- and nitroso-compounds, structure of filamentous materials, recent trends in textile chemistry, recent methods of finishing in the textile chemistry, purification of tar-cresols from domestic lignites and preparation of phenoplasts from them, alkali-sensitivity of developed dyes with nitro-groups, causticity of urea-containing printing pulp on metal sieves, products of xanthogenates with aromatic nitro- and amino-compounds, changes of cellulose in the viscose process etc.

In the fifties the main research directions of the Department have been established. At this time the most amply published research topic of the Department was heterogeneous catalysis. For his work performed in this field, professor Csürös was awarded the highest Hungarian scientific prize, the Kossuth prize in 1953. Liquid phase hydrogenation and oxidation reactions were studied. The role of the amount of catalyst and the kinetics of the reactions were studied. In catalytic hydrogenation Raney-nickel catalysts were dealt with in the first place. It was established that the activity of the catalyst is influenced by its hydrogen content and that—depending on the conditions of preparation—catalysts of different activities and hydrogen contents can be obtained.

In the field of catalytic oxidation and inhibition mainly the oxidation of benzaldehyde and drying oils were dealt with. The effects of organic compounds, oxidation—reduction and metal oxidation—reduction systems were studied in the reactions. Moreover, research work was carried out also in the field of inhibiting the above reactions.

It is a special case of homogeneous catalytic reactions when Lewis acids of complex-forming character are applied as catalysts. As these catalysts are often used in industrial reactions (Friedel-Crafts reactions), these investigations had—beside their theoretical value—also a practical importance. From the Lewis-acids the non-ion-forming boron trifluoride and the ion-forming titanium tetrachloride were used during the experiments. The investigations were, in the first place, aimed at finding the suitable solvent in which the reaction take place in homogeneous phase. When working with boron trifluoride complexes, the suitable solvents are glacial acetic acid and chloroform, respectively, while for titanium tetrachloride it is nitromethane.

In further work the stereochemical transformation was investigated which took place on the semi-acetal hydroxylic group of the aldohexoses upon

the action of boron trifluoride. It was established that the mechanism of the reaction was different from the mechanism of the reaction catalyzed by protonic acid. According to the opinion of the investigators the cause of the phenomenon is to be sought in the complex-forming tendency of boron trifluoride which, under the given circumstances, is stronger than that of the proton.

The mechanism of action of titanium hydrochloride was studied in the decomposition of the anhydro-ring of sugar anhydrides. In this case titanium tetrachloride is not only a catalyst but it acts also as reactant.

The other field of research of the Department was related to plastics chemistry and rheology. Work related to this field was carried on in two directions:

— Production of plastics by polymerization,
— Rheological investigations into the properties of the consistent products obtained.

Beside elucidating theoretical questions, both research directions aimed at resolving also problems important for the industry.

The study of the competitive reactions polymerization and catalytic hydrogenation, was important from the teoretical aspect. In a polymerization activated with catalytic hydrogen, the two reactions can take place simultaneously, i.e. the reaction can be shifted in one direction or the other, depending on the concentration of hydrogen on the surface of the catalyst and on the experimental conditions. It was possible to elucidate the kinetics and mechanism of polymerization activated by catalytic hydrogen for a number of monomers.

Another topic was the polymerization and copolymerization, respectively, of allyl compounds as from these compounds it is much more difficult to form polymers than from vinyl compounds.

The rheological tests were used to study the behavior of PVC plasticizers as a function of processing parameters.

The optimum technological parameters for printing pastes obtained from textile thickeners as well as problems of theoretical importance could also be elucidated by rheological methods.

In the last decade of his being the head of Department, Professor Csűrös and his co-workers were dealing, beside the aforesaid, also with the reactions of phosgene. In the course of this work a number of industrial processes have been developed for obtaining compounds starting from aromatic iso-cyanates. Industrial acylation and dehydrogenation as well as ring closing reaction were studied. A new, industrially applicable method was developed for the production of an intermediate product of papaverin.

During the period 1975—85 professor Rusznák and from 1985 on professor Tőke have been the heads of the Department. Under their direction

the teaching staff of the Department and the researchers of the Research Group of the Hungarian Academy of Sciences at the Department of organic Chemical Technology carried out their research activities within the following groups of themes of high priority, whereby the basic and applied character of research often cannot be separated from each other:

4.1. *Study, modification and utilization of processes taking place in filament forming polymer systems*

a) *Modification of filament forming polymers by topochemical reactions*

Results achieved in cotton finishing:

— a method of finishing cotton fabric with synthetic resins avoiding the considerable decrease in firmness;
— boiling with alkali (lye) and hot mercerization of cotton in one operation; with 25% reduction of prime costs and 30—40% savings of colorant,
— new, singlet-oxygen, energy and chemicals saving, quick and filament-protecting bleaching method for cotton and cotton-polyester mixed fabrics.

The processes have been introduced on industrial scale in a number of domestic textile factories.

Results achieved in wool finishing:

— fibre-strengthening washing of Hungarian wool by singlet-oxygen treatment (the process is currently being introduced on an industrial scale in two factories);
— transfer printing of woollen fabrics and polyester fabrics of high wool content with transfer paper containing a dispersion dye (introduced on industrial scale in one factory).

Results of the work aimed at developing the technologies of the domestic paper industry and at enlarging its raw material basis:

— reduction of the energy requirements of waste paper processing;
— decoloration of the obtained from the wastes and their reproducible coloration in colored-paper manufacture;
— Resolving of theoretical and practical problems related to various gluening technologies and to the production of finished papers.

b) Formation, study and utilization of two-, three- and four-component systems containing fibre-forming polymers and tensides

Associated systems of advantageous properties were obtained by adding filling materials to a system of crystalline and non-crystalline polyolefins. The formulations which lend themselves to the manufacture of different products of special utilization are marketed by the firm TVK (Tiszai Vegyi Kombinát) under the name of the product family "Modylen"; the yearly production value amounts to 40—200 million Ft.

Results achieved by associating polymers to paper:

— technology of the domestic production of silicone-coated papers;
— possibility of producing biologically active compounds on a paper carrier.

c) Elucidation of the theoretical fundaments of technological processes in the fibre and filament industries

A new mechanism has been proposed for the cationic lactam polymerization; the caracteristic kinetics of the polymer formation has been elucidated.

New relationships have been recognized in the synthetic resin-finishing of cotton in relation to the

— interaction between cellulose and N-methylol compounds and
— the wetting processes of the cotton fabrics with a synthetic resin finish.

In the course of the development and modification of the dyeing technologies, the reactive dyeing of cotton fabrics has been optimized and the quantitative knowledge related to the reactive process has been enlarged.

With the chemical decomposition of the vegetable impurities of cotton the foundations of new, effective delignification processes have been laid.

d) Production of new auxiliary materials of domestic origin

In order to substitute the dirt-repellent finishing agent Permalose (product of ICI), the auxiliary material Pehidro SRB has been developed and introduced.

In order to substitute the slime-killer Busan used in the paper industry, a process has been developed for the production of the auxiliary material DOPK. Its manifacture and utilization are resolved.

4.2. Syntheses aiming at the production of pharmaceuticals and plant protection agents

a) Synthesis of condensed polycyclic compounds with nitrogen bridge-head

A number of new pyrido (1,2-a) pyrimidine compounds of antiasthmatic effect have been produced and the isomerism and tautomerism conditions characteristic of the ring system have been studied. Starting from pyrido (1,2) pyridines the synthesis of two new ring systems: (2,3a, 6a) triazaphenalene and 1-thia-2a, 5a-diaza-acenaphthene, has been achieved; moreover, ring transformation reactions yielding interesting polycyclic compounds have been observed.

In the cyclo-addition reactions of N-libids generated from 3,4-dihydroisoquinolinium salts a number of imidazole and pyrrolo (2,1-a) isoquinoline derivatives, respectively, have been synthesized. The diastereoselectivity characteristics of the reactions had been interpreted in terms of steric and molecular orbit interactions.

b) Synthesis of cyclopropane-carbonic acid-ester type insecticides

New syntheses have been developed for the production of 1,1-dichloro-4-methyl-1,3-pentadiene, the key intermediate of permetrin. In the course of the work the mechanism of the halogenation reactions of 1,1,1-trichloro-2-hydroxy-4-methyl-pentene-3 have been thoroughly studied.

c) Research into organic phosphorus compounds

Having studied the reaction of α-acetophenones and trialkyl-phosphites, a new, uniform mechanism has been proposed for the Perkow-Arbuzov reaction which is of great practical importance. A new, simply achievable monodealkylation process was developed in the sphere of the organic phosphorus esters.

A number of new, biologically active organic phosphorus compounds have been synthesized: thiophosphate, α-hydroxy-phosphate, cyclopropyl-phosphate, vinylphosphate and β-keto-phosphate derivatives. A process has been developed for the production of a fungicidal thiophosphate, the "Ftalimfosz".

d) Synthesis of crown ethers and study of their complexing properties

Benzo-15-crown-5 and benzo-18-crown-6 derivatives have been prepared which influence the selective transport of alkali ions through artificial and natural membranes. Some of these ligands of high K^+-ion selectivity have been utilized as active principle of ion selective membrane electrodes.

Non-toxic, sugar-based chiral crown ethers have been produced which lend themselves for pharmacological investigations. They can be used also as phase transfer catalyzers in enantioselective reactions.

e) Separation of optical isomers

The processes of diastereomeric salt formation have been characterized on the basis of a thermodynamic model. Relationships have been established, using mathematical-statistical analysis of the experimental results, which satisfactorily describe the relationships between the result of resolution and the structure of the initial racemic compound within a given family of compounds. The possibilities of purifying, with chiral auxiliary substances, the mixtures of enantiomers of different optical purity, have been studied. New selective separation methods have been developed which are based on the different properties of the diastereomeric associates formed in the mixture. The new methods developed and the theoretical models permit to predict the resolution of a given racemic compound; the configuration of the enantiomer present is the precipitated disastereomeric salt is given and its resolution is optimized, respectively.

f) Linear polyethers, phase transfer catalysis

The research workers of the department were among the first to recognize the suitability of cheap linear polyethers for being used in phase transfer reactions. It was established that in solid-liquid systems the catalytic effect of the linear polyethers reaches or sometimes even surpasses that of the crown ethers. A relationship was established between chain length, the quality of end groups and the cation complexing effect. The observations made during the study of the parameters of phase transfer catalysis facilitate the interpretation of the individual details of the process and serve as practical guide in performing a number of chemical reactions.

g) Formation of pharmaceuticals and plant protecting agents

Fundamental theoretical and practical relationships in pharmaceutical technology have been recognized by simulation analysis of pharmacokinetic functions.

The production of pharmaceutical and plant protecting formulations has been resolved which grant a controllable delivery of the active principle.

The adsorption of the plant protecting agents on soil-simulating humic acids has been studied.

A number of new formulations and methods of formulating, respectively, have been developed for pyrethroid insecticides.

h) Research into plant growth regulating hormones and their analogues

By synthesis of strigol and other plant growth regulating hormones of the nor-diterpene type, the researchers of the department wished to produce, in the first place, herbicides of hormone action. Investigations into the synthesis of lycoricidine-analogous plant hormones with a phenantridine skeleton have also been carried out.

4.3. Heterogeneous catalysts and catalysis

a) Investigations into heterogeneous catalysts

Heterogeneous catalysts have been studied with electrochemical, thermal desorption and magnetic measurements:

— by electrochemical studies of the precious metal catalysts the specific surface of the catalysts has been determined as well as the extent of hydrogen sorption and its energetic distribution. A relationship was established between changes in hydrogen sorption and dispersity as well as specific hydrogenation activity. In the case of catalysts containing two metals a relationship was detected between phase structure and hydrogenation activity of the catalysts;

— the method developed for the study of vapor phase catalytic processes was applied to selective hydrogenation of phenol and to hydrogenation of benzene;

— the properties of hydrogen binding in the dry state to the Raney-nickel catalyst as well as the adsorption of benzene and cyclohexane on carrier nickel catalysts were studied by measurements of magnetic susceptibility.

b) Preparation of heterogeneous catalysts

Nickel skeleton catalysts. A patented process was developed for preparing nickel skeleton catalysts more active and selective than those formerly known. The patent has been purchased by the pharmaceutical factory Chinoin and they manufacture about 15 t of catalyst per year. A skeleton catalyst "family" has been developed which is not prone to self-ignition and is, therefore, safer to handle.

Carrier palladium catalysts. A process has been developed to produce catalysts of substantially higher activity than the imported palladium catalysts on active carbon carrier ever had. The right of manufacturing these catalysts has been purchased by the firm Finomvegyszer Szövetkezet. The process was successfully implemented on an industrial scale, and a process has been developed for the regeneration of used palladium catalysts and for the purification of palladium. The above mentioned cooperative firm manufactures the catalysts on an industrial scale under the trade names of Selcat Q and Selcat A. These are applied by the pharmaceutical factory Kőbányai Gyógyszerárugyár in industrial hydrogenations, and this has brought about considerable import savings.

The catalysts used in the domestic pharmaceutical and insecticide or herbicide industries are manufactured today solely by the processes developed by the Department.

Metal-containing zeolite catalysts. A process has been developed for incorporating catalytically active metals into zeolite catalysts in one step, during hydrothermal crystallization of zeolites. From these catalysts, palladium-containing zeolite has been used, in co-operation with the Zelinsky-Institute of the Academy of Sciences of the Soviet Union, for producing propionic acid by carbonylation of ethylene. The experiments on an industrial scale are in progress.

d) Catalytic hydrogenations

The patent "Procedure for catalytically hydrogenating organic compounds" has been purchased by several enterprises. At the firm Budapesti Vegyiművek the process has been used for the hydrogenation of polychloro benzenes. The industrial scale experiments have been closed with success.

The process has been implemented at the pharmaceutical factory EGIS for manufacturing the two phase-products of the medicament Clopamid, and the firm Kőbányai Gyógyszerárugyár has applied the same for manufacturing steroids.

d) Production of indole and its derivatives

The process of producing indole has been purchased by the firm Reanal, and the patent for producing 4-hydroxy-indole by the pharmaceutical firm EGIS.

4.4. Other results of research

a) Investigations into the production of non-ionic tensides

Study of hydroxy-alkylation reactions. Within the frame of this project non-ionic tensides have been produced from different hydrophobic compounds containing active hydrogen (fatty alcohols, fatty acids) and epoxides (ethylene-, propylene-oxide). In the course of hydroxy-ethylation of fatty alcohols the molecular mass distribution and its dependence on the reaction parameters (temperature, quality and concentration of the catalyzers, average degree of hydroxy-alkylation) have been studied.

b) Oxidation reactions with singlet oxygen

New singlet oxygen sources have been found, most of which were soluble in organic media.

— A singlet oxygen cotton bleaching process has been developed and patented.

— Patented processes have been developed for the production of N-oxides of nitrogen-containing heterocyclic compounds and for the synthesis of chloro-pyridines by chlorinating the N-oxides.

c) Production and cross-linking of acrylic copolymers

A procedure has been developed for producing acrylic copolymers in aqueous media which contain a functional group and are of film forming properties. The characteristics of the products in varnish technology have been also-determined.

d) Reactions catalyzed by ion-exchange resins

Domestic cation-exchanger resins have been applied as catalyzers in esterification and the Friedel-Crafts reaction.

e) Optimation of glueing technologies for the light industry

Methods have been developed for the characterization of the glues from the aspect of implementation technology. These methods were applied for qualifying domestic glues and for optimizing glueing technologies used in the light industry.

f) Quantitative determination of air polluting chloro-fluoro-alkanes

A gas chromatographic method has been developed for the quantitative determination of different chloro-fluoro-alkanes. The method was applied for the qualification of samples taken at different places and times.

g) Role of amino acids in plant growth

In close co-operation with the researchers of the Institute for Plant Protection of the Hungarian Academy of Sciences, the Research Institute of Medicinal Plants and the co-workers of the Agricultural Co-operative "Lenin" in Tiszaföldvár, the outstanding role of some amino acid derivatives in plant growth has been elucidated. On the basis of this recognition, patented processes for manure treatment and spraying have been developed and new ways of synthesis and formulations of optimum composition have been applied hereby.

In large scale agricultural production experiments increases ranging from 5 to 20% have been achieved in the yields of cereals, root crops and fibre plants.

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The development of the scientific activities of the Department is indicated also by the number of the papers published and the patents granted with progressing time as can be seen in Fig. 3.

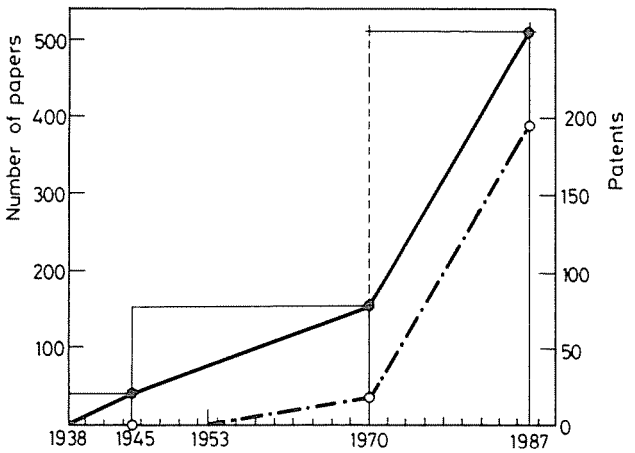

Fig. 3. Changes in the number of papers published and patents granted during the 50 years of existence of the Department

5. Heads, teaching staff and researchers, titular professors and associate professors of the Department

5.1. Work of Dr. Zoltán Csűrös, foundation professor of the Department (1901—1979)

University professor Zoltán Csűrös was born on February 6, 1901, in Budapest. He started his studies of chemical engineering in 1920 at the Technical University Budapest. His special capabilities appeared already during his being a student, he won several prizes. He finished his university studies in 1924 and remained as an assistant professor at the Department of Organic Chemistry headed by professor Géza Zemplén. He obtained the degree of university doctor in 1929; in 1936 he became private docent in the sphere of themes plastics and varnishes; in 1938 he became, as extraordinarious professor, head of the Department of Textile Chemistry organized by himself. He was nominated professor ("ordinarius") in 1940.

After the liberation he actively participated, as rector, in the reconstruction of the ruinous Technical University within the frame of the movement "Workers for the scientists, scientists for the workers".

In 1946 he became first correspondent and then ordinary member of the Hungarian Academy of Sciences;

In 1947 he reorganized the department headed by him, according to the demands of the people's economy, into the Department of Organic Chemical Technology, with a broader profile. Thousands of chemical engineers obtained, during his long teaching career, their first knowledge in the fields of organic

chemical technology, textile and plastics chemistry as well as an attitude, for a lifetime, to the tasks of a chemical engineer and to the way how to serve, in the most efficient way, the benefit of their people.

Professor Csűrös started his scientific work, under the leadership of professor Zemplén, in the field of carbohydrate chemistry and became, shortly afterwards, a participant in important works on the elucidation of the structure of cellobiose. His thesis for the degree of university doctor was submitted in the field of the effect of nitrosyl-halogenides on amino acids. Further on, he remained faithful to the chemistry of carbohydrates, glucosides and natural macromolecules. He recognized, at a time when this was not yet self-evident, the importance of the chemistry and technology of synthetic and natural macromolecules (plastics and cellulose, wool, leather and paper). He raised the tuition of these subjects to a university rank, preceding famous universities in highly developed industrial countries. This educational and research work was strongly related to the needs of domestic industry. Thus, his research work in the field of textile chemistry considerably improved the quality of the products of the domestic textile industry—it is sufficient to refer here to the creaseresisting finish with synthetic resins—at that time a solution of pioneering character.

He recognized in time that our textile industry, relatively small on an international level, can be competitive only by improving the quality in a radical way, through chemical finishing. In the forties, again by far preceding the domestic needs to be expected, he started to deal with the study of catalytic processes which meant the key to large scale organic synthetic industry. Thus, he started to study the rules of heterogeneous catalysis and of the catalytic oxidation reactions of aromatic compounds. An important school of domestic research into heterogeneous catalysis way brought up on the interpretation of his observations and experimental experience. His interest embraced a vast territory in polymer chemistry, from rheological investigations of plasticized PVC systems through the polymerization and copolymerization, respectively, of acrylic nitril and allyl compounds to the study of the mechanism of caprolactam polymerization. Beside the fact that he largely contributed to the international development of this field by recognizing important new relationships, we must notice—from the objects investigated—the strong relations to the domestic industrial production.

He was interested, in a similar way, in the problems of intermediate production. Both in the research work at the Department and in the educational work and laboratory courses he laid great emphasis on the work related to intermediates. He realized it quite well that, on the one hand the petrochemical development program will bring its full economical efficiency only if it will not be restricted to the main products' (ethylene and propylene) utilization but if the utilization of the full flow of materials and by-products will

be attained; on the other hand, intermediates are required also by the domestic pharmaceutical, insecticide and herbicide, paint and varnish industries as the economic efficiency of their activities is dependent on these. From the aforesaid it can be seen that professor Csűrös anticipated to the necessary extent (by 10 to 15 years) the appearance of the social needs to be expected; thus, when these emerged, there were already well-trained experts available.

He was an excellent lecturer. During decades, he was always looking for more and more up-to-date methods of education. He laid a special stress upon teaching the basic principles of chemistry to the students who were then able to find their way in any field of chemical industry or research as chemical engineers.

He was much concerned with the ulterior professional training of the chemical engineers and chemists who were already working. He was one of the front-line fighters of the so-called training of specialized engineers. He was a passionate figure of public life. He assumed leading posts in the most difficult years of the Technical University Budapest: in 1943/44 he was dean of the Faculty of Mechanical and Chemical Engineering; in 1946—49 and 1957—1961 he was the rector of the Technical University Budapest.

He found it important to popularize the achievements of science; he was on the board of the Society for Popularization of Scientific Knowledge and chairman of the editorial board of the journal "Élet és Tudomány" (Life and Science). He was president of the Hungarian Teachers' Union, member of the presidential board of the Hungarian Chemical Society and of the National Peace Council. For a long time he acted also as editor-in-chief of the journals Acta Chimica and Periodica Polytechnica.

His outstanding social activity as well as the success of his scientific and educational work were honoured with a number of high state distinctions. Thus, e.g., he was awarded the mentioned Kossuth prize (1953); four times the golden class of the Order of Labour (1956, 1958, 1961, 1970); the Liberation Jubilee Commemorative Medal (1970); on the occasion of his seventieth birthday the 2nd class of the Banner Order of the Hungarian People's Republic. The Technical University Budapest conferred him the title of honorary doctor (1975) and awarded him a commemorative medal (1976). The University of Chemical Industry Veszprém honoured his activity with its golden commemorative medal (1978).

Professor Csűrös headed the Department from its foundation until June 30, 1971. However, after his retirement, he still frequented the Department and participated in its scientific work. He died at the age of seventy-eight, in 1979.

5.2. Activity of university professor István Rusznák, second head of the Department (1971—1985)

He was born in Budapest, 1920. He studied at the Faculty of Philosophy of the University Pázmány Péter in the years 1938—1942, his specialization was chemistry and physics. He obtained his degree of university doctor in 1944 from the same university for his thesis "Products of aromatic nitro compounds with cellulose xanthogenate" which he had prepared at the Department of Textile Chemistry of the Technical University; in 1959 he became the C. Sc. degree, on the basis of his thesis "Preparation and alkali sensitivity of celluronic acid"; after having submitted a thesis on "Thermolysis of cellulose during short thermal treatment", he obtained, in 1975, the D. Sc. degree.

He was active at different working places and in different lines. In the years 1942—1950 he worked at the Goldberger Textile Works as chemist, analytical chemist, research fellow, chemical technologist, work superintendent and director of a section of the plant; in the period 1950—1969 he was the head of the section, later division, of chemistry at the Research Institute of the Textile Industry; from 1949 until 1960 he held as associate professor the secondary job of head of the Department of Practical Chemistry. After dissolution of this Department he was releaved of his job. In 1963 he became associate professor, and in 1969, professor at the Department of Organic Chemical Technology. From 1951 to 1955 he was deputy dean of the Faculty of Chemical Engineering of the Technical University Budapest; from 1964 to 1965 he was visiting professor of the National Research Centre of Egypt (Cairo). In the period 1970—1979 he was again deputy dean of the Faculty of Chemical Engineering; from 1971 to 1985 he was head of the Department of Organic Chemical Technology of the Technical University Budapest. In 1980 he was entrusted with the post of leader of the Organic Chemical Technologic Research Group of the Hungarian Academy of Sciences.

His social activities are widespread: he is member of the Committee for Filament and Fibre Technology of the Hungarian Academy of Sciences (1952), then its secretary (1973) and, finally, chairman (1979—); in the VIth class of the Hungarian Academy of Sciences he is member of the Professional Group of Mechanics and Metallurgy, further, he is member of the Committee for Macromolecular Chemistry of the Hungarian Academy of Sciences (1973—); member of the Working Commitee for Colloidal Chemistry of the Hungarian Academy of Sciences (1966—1976); chairman of the Working Committee for Natural Polymers of the Hungarian Academy of Sciences (1976—); member of the Working Committee of Carbohydrate Chemistry (1973—1978). He was member of the plenum of the National Committee of Technical Development (1979—1981); is member of the Coordinating Council for Technical Research (1979—), member of a Professional Commission of the Committee for

Scientific Qualification (1975—), member of a sub-committee (1970—) and later of the plenum of the State and Kossuth prize Committee (1984—). He is member of the national presidium of the Federation of Hungarian Scientific and Technical Associations (1974—), life honorary member of the same (1986); chairman of the Technical and Scientific Association of the Textile Industry (1974—1985), and its co-chairman (1985—); member of the board and council of the Hungarian Chemical Society. He is member of the Council of Fellowships (1973—); member of the presidium of the International Federation of Associations of Textile Chemists and Colorists (1968—), president of the same (1980—1983) and vice-president of the same (1983—). He was chairman of the Professional Committee of Chemical Engineering of the Ministry of Culture and Education (1979—1984). In Egypt, he is external examiner of Cairo University and of Alexandria University (from 1956 on).

His research activities embrace, in the first place, the following professional fields: chemistry and chemical technology of filament forming polymers (cellulose and protein chemistry, textile chemistry and technology). Test methods of textile chemistry. Applied macromolecular chemistry. Applied colloidal chemistry.

Outstanding utilized: continuous bleaching (domestic cotton industry, linen industry; socialist countries; recognition by the Kossuth prize). Thermotex processes (domestic application, selling of licence in the GFR, serial production in the Soviet Union). Hot mercerization (international co-operation with English and Federal German machine factories, industrial implementation: GDR, India). Associated polyolefin systems (domestic implementation at the Chemical Combinate Tisza, in the plastics industry and the light industry). Finishing machines (domestic manufacture in small series). Resorbable surgical dressings (domestic experimental production, manufacture in the Soviet Union). Production and utilization of a yield-improving substance (experimental implementation on 10,000 ha per year).

For his activities Professor Rusznák obtained many distinctions and acknowledgements: Medal of Merit for Socialist Work (1953), Kossuth prize (1954), Medal for Outstanding Work in the Light Industry (1955), for Development of the Textile Industry (1960), Outstanding Inventor (golden class) (1966, 1983), For Outstanding Work (1979, 1980), prize of the Federation of Hungarian Technical and Scientific Associations, golden class of the Order of Labour (1985), Commemorative Medal of the Technical University Budapest (1986), Prize of Creativity (Ministry of Industry, 1986).

5.3. Activity of university professor László Tőke, present head (1985—) of the Department

He was born in the County Vas, in Vönöck, in 1933, as ninth child of a railway track-repairer. After a successful so-called talent-rescueing examination he gained access to the Lutheran Lyceum in Sopron (later Gymnasium Berzsenyi Dániel) at a free place, then became collegian of the Federation of People's Colleges and there he obtained his certificate of maturity (final certificate of secondary school) in 1952.

From 1952 to 1957 he studied at the Faculty of Chemical Engineering of the Technical University Budapest, where he obtained a diploma of chemical engineer. From 1957 to 1957—his appointment as professor—he worked at the Department of Organic Chemistry. As leader of the laboratory courses in preparative organic chemistry, he was the author and co-author, respectively, of a number of lecture notes and lectured on "Theoretical Organic Chemistry" for the students of the evening courses.

He performed his research work under the leadership of Dénes Beke in the field of the pseudo-bases. His first publications were dealing with this problem and this gave the foundation for the preparation of a new family of multinuclear heterocyclic compounds (university doctoral thesis, 1960). Furthermore, it gave also the foundation for aiming at the stereoselective synthesis of compounds with benzo- and indoloquinolisine skeletons, among them of emetine, yohimbine and reserpine which are of therapeutical importance. The success of this work is manifested by his C. Sc. thesis (1965) and D. Sc. thesis (1974), dealing with the syntheses of yohimbine and its isomers, as well as by the silver class of the State prize (1975, shared with Csaba Szántay and Lajos Szabó).

In 1973, he gained access to the laboratory of professor M. Shamma at Pennsylvania State University, first with a 7-month-fellowship of the Academy of Sciences and then, after a brief interruption, as employee. It is here that he develops an entirely new, simple way of the synthesis of alkaloids with a benzazepine skeleton which is cited as example in the books "Creativity in Organic Syntheses" and "Art in Organic Synthesis" (Academic Press, New York, London, Amsterdam, 1974).

In 1975 he comes to the Department of Organic Chemical Technology. At his new working place he directs the educational and research work of the pharmaceutical section of the Department. He lectures on "Pharmaceutical chemistry" and "Synthesis of biologically active substances". From the former course he writes also lecture notes entitled "Chapters of pharmaceutical chemistry". Maintaining his former predilection, he lectures on "Theoretical organic chemistry" at the courses of specialized engineering for the pharmaceutical industry and for the insecticide-herbicide chemistry.

His research work, too, takes a new turn: he deals now with the economically feasible synthesis of the active principles of pharmaceuticals and insecticides as well as ith the elucidation of the emerging theoretical problems. Thus, beside his publishing activity, he lays great stress also on obtaining patents for the processes that deserve it. Good examples for these can be found in the sphere of his research work on organophosphates and pyrethroids of insecticidal action.

The spheres of the crown ether phase-transfer catalysis and the resolution of the racemates give—in addition to the aforesaid—several examples for the fact that the really successful applied research requires the close co-operation of researchers active in different fields of science. E.g., the researchers of the Department of General and Analytical Chemistry of the Technical University Budapest have taken part in creating the licence of the potassium-ion selective electrode used many sides.

Beside domestic research institutions, he developed successful co-operations with several research groups abroad. This co-operation resulted in joint publications, lectures and in study trips of young researchers.

Professor Tőke is the author and co-author, respectively, of 100 papers and about 60 patent applications. From the latter, the process for producing emetine, a medicament used against dysentery—which has been appreciated also by the State prize—has been implemented on an industrial scale. Other processes that have been implemented in the industry, are: production of 4-methyl imidazole, the initial compound in the preparation of cimetidine which is used to cure gastric ulcer; development of crown compounds used as ligands in ion selective membrane electrodes as well as of other crown compounds and their intermediates; elaboration of pharmaceuticals, e.g. the active form of prostaglandine-F_2 and of insecticides, e.g., pyrethroids.

Beside the two study trips to the U.S.A. as mentioned, he spent shorter or longer periods in the Soviet Union (Moscow, 1958, 4 months), in India (1978, 6 weeks), England, Italy, Norway, Sweden, Greece, Bulgaria, Yugoslavia, the FRG and the GDR as well as in Japan.

He is the member and chairman, respectively, of several committees and sub-committees of the Hungarian Academy of Sciences, of the University and the Faculty.

He is holder of the distinctions "Outstanding Inventor" (golden class, 1986), "For Trade Union Work" (silver class, 1979; golden class, 1983), "For Outstanding Work" (1978), further the State prize (silver class, 1975).

In July 1985 he was appointed Head of the Department of Organic Chemical Technology which post has been held by him ever since.

5.4. Leading teachers and researchers of the Department

Elemér Fogassy, born in Budapest, 1934; chem. eng.[++]: 1957 (TUB)[+++], specialized engineer of pharmaceutical chemistry: 1966; university doctor: 1965, C. Sc.: 1974, D. Sc.: 1986. Employed at the Department since 1964: 1964—65: assistant, 1965—1975: senior assistant, 1975—1987: associate professor, 1987— professor. Educational activity: leader of various laboratory courses; lecturer of the courses "Unit processes in pharmaceutical chemistry" (1971—), "Technology of pharmaceutical chemistry" (1984—), "Basic processes in pharmaceutical and insecticide chemistry" (1983—). Head of the section of pharmaceutical industry at the Department (1972—1985). His scientific activity is aimed, in the first place, at the solution of technological problems related to the pharmaceutical industry, at the development of technological processes that can be implemented in the industry and at answering the theoretical and practical questions related to the production of optically active compounds. Publications: 29 papers written in foreign languages which have appeared mainly in journals published abroad, 51 lectures, given mainly at international conferences as well as 52 patent applications. Social activity: member of the Working Committee of Theoretical Organic Chemistry of the Hungarian Academy of Sciences. Distinctions: "Outstanding inventor" (golden class, 1979), "For Outstanding Work": 1980.

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József Petró, born in Budapest, 1927, chem. eng. 1951 (TUB), C. Sc: 1960; D. Sc.: 1978; has been employed at the Department since 1951: 1951—1956: assistant, 1956—1958: scientific co-worker, 1958—1961: senior assistant, 1961—1980: associate professor, from 1980 professor. Educational activity: leader of the section of organic synthesis. University lectures: "Industrial catalysis", "Organic chemical technology", "Development of organic chemical technologies"; courses for training of specialized engineers and at the Institute of Refresher Courses for Engineers. Scientific activity: main field: heterogeneous catalysis, development of catalysts and study of catalytic hydrogenation reactions. Publications: 85 papers, 1 book, 2 contributions to books, 32 lectures abroad and 20 lectures given in Hungary, 2 lecture notes, 37 original patents (author and co-author, respectively). Social activity: member of the Working Committee of Catalysis and Kinetics of the Hungarian Academy of Science; member of the Professional Scientific Council of the Isotope Institute and the Central Chemical Research Institute, both of the Academy of Sciences. National coordinator of the range of subjects "Production of industrial catalysts" of the Problems' Committee of Kinetics and Catalysis of the socialist academies. Formerly member of the professional commission of the Committee of Scientific Qualification. Distinctions: "Outstanding Inventor", golden class: 1974, 1980, 1982, 1984 and twice in 1986; "For Outstanding Work", 1982.

*

György Bertalan, born in Budapest, 1933; chem. eng.: 1958 (TUB), university doctor and C. Sc. degree: 1968; has been employed at the Department since 1958: 1958—1966: assistant, 1966—1977: senior assistant, from 1977 on associate professor. Educational activity: courses "Synthetic filaments" and "Physics of filamentous materials" as well as subjects

[++] chemical engineer
[+++] Technical University Budapest

related to applied macromolecular problems, primarily in the light industry and, within it, in the field of the textile industry. Scientific activity: investigations into the mechanism of cationic lactam polymerization as well as themes of research related to the solution of problems of applied macromolecular chemistry, in the field of the filament and fibre industry as well as in other fields. Out of these, the theme "Modification of the properties of polyolefins with inorganic filling materials as well as with low- and macromolecular additives". In the frame of this work he suceeded, together with the Chemical Combinate Tisza (Tiszai Vegyi Kombinát), in developing the product family MODYLEN. Another field of research of his is the development of aqueous polymer dispersions, primarily as auxiliary material in the textile, leather and paper industry. Publications: he published about 90 papers in domestic and foreign journals and read about 50 papers at international and domestic meetings; he is co-author of 4 lecture notes and 2 books. Social activity: secretary of the Sub-committee of Chemistry of the Committee for Filament and Fibre Technology of the Hungarian Academy of Science; member of the Working Committee of Plastics Chemistry. Distinctions: diploma of merit of the rector (1985); Creativity prize (Ministry of Industry): 1986.

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Sándor Békássy, born in Budapest, 1941. Chem. eng.: 1964 (TUB), university doctor: 1974, C. Sc.: 1982. He has been employed at the Department since 1967: 1967—1975: assistant, 1975—1984: senior assistant, 1984: associate professor. Educational activity: within the branch of general and organic chemical industry he lectures on Organic chemical technology (I); he is the leader of the laboratory courses of the subject. He is also leader of factory courses and designing tasks. Scientific activity: research into production and structure analysis of skeleton catalysts within the theme heterogeneous catalysis. He deals also with the chromatography of biologically active substances and intermediates. Publications: 32 scientific papers, 44 lectures, author and co-author, respectively, of 5 lecture notes and 2 patents. Social activity: co-worker of the University and College Division of the Ministry of Culture and Education. Distinctions: diploma of merit of the Minister, 1983.

*

László Fenichel was born in Budapest, 1934; chem. eng. 1957 (TUB), university doctor: 1964, C. Sc.: 1976; has been employed at the Department since 1957: 1957—1964: assistant, 1964—1978: senior assistant, 1978—: associate professor. Educational activity: formerly Unit processes of the pharmaceutical chemistry; at present Unit process in the chemical industry, and labour safety. Scientific activity: Lewis-acid catalysis; synthesis and application of chiral crown ethers. Publications: 26 papers, 32 lectures, 8 lecture notes and books as well as 6 patents (author and co-author, respectively). Social activity: member of the Sub-committee of Carbohydrate Chemistry of the Hungarian Academy of Sciences. Distinctions: "For Outstanding Work": 1986.

*

József Heiszmann, born in Berente, 1932; chem. eng.: 1957 (TUB), university doctor: 1964, C. Sc.: 1975. He has been employed at the Department since 1957: 1957—1964: assistant, 1964—1976: senior assistant, 1976—: associate professor. Since 1985: deputy head of the Department. Educational activity: lectures in "Organic chemical technology" and leading its laboratory courses, and in "Industrial catalysis"; since 1979 member of the State Examinationa Committee. Scientific activity: study of heterogeneous catalysts (thermal desorption); synthesis of organic intermediates. Publications: 33 papers, 26 lectures, 6 lecture notes and 9 patents (author and co-author, respectively). Distinctions:

"Outstanding Work in University Education": 1975; merit medal "For Trade Union Work" (Central Council of the Hungarian Trade Unions): 1978.

*

György Lepenye, born in Budapest, 1934; chem. eng.: 1958 (TUB), university doctor: 1970, C. Sc.: 1970. Has been employed at the Department since 1973: 1973–1976: senior scientific co-worker, 1976–: associate professor. Scientific activity: chemistry of filamentous and fibrous materials and technology of their industrial application. Educational activity: in the tuition of certificated engineers formerly "Physics of filamentous materials", at present "Unit chemical processes in the filament and fibre industry"; in the tuition of production engineers "Tenside chemistry and technology" (lecturer of courses); between 1974 and 1985 leader of the section of the light industry; since 1975 member of the State Examination Committee. Publications: 40 papers, 2 patents, 2 contributions to books and near to 60 lectures (author and co-author, respectively). Social activity: member of the Committee of Filament and Fibre Technology of the Hungarian Academy of Sciences (1975–); secretary of the Committee (1980–); member of the Educational Committee of the Scientific Association of Textile Workers (1974–). Distinctions: Outstanding Worker of the Branch: 1967, "For Outstanding Work": 1978.

*

Béla Losonczi, born in Győr, 1934, chem. eng. 1957 (TUB), university doctor: 1964, C. Sc.: 1975. Has been employed at the Department since 1958: 1958–1964: assistant, 1964–1976: senior assistant, 1976– : associate professor. Educational activity: theoretical and practical tuition of Unit processes in the organic chemical industry, leading of the plant design for synthetics, leading of the courses of production practice in chemical engineering. Scientific activity: investigations into the oxidations in the liquid phase as carried out with oxygen and compounds containing active oxygen, respectively, as well as into the inhibition of these reactions. Publications: author and co-author, respectively, of 22 papers, 18 lectures, 11 lecture notes, 2 contributions to books and 11 patents. Distinctions: Outstanding Worker of the Heavy Industry: 1974; Outstanding Work in Public Education: 1986.

*

Jenő Morgós, born in Kompolt, 1926; chem. eng.: 1950 (TUB); university doctor, C. Sc.: 1965. Has been employed at the Department from 1950 to 1986 (as a retired professional from 1987): 1950–1953: assistant, 1953–1965: senior assistant, 1965–1986: associate professor. Principal educational activity: lecturer of the courses Organic chemical technology and Unit processes of organic chemical industry for specialized engineering training and in series of lectures given at the Institute for Refresher Courses of Engineers (from 1971 on he is the lecturer of this subject in the evening courses and between 1975 and 1985 leader of the tuition, in groups, of daytime students). Member of several State Examination Commissions; leader of the section of light industry (1965–1973) and of the section of Unit processes (1973–1985). Scientific activity: mainly oxidation processes and ethylene-oxide adducts suitable as tensides. Publications: about 60 papers, 50 lectures, 10 contributions to books, research notes and patents (author and co-author, respectively). Social activity: member of the Committee of Filament and Fibre Technology of the Hungarian Academy of Sciences (1969–); member of the Hungarian Chemical Society and chairman of its section of Coloristics (1980–); Hungarian member of the Standing Commission Intercolor (1980–); member of the editorial board of the Coloristical Communications (1970–). Distinctions: Outstanding Worker of Public Education: 1960;

Outstanding Worker of the Heavy Industry: 1968; "For Outstanding Work": 1982; silver class of the medal of merit "For Social Work" of the Central Council of Hungarian Trade Unions: 1982; "For Outstanding Work": 1986.

*

István Bitter, born in Budapest, 1941, chem. eng.: 1964 (TUB), university doctor and C. Sc.: 1973, D. Sc.: 1986. Has been employed at the Department since 1965: 1965—1966: assistant; 1966—1974: scientific co-worker, 1974—1986: senior scientific co-worker, 1986—1987: scientific consultant, 1987—: associate professor. Educational activity: Pharmaceutical chemistry (co-lecturer) and Methods of synthesis in organic chemical industry (optional compulsory course); laboratory course for students of the pharmaceutical branch and leading of the works on theses (of certificated engineers). Scientific activity: research into ion selective crown ethers, research into pyrethroids, synthesis of heterocyclic compounds with N-bridge-head. Publications: 56 papers, 102 orally given papers, 2 lecture notes, a book, 32 patents (author and co-author, respectively). Social activity: member of the Working Committee for Heterocyclic Chemistry of the Hungarian Academy of Sciences: 1976—1985; member of the Working Committee of Terpenoid Chemistry of the Hungarian Academy of Sciences: 1986—. Distinctions: golden class of the medal "Outstanding Inventor": 1986.

*

Tamás Mallát, born in Csepel, 1954, chem. eng.: 1972, university doctor: 1976, C. Sc.: 1981. Has been employed at the Department since 1972: 1972—1985: scientific co-worker, 1985—: senior scientific co-worker. Educational activity: the course "Industrial setup of processes", leading of themes (thesis laboratory, specialization laboratory, leading of plant practice), practical course in plants. Scientific activity: reductions by heterogeneous catalysis and with metals. Publications: co-author of 23 scientific papers, 19 orally given papers and 3 patents.

*

Tibor Máthé, born in Budapest, 1941, chem. eng.: 1966 (TUB), university doctor: 1972; C. Sc.: 1980. Has been employed at the Department since 1966: 1966—1967: assistant, 1967—1969: junior scientific co-worker, 1969—1981: scientific co-worker, 1981—: senior scientific co-worker. Educational activity: development of organic chemical technologies. Scientific activity: research into, and development of the production of heterogeneous metal catalyzers and of hydrogenation procedures; selective and enantioselective hydrogenations. Publications: author and co-author, respectively, of 19 papers, 16 papers given orally, 1 contribution to a book and 19 patents. Social activity: propagandist of the course "Actual problems of the policy of science"; permanent invited participant of the Working Committee of Reaction Kinetics and Catalysis of the Hungarian Academy of Sciences. Distinctions: bronze class of the medal "Outstanding Inventor": 1979, golden class of the same: 1982, 1984, 1986.

*

Antal Tungler, born in Budapest, 1944, chem. eng.: 1967 (TUB), university doctor: 1972; C. Sc.: 1978. Has been employed at the Department since 1967: 1967—1979: scientific co-worker, 1979—: senior scientific co-worker. Educational activity: giving the course "Industrial catalysis"; development of organic chemical technologies; laboratory courses. Scientific activity: research into and development of heterogeneous metal catalysts and hydrogenation processes, stereoselective and enantioselective heterogeneous catalytic hydrogena-

tions. Scientific publications: 17 papers, 9 orally given papers, 1 contribution to a book and 17 patents (author and co-author, respectively). Social activity: permanent invited participant of the Working Committee of Reaction Kinetics and Catalysis of the Hungarian Academy of Sciences; member of the Central Committee of Innovations of the Teachers' Union; propaganda secretary of the Trade Union Committee of the Faculty of Chemical Engineering. Distinctions: Medal of Educational Merits in University Education: 1968; golden class of the medal "Outstanding Inventor": 1982, 1984, 1986.

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5.5. Educational and research staff, fellowship-holders and doctorands in the eighties

Mária Ács, born in Budapest, 1948, chem. eng. 1971 (TUB), university doctor: 1974, C. Sc.: 1978. Has been employed at the Department since 1973: 1973—1979: assistant, 1979—: senior assistant.

Béla Ágai, born in Budapest, 1944, chem. eng. 1967 (TUB), university doctor and C. Sc.: 1982. Has been employed at the Department since 1976 (formerly at the Department of Organic Chemistry) as senior assistant. Distinction: golden class of the medal "Outstanding Inventor": 1986.

Péter Bakó, born in Budapest, 1943, chem. eng. 1966 (TUB), university doctor: 1972. Has been employed at the Department since 1966: 1966—1976: assistant, 1976—: senior assistant.

József Bozzay, born in Budapest, 1923, chem. eng. 1961 (TUB), graduate specialized engineer: 1968, doctor of political sciences: 1946; (University of Sciences Pázmány Péter), university doctor (technical): 1974. Has been employed at the Department from 1962 to 1983; 1962—1966: scientific co-worker, 1966—1983: senior assistant.

Sándor Csányi, born in Budapest, 1945, chem. eng. 1977 (TUB), university doctor: 1984. Has been employed at the Department since 1980. 1980—1985: assistant, 1985—: senior assistant.

Zsigmond Dusza, born in Bábonymegyer, 1929, chem. eng. 1951. (TUB), university doctor: 1965. Has been employed at the Department since 1951: 1951—1964: assistant, 1964—: senior assistant. Distinction: Outstanding Worker of Public Education: 1965.

László Farkas, born in Miskolc, 1946, chem. eng. 1970 (TUB), graduate specialized engineer: 1975, university doctor: 1978. Has been employed at the Department since 1971: 1971—1973: scientific co-worker, 1974—1981: assistant, 1982—: senior assistant. Distinction: "Buzágh Aladár" prize of the Hungarian Academy of Sciences: 1983.

Judit Frankl, born in Budapest, 1934, chem. eng. 1957 (TUB), university doctor: 1965, C. Sc.: 1980. Has been employed at the Department since 1959: 1959—1966: assistant, 1966—: senior assistant. Distinction: "For Outstanding Work": 1978.

Ida Gyurkovics, born in Budapest, 1933, chem. eng. 1956 (TUB), university doctor: 1965. Has been employed at the Department since 1958: 1958—1965: assistant, 1965—: senior assistant.

István Kádas, born in Budapest, 1946, graduate chem. eng. 1969 (TUB), university doctor: 1979. Has been employed at the Department since 1969: 1969—1982: assistant, 1982—: senior assistant.

György Keglevich, born in Budapest, 1957, graduate chem. eng. 1981 (TUB), university doctor: 1985. Has been employed at the Department since 1981: 1981—1983: doctorand, 1983—1987: assistant, 1987—: senior assistant.

Magda Kiss, born in Miskolc, 1938, chem. eng. 1962 (TUB), university doctor: 1970, has been employed at the Department since 1962: 1962—1971: assistant, 1971—1986: senior assistant.

István Kovács, born in Devecser, 1949, chem. eng. 1974 (TUB), university doctor: 1980. Has been employed at the Department since 1974: 1974—1982: assistant, 1982—: senior assistant.

(*Mrs.*) *Zoltánné Lengyel* (Ágnes Mészáros), born in Budapest, 1937, chem. eng. 1960 (TUB), university doctor: 1973. Has been employed at the Department since 1960: 1960—1965: scientific co-worker, 1965—1975: assistant, 1975—: senior assistant.

Imre Petneházy, born in Mezőtúr, 1940, chem. eng. 1963 (TUB), university doctor: 1968, C. Sc.: 1984: Has been employed at the Department since 1964: 1964—1969: assistant, 1969—: senior assistant.

Éva Polyánszky, born in Budapest, 1940, chem. eng. 1965 (TUB), university doctor, C. Sc.: 1980. Has been employed at the Department since 1965: 1965—1973: assistant, 1974—: senior assistant. Distinction: ministerial praise: 1985.

Mrs. Recski, Judit Borsa, born in Budapest, 1948, chem. eng. 1971 (TUB), university doctor: 1978. Has been employed at the Department since 1971: 1971—1979: assistant, 1979—: senior assistant. Distinctions: badge of the Young Communist League with the golden wreath: 1973; medal of merit of the Young Communist League: 1975; diploma of merit of the rector: 1979; "For Outstanding Work": 1981.

Johanna Reicher, born in Székesfehérvár, 1937, chemist 1962 (University of Sciences Eötvös Lóránd), university doctor: 1978, C. Sc.: 1985. Has been employed at the Department since 1971: 1971—1979: assistant; 1979—: senior assistant. Distinction: "For Outstanding Work": 1982.

Péter Sallay, born in Budapest, 1942, chem. eng. 1965 (TUB), university doctor: 1972, C. Sc.: 1981. Has been working at the Department since 1965: 1965—1973: assistant, 1974—: senior assistant. Distinction: "Outstanding Inventor", golden class: 1983.

Gábor Tamás Szabó, born in Budapest, 1941, chem. eng. 1964 (TUB), university doctor: 1971, C. Sc.: 1983. Has been working at the Department since 1967: 1967—1972: assistant, 1972—: senior assistant.

Iajos Szeghy, born in Alsónemesapáti, 1937, chem. eng. 1960 (TUB), university doctor: 1973. Has been employed at the Department since 1961: 1961—1966: assistant, 1966—: senior assistant. Distinctions: Outstanding Inventor, bronze class, 1971; Outstanding Worker of the Heavy Industry: 1977; Military Medal of Merit: 1980 and 1985.

Jenő Szoróka, born in Budapest, 1926, graduate chem. eng. 1953 (TUB), university doctor: 1972: Has been employed at the Department from 1959 to 1985: 1959—1962: assistant, 1962—1985: senior assistant. Distinctions: Outstanding Worker of the Light Industry: 1972, Outstanding Inventor, golden class: 1983.

Ildikó Tánczos, born in Szeged, 1943, chem. eng. 1966 (TUB), university doctor; C. Sc.: 1984. Has been employed at the Department since 1966: 1966—1983: assistant, 1983—: senior assistant.

Lászlóné Török (Mrs.) Anna Kalmár, born in Mesteri, 1935, chem. eng. 1960 (TUB); university doctor: 1971. Has been employed at the Department from 1960 to 1983: 1960—1973: assistant, 1973—1983: senior assistant.

Iajos Trézl, born in Cserénfa, 1935, chem. eng. 1958 (TUB), university doctor: 1972. Has been employed at the Department since 1958: 1959—1972: assistant; 1973—: senior assistant. Distinction: "For Outstanding Work": 1982.

János Veress, born in Budapest, 1959, chem. eng. 1984 (TUB), has been employed at the Department since 1984 as assistant. Distinction: badge of the Young Communist League with the golden wreath: 1977.

Attiláné Kárpáti, (Mrs.), born in Budapest, 1942, chem. eng. 1969 (TUB), university doctor: 1986. Has been employed at the Department since 1962: 1962—1970: technician, 1970—1981: department engineer, 1981—: chief official.

Béla Pete, born in Budapest, 1953, graduate chem. eng. 1977 (TUB), university doctor: 1981. Has been employed at the Department since 1982 as department engineer.

Péter Anna, born in Vácrátót, 1945, chem. eng. 1969 (TUB), university doctor: 1978. Has been employed at the Department since 1969: 1969—1972 junior scientific co-worker, 1973—: scientific co-worker.

Zoltán Bende, born in Máramarossziget, 1942, chem. eng. 1966 (TUB), university doctor: 1973. Has been working at the Department between 1966 and 1986. 1966—1972: assistant, 1972—1986: scientific co-worker. Distinction: Outstanding Inventor, golden class: 1981.

Ferenc Faigl, born in Budapest, 1953, chem. eng. 1977 (TUB), university doctor: 1981. Has been employed at the Department since 1977: 1977—1979: holder of scientific grant, 1979—: junior scientific co-worker, 1984—scientific co-worker.

Zoltán Hell, born in Budapest, 1958, chem. eng. 1982 (TUB), university doctor: 1985. Has been employed ath the Department since 1982: 1982—1983: scientific-technical offical, 1984—1986 junior scientific co-worker, 1987—: scientific co-worker.

Viktória Horváth, born in Budapest, 1946, chem. eng. 1973 (TUB), university doctor: 1985. Has been employed at the Department since 1973: 1973—1976: assistant, 1976—: scientific co-worker.

György Marosi, born in Budapest, 1955, graduate chem. eng. 1981 (TUB). Has been employed at the Department since 1974: 1974—1977: laboratory assistant, 1977—1979: stock-keeper, 1979—1985: technical official, 1985—: scientific co-worker.

Mártonffyné (Mrs.) Zsuzsa Jászay, born in Budapest, 1948, chem. eng. 1971 (TUB), university doctor: 1979. Has been working at the Department since 1982 as scientific co-worker.

András Vig, born in Budapest, 1952, chem. eng. 1976 (University of Textile Industry, Moscow); university doctor and C. Sc.: 1982. Has been working at the Department since 1982 as scientific co-worker. Distinctions: "For Outstanding Studies": 1976 (distinction given by the Minister of University Education of the USSR), Medal of Merit for University Studies: 1977; youth prize "Lehr Ferenc": 1986 (Scientific and Technical Association of the Textile Industry).

Tibor Meisel born in Budapest, 1952, chem. eng. 1976 (TUB), university doctor: 1984. At the Department from 1984 as scientific co-worker.

Holders of Scientific Grants

Borosné Mária Ivicz (Mrs.), born in Budapest, 1950, chem. eng. 1977 (TUB).

Pál Csókási, born in Budapest, 1962, chem. eng. 1986 (TUB).

Koczkáné Emília Csiszár (Mrs.), born in Kapuvár, 1960, chem. eng. 1983 (TUB).

Kovácsné Éva Kozsda (Mrs.), born in Hatvan, 1962, chem. eng. 1985 (TUB).

Ágnes Ludányi, born in Budapest, 1958, chem. eng. 1981 (TUB).

László Szabó, born in Budapest, 1958, chem. eng. 1982 (TUB).

5.6. Titular professors and associate professors

Titular professors:

Gyula Deák, D. Sc. Research Institute of Experimental Medicine of the Hungarian Academy of Sciences

Zoltán Földi member of the Hungarian Academy of Sciences—Pharmaceutical Factory Chinoin

Dénes Kiss C. Sc. former Ministry of Heavy Industry

Barna Mezei retired director of the Chinoin Pharmaceutical Works
Zoltán Mészáros D. Sc., chief engineer, Chinoin Works

Titular associate professors:

Sándor Annus C. Sc., Enterprise of the Paper Industry
Béla Bartha C. Sc. Egyesült Vegyiművek (United Chemical Works)
Tamás Bonkáló INNOVATEXT
András Messmer D. Sc., Central Chemical Research Institute of the Hungarian Academy of Sciences
László Pallos D. Sc., Pharmaceutical Factory EGIS
Gábor Szabó C. Sc., Chinoin Works
Gyula Szűk Chinoin Works
Antal Tungler C. Sc., Research Group for Organic Chemical Technology of the Hungarian Academy of Sciences
Géza Tóth Chinoin Works, director

6. International and domestic scientific relations of the Department

The co-workers of the Department have, in the past years and decades, established widespread scientific relations with the educational staff and with researchers of foreign and domestic institutions. The beneficial effect of these relations can be noticed both in research and in education. A number of joint publications and patents have been issued as a result of co-operation. The main foreign institutions and themes of co-operation are as follows:

1. Great Britain: Polytechnic of North London, Department of Chemistry (Research into organic phosphorus compounds; preparation of sugar-base crown compounds)
2. Italy: University of Milano, Department of Industrial Chemistry (phase transfer catalysis)
3. France: College de France, Laboratory of Molecular Interactions (separation of optical isomers)
4. GDR: Technical University Dresden, Department of Polymer and Textile Chemistry (rheological study of modified polymer systems and their processing into filaments or foils)
5. Soviet Union: Research Institute of Elemental Organic Compounds of the Academy, Moscow (mechanism of cationic lactam polymerization)
6. Soviet Union: Moscow University of Textile Industry (mechanism of reactive coloration of cotton; bleaching mechanism of colored systems).
7. FRG: BASF, Ludwigshafen (participation in the firm's summer courses).
8. FRG: University of Karlsruhe, Institute Engler-Bunte, Department of Organic Chemical Technology (oxidation reactions, catalysis).
9. United States of America: Massachusetts State University, Amherst, Department of Chemistry (synthesis of phosphorus-containing cyclic compounds).

10. Poland: Technical University Wroclaw, Department of Organic Chemical Technology (synthesis and study of non-ionic surfactants).
11. Poland: Technical University Krakow, Department of Organic Chemical Technology (new tendencies in the application of polyurethan).

Considering the international relations as reflected by the trips abroad and the receiving of guests, it can be stated that in the 60-ties and the 70-ties the development was rather dynamic. In the 80-ties there was some recess, however, even in the past years 20—22 co-workers of the Department had the opportunity to travel abroad per year, and the Department received about 15—20 foreign visitors. The objects of the travels abroad are various: most often it is to read a paper at an international conference and to discuss co-operations with direct contacts or research projects, respectively. It serves the professional development in an efficient way that one or two co-workers have the opportunity to take part in study trips of longer duration (over 6 months) at recognized foreign research institutions.

In the past period close relations of work have been established with a number of domestic universities, research institutes and industrial enterprises, respectively. The list of the most important ones is given below:

— Technical University Budapest, Department of General and Analytical Chemistry; University of Sciences Eötvös Lóránd, Department of Organic Chemistry and Laboratory of cybernetics; University of Horticulture and Food Industry, Department of Vegetable Growing; Central Research Institute of Chemistry of the Hungarian Academy of Sciences; Isotope Institute of the Hungarian Academy of Sciences; Research Institute of Plant Protection of the Hungarian Academy of Sciences; Research Institute of Metallurgy; Research Institute of the Heavy Industry; Research Institute of the Enterprise of the Paper Industry; Factory of Pharmaceutical and Chemical Products Chinoin, Corp.; Chemical Combinate Tisza; Reanal Factory of Fine Chemicals; Factory of Pharmaceutical Products Richter; Factory of Pharmaceutical Goods EGIS; United Chemical Works; Chemical Works of North-Hungary; Chemical Factory Alkaloida; Enterprise for Cosmetics and Household Chemical Industry Caola; Fur Factory Pannónia; Fine-cloth Factory Richards; Textile Factory Kispest; Tobacco Factory Pécs; Budaflax Linen Spinnery and Weavery; Budaprint; Hungarian Enterprise of Silk Industry; Radelkis Industrial Co-operative for Manufacture of Electrochemical Instruments.

7. Research group of the Academy of Sciences at the Department

It was first in 1956 that the Hungarian Academy of Sciences established permanent staff for the research work of its members. Thus, it granted two graduates for the Department, to work with professor Csűrös, member of the Academy, as of December 1, 1956. Thus, research work on catalysis and sugar chemistry has been started in the frame of the Academy, too. In the years that followed, the academic posts for researchers increased in number and in 1962 the research group consisted already of 7 graduates and 4 laboratory assistants. The focus of the research work was, following professor Géza Zemplén's track, sugar chemistry and heterogenous catalysis. Beside these, research for the light industry started, too.

The research topics remained unchanged in the course of time. It meant a change that the research group adopted in the meantime the name of Organic Chemical Technological Research Group of the Hungarian Academy of Sciences.

The head of the Research Group is from 1975, on, professor István Rusznák. The number of the researchers of the group is at present 12, the number of the technicians and laboratory assistants is 8.

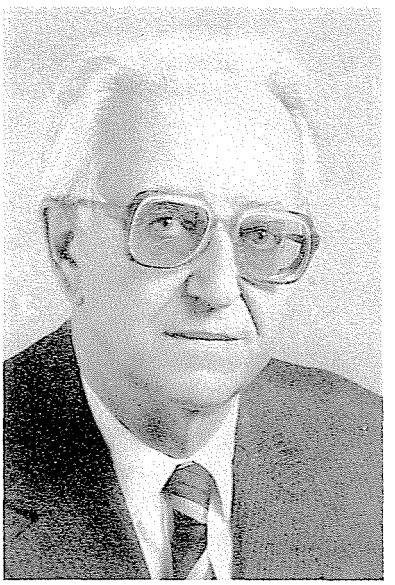
*

The sources used in compiling this material were:

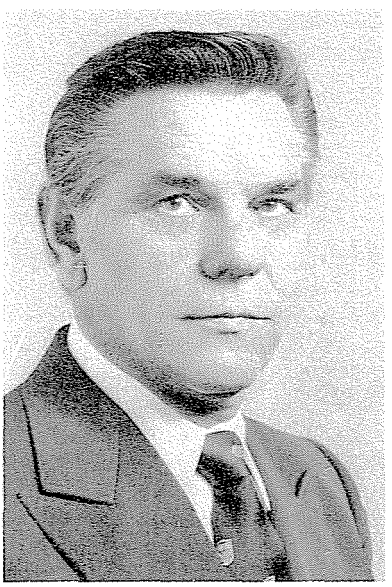
— materials of the archives of the Technical University Budapest,
— various materials of the Faculty and the Department (minutes, yearbooks, reports of the heads of department etc.)
— personal communications of some co-workers of the Department.

The author expresses his thanks to Emma Anna Pedroni and Márton Kiss for their assistance in acquiring the archivalia.

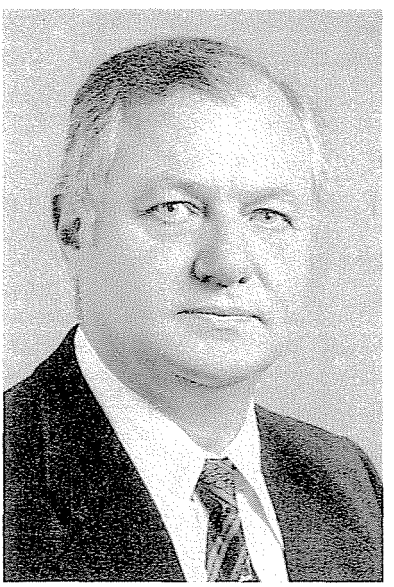
Prof. Z. Csürös



Prof. I. Rusznák

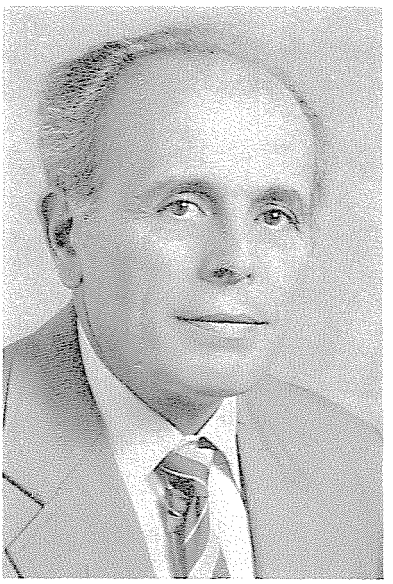


Prof. L. Töke

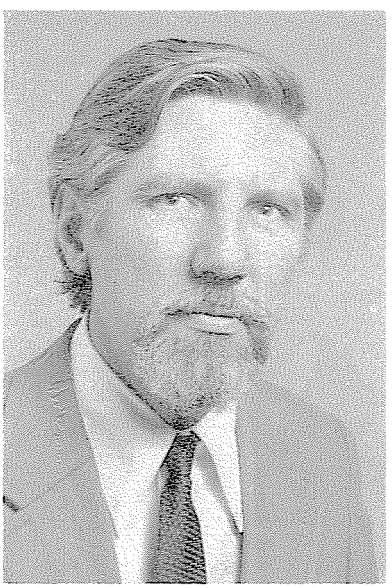


Prof. E. Fogassy

Prof. J. Petró

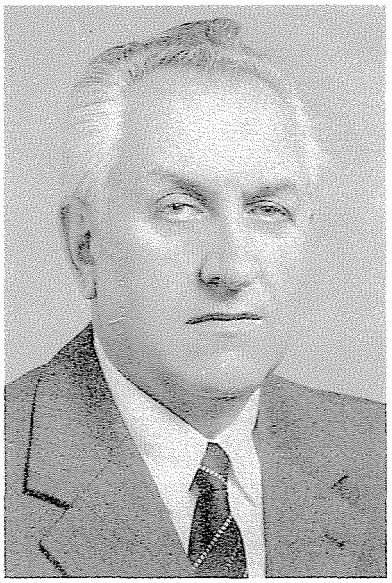


Gy. Bertalan



S. Békássy

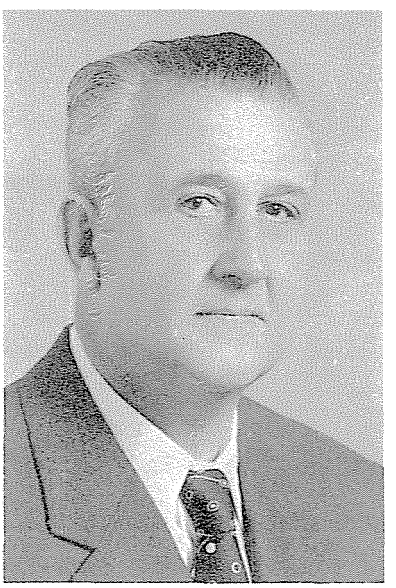
L. Fenichel



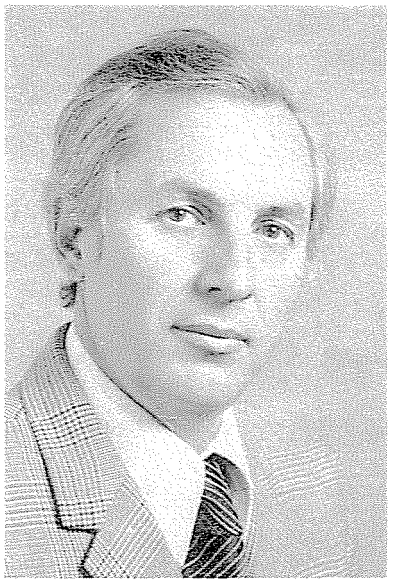
J. Heiszman

Gy. Lepenye

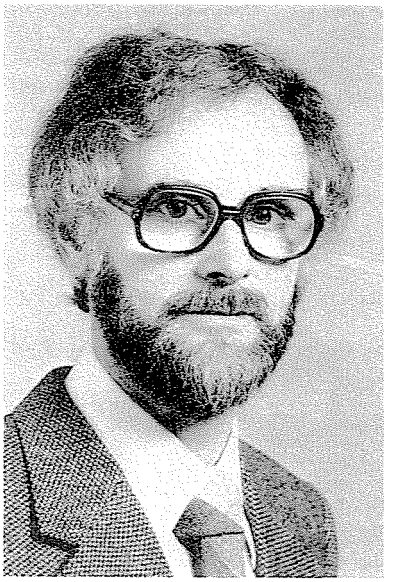
B. Losonczi



J. Morgós

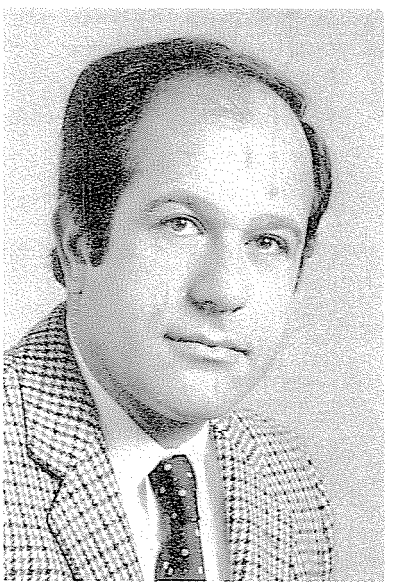


I. Bitter

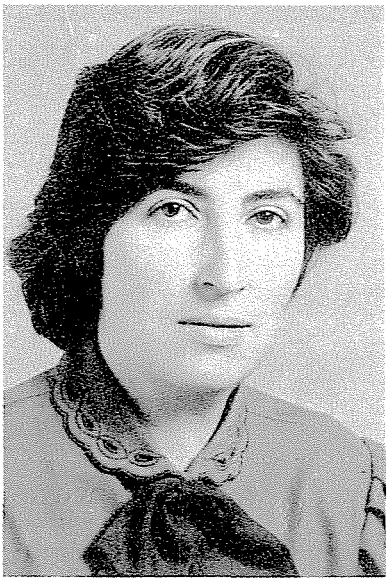


T. Mallát

T. Máthé

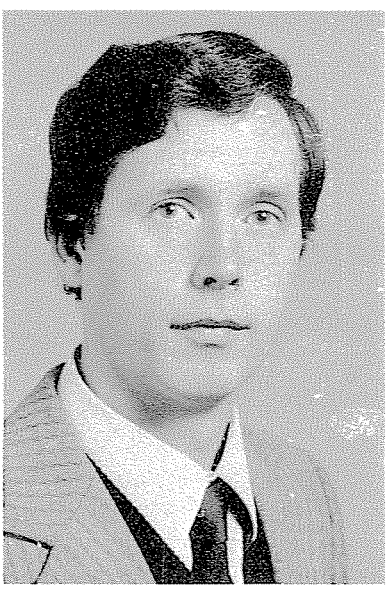


A. Tungler



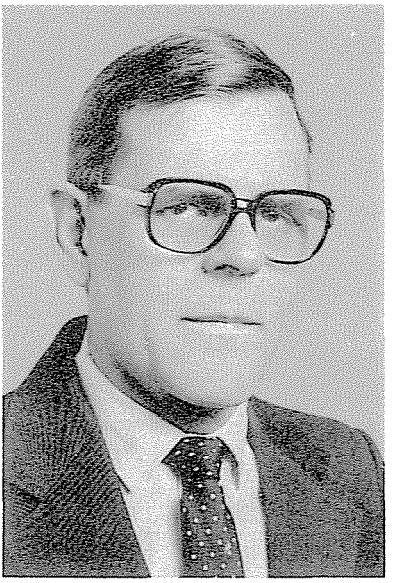
M. Ács

B. Ágai



P. Bakó

S. Csányi



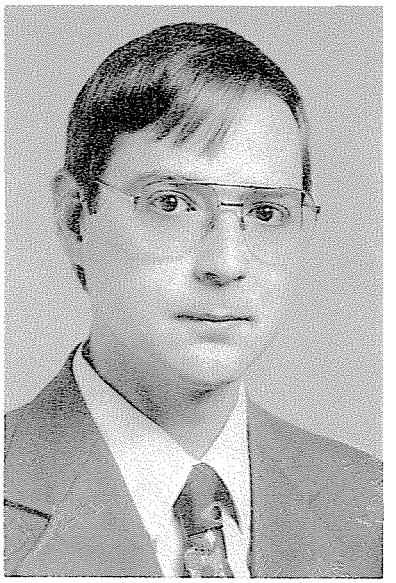
Zs. Dusza

L. Farkas

J. Frankl

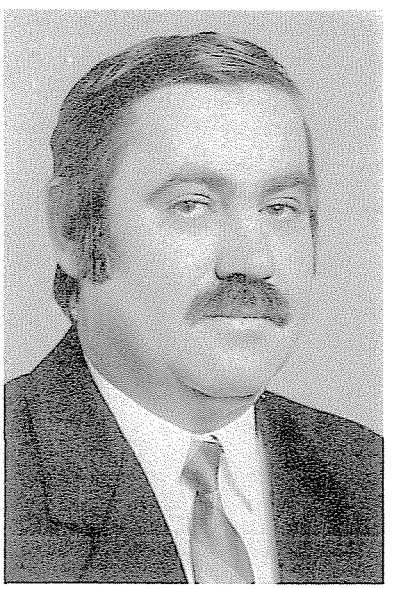
I. Gyurkovics

I. Kádas



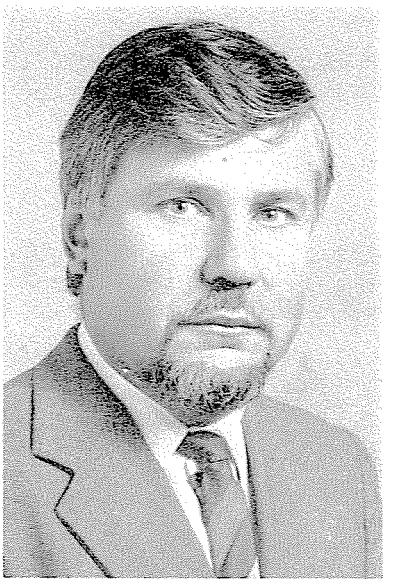
Gy. Keglevich

M. Kiss



I. Kovács

Z. Lengyel



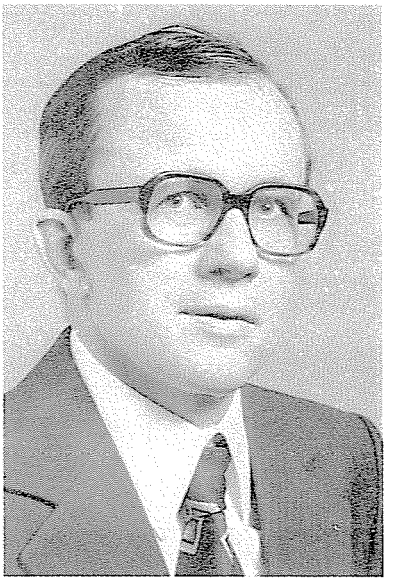
I. Petneházy

É. Polyánszky

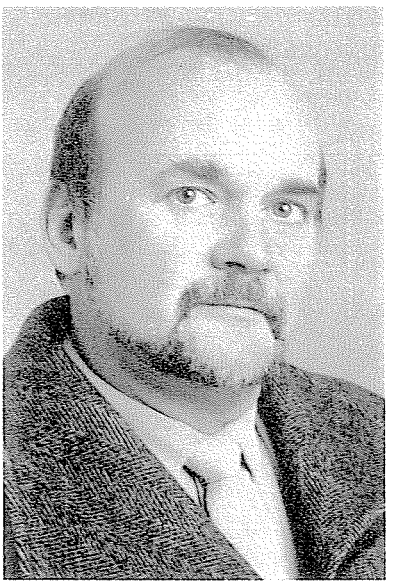
J. Recski-Borsa*

* At present working abroad.

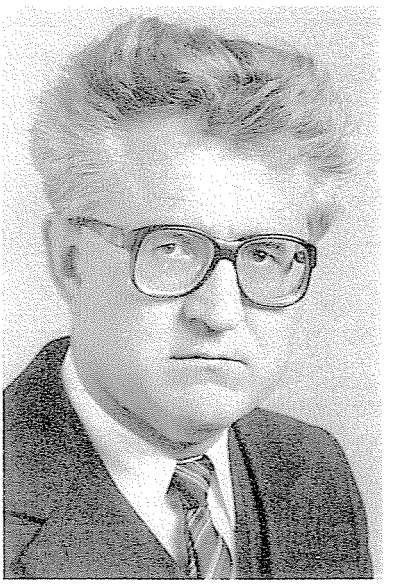
J. Reicher



P. Sallay

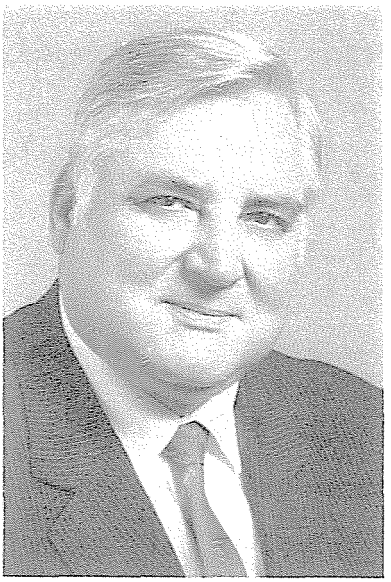


G. T. Szabó



L. Szeghy

I. Tánczos

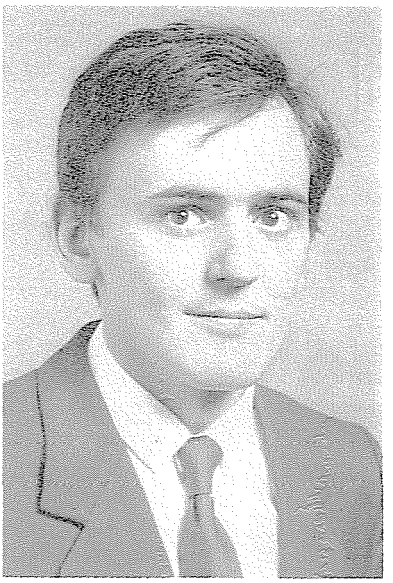


L. Trézl

J. Veress

A. Kárpáti

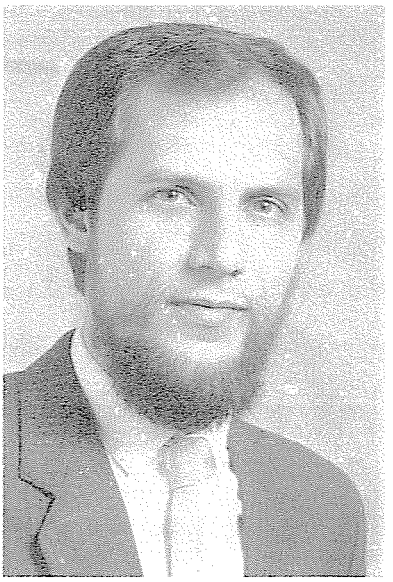
P. Anna



F. Faigl

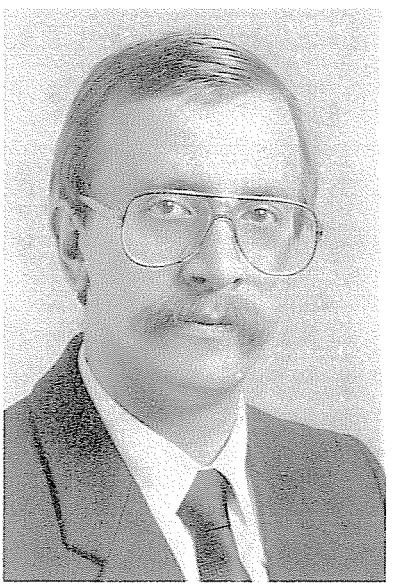
Z. Hell

V. Horváth

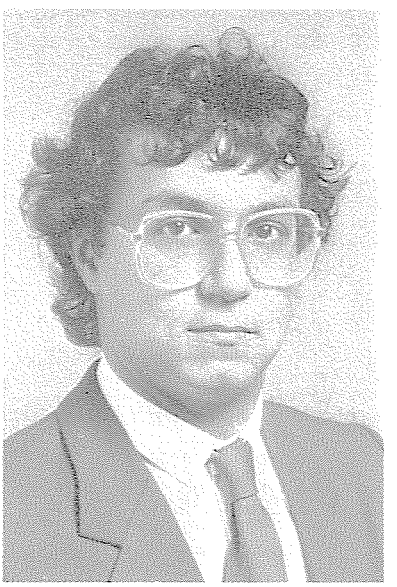


Gy. Marosi

Zs. Mártonffy-Jászay



A. Vig



T. Meisel