

TECHNICAL UNIVERSITY  
OF ŁÓDŹ

# GUIDEBOOK



1989





**TECHNICAL UNIVERSITY OF ŁÓDŹ**

# **GUIDEBOOK**

**1989**



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Institute of Papermaking and Paper Machines  
Faculty of Machine Design (Bielsko-Biala)  
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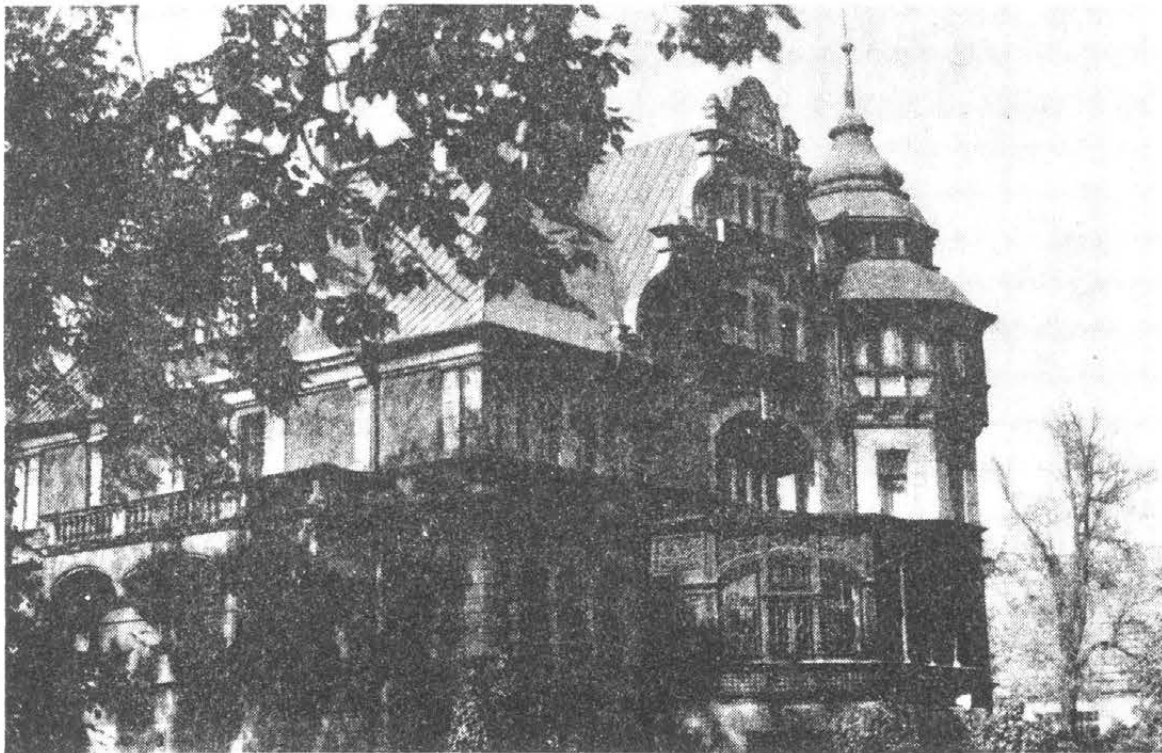
# TECHNICAL UNIVERSITY OF ŁÓDŹ

## INTRODUCTION

Łódź Technical University with its Bielsko-Biała Branch is the only one of this kind in Łódź macroregion.

## HISTORY

- 24.05.1945 - the decree of the National People's Council (KRN) creating the Technical University of Łódź.
- 25.10.1945 - the first meeting of 3 Faculty Councils (Mechanical and Textile Engineering, Electrical Engineering and Chemical Technology),
  - academic staff: prof. - 34, senior research fellows - 15, assistants - 53, other academic staff - 12,
  - students - 983 registered in all years of study,
  - the seat of the University - old factory buildings acquired for the University situated in the area of Żwirki St., Żeromski St. Swierczewski St. (formerly Radwańska St.) and Stefanowski St. (formerly Gdańska St.).
- 01.10.1947 - transformation of the Textile Section of Mechanical Engineering into the Textile Faculty (the fourth of the University, the only one of this kind in Poland).



Rector's Offices Building

- 1950 - organizing the Faculty of Food Chemistry (the fifth faculty of the University).
- 1956 - creating the Faculty of Civil Engineering (the sixth faculty of the University).
- 1962 - the first general project of the development of the University including the plans for erecting new buildings for such faculties as Mechanical Engineering, Electric Engineering and Civil Engineering and for Radiation Chemistry, Dyes and Chemical Engineering Institutes; erecting student hostels, canteens and other facilities was also planned.
- 1969 - creating the Bielsko-Biała Branch of Łódź Technical University.
- 1970 - changing of the organizational structure of the University. 28 faculty and interdepartmental institutes were created besides the Institute of Chemical Engineering with faculty status. The Institute of Papermaking and Papermaking Machines moved to its new building.



- 1976 - creating the Faculty of Applied Physics and Applied Mathematics (the seventh Faculty of the University). The Institute of Electronics in the Faculty of Electrical Engineering started MSc course in Electronics.
- 1980 - incorporation of the Institute of Electronics into the Faculty of Applied Physics and Applied Mathematics.
- 1982 - Bielsko-Biała Branch was transformed into an independent Faculty of Construction of Machinery and the Institute of Textiles.

#### RECTORS

- 1945 - 1948 prof. Bohdan Stefanowski
- 1948 - 1952 prof. Osman Achmatowicz
- 1952 - 1953 prof. Bolesław Konorski
- 1953 - 1962 prof. Mieczysław Klimek
- 1962 - 1968 prof. Jerzy Werner
- 1968 - 1975 prof. Mieczysław Serwiński
- 1975 - 1981 prof. Edward Galas
- 1981 - 1987 prof. Jerzy Kroh
- 1987 - prof. Czesław Strumiłło



Prof. Bohdan Stefanowski



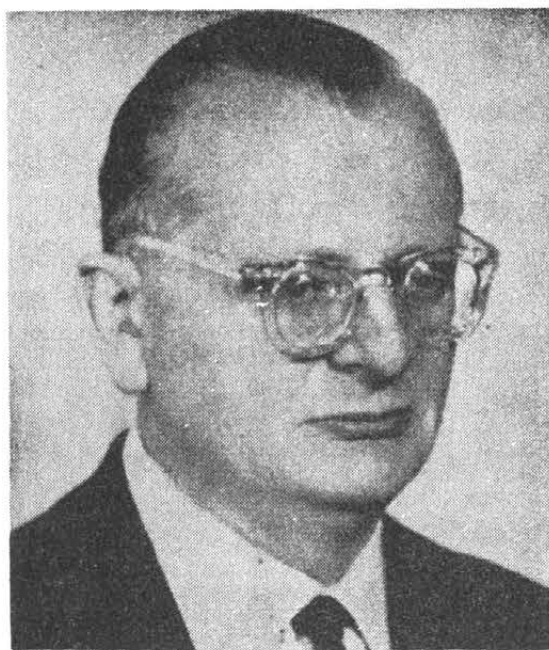
Prof. Osman Achmatowicz



Prof. Bolesław Konorski



Prof. Mieczysław Klimek

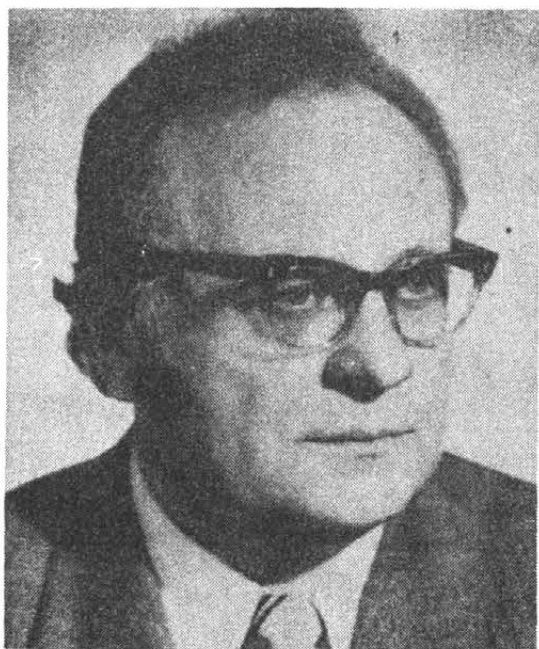


Prof. Jerzy Werner

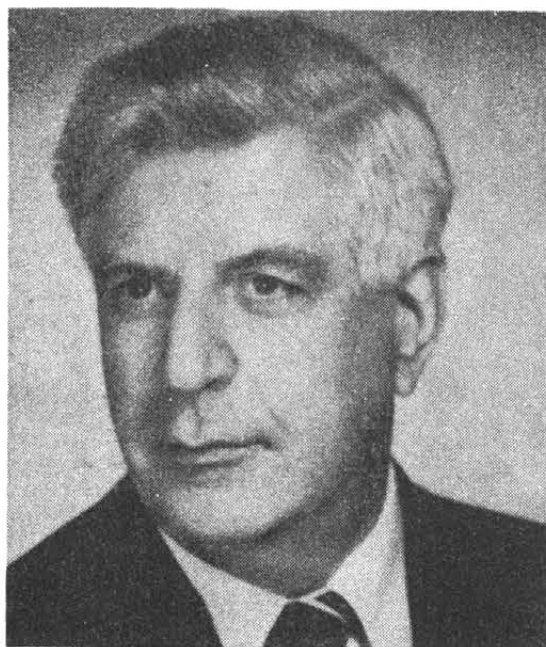


Prof. Mieczysław Serwiński





Prof. Edward Galas



Prof. Jerzy Kroh



Prof. Czesław Strumiłło



Rector's staff up to date 1987/88

From left to right: Prorector for Scientific Research prof. Zbigniew Piotrowski, Rector prof. Czesław Strumiłło, Prorector for Students' Affairs doc. Piotr Klemm, Prorector for University Development prof. Tadeusz Jackowski

#### FACULTIES AND INSTITUTES OF ŁÓDŹ TECHNICAL UNIVERSITY

Faculty of Mechanical Engineering

Faculty of Electrical Engineering

Faculty of Chemical Technology

Faculty of Textile Engineering

Faculty of Food Chemistry

Faculty of Civil Engineering and Architecture

Faculty of Applied Physics and Applied Mathematics

Bielsko-Biała Faculty of Construction of Machinery and two Institutes

The Institute of Papermaking and Papermaking Machines

The Institute of Chemical and Process Engineering (with a faculty status).

## UNIVERSITY STAFF

Each faculty of our university includes: full professors, associate professors (docents), assistant professors (adiunkts) lecturers and teaching assistants. Professors and associate professors are appointed to their positions by national authorities on application of the University Senate, and hold them as life tenures. They have to hold a PhD and, among other requirements, submit a postdoctoral dissertation i.e. attain the third academic degree following M.Sc. and PhD. Assistant professors (adiunkts) have to have a PhD, whereas teaching assistants who are employed to teach practical classes hold M.A. and M.Sc. degrees.

full professors - 93

associate professors (docents) - 166

assistant professors (adiunkts) - 748

lecturers and senior lecturers - 209

assistants and senior assistants - 254

other academic staff - 20

non - academic staff - 1177

administration - 1401

4174 people in all, including 333 persons employed in Bielsko-Biala.

## DEGREES

The University conferred the following higher degrees and diplomas:

M.Sc. - 37 240 (undergraduate courses)

1560 - post - graduate diplomas (post-graduate courses)

PhD - 1723

1210 diplomas qualifying for associate professorship (docents).

## STUDENTS

5500 students in 14 branches of studies are offered 32 specializations and 105 graduation fields.



## RESEARCH

12 leading in the country branches of research: Food Chemistry and Food Processing Chemistry, Biological Active Compounds, Chemistry of Dyes, Radiation Chemistry, Chemistry and Physics of Polymers, Electric Machines and Transformers, Electric Equipment and Apparatuses, Electroheat, Processing Machines and Equipment, Mechanical and Chemical Textile Technology, Chemical Technology of Wood and Paper, Chemical and Processing Engineering. Apart from the research mentioned above the University carries on research work and projects, frequently unique in the country. Information concerning these can be found in the research reports of all the Institutes.

## SCIENTIFIC COOPERATION WITH FOREIGN PARTNERS

The University cooperates with 30 research centers in 12 countries and its institutes organize numerous home and international conferences, sessions and symposia.

The Honoris Cause degree of Łódź Technical University was conferred to 12 outstanding scientists from Poland and abroad and 7 of the University professors were conferred the Honoris Cause degree by foreign universities.

Honoris Cause degree of University of Strathclyde, Glasgow

prof. Jerzy Werner 1973

prof. Mieczysław Serwiński 1977

prof. Edward Galas 1978

prof. Jerzy Kroh 1983

prof. Czesław Strumiłło 1989

Honoris Cause degree of the Textile Institute of Moscow

prof. Janusz Szosland 1979

Honoris Cause degree of Université Paul Sabatier Toulouse

prof. Władysław Pelczewski 1983

## THE LIBRARY

Apart from the Central Library of the Łódź Technical University, there are 4 faculty libraries and one general library. The book collection includes 734 000 volumes, special collections (154.000 units) and periodicals (1162) units - a significant source of the current scientific information.

## PUBLISHING

The University has its own publishing office and its own printing house. 12 series of Scientific Papers of T.V.L and one series of Scientific Theses, handbooks and other teaching materials are printed each year.

## POLITICAL PARTIES AND OTHER ORGANIZATIONS

Political parties play an important role at the University. Their representatives serve in all collective bodies of the university. There are:

- Polish United Workers' Party (PZPR)
- Democratic Party (SD)
- United Peasant Party (ZSL).

Apart from political parties there are numerous scientific associations, NOT being the most important one, cultural and sport associations and several student organizations, such as

- Polish Teachers Union (ZNP)
- Polish Students Association (ZSP)
- Polish Socialist Youth Association (ZSMP)
- Polish Rural Youth Association (ZMW)
- Academic Sports Association (AZS)

## UNIVERSITY BUILDINGS

There are 39 buildings to provide for the scientific, teaching, administrative and social functions of the university (730000 m<sup>3</sup> and 194000 m<sup>2</sup>).

### ACCOMODATION

There are 8 Hostels which provide residential accomodation for over 2700 students. They are linked by a communal block containing the cinema, the student union office, and the canteen. There are also 4 student clubs.

### MEDICAL ADVICE AND TREATMENT

All the students and workers of the University are entitled to make use of the Health Service Center which provides a comprehensive medical service with access to specialist facilities. It is staffed by full - time medical officers and nursing staff.

### REST AND RECREATION

The University administrates four holiday rest - houses for its workers - Jastrzębia Góra (at the sea-side), Wiartel (Mazurian Lakes), Konopnica, Szklarska Poręba (in the mountains).

# THE FACULTY OF MECHANICAL ENGINEERING W-1

Dean's office address: 90-542 Łódź, ul. B. Stefanowskiego 1/15

tel. 36-46-83

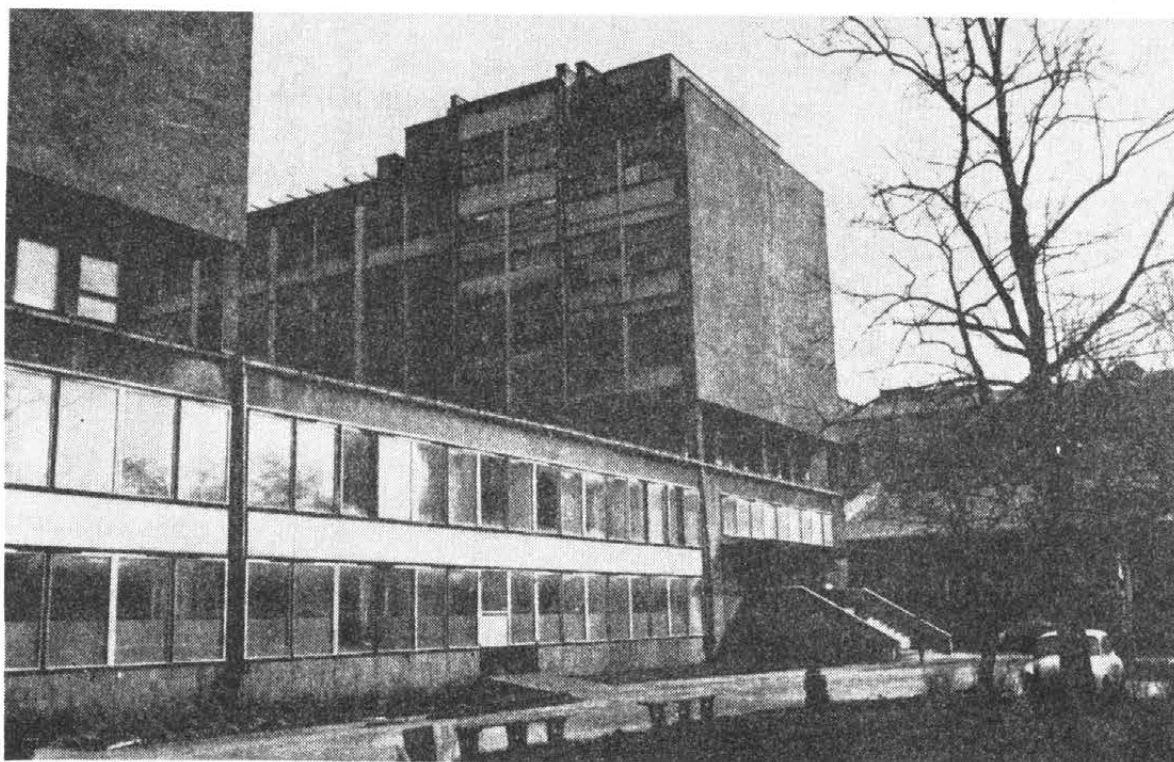
## 1. HISTORY OF THE MECHANICAL ENGINEERING FACULTY

The Mechanical Engineering Faculty of the Technical University of Łódź was created by the state decree of May 24, 1945. Sixteen professors who answered the call of Professor Bohdan Stefanowski, the first Rector and also the initiator and architect of the Faculty, participated in the first meeting of the Council of the Mechanical Engineering Faculty which was held on June 26, 1945. Those professors were very active in organizing the Faculty.

Prof. Bolesław Tołkoczko was elected the first Dean of the Faculty. It was decided that in the academic year 1945/46 courses on all four years of studies at five specializations-energy conversion and construction, railway engineering, vehicle engineering, technological, and textile engineering - would be started. Teaching and organizational preparations were initiated in July 1945 and in October of the same year 523 students, in that number 259 newly enrolled, commenced studies at the Faculty.

Professors Wacław Moszyński, Witold Pogorzelski, Bolesław Tołkoczko, Czesław Witoszyński, Kazimierz Zembrzuski, Ludwik Żarnowski, and engineers Jerzy Młodziński and Wiktoria Morozowska were the most active in establishing the profile of the Mechanical

Engineering Faculty, preparing the programmes and organizing the classes. An exceptional contribution to the development of the Faculty was brought by the first Rector, Prof. Bohdan Stefanowski and by his close co-worker, Marian Mieszkowski.



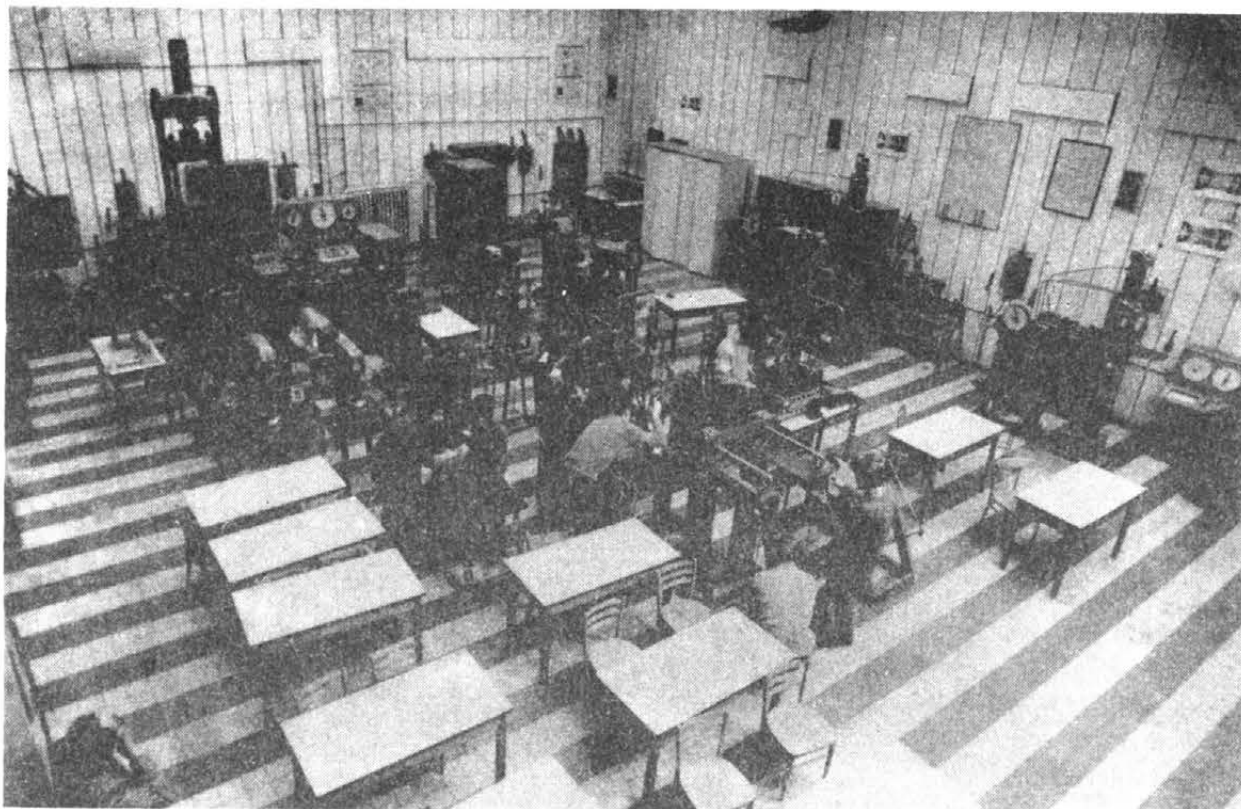
The building of the Mechanical Engineering Faculty. Technical University of Łódź

Initially, the staff of the Faculty included 49 persons, among them 16 professors, 7 senior lecturers and 26 assistant lecturers. In the years 1945-46 sixteen chairs were created at the Faculty. In the course of time the Faculty developed and its organizational and teaching activities reached far beyond the Łódź region. In the academic year 1963/64 the Faculty organized a course for extramural students in Płock and conducted teaching until the moment when the Technical University of Warsaw took over that unit. In the year 1968/69 the Faculty established a consulting unit for extramural students in Piotrków Trybunalski. The unit existed for over 10 years. The Faculty organized its section in Bielsko-Biała where the Łódź Technical University

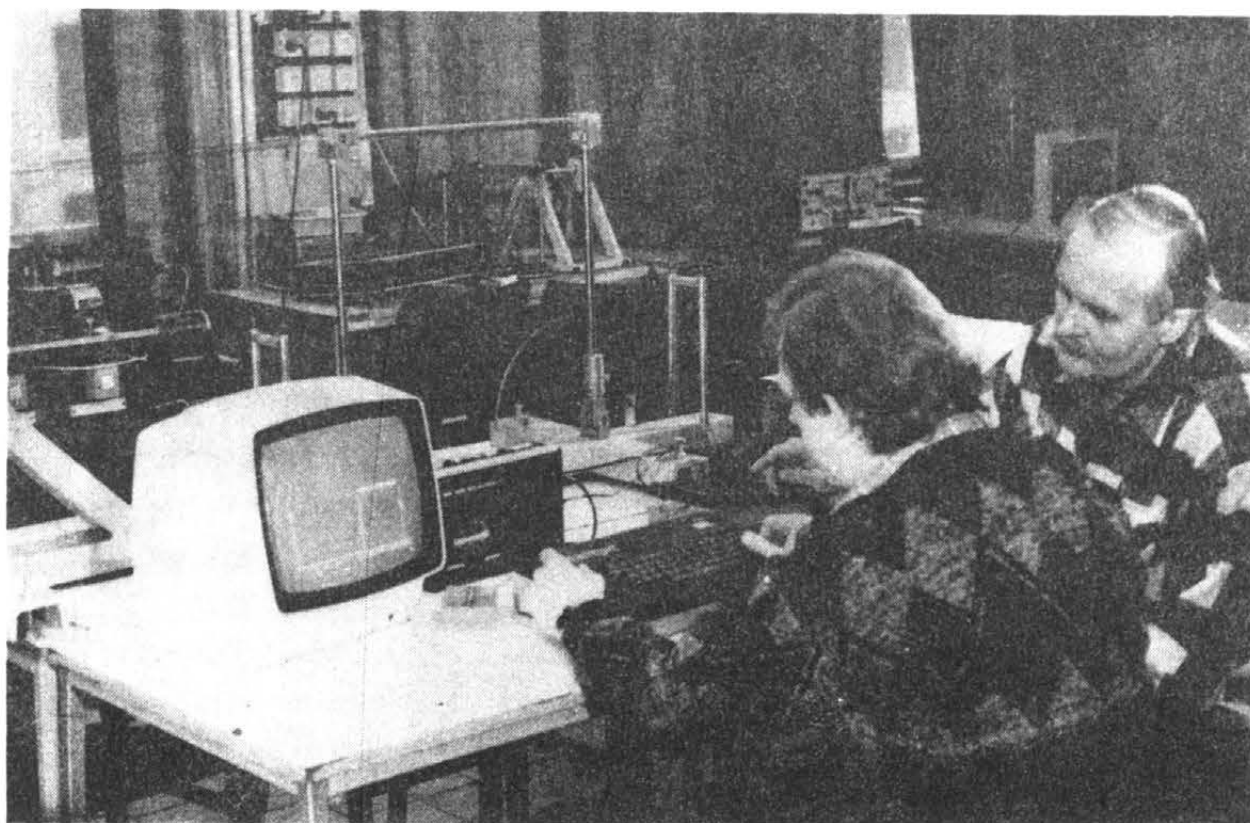


The Council of the Mechanical Engineering Faculty





Students' Laboratory of General Mechanics at the Institute of Applied Mechanics (I-5)



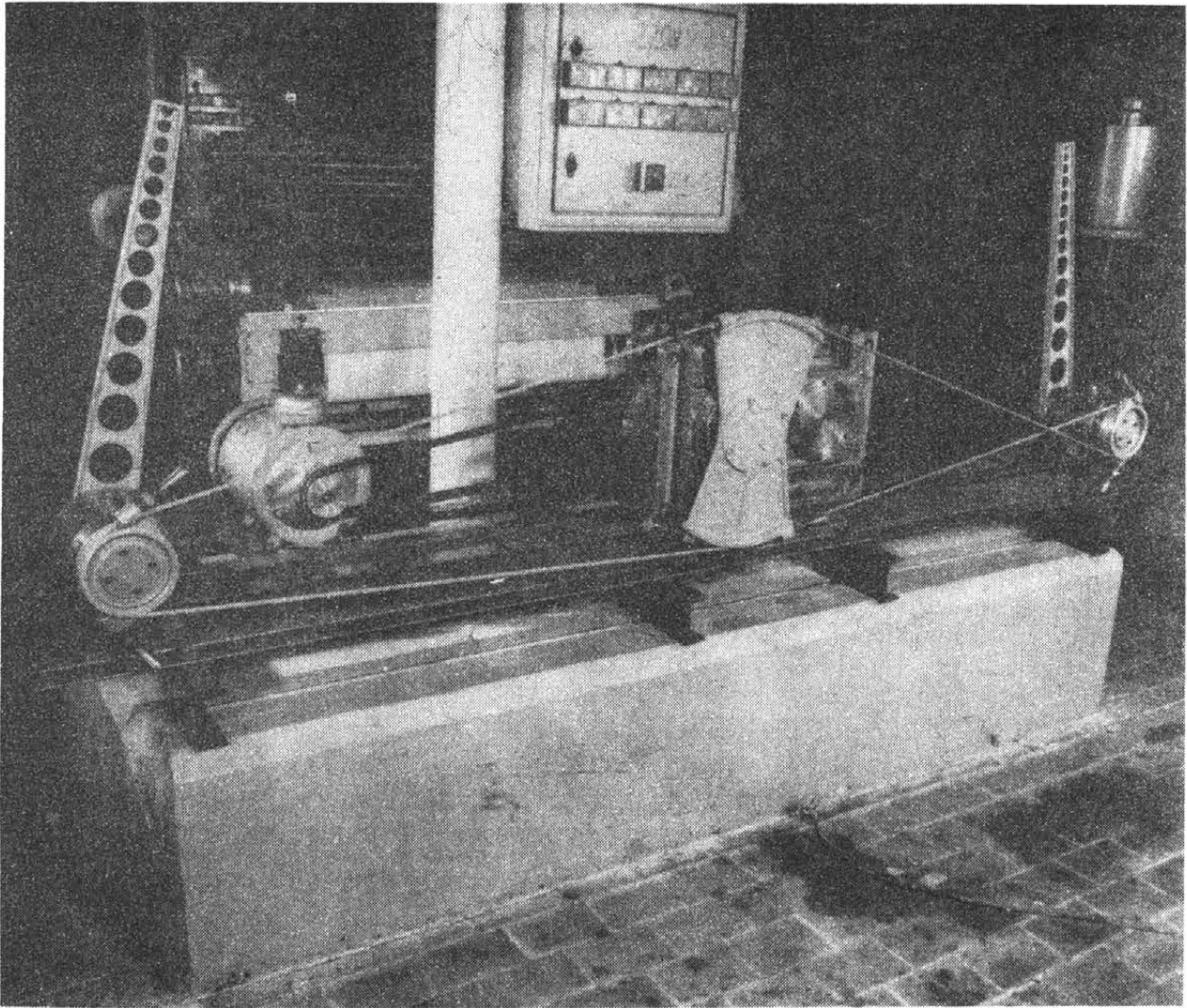
Students' Laboratory of Strength of Materials at the Institute of Applied Mechanics (I-5)

founded its branch. In 1981 this section was transformed into an independent unit, the Faculty of Machine Construction.

In 1970 a significant organizational change at the Faculty took place as a result of the decree of the Minister of Higher Education; instead of the chairs, seven institutes were formed: Applied Mechanics, Machine Design, Materials Science and Technology of Metals, Machine Tools and Production Engineering, Thermal Engineering and Refrigeration, Turbomachinery, and Vehicles Research. This system has been valid until now. The Faculty includes also a technical section of the Inter-Faculty Institute of Papermaking and Paper Machines.

## 2. DEANS AND DIRECTORS OF FACULTY ORGANIZATIONAL UNITS

Since the academic year 1987/88 the Faculty has been headed by Dean: Prof. Jan Krysiński, Dean's office tel. 36-46-83,  
 Vice-Dean for Scientific Research: Prof. Leszek Kwapisz,  
 Vice-Dean for Students' Affairs: Docent Tadeusz Bratek,  
 Vice-Dean for the 5th year Courses and Extramural Courses: Docent Jerzy Grabowski,  
 Directors of the Institutes in the present tenure (1987/88-1989/90):  
 Docent Kazimierz Grossman, Institute of Applied Mechanics, tel. 36-49-85,  
 Docent Henryk Krzemiński-Freda, Institute of Machine Design tel. 36-21-42,  
 Prof. Zdzisław Haś, Institute of Materials Science and Technology of Metals tel. 36-20-65,  
 Prof. Jan Rafałowicz, Institute of Machine Tools and Production Engineering tel. 36-20-91,  
 Docent Jacek Kulesza, Institute of Thermal Engineering and Refrigeration tel. 36-74-81,  
 Prof. Władysław Gundlach, Institute of Turbomachinery, tel. 36-13-83,  
 Prof. Cezary Szczepaniak, Institute of Vehicles Research tel. 36-22-65,  
 Docent Kazimierz Modrzejewski, Institute of Papermaking and Paper Machines, tel. 36-88-22.



Laboratory of Textile Machines of the Institute of Machine Design.  
Testing rig for examination of the dynamic characteristics of rapier mechanism of loom (I-6)

### 3. ORGANIZATION OF THE FACULTY

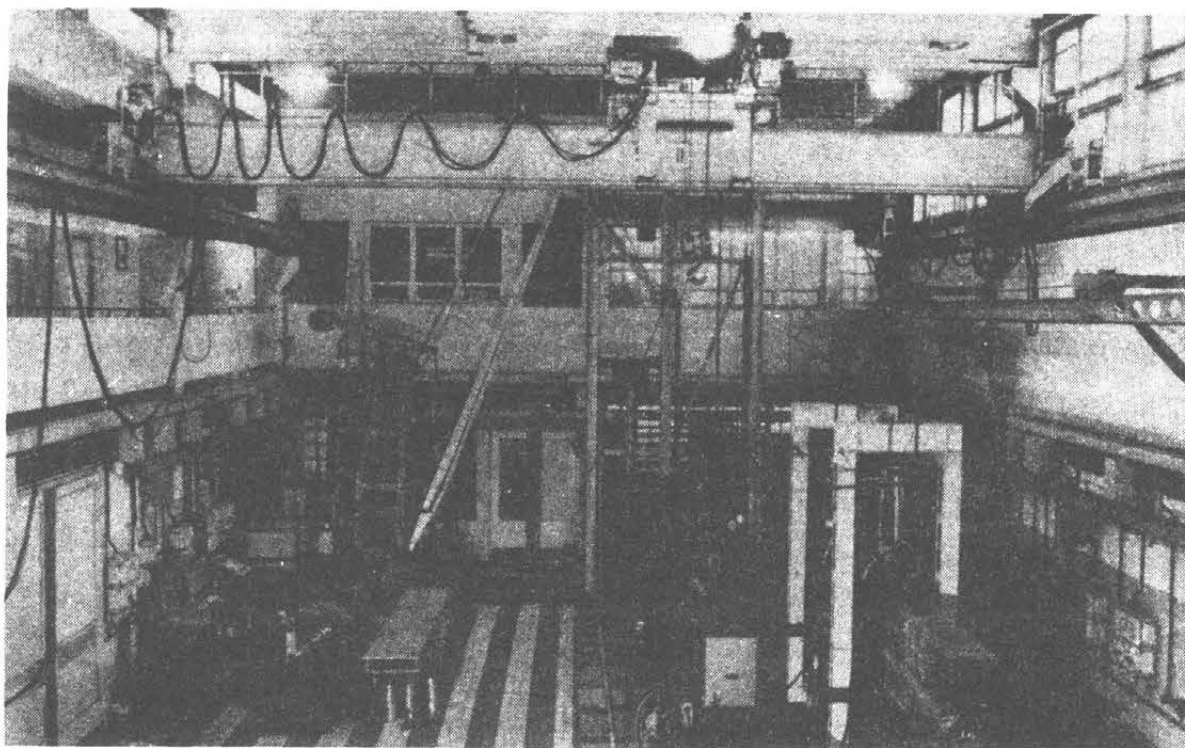
The Mechanical Engineering Faculty comprises the following Institutes:

Institute of Applied Mechanics (I-5):

- General Mechanics Group,
- Strength of Materials Group,
- Theory of Mechanisms and Machines Group,

Institute of Machine Design (I-6):

- Division of Descriptive Geometry and Engineering Drawing,
- Division of Principles of Machine Design,
- Division of Heavy Machines,
- Division of Textile Machines,



Heavy Working Machine Room at the Institute of Machine Design (I-6)

Institute of Materials Science and Technology of Metals (I-7):

- Materials Engineering Group,
- Foundry Engineering Equipment Group,
- Plastic Technology and Welding Group,
- Metal Materials Group,

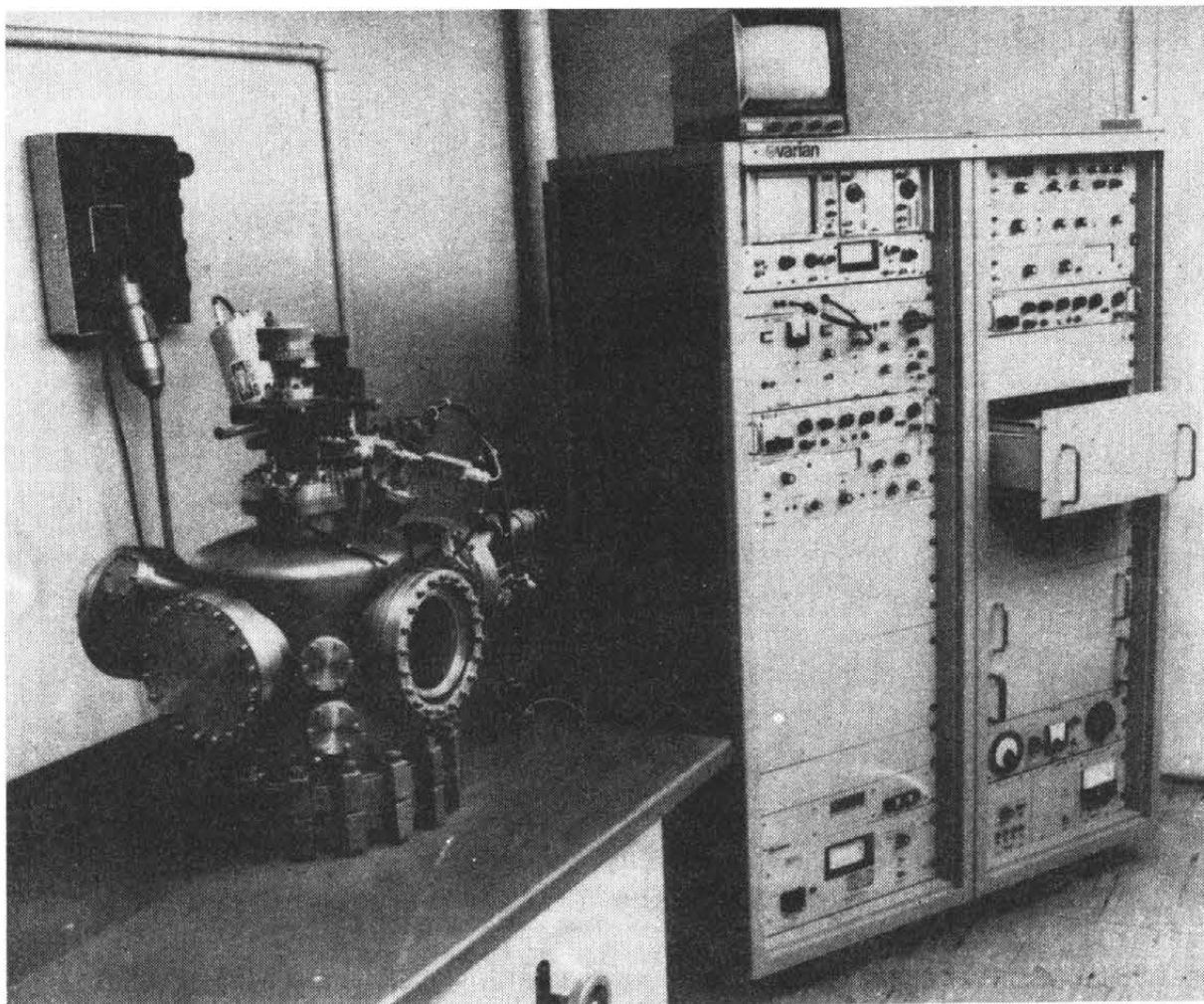
Institute of Machine Tools and Production Engineering (I-8):

- Division of Machine Tools,
- Division of Machine Tools Automation,
- Division of Production Engineering,
- Division of Machining Processes and Tools,



Institute of Thermal Engineering and Refrigeration (I-9):

- Thermodynamics Group,
- Group of Machines and Equipment of Chemical and Food Industry,



Auger electron Spectrometer for testing chemical composition of surfaces. Institute of Materials Science and Technology of Metals (I-7)

Institute of Turbomachinery (I-10):

- Division of Fluid Mechanics,
- Thermal Fluid-Flow Machinery Group,
- Metrology Group,
- Pneumatics Group,
- Hydraulics Group,

Institute of Vehicles Research (I-11):

- Cars and Tractors Group,
- Fuel Engines Group,
- Cars Exploitation Group,

Technical section of the Inter-Faculty Institute of Papermaking and Paper Machines (I-4):

- Division of Paper and Fibreboard Machines,
- Division of Thermal Equipment and Converting Machines,
- Division of Printing Machines.

#### 4. ACADEMIC AND NON-ACADEMIC STAFF OF THE FACULTY (IN NUMBERS)

Academic staff:	239
professors	15
docents	26
others	198
Technical staff	228
Administration workers	
and librarians	49

The total number of employees at the Mechanical Engineering Faculty is 516 people.

#### 5. EDUCATION

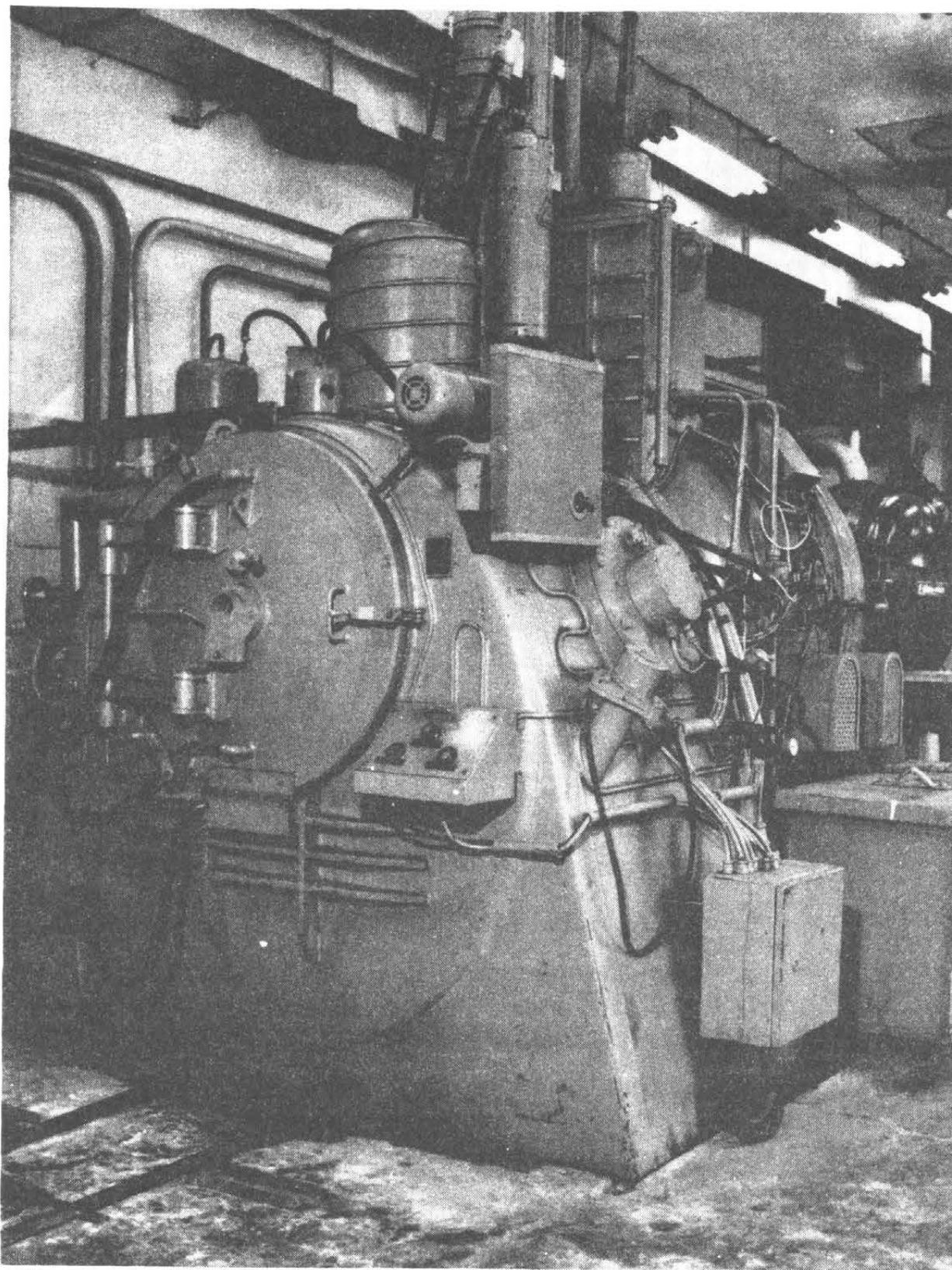
In the years 1945-1988 8383 students graduated from the Faculty; 2934 graduates obtained engineer degree and 5449 the title of Master of Science.

The following courses are conducted at present at the Faculty:

M.Sc. full-time courses in:

- Mechanical Engineering,
- Material Engineering,





Vacuum furnace for thermal treatment. Institute of Materials  
Science and Technology of Metals (I-7)

Courses for working students:

- part-time courses,
  - Eng. programme,
- extramural courses,
- mixed type courses      - M.Sc. programme,
- university extension courses
  - 2nd level M.Sc. programme,
- complementary M.Sc courses,
  - Ph.D. courses.
  - Post-graduate courses.

The Mechanical Engineering Faculty offers M.Sc. courses in the following specializations:

### Mechanical Engineering

#### Design Section

Specialization: Heavy working machines.

Graduation fields: - cranes and conveyors,  
                           - earth work machines.

Specialization: Machinery and equipment for chemical and food industry.

Graduation fields: - refrigeration,  
                           - air conditioning,  
                           - low-temperature technique.

Specialization: Machinery and equipment of paper and wood-working industry.

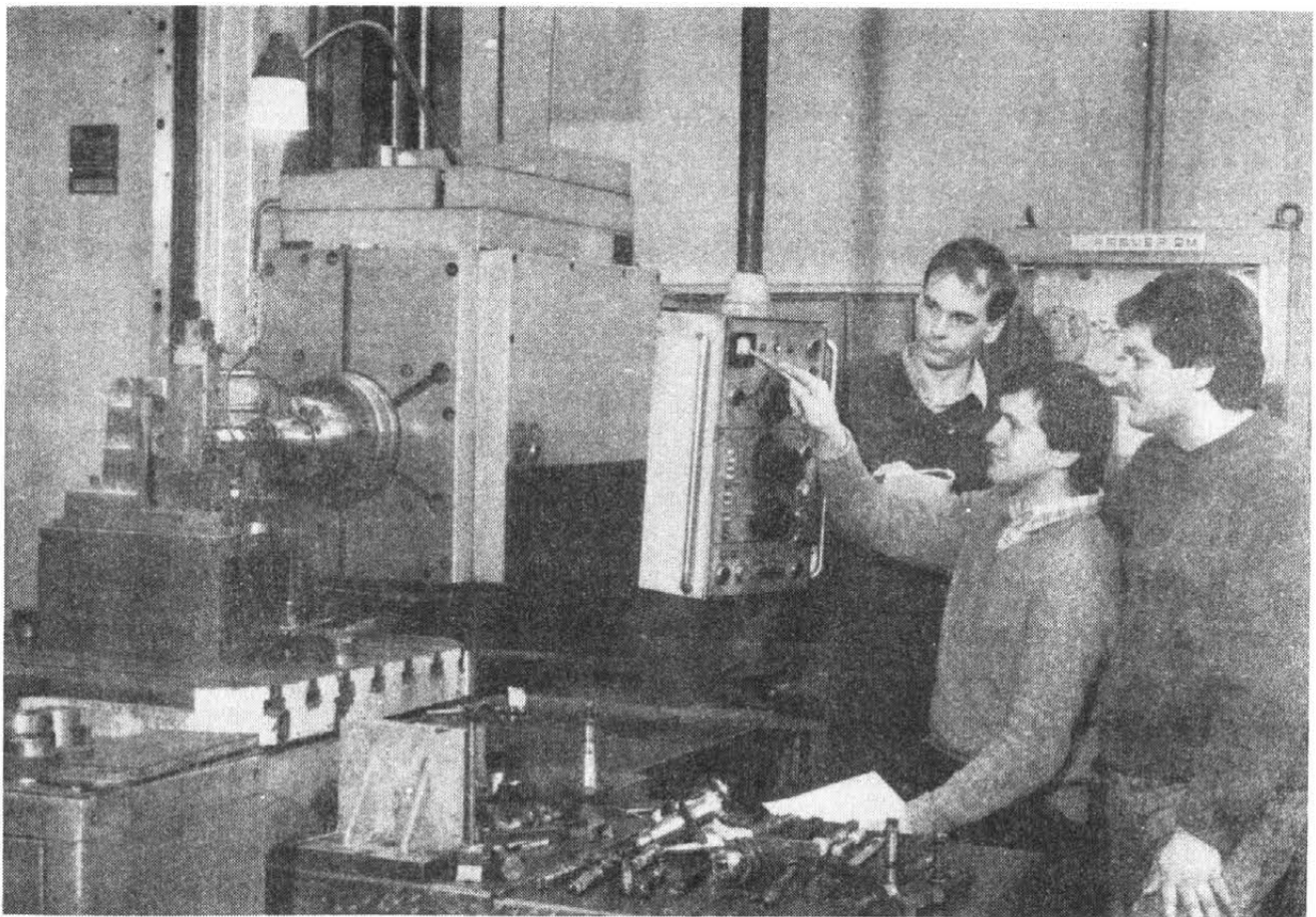
Graduation fields: - machines and equipment of the paper industry,  
                           - machines and equipment of the fibre-  
                                   -and particle board industry,  
                           - machines and equipment of the paper  
                                   converting industry,  
                           - machines and equipment of the printing  
                                   industry.

Specialization: Machinery and equipment for textile industry.

Graduation fields: - machines for natural fibres and mixtures processing,  
- machines for production and processing of chemical fibres.

Specialization: Cars and tractors.

Graduation fields: - construction of cars and tractors,  
- engine constructions,  
- construction and technology of car bodies,  
- exploitation and repair technology of cars and tractors,  
- cars and tractors testing.



Numerically controlled boring machine. Institute of Machine Tools and Production Engineering (I-8)

### Energy Conversion Section

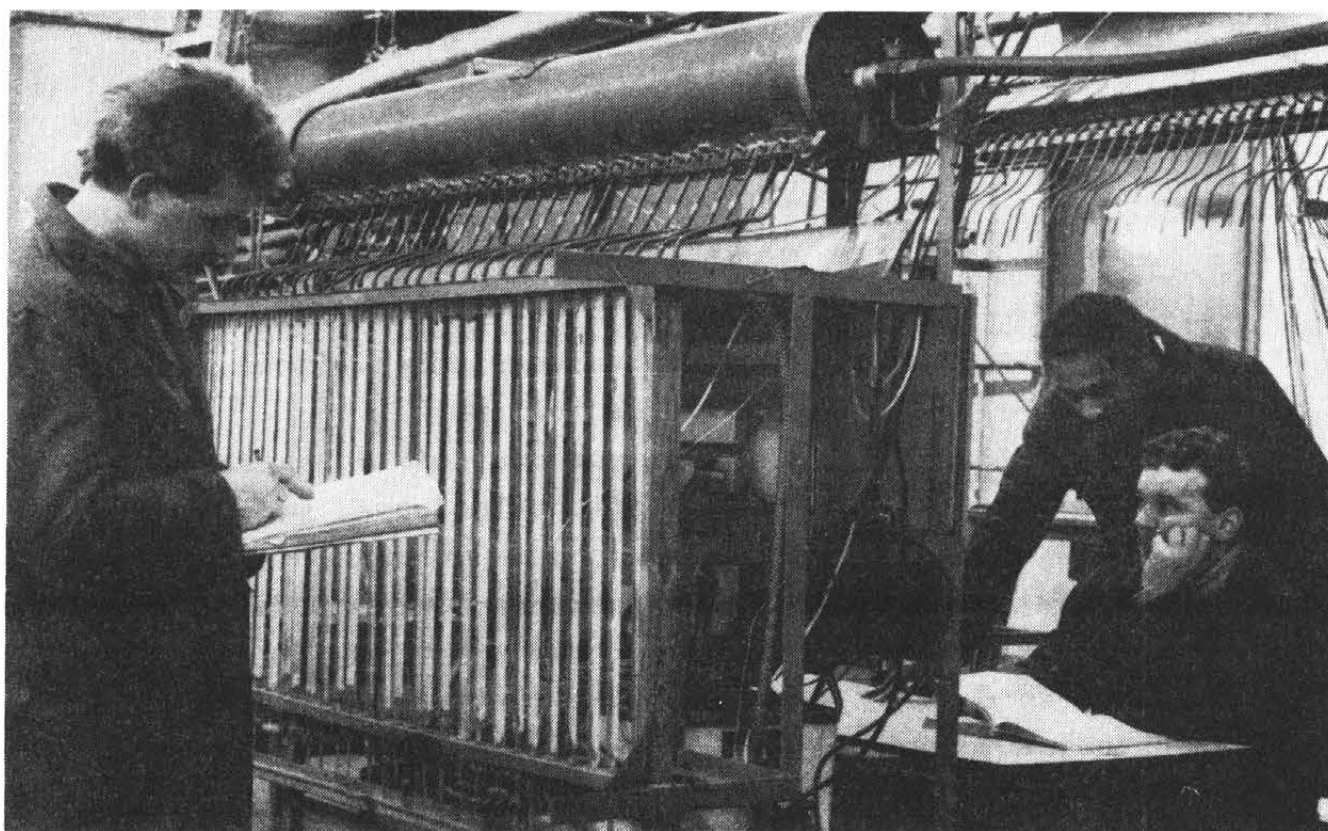
Specialization: Energy conversion systems, machines and equipment.

Graduation fields: - thermal turbomachinery,  
- hydraulic machines,  
- pneumatic and hydraulic equipment,  
volumetric thermal machines.

### Technology Section

Specialization: Machine technology.

Graduation fields: - machining processes,  
- foundry engineering.



Students' Laboratory of Heat Transfer. Institute of Thermal Engineering and Refrigeration. Testing of a heat exchanger (I-9)

Specialization: Machine tools and technological equipment.

Graduation fields: - machine tools design,  
- casting machines and equipment.

### Applied Mechanics Section

Specialization: Applied mechanics.

Graduation fields: - solid mechanics,  
- machinery dynamics and automation,  
- fluid mechanics.

### Materials Engineering

(without specialization and graduation fields)

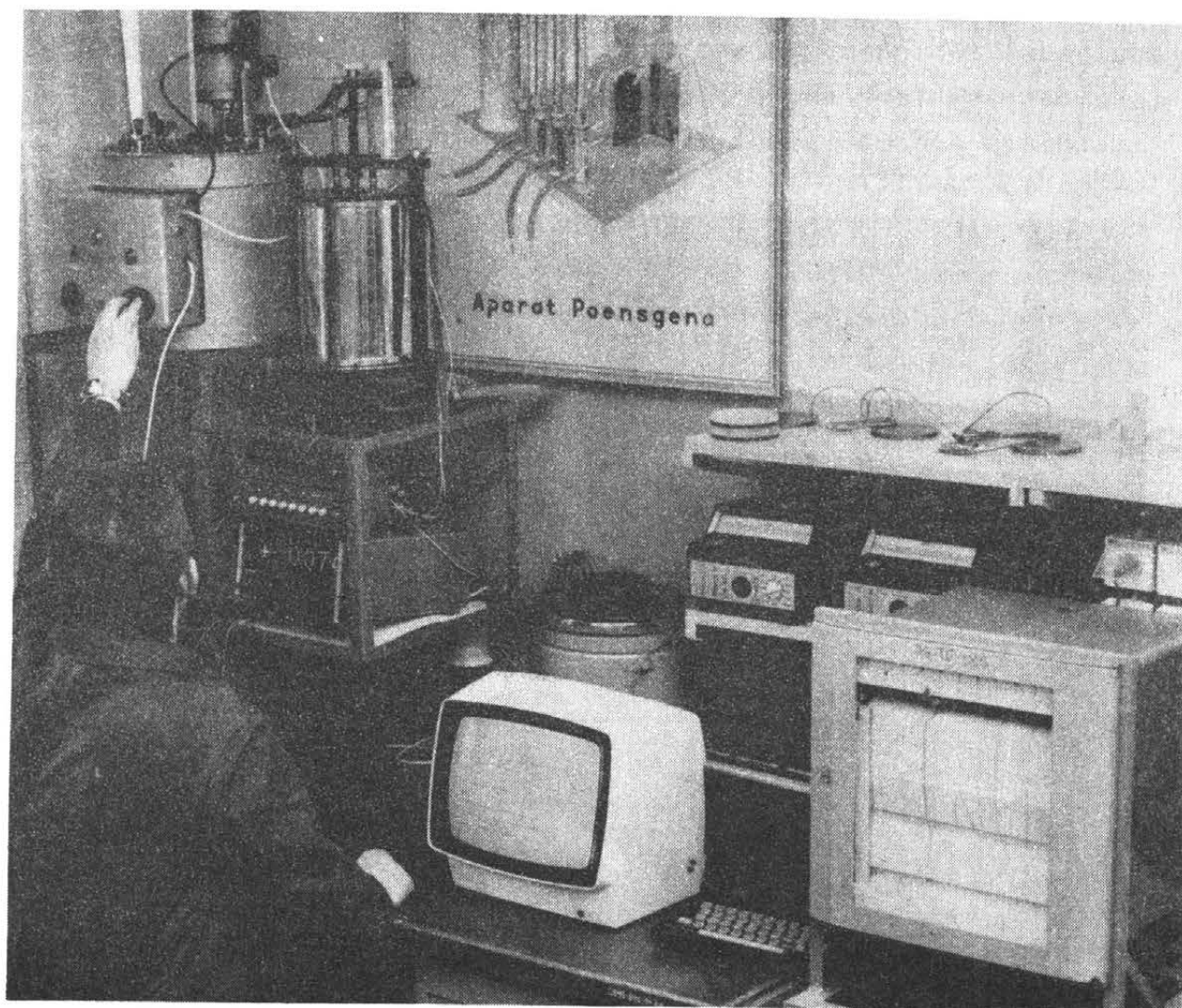
### General Characteristics of Studies

Full-time courses offer an opportunity of acquiring higher technical education. The full-time courses require 10 semesters (15 weeks each) for completion of studies.

Courses for working students give them an opportunity to graduate and complete earlier terminated studies. The duration of particular types of studies is as follows:

- part-time, extramural and mixed-type courses: 9 semesters; at the mixed-type studies students attend lectures and classes during 7 months and during the remaining 5 months they work, carry on industrial practice and have their regular leaves,
- university extension and complementary M.Sc. courses have been introduced to enable engineers who completed so-called 1st level studies to obtain M.Sc. degree. The programme of both types of studies encompasses complementary material which is normally presented to full-time course students during 3 semesters, while at the university extension course students are obliged to complete it in 3 years, and at the complementary M.Sc. course system this period comprises 4 semesters.



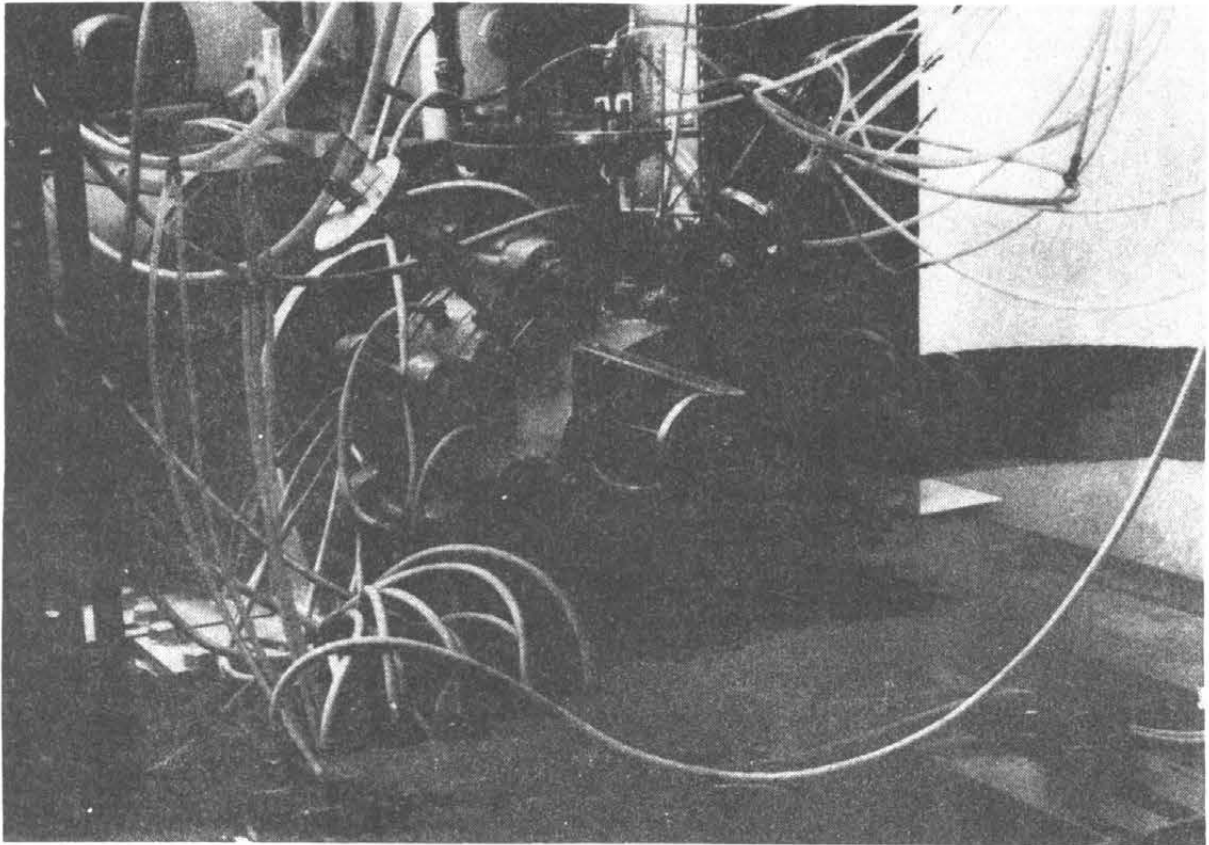


Students Laboratory of Heat Transfer. Institute of Thermal Engineering and Refrigeration. Testing of thermal properties of materials (I-9)

Education at the Mechanical Engineering Faculty of the Technical University of Łódź includes basic subjects necessary for mechanical and materials engineers, as well as specialized fields characteristic for individual studies. Faculty members of certain institutes conduct lectures and classes in basic subjects, e.g. technical mechanics, principles of machinery design, materials science, and in specializations: I-5 - applied mechanics, I-6 - heavy working machines, machinery and equipment of textile industry, I-7 - materials engineering, I-7 and I-8 - production engineering,



machine tools and technological equipment, I-9 - machinery and equipment for chemical and food industry, I-10 - energy conversion machines, systems and equipment, I-11 - cars and tractors, I-4 - machines and equipment of paper and woodworking industry.



Laboratory of Hydro-Machines at the Institute of Turbomachinery.  
A pump for mine drainage on the testing rig (I-10)

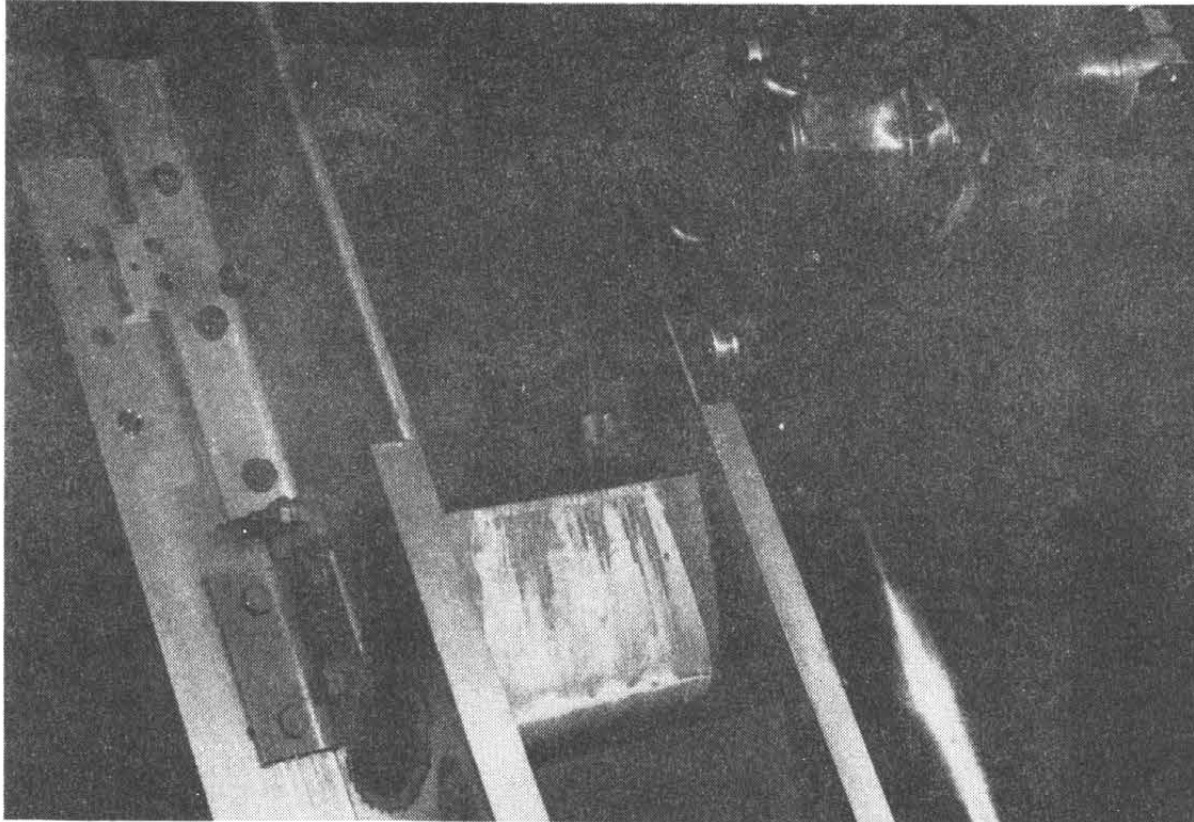
## 6. RESEARCH PROJECTS

Faculty members take part in the following state research projects:

- 7 central basic research programmes (CPBP),
- 3 central research and development programmes (CPBR).

Three institutes realize governmental projects: at the Institute of Materials Science and Technology of Metals a research - production laboratory is being constructed, at the Institute of

Turbomachinery a machine for glass wool production for building insulation is under construction. The Institute of Vehicles Research cooperates in the implementation of devices preventing locking of wheels in pneumatic braking systems and produces testing probes for injectors PW 81.

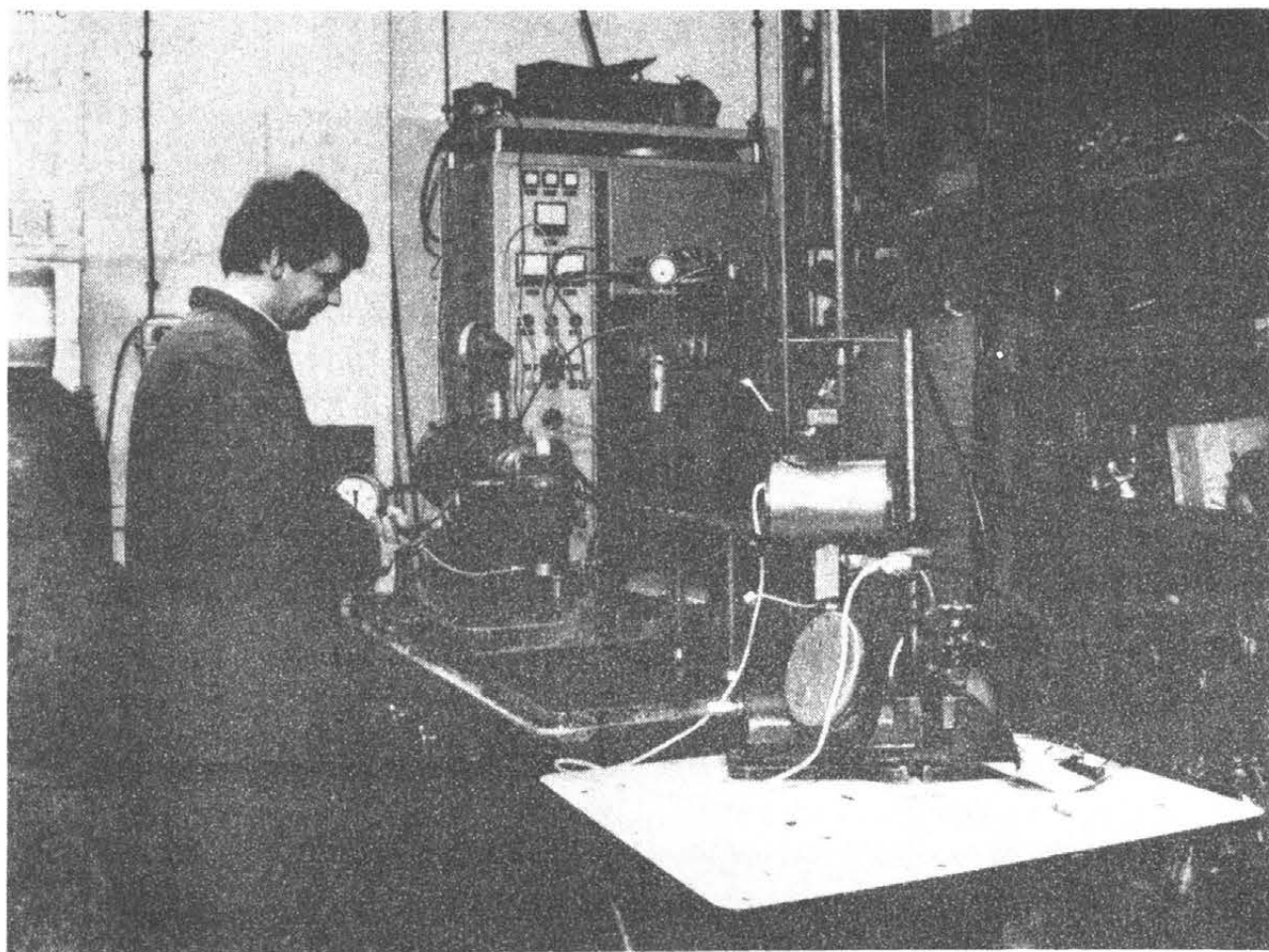


Wind tunnel at the Institute of Turbomachinery. Testing of blade profiles of steam turbines (I-10)

At the Mechanical Engineering Faculty the following research projects are being carried out:

- Analysis of stresses, strength and ultimate load of constructions taking into account stability and post-buckling behaviour of elasto-plastic materials and cracking mechanisms,
- Theoretical and experimental analysis of dynamics and vibrations of machines and their elements (cranes, textile machinery, machine tools),
- Theoretical studies and testing of slide and rolling bearings with respect to the theory of hydrodynamic and elastohydrodynamic lubrication; theoretical studies on tribology,

- Development of gas and liquid bearings and special high-speed drives,
- Computer-aided design and computer-aided manufacture (CAD-CAM),
- Hydrostatic, hydrokinetic and hybrid drives and control systems for vehicles, machines, cranes and machine tool: theory and testing,
- Basic research and development of new technologies in surface engineering,
- Development of technology of new materials with controlled structure,



Laboratory for Fuel Apparatus Testing at the Institute of Vehicles Research (I-11)

- Research and development of automation of technological processes (numerical control, monitoring, diagnostic),
- Analysis and investigation of basic phenomena in processing and improvement of cutting tools,

- Basic research in fluid thermodynamics, heterogeneous fluid flow in refrigerating and air-conditioning systems and in fluid flow machines,
- Development of measuring methods and equipment for automation of measurement and computer analysis of experimental data,
- Investigations aiming at development of the theory of fluid-flow machines and equipment,
- Technological, design and exploitation improvements of machines, mechanisms and machine elements,
- Theoretical and experimental analysis of vehicle braking with anti-locking devices (theory, construction, tests),
- Theoretical and experimental investigations concerning basic processes and accessories of compression-ignition engines.

The Faculty of Mechanical Engineering is authorized to award Ph.D. and docent degrees in the field of Mechanics and Machine Construction and Exploitation. In the period 1945-1987 384 Ph.D. and 36 docent degrees were conferred.



Computer laboratory at the Institute of Vehicles Research (I-11)

The Faculty offers Ph.D. courses to young researchers employed in academic centres and in industry. At present, the following Ph.D. courses are available:

- full-time: machine dynamics and automatic control (3 years),  
                    mechanical engineering (4 years),
- extramural organized on an individual basis at the institutes.

Since 1972 complementary courses have been conducted to enable graduates to extend their knowledge in the following areas:

- turbomachinery and equipment,
- refrigeration,
- design of paper and converting machines,
- thermal and thermo-chemical treatment,
- machine technology and materials engineering (for teachers since 1985).

The complementary studies for engineers and teachers include two semesters. After finishing them, students obtain certificates.

The students of the Mechanical Engineering Faculty can develop their interests in Students' Scientific Groups such as: Applied Mechanics, Cranes, Textile Engineering, Materials Engineering, Foundry Engineering, Machine Tools, "CHAK" (Refrigeration and Air Conditioning), Energy Conversion, "SAMCIAG" (Cars and Tractors). They organize scientific camps, practical training, symposia, trips to factories, discussions and lectures. They take active part in research work carried out at the institutes.

## 7. COOPERATION WITH INDUSTRY

Mechanical Engineering Faculty cooperates with many branches of industry, among others, electro-machine building, car industry, aircraft industry, mining, power industry, food, chemical, textile and papermaking industries. This cooperation has created possibilities for developing laboratories and production or purchase of valuable equipment and rigs, as, for instance, the rig for complex testing of friction and wear in a surface layer, scanning electron microscope, rigs for testing the parameters of active



face of grinding wheels and their strength, automatic measuring rigs for experimental turbine models and for wind tunnels (investigations of blade profiles), a testing rig for anti-locking systems of brakes, and others.

The most important fields of cooperation with industry are:

- calculations of strength, dynamic stability and stiffness of machines and structures (transformers, pipelines, refrigerating systems),
- computer-aided design (CAD) and computer-aided manufacture (CAM),
- increase of durability of kinematic pairs and mechanisms of textile machines,
- implementation of sulfonitriding and vacuum nitriding NITROVAC'79,
- airhydraulic drive and control of machine tools,
- grinders and grinding processes,
- implementation of the automatic packing system for razor blades,
- optimization of energy consumption in the food industry,
- implementation of special impeller pumps (submerging pumps for mining industry and for coal transportation, medium-pressure pumps for mine drainage),
- industrial implementation of turbine-driven pumps for paper machines,
- machine for glass wool production with an impeller with air bearings,
- implementation of anti-locking devices of the 2nd generation in car braking systems,
- consolidation of fibrous webs in paper and fibreboard machines, design and modernization of these machines.

## 8. CONTACTS WITH FOREIGN SCIENTIFIC CENTRES

Mechanical Engineering Faculty cooperates extensively with scientific and academic centres abroad. The Institutes of the Faculty have close links with universities in USSR, Czechoslovakia, GDR, Hungary, Bulgaria, Cuba, Algeria, Yugoslavia, Great Britain, Belgium, France, FRG, Mexico and USA. The most animated



contacts are with those universities with which the Technical University of Łódź signed agreements of direct cooperation. Within such agreements joint research projects are carried out, joint papers and publications are prepared and computer programmes are exchanged. There is also exchange of staff members, participation in symposia and seminars.

The universities with which the Faculty cooperates within the direct agreements are:

- Rheinisch-Westfälische Technische Hochschule Aachen, FRG,
- Université Paris VI P.M. Curie, France,
- Technische Universität Karl-Marx-Stadt, GDR,
- Technische Universität Dresden, GDR,
- Technische Hochschule Zittau, GDR,
- Vysoké Učení Technické v Brně, Czechoslovakia,
- Chemical-Technological University of Dnepropetrovsk, USSR.

Scientific cooperation has been initiated with:

- Ecole Supérieure d'Ingénieurs de Marseille, France,
- Leningrad Technical University, USSR.

Members of the Faculty cooperate closely with scientists of Moscow Power Engineering Institute - USSR; Université Libre de Bruxelles - Belgium; Electricité de France; ETH - Zurich, Switzerland; University of Calgary - Canada, universities in Algeria and UNAM Mexico D.F. Universidad de Guanajuato

Of particular significance is the cooperation of the Mechanical Engineering Faculty with its counterpart, the Faculty of Engineering at the University of Strathclyde in Glasgow. Apart from the above mentioned forms of cooperation there is also a joint Ph.D. scheme. (Two of the four members of the staff of the Technical University of Łódź who obtained their Ph.D at Strathclyde, are from the Mechanical Engineering Faculty). Joint seminars of both Faculties are organized regularly.

The Institute of Vehicles Research initiated and organized regular International Meetings of the Institutes and Departments of Vehicles at Technical Universities in socialist countries. The meetings promote cooperation in the field of teaching and research.

Members of the Faculty belong to various international scientific organizations and associations:

- Professor Władysław R. Gundlach, is a member of the American Society of Mechanical Engineers (ASME), USA; Gesellschaft für Angewandte Mathematik und Mechanik (GAMM), FRG; GEP ETH, Switzerland; VDI-GET, FRG;
- Doc. Henryk Krzemiński-Freda, is a corresponding member of the International Tribology Council in London;
- Doc. Tomasz Kapitaniak, is a member of the American Mathematical Society;
- Professor Cezary Szczepaniak, is a corresponding member of the National Academy of Engineering, Mexico;
- Doc. Jan Zaráś, is a member of the International Journal of Thin-Walled Structures;
- Jan Zaráś and Wojciech Klonowicz are members of the Polish Group of Strathclyde University Alumni Association in Glasgow, UK.

Students' exchange agreements are realized at the universities in GDR, USSR, Czechoslovakia and Algeria. Graduate students' exchange is arranged with Ecole Supérieure d'Ingénieurs de Marseille. Every year international symposia on microcomputers are organized and attended by students from France, Belgium, Switzerland, Canada, USSR and Czechoslovakia.

## 9. LIBRARIES

At the Faculty there is no faculty library, but each Institute has its own library providing monographs, handbooks, textbooks and publications concerning the field of research in a given institute. Below, the number of books and titles of journals in particular libraries are given.

Institute	Books	Journals
I-5 :	7320	12 (4)
I-6 :	6370	66 (37)
I-7 :	12000	148 (32)
I-8 :	3350	12 (5)
I-9 :	11676	113 (33)
I-10:	9295	200 (30)
I-11:	7961	16 (9)

The number of titles of foreign journals is given in brackets.

## 10. PUBLICATIONS

In the last three years (1985-1988) 47 papers were published in international scientific journals and conference proceedings. In Polish scientific journals over 80 papers written by the members of the Faculty were published. In the years 1984-1988 30 handbooks and textbooks were published by the Faculty members.

## 11. ORGANIZATIONS AND ASSOCIATIONS ACTIVE AT THE FACULTY

Both the students and the members of the staff can be active in political, social and sports organizations and associations affiliated at the Technical University of Łódź. At the Mechanical Engineering Faculty there are the following associations: Polish Society of Mechanical Engineers and Technicians (SIMP), Technical Association of Polish Foundry Engineers (STOP) and Polish Society of Theoretical and Applied Mechanics. Some members of the staff hold high positions in the technical organizations.

Moreover, the members of staff of the Faculty participate in the activities of scientific sections of the Polish Academy of Sciences:

- Professor Władysław Gundlach is a Chairman of the Energy-Conversion Section of the Committee of Thermodynamics of the Polish Academy of Sciences,

- docent R. Przybylski is a Secretary of the Energy-Conversion Section of the Committee of Thermodynamics of the Polish Academy of Sciences,
- docent Marian Królak is a Vice-President of the Construction Stability Section of the Machine Construction Committee of the Polish Academy of Sciences.



# THE FACULTY OF ELECTRICAL ENGINEERING W-2

Dean's office address: 90-924 Łódź, ul. B. Stefanowskiego 18/22

tel. 36-47-02

## FOUNDATION AND GROWTH

The Faculty of Electrical Engineering of the Technical University of Łódź was founded on May 24, 1945 by a decree of the Council of Ministers, founding the University.

The need for the creation of the Faculty of Electrical Engineering was enhanced by the condition of the national economy in the process of postwar reconstruction, as well as by the intense progress of electrification of the country.

Some important dates in the life of the Faculty of Electrical Engineering are:

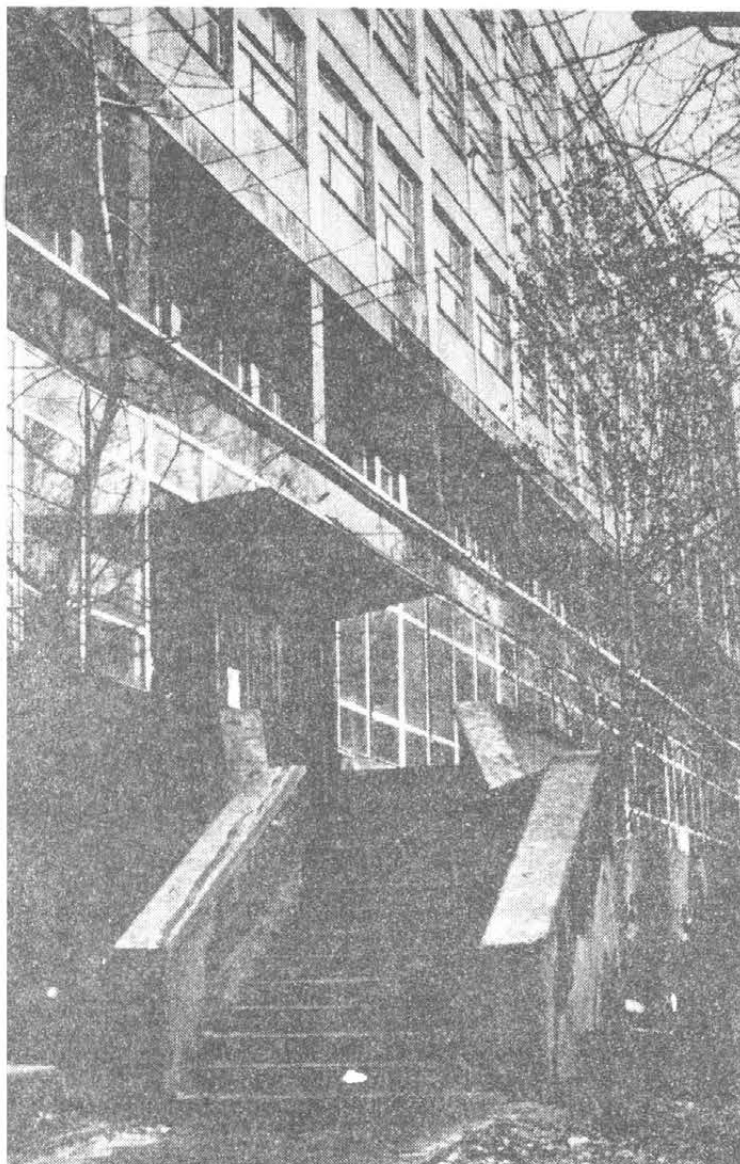
1945 - 26th October - first meeting of the Faculty Council presided by professor J. Groszkowski in the presence of professors; W. Iwaszkiewicz, J.L. Jakubowski, S. Kończykowski and R. Podoski. The Faculty structure was established.

1945 - October - Inauguration of the first academic year. The following chairs started their activity: Chairs of Technical Physics, of Mechanics, of Principles of Electrotechnics, of Electrical Machines, of General Electronics, of Electrical Power Engineering and of Radiotechnics.



1956 - establishing of the following new Chairs: Electrical Traction, Electrical Drives, Electroheat, Electrical Apparatus and Machinery, Electrical Power Stations and Industrial Electrotechnics.

1969 - new buildings A and B of the Electrical Department at **Stefanowski Street 18/22** were completed.



The Building of Electrical Engineering Faculty - entrance from B. Stefanowskiego St.

- 1970 - reorganization of the Faculty structure, creation of the Institutes of: Principles of Electrotechnics, Automatics, Transformers, Electrical Machines and Apparatus, Electrical Power Engineering and Electronics.
- 1982 - Building C was completed.
- 1985 - Institute of Transformers, Electrical Machines and Apparatus was divided into two new Institutes of: Electrical Machines and Transformers, Electrical Apparatus and Machinery, and Machinery, and the Chair of High Voltage Engineering
- 1986 - Building D was completed.

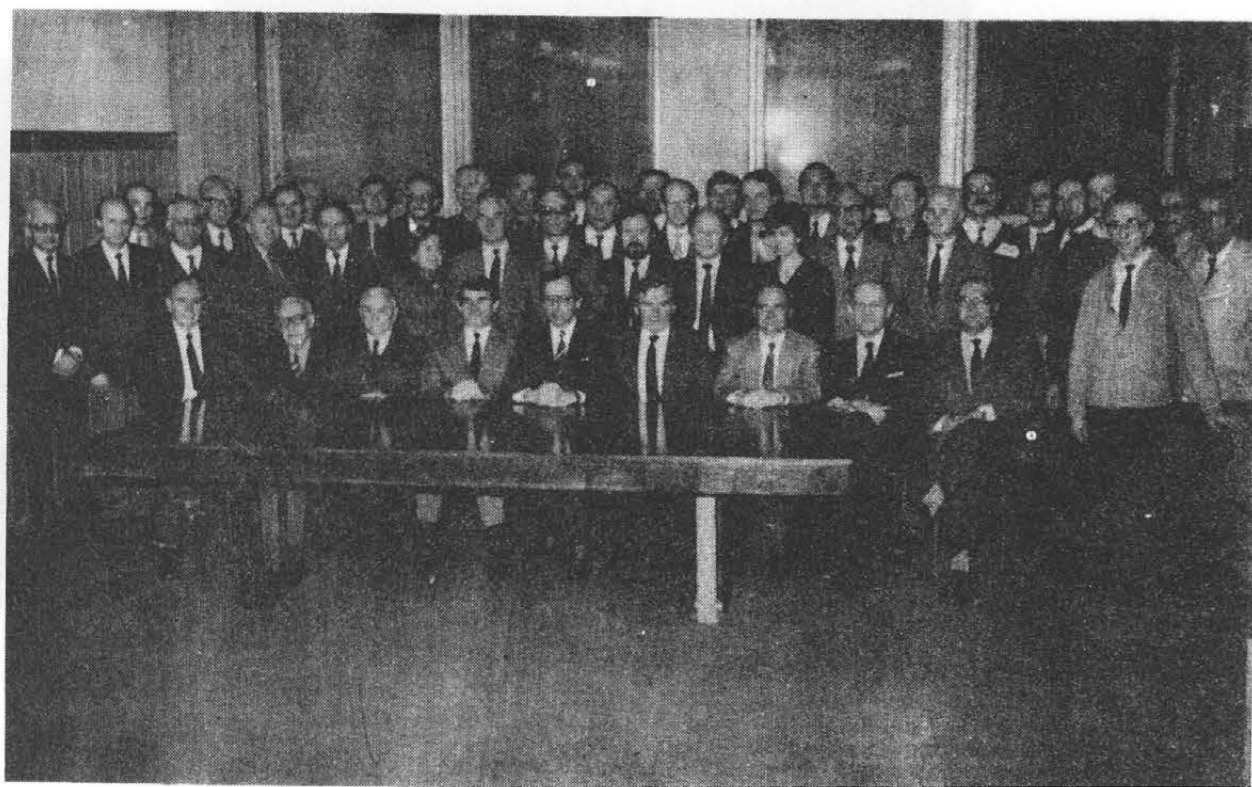


The Building of Electrical Engineering Faculty - view from  
Wólczajska St.

The Deans of the Electrical Engineering Faculty

1945-	Prof. Janusz Groszkowski
1945-1948	Prof. Stanisław Kończykowski
1948-1952	Prof. Witold Iwaszkiewicz
1952-1953	Prof. Eugeniusz Jezierski

1953-1956	Doc. Czesław Dąbrowski
1956-1959	Prof. Bronisław Sochor
1959-1960	Prof. Władysław Pełczewski
1960-1962	Prof. Karol Przanowski
1962-1966	Prof. Stanisław Dzierzbicki
1966-1969	Prof. Tadeusz Koter
1969-1973	Doc. Zdzisław Pomykański
1973-1981	Prof. Zdzisław Szczepański
1981-1987	Prof. Bolesław Bolanowski
1987-	Doc. Maciej Pawlik



Faculty Council 1988-89

#### ORGANISATION

The Faculty has 214 members of the teaching staff, including 14 professors and 25 docents as well as technicians and administration staff.

The Faculty Library organized in 1981 possesses 35 000 volumes and 250 titles of monthly reviews. About 10 000 readers visit the Library each year.

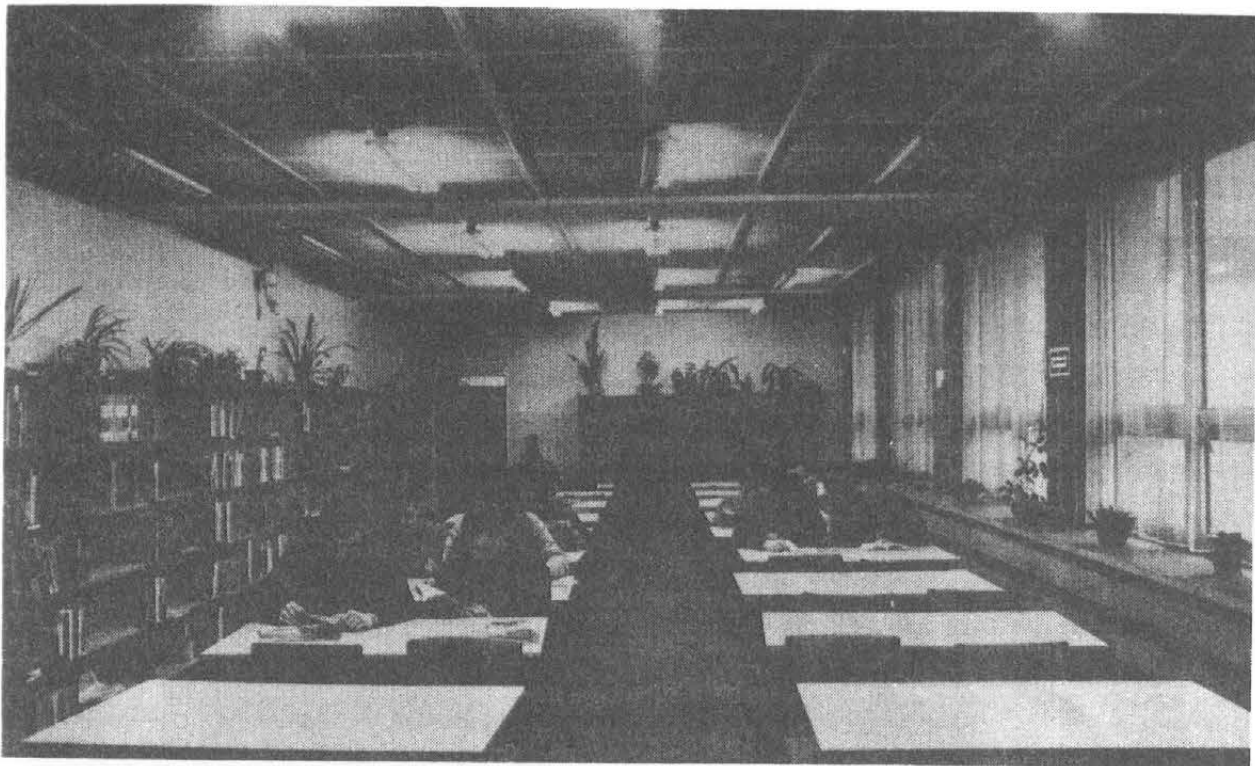
Till the end of 1988, 4095 full-time students and 1816 extramural students graduated from the Faculty of Electrical Engineering.

317 Ph.D. degrees and 45 docent degrees (see. Introduction p.3) have been awarded since the creation of the Faculty.

The actual teaching programs were designed in 1973 and modified in 1982.

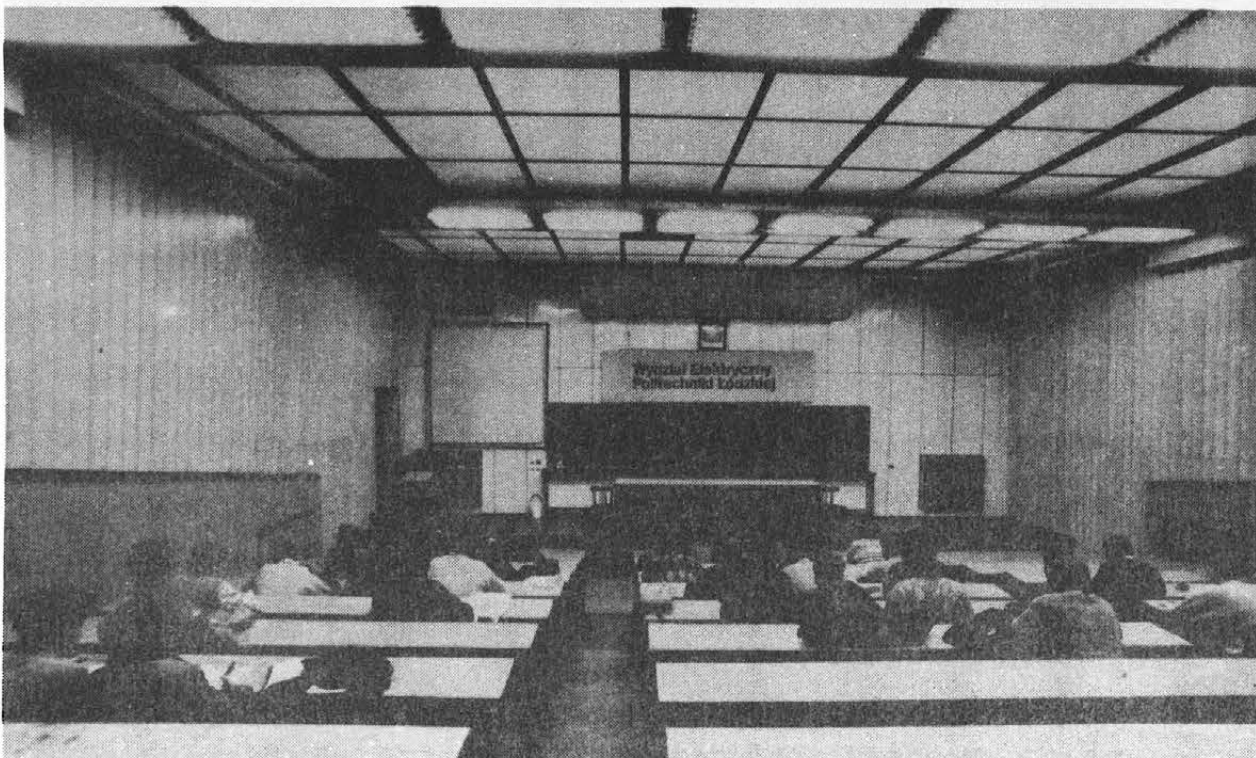
The Faculty offers the following courses leading to the M.Sc. degree:

1. Electrical power engineering, covering:
  - a) Electrical power stations,
  - b) Electrical power systems,
  - c) Industrial power engineering.



Reading - room for students in the Faculty Library

2. Electrical machines and apparatus:
  - a) Transformers,
  - b) Electrical machines,
  - c) Electromechanical elements in automation,
  - d) Electrical apparatus,
  - e) Control and protecting equipment,
  - f) High voltage engineering,
3. Conversion and utilization of electrical energy:
  - a) Industrial electroheat,
  - b) Automation in electroheat,
  - c) Electric lighting.
4. Electric traction.
5. Automatic control and electrical metrology.
6. Electronic instrumentation:
  - a) Telecommunication,
  - b) Medical Electronics,
  - c) Power electronics.



Lecture in E2 auditorium



The full-time students choose the general direction of their studies in the 2nd year to concentrate on a given specialization in the 4<sup>th</sup> and 5<sup>th</sup> year.

The teaching activity of the Institute of Principles of Electrotechnics covers also instruction in Electrotechnics and Automobile Electrotechnics for the students of the other Faculties.

The graduates of the Faculty of Electrical Engineering are well prepared for the jobs in all industry branches, power engineering, electrical traction, research laboratories and designing bureaus.

In all specializations the post - diploma courses are organized for the engineers from industry.

#### THE INSTITUTE OF PRINCIPLES OF ELECTROTECHNICS (I-12)

Director: Doc. Franciszek Lachowicz, tel.36-22-81

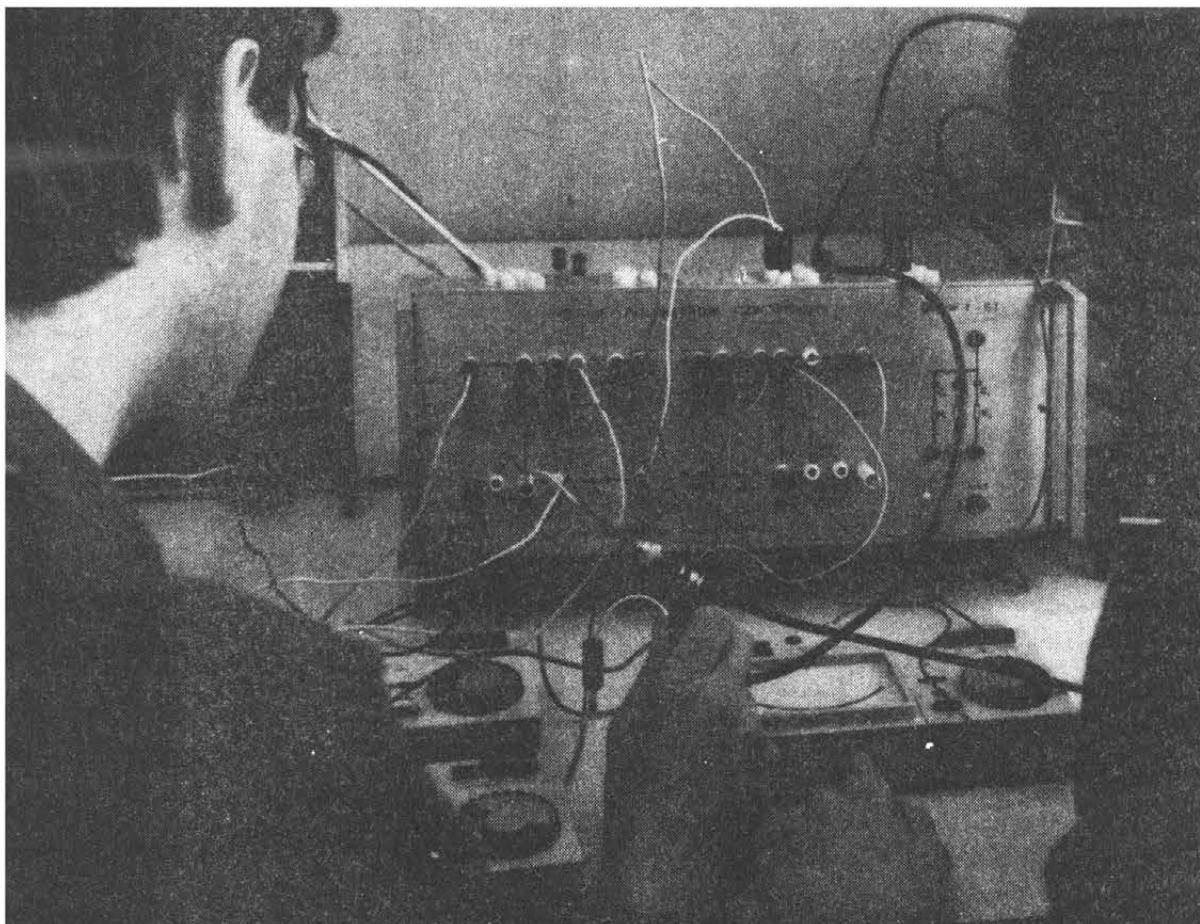
The main subjects of the research carried on at the Institute are: application of laser for micro-processing of materials, mathematical modelling of magnetic fields in instrument transformers, analysis of nonlinear circuits and electromagnetic fields in conducting medium, construction of prototype equipment and computer systems for measurement of various physical quantities.

The Institute co-operates with foreign countries, participating in the works of International Committee of Theoretical Electrotechnics of socialist countries and keeps in touch with Electrotechnics Section of Scientific Faculty of Electrical Machines in Dresden (GDR). The Institute co-operates with the important industrial plants in Poland, such as: Elester - Łódź, Elta - Łódź, Zeto - Skierniewice, Miflex - Kutno, ZWAR - Warszawa, Radmor - Gdańsk.

#### Staff of the Institute:

Prof. Zbigniew Piotrowski, Prof. em. Walenty Starczakow, Prof. em. Zdzisław Pomykański, 8 docents, 33 senior lecturers, 9 assistants and 41 persons of non - academic staff.





Laboratory of circuits theory and field theory in Theoretical Electrotechnics Department (I-12)

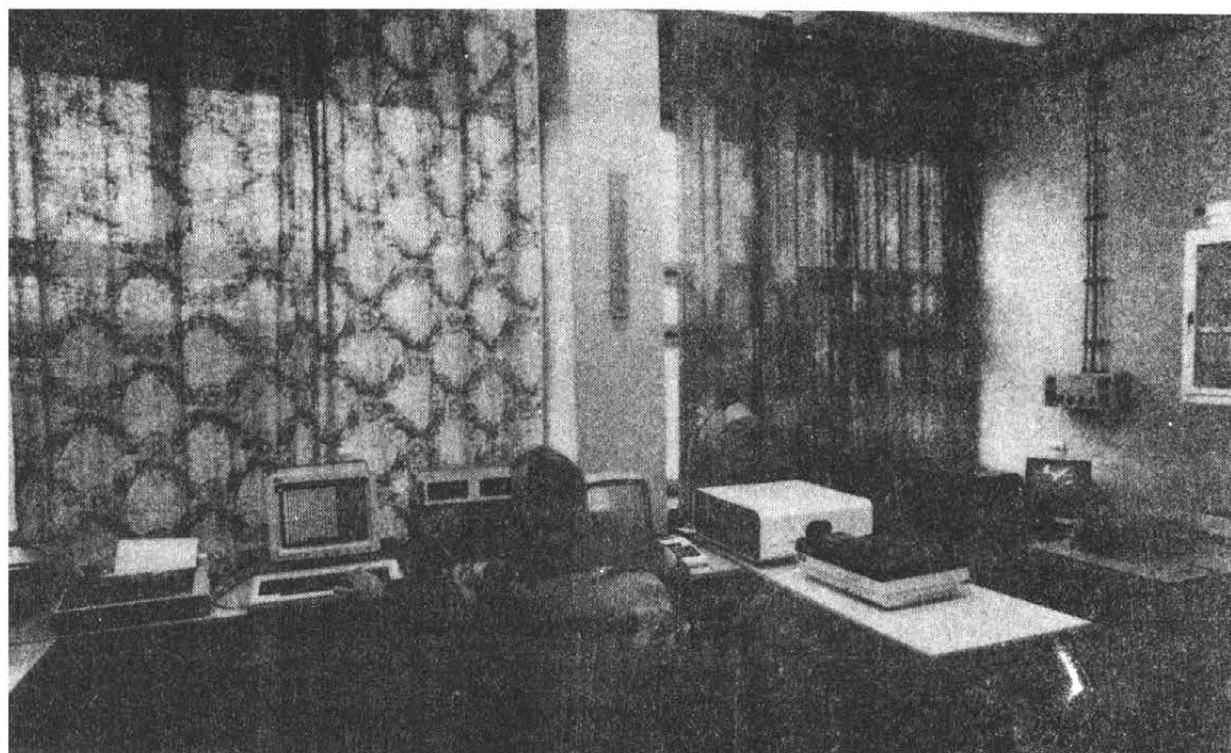
The Institute comprises 4 research groups:

1. Group of Theoretical Electrotechnics

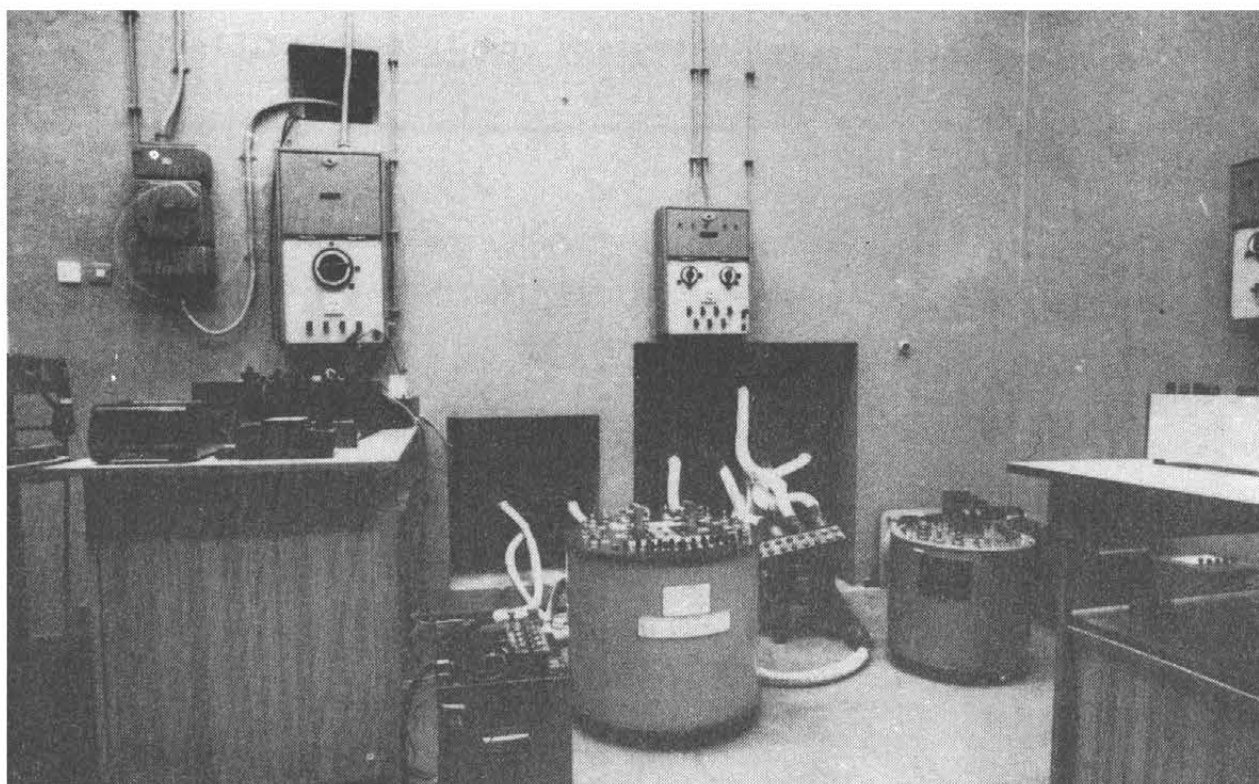
The head of the Group is Doc. Michał Tadeusiewicz. The personnel consists of 19 persons including 13 academic teachers and among them 2 docents: Franciszek Lachowicz and Stefan Wojciechowski. The main subjects of research are as follows: theory and analysis of nonlinear circuits focusing on diode-transistor circuits, analysis of electromagnetic fields in conducting medium, research and constructing of electromedical equipment.

## 2. Group of Electrical Metrology and Automobile Electrotechnics

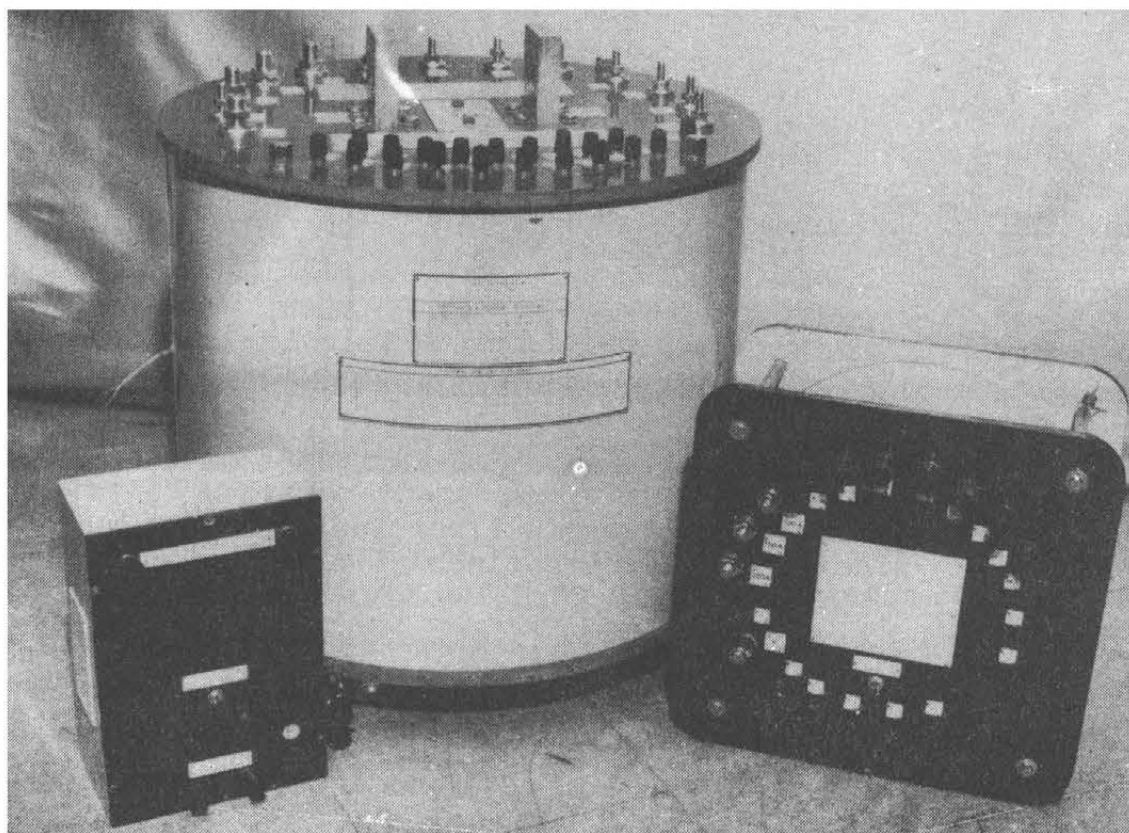
The head of the Group is Doc. Zygmunt Kuśmierek. The staff consists of 24 persons including 17 academic teachers. The main subjects of research are: measurements of electrical quantities such as voltage, current, power, especially in nonsinusoidal systems, electric measurements of non electric quantities, e.g. temperature, rotational speed, mechanical power and torque, humidity etc, magnetic measurement, testing of magnetic properties of ironplates, measurements automation, testing and improving of the design of automobile equipment.



Laboratory of measurement systems in Electrical Metrology and Car Electrotechnics Department I-12



Laboratory of instrument transformers in Instrument Transformers  
Department I-12



Multirange standard current transformer of 0,02 class worked out  
and manufactured in Instrument Transformers Department I-12



### 3. Group of Instrument Transformers

The head of the Group is Prof. Zbigniew Piotrowski. The personnel consists of 19 persons including 13 academic teachers (Doc. Ryszard Nowicz and Doc. Andrzej Koszmider among them).

The main subjects of research are: mathematical modelling of magnetic field in instrument transformers, studying electromagnetic processes in transreactors, studying instrument transformers working in atypical conditions, automatization of measurements concerning instrument transformers.

### 4. Group of Materials Science and Electrotechnology

The head of the Group is Doc. Jan Leszczyński. The personnel consists of 12 persons including 8 academic teachers with Doc. Franciszek Kostrubiec. The main subjects of research are: using of laser in materials treatment, development and application of electroconducting polymers, high temperature superconducting materials and films technology, impregnation and hermetic sealing technology, spatial charges in dielectrics.



Laser treatment of materials in Materials Science and Electrotechnology Group I-12

The most significant achievements of the Institute of Principles of Electrical Engineering are: theory and analysis of nonlinear circuits, constructing of measuring devices for testing of electromedical equipment, constructing of electronic measuring devices and computer systems for measurements of various physical quantities, studying and diagnostics for elements of car electrical equipment, application of microcomputers for measuring instrument transformer parameters in transients, modern methods of calculating instrument transformers and transreactors, working-out electrically conducting glues, working-out the technology for producing high temperature superconductors and hermetic sealing technology for electronic elements.

The Institute is involved in teaching at every branch of study in Electrical Engineering Faculty and in teaching electrical engineering at other university faculties and in supervising graduate studies on Circuit Theory, Electrical Metrology, Instrument Transformers and Electrotechnology.

#### THE INSTITUTE OF AUTOMATIC CONTROL I-13

Director: Prof. Mirosław Krynke tel. 36-76-44

Research activity of the Institute is focused mainly on the following topics:

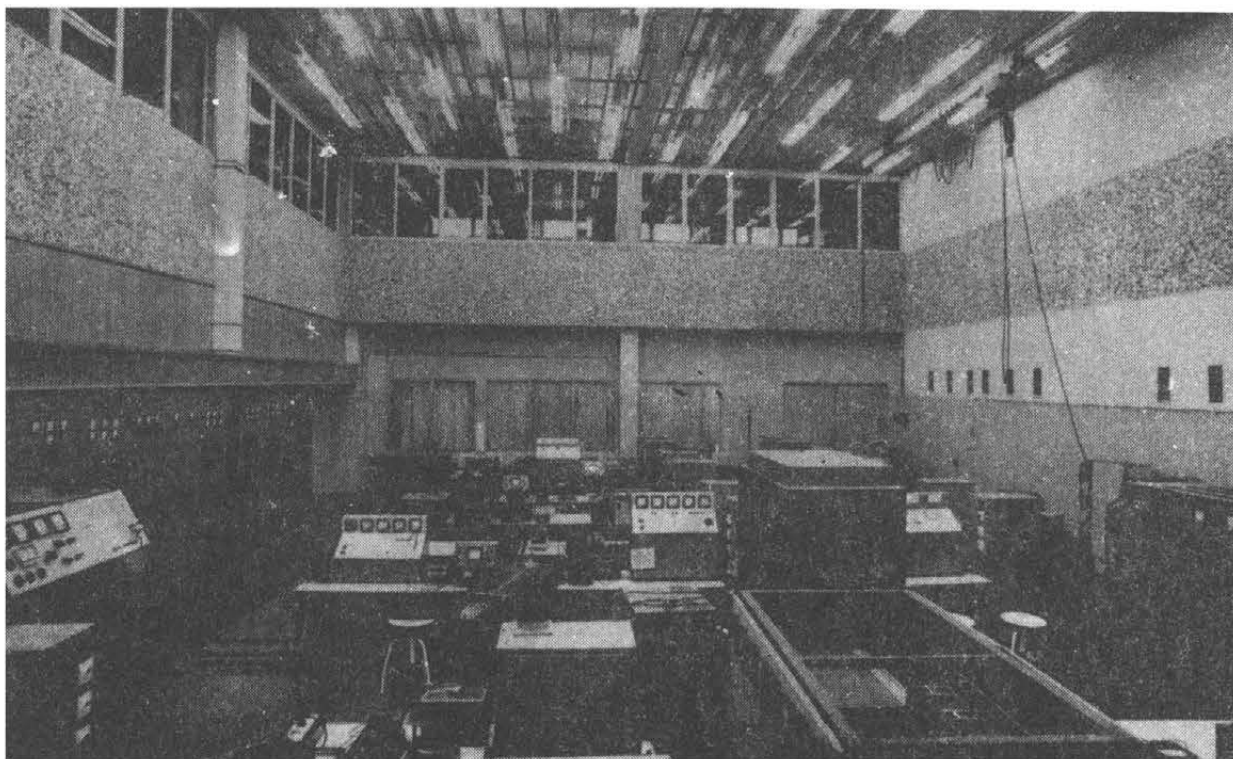
- control theory,
- control of electric drives,
- digital and analog devices and systems,
- robotics.

This research embraces the following problems:

- optimal and adaptive control (theory and application in industrial electric drives and in drives of robots and mechanical manipulators),
- control systems (mainly concerning the electric drives in robots and manipulators),
- application of microcomputers in control of electric drive systems with asynchronous motors fed by frequency converters,
- digital data acquisition and processing for dynamic properties evaluation of electric drives.

Main results of cooperation with industry are:

- design, hardware realization, testing and industrial implementation of 12 different type thyristor drives in sugar industry,
- concept preparation, design, hardware realization and implementation of a computer data acquisition and processing system for control of lignite strip mine in Bełchatów.



Laboratory of electric drive automation and power converters in  
I-13

Institute of Automatic Control offers the following graduate courses:

- complex and optimal control systems,
- analog and digital control systems,
- control of electric drives.

Staff of the Institute: 3 professors - Prof. Emeritus Władysław Pełczewski, member of the Polish Academy of Sciences., Prof. Mirosław Krynke, Prof. Krzysztof Kuźmiński, 3 docents - Andrzej Czajkowski, Zbigniew Nowacki, Edward Jezierski, 21 senior lecturers, 8 assistants and 22 persons of technical and office personnel.



THE INSTITUTE OF ELECTRICAL MACHINES  
AND TRANSFORMERS I-14

Director: Prof. Janusz Turowski tel. 36-23-09

The Institute of Electrical Machines and Transformers specializes in electrodynamics of electrical machines and transformers with special respect to computerization, electronization and transients. Creation and training of specialist staff for national transformer industry was one of main achievements of the Institute.



Laboratory of electric machines in I-14

The Institute cooperates with scientific centres of the Polish Academy of Sciences, Electrotechnical Institute in Warsaw and other Polish and foreign scientific centres. It maintains numerous scientific relations with the Universities and Science Academies in Italy, United Kingdom, Japan, France, Ukraine, Russia, Latvia, Czechoslovakia, GDR etc.

Staff of the Institute:

Prof. Emeritus Eugeniusz Jezierski,

Prof. Michał Jabłoński,

Prof. Tadeusz Koter,

Prof. Bohdan Narolski,

Prof. Janusz Turowski,

Prof. Kazimierz Zakrzewski,

Docent Alicja Kozłowska,

12 senior lecturers and 17 persons of non-academic staff.

Scientific research is carried on in three Research Groups:

1. Rotating electrical machines - head-prof. T. Koter.
  2. Transformers and static converters - head-prof. M. Jabłoński
  3. Electrodynamics and small machines - head-prof. J. Turowski
- Computer Laboratory - head-prof. K. Zakrzewski.

Research and educational activities concentrate on the problems of the methods of modelling and analysis of electromagnetic and thermal phenomena, power electronics and transient processes, especially in the scope of electrodynamics: magnetic circuits and vibroacoustics of electrical machines and transformers as well as special transformers, induction motors, convertor - motor systems, electromachine components of servomechanisms and special machines (linear, impulse controlled etc). The Institute has brought a remarkable contribution to the development of scientific problems mentioned above, both in the country and abroad. Results of these works are immediately applicable in improvement of quality and reliability of products of Polish electrical industry. Cooperation with industry and scientific centres is carried out on the basis of long term agreements. As a result the conception and development of transformer test plant in ELTA factory in Łódź, some prototypes of special transformers and reactors as well as heavy - current DC sources have been worked out.

Problems of noise suppression and improvement of magnetic circuits in induction motors for KOMEL and EMIT factory and in transformers for ELTA factory have been solved. Computer aided design and computation methods in factories EMIT, ELTA etc are

implemented. The works under implementation of linear motors in textile industry, switched reluctance motors - for mining and new small electrical motors for SILMA factory are being elaborated.

Within the years 1945-88 469 works were published including 49 books; 54 Ph. D. and 8 docent degrees were conferred.

#### THE INSTITUTE OF ELECTRIC POWER ENGINEERING I-15

Director: Professor Zbigniew Kowalski, tel. 36-11-93

The Institute maintains the scientific cooperation with many Polish and foreign Universities from Belgium, Federal Republic of Germany, German Democratic Republic, Great Britain, The Netherlands and USSR.

Of 84 people, employed at the Institute, 47 are the members of the teaching staff, including 4 professors, 7 docents, 26 senior lecturers and 10 assistants.

The Institute is divided into four research Groups.

#### 1. Power Stations, Networks and Systems

Head of the Group: Doc. Maciej Pawlik

Teaching staff: Doc. Janusz Skierski

Doc. Franciszek Strzelczyk

10 senior lectures.

- The research activity of the group covers the following topics:
- power station operation with special regard to auxiliary networks and installations,
  - rationalization of thermal and electric energy production in industrial power stations,
  - networks and power systems with special regard to the problems of short-circuit phenomena,
  - load forecasting in communal distribution networks.



Laboratory of automatization and measurements for power generating stations I-15

## 2. Industrial Power Engineering and Electric Lighting

Head of the Group: Prof. Zbigniew Kowalski

Prof. emeritus Karol Przanowski

Teaching staff: Prof. Jerzy Bąk

Doc. Władysław Mielczarski

10 senior lecturers

The main fields of current research are:

- optimum power distribution and utilization in industrial power networks,
- quality and reliability of power supply in industrial power networks,
- electrical lighting and lighting supply networks,
- testing of lighting equipment.

### 3. Electric Traction

Head of the Group: Prof. Henryk Karbowski

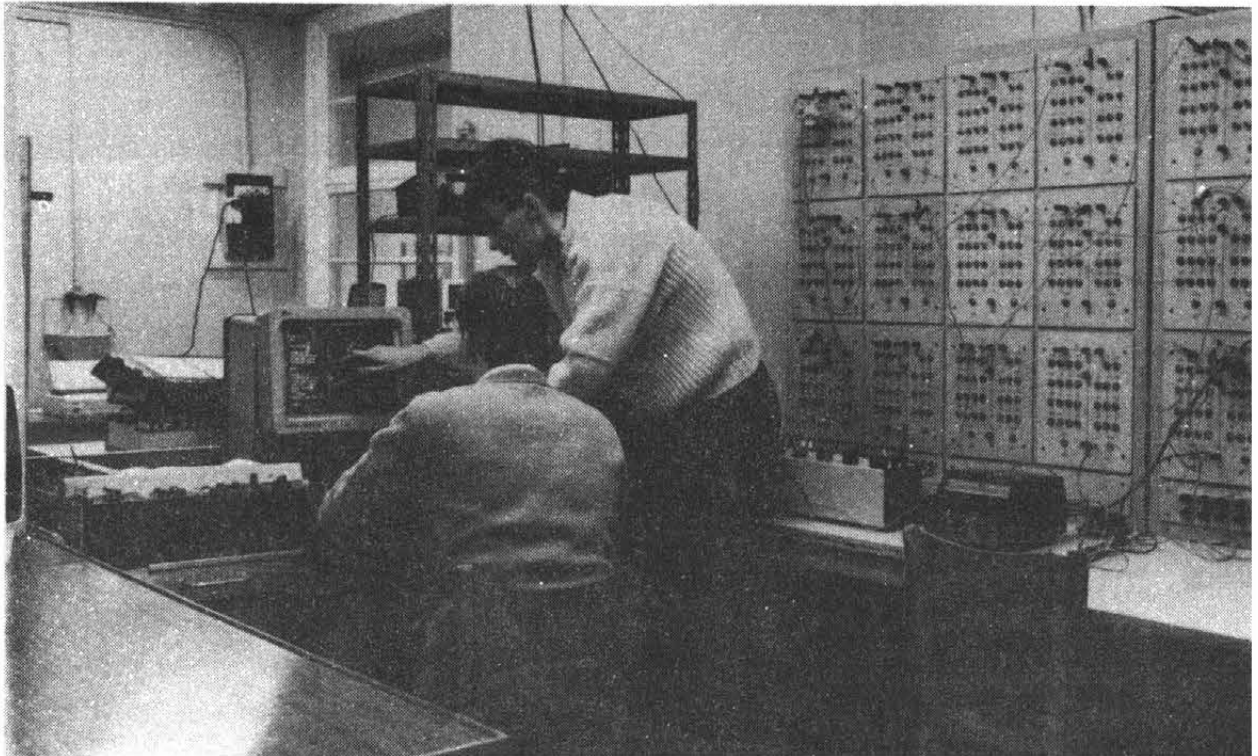
Teaching staff: Doc. Franciszek Kotarski

Doc. Andrzej Ławnicki

5 senior lecturers

The main fields of current research are:

- selected problems of automatic train control, including the underground trains,
- signal transmission to and from the trains,
- supply networks of electric traction,
- regenerative braking.



A/D hybrid system for modelling of electrothermal devices in I-15

#### 4. Electroheat

Head of the Group: Prof. Ludwik Michalski

Prof. emeritus Bronisław Sochor

Teaching staff: Doc. Krzysztof Januszkiewicz

6 senior lecturers

The main fields of current research are:

- induction heating,
- resistance heating,
- temperature measurement and control,
- automation of electroheat processes.

The most important achievements of the Institute of Electric Power Engineering are:

- novel methods of short-circuit current calculations,
- methods of load and energy consumption forecasting,
- simulation models for reliability forecasting,
- models of fluorescent lamps, supplied at higher frequency,
- methods of state estimation of the synchronous generators,
- automatic limitation of the underground trains speed,
- regenerative braking in electric traction,
- automatic hardening of high-speed steel tools,
- new methods of simulation and computation of electro-heat equipment.

The Institute of Electric Power Engineering offers the following graduate courses:

1. Electric Power Engineering divided into:
  - a) Electric Power Stations,
  - b) Networks and Systems,
  - c) Industrial Power Engineering.
2. Conversion and Utilization of Electrical Energy, divided into:
  - a) Industrial Electroheat,
  - b) Automation in Electroheat,
  - c) Electric Lighting.
3. Electric traction.



## THE INSTITUTE OF ELECTRONICS I-16

Director: Professor Jerzy Luciński, tel. 36-00-65

The research activity of the Institute of Electronics is concentrated on fundamentals of circuit theory and design of electronic circuits. The developing research includes problems of designing prototype electronic instruments, sometimes of a nation-wide unique value. The instruments are made under industry contracts and for research and student laboratories. The employees of the Institute maintain relations with many Polish electronic companies and foreign universities.

## Staff of the Institute:

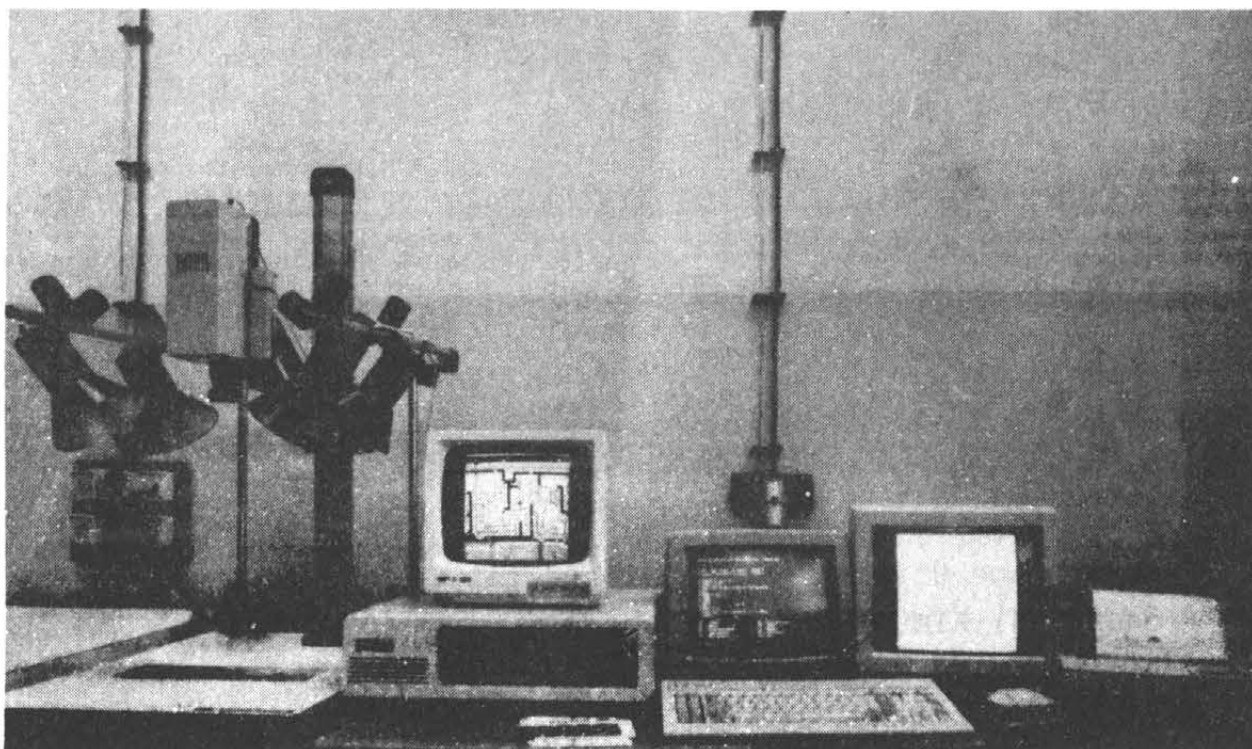
Prof. Zdzisław Korzec,

Prof. Jerzy Luciński,

Doc. Zygmunt Leszczyński,

Doc. Andrzej Materka,

21 senior lecturers, 9 assistants and 47 persons of non-academic staff.



Microcomputer image analyser in I-16

The Institute is composed of four research and teaching groups:

1. group of electronic circuits,
2. group of power electronic circuits,
3. group of measurement techniques of energoelectronic circuits,
4. group of medical electronics.

The Institute includes also a Group for Students' Laboratory Development which integrates activity of all the Institute workshops. The Institute specializes in the field of electronic instruments design with emphasis on:

- telecommunication,
- medical electronics,
- power electronics.

The Institute carries out the fundamental research in computer analysis of biomedical images, computer analysis and design of electronic circuits, especially telecommunication systems, modeling and computer analysis of phenomena in power semiconductor structures, circuit theory and power electronic circuits.

The developing research includes problems connected with designing the prototype electronic apparatus in the range of:

- microprocessor systems for power stations,
- computer analysis of images,
- control systems for technological processes,
- measurement systems for energoelectronic circuits,
- special purpose thyristor circuits and systems.

The research in these fields is linked with national program for electronic progress in different fields of economic life.

The Institute offers MSc courses to those who specialize in Electronic Engineering in three graduation fields: Telecommunication, Medical Electronics and Power Electronics.

#### THE INSTITUTE OF ELECTRICAL APPARATUS I-36

Director: Doc. Marek Bartosik, tel. 36-55-22, int. 274

The Institute of Electrical Apparatus specializes in the field of d.c. and a.c. low-voltage power switchgear and switching equipment for both railway and urban electric traction. Fundamental re-

search tasks included in both Government and Ministerial Research Programmes pertain to the general theme "Switching phenomena in electric circuits".

Frequent contacts are maintained by the I.E.A. with the related institutes at home and abroad, e.g. in People's Republic of China, German Democratic Republic and The United Kingdom. Results of the research are introduced into practice on the ground of contracts with industrial plants.

Staff of the Institute:

Prof. Bolesław Bolanowski,

Doc. Marek Bartosik,

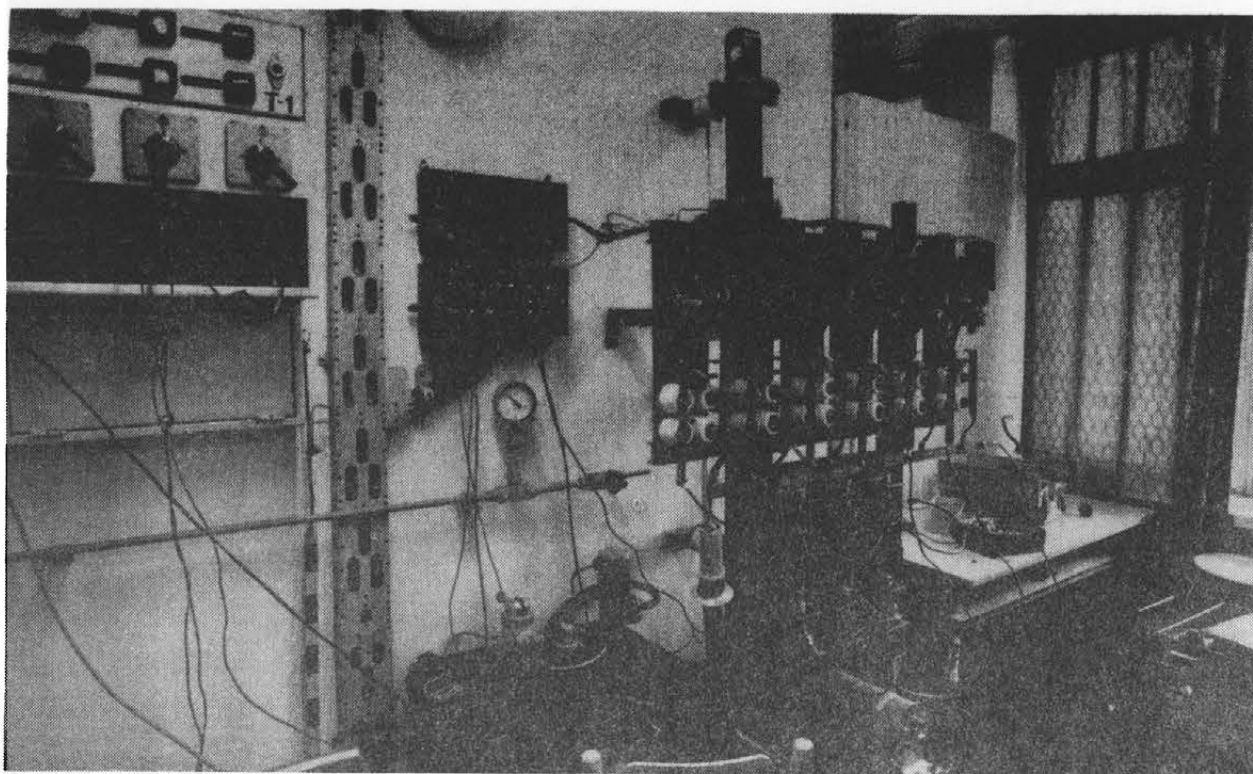
Doc. Zbigniew Kołaciński,

Doc. Sławomir Lesiński,

Doc. Zdzisław Tarociński,

Doc. Eugeniusz Walczuk,

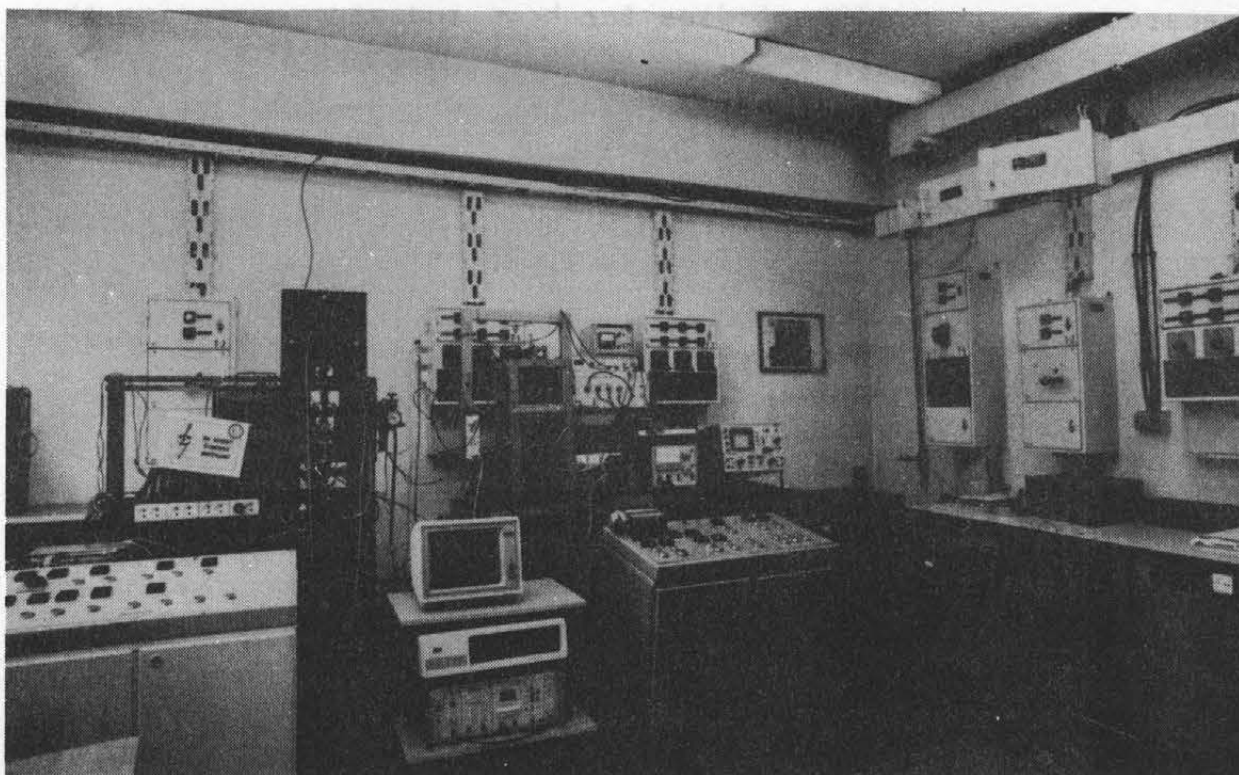
7 senior lecturers 4 assistants and 29 persons of non-academic staff.



Capacitor short circuit testing station in I-36

The research is carried on in four research groups:

1. Vacuum and semiconductor circuit breakers.
2. Magnetic - blast circuit breakers and control switchgear.
3. Extinguishing chambers and arc plasma.
4. Electric contacts and sensing switches.



Automatic station for contacts testing in I-36

The main lines of the research are:

- theory of electric arc in gases and vacuum and low-temperature plasma diagnostic,
- theory of recovery strength in gases and vacuum,
- theory of arc movement,
- theory of contact phenomena,
- theory of d.c. and a.c. hybrid switches,
- theory of spiral arc extinguishing chambers,
- theoretical principles of switchgear design,
- countercurrent breaking of direct current,
- synchronous breaking of alternating current,
- pre-arc phenomena in air and vacuum,

- interaction of different types of circuit breakers and electric power circuits,
- methods of measurements in switchgear technique,
- computerization of research works.

The Institute has obtained a large number of patents and prepared more than 1300 studies for home industry, covering the fields of exploitation testing, engineering works, testing of contact materials, manufacture of research and testing equipment.

The Institute offers Msc. courses in the following specializations: Electrical Apparatus, Electromechanical Elements in Automation, Control and Protecting Equipment.

#### THE CHAIR OF HIGH VOLTAGE ENGINEERING K-21

Head: Doc. Jerzy Wodziński tel. 36-55-22 ext. 273

Staff of the Chair: doc. Franciszek Mosiński, 8 senior lecturers, 1 assistant and 7 persons of non-academic staff.

#### Subject of research:

- investigation of mechanisms of electrical discharges in solid dielectrics and paper-oil insulation systems, including partial discharge mechanisms, insulation deterioration processes and pre-breakdown phenomena, e.g. by means of laser optical methods,
- investigation of electrical breakdown strength and methods of its estimation using statistical methods and numerical analysis of electric fields mainly applied to high voltage insulation of power transformers,
- works on computer aided design of insulation structures,
- H.V. measuring and test technics including design and manufacturing of H.V. impulse voltage sources and complete test stands.

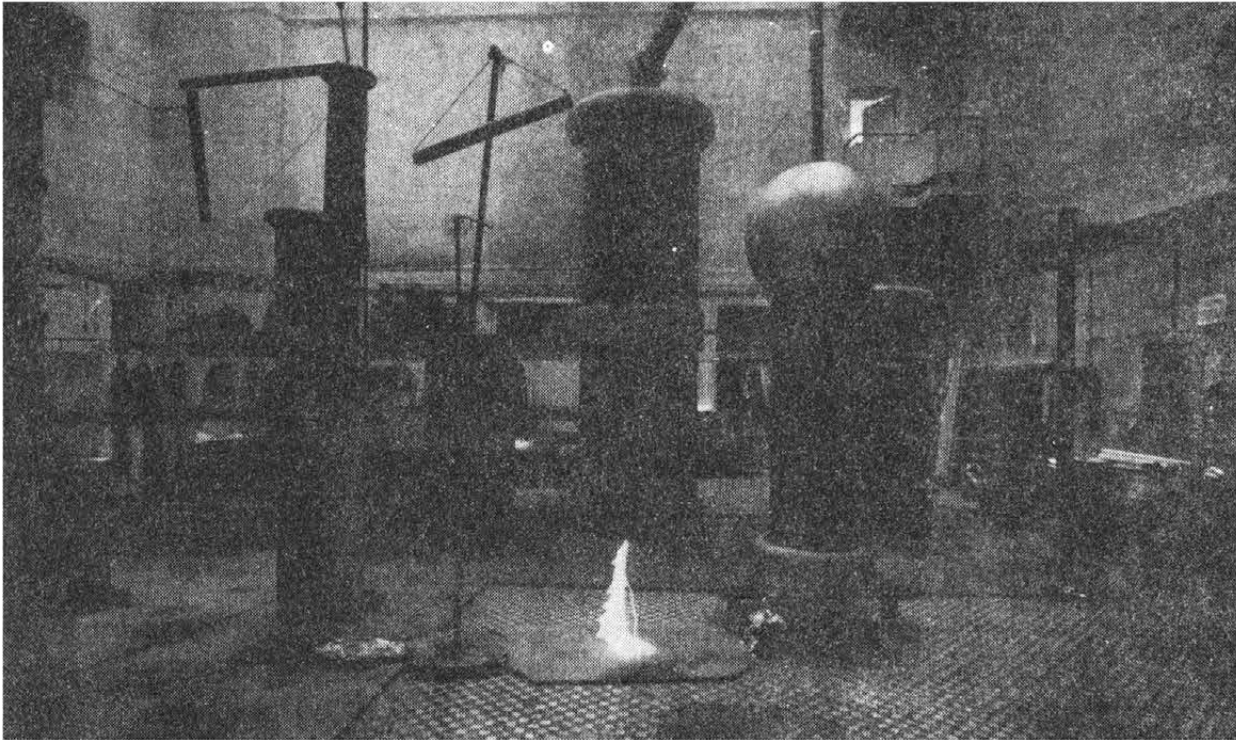
The most important achievements of the Chair within the last years:

- design and manufacturing of a series of H.V. lightning and switching impulse generators of rated voltages from 20 kV up



to 2400 kV; these are used in insulation tests but have also unconventional applications, e.g. in microbiology in studies on electrofusion of living cells,

- elaboration of estimation methods of paper-oil insulation withstandability and computer aided design methods of that insulation, which find their application in transformer industry.



High Voltage Room in K-21

In the field of teaching, diploma studies "High Voltage Engineering" are realized within the specialization "Construction of electrical machines and devices" on the course of study "Electrotechnics". The graduates of diploma studies gain professional knowledge both in design and in maintenance of insulating systems of H.V. devices. They may find jobs in electrical machines industry, in power stations, electricity boards and in research centres.





## THE FACULTY OF CHEMISTRY W-3

Dean's office address: 90-539, ul. Żwirki 36

tel. 36-47-03

The Faculty of Chemistry was established together with the Faculties of Mechanics and Electrical Engineering on May 24, 1945 by the decree of the Contemporary Government, KRN. From the beginning the scientific and teaching programs of the faculty were closely related to the local industry. Professor Tadeusz Wojno, the last pre-war dean of the Chemistry Faculty at Warsaw Politechnika, was nominated the first dean of the Faculty of Chemistry. Then the following professors acted as deans:

Prof. Tadeusz Wojno	1945
Prof. Alicja Dorabialska	1945-51
Prof. Edward Józefowicz	1951-53
Prof. Witold Janowski	1953-54
Prof. Edmund Trepka	1954-56
Prof. Bolesław Bochwic	1956-58
Prof. Edward Józefowicz	1958-60
Prof. Stanisław Chrzczonowicz	1960-68
Prof. Jan Michalski	1968-70
Prof. Jerzy Ruciński	1970-72
Prof. Kazimierz Studniarski	1972-75
Prof. Tadeusz Paryjczak	1975-81
Prof. Włodzimierz Surewicz	1981-84
Prof. Tadeusz Paryjczak	1984-



Main Building of Chemistry Faculty

The Institute of General Chemistry - head  
Prof. Tadeusz Paryjczak

The Institute of Organic Chemistry - head  
Prof. Mirosław Leplawy

The Institute of Polymers - head  
Prof. Kazimierz Studniarski

The Institute of Dyes - head  
Prof. Jan Kraska

The Interdepartmental Institute of Applied Radiation Chemistry - head  
Prof. Jerzy Kroh.

The scientific staff includes 19 professors, 20 docents, 11 senior lecturers, 120 tutors and 15 senior assistants and assistants.

Up to 1988 4095 students graduated receiving diplomas either of M.Sc or engineer. At present 350 students are taking the 5-year course at the Faculty of Chemistry.

There are 4 specializations with the following diploma courses.



Council of the Faculty of Chemistry, 1988/89

I. Inorganic chemistry and technology:

- trace analysis,
- technology of sorbents and catalysts,
- environment protection,
- nuclear and radiation technique.

II. Organic chemistry and technology:

- chemistry and technology of drugs,
- chemistry and technology of pesticides,
- chemistry and technology of dyes,
- chemistry and technology of chemical auxiliaries,
- nuclear and radiation technique.

III. Polymer Chemistry and Technology:

- technology of leather manufacture,
- rubber technology,
- plastics technology,
- nuclear and radiation technique.

IV. Pulp and paper technology:

- pulp technology,
- paper technology,
- paper converting technology,
- nuclear and radiation technique.

The scientific activity of the Faculty of Chemistry is very extensive and representative of the specializations of the particular institutes.

Research activity of the Faculty is directed both to the fundamental problems and applications.

The details of the scientific activity of the institutes are given below.

The Faculty of Chemistry is entitled to confer the doctor degree and the docent degree. Every year a few persons receive docent degrees and a dozen or so Phd degrees.

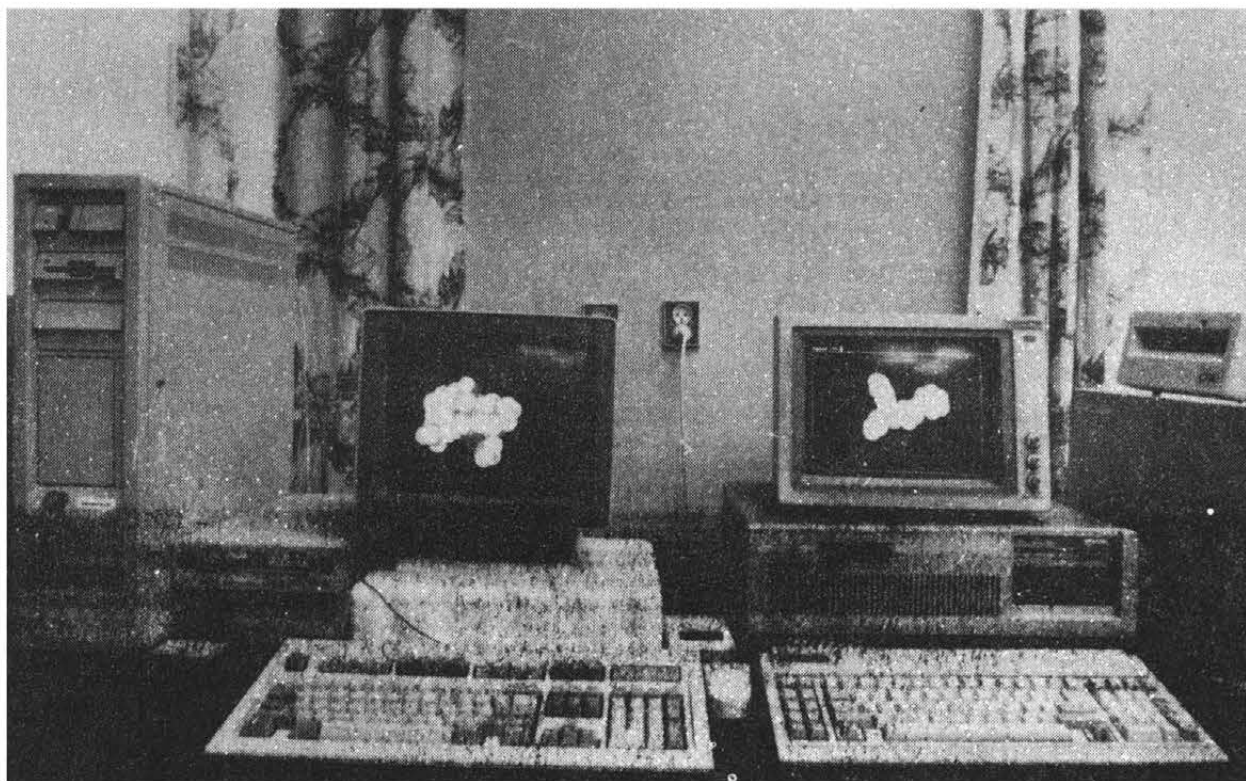
At the Faculty of Chemistry a graduate program leading to the doctor degree is offered to the research workers either from industry or other institutions. Up to now 64 scientists have received the docent degree, and 375 doctoral dissertations were conducted.

The Faculty Library, the subunit of Main Library of Łódź Technical University, offers a rich collection of books and journals to the staff members and students. The scientific letters of Łódź, Technical University, entitled "Chemistry", are periodically edited. The Polish Chemical Association and the Association of Engineers and Technicians of Chemical Industry are active at the Faculty of Chemistry. In addition, the students may develop their interests acting as members of the Young Chemists' Association.

#### THE INSTITUTE OF GENERAL CHEMISTRY (I-17)

Director's office tel. 36-23-39

The Institute of General Chemistry was founded in 1970, as a result of fusion of former Chairs of General Chemistry, Inorganic Chemistry and Inorganic Technology. The director of the Institute is Prof. Tadeusz Paryjczak and deputy directors are: Prof. Andrzej Cygański, Doc. Zbigniew Gorzka and Dr Władysław Farbotko.



IBM computer Ps/Z 80/III. The molecular structure of crystal is shown on the monitor I-17



There are 4 scientific teams at the Institute:

- Catalysis and Adsorption Group,
- Inorganic and Analytical Chemistry Group,
- X-ray Crystallography and Crystal Chemistry Group,
- Chemical Technology and Environment Protection Group.

There are 6 professors, 6 docents, 7 senior lecturers, 38 doctors and 3 assistants employed at the Institute. 61 people do technical, administrative and operating jobs.

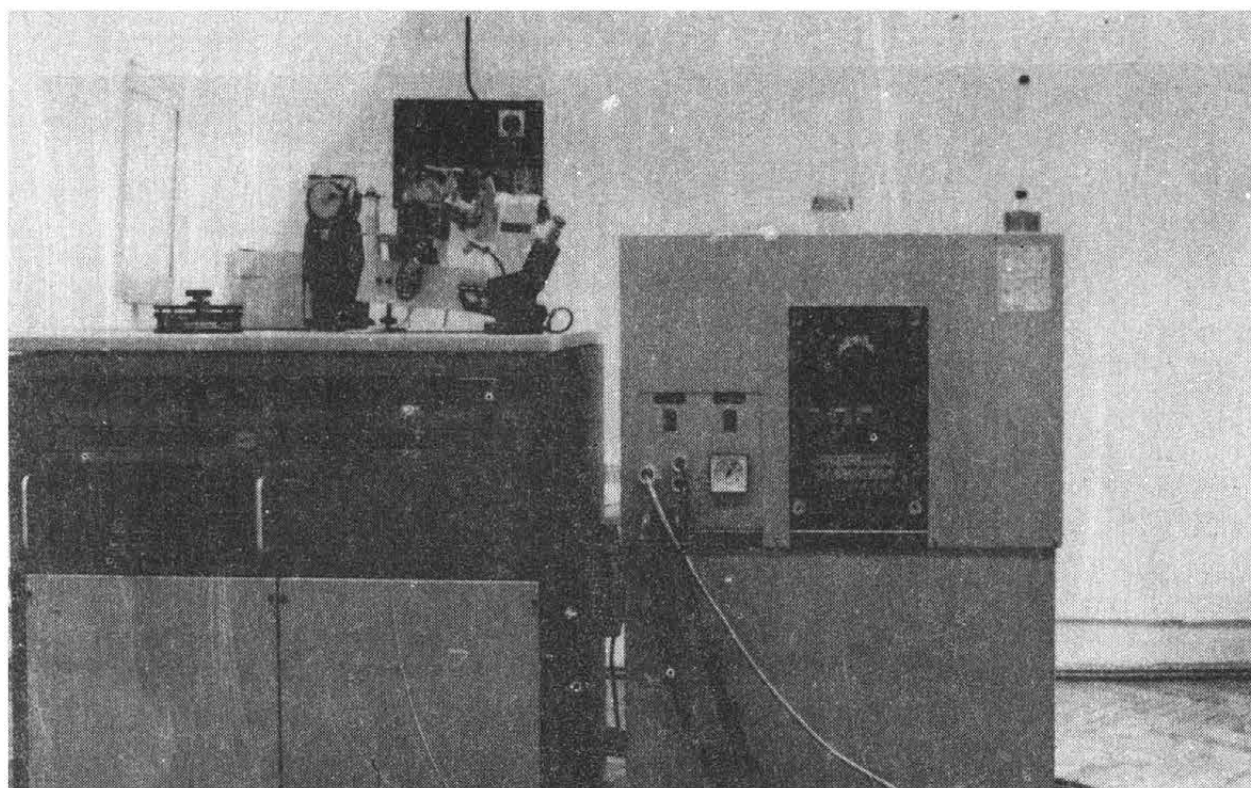
The main directions of scientific research conducted at the Institute are connected with the specific subjects dealt with by the 4 scientific teams mentioned above.

The subject matter of the research carried out by the Catalysis and Adsorption Team includes investigation of physico-chemical properties of catalysts and adsorbents with a special application of gas chromatography. The X-ray Crystallography and Crystal Chemistry deals with crystallography, X-ray structure analysis, applied crystallography and X-ray crystallography methodology (programming of crystallographic calculations). The subject matter of the research carried out by the Analytical Chemistry Team comprises chemistry of coordination compounds, inorganic chemistry, and analytical chemistry. The research conducted by the Chemical Technology and Environment Protection Team includes sorption and ion exchange, thermocatalytic oxidation of organic substances in water solutions and electrochemical methods of sewage purification. The above mentioned research is carried out either by the Institute itself (for doctoral theses or works qualifying docent) or in cooperation with industry or research units of the Polish Academy of Sciences, other universities or other departments.

Among numerous scientific institutions with which the Institute cooperates in our country are: the Department of Catalysis and Surface Physicochemistry Institute of the Polish Academy of Sciences in Kraków, UMCS in Lublin, the Crystallography Committee of the Polish Academy of Sciences. Among industrial institutions there are: ZPF "Polfa" in Pabianice, Łódź, Tarchomin, Kutno and plants producing dye stuffs and plastics.

For many years now the Institute has been cooperating with the following centres abroad: the University of Strathclyde,

Higer Chemo-technological Institute in Sofia, Catalysis Dept. of the Moscow University, Catalysis Institute in Novosibirsk, Catalysis Institute in Lyon, Higher Chemical School in Perdubice. The cooperation has resulted in many scientific publications and a very profitable exchange of experience.

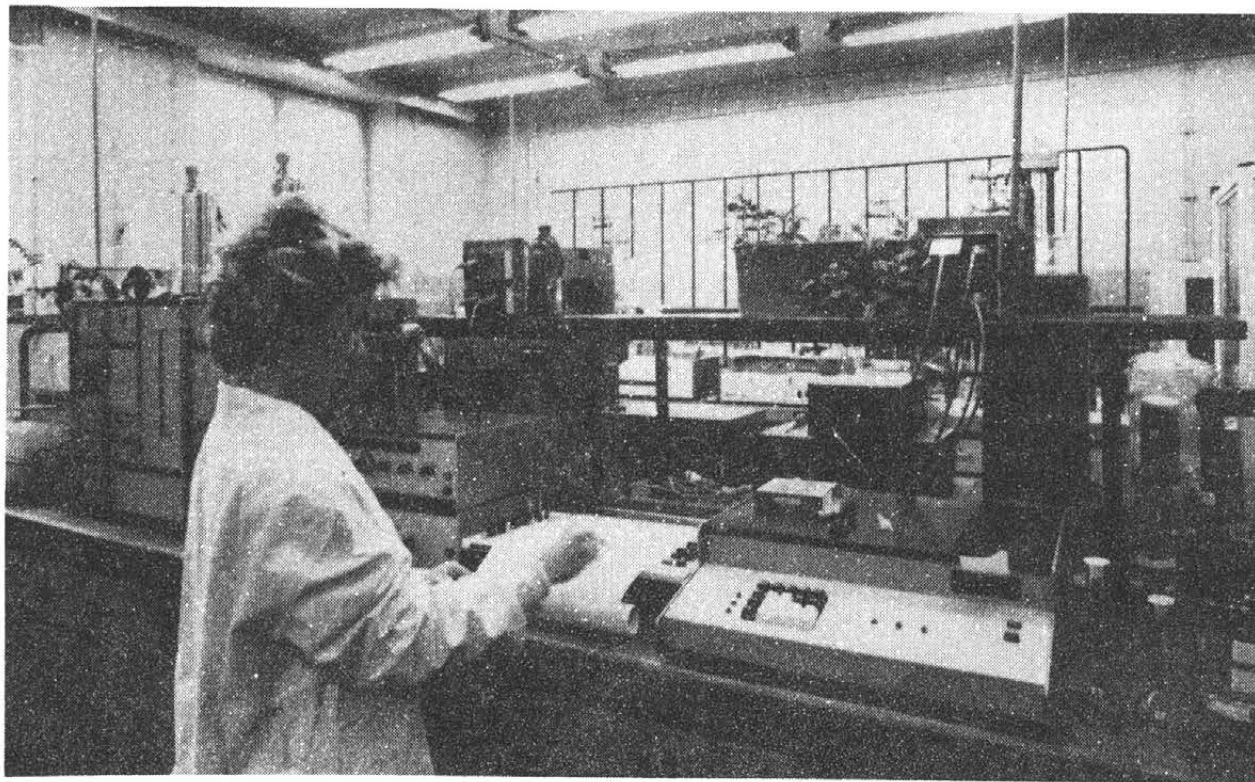


X-ray generator with Reciprocal-lattice explorer made by "Simens" I-17

The Catalysis and Adsorption Group has at its disposal very modern apparatus for investigation of solid bodies and especially absorbents and catalysts, which allows determination of the catalytic activity, texture and physicochemical properties of the objects under study. Moreover, gas and liquid chromatographs in combination with mass spectrometer allow for an almost complete examination of catalysts and adsorbents of different types and of catalytic reaction products.

The Institute has had remarkable achievements in the field of examination of mono- and bimetallic supported catalysts (metals: Pt, Pd, Rh, Ir, Ag, Ni, Co, Fe and others) consisting in determination of such parameters as liability to reduction

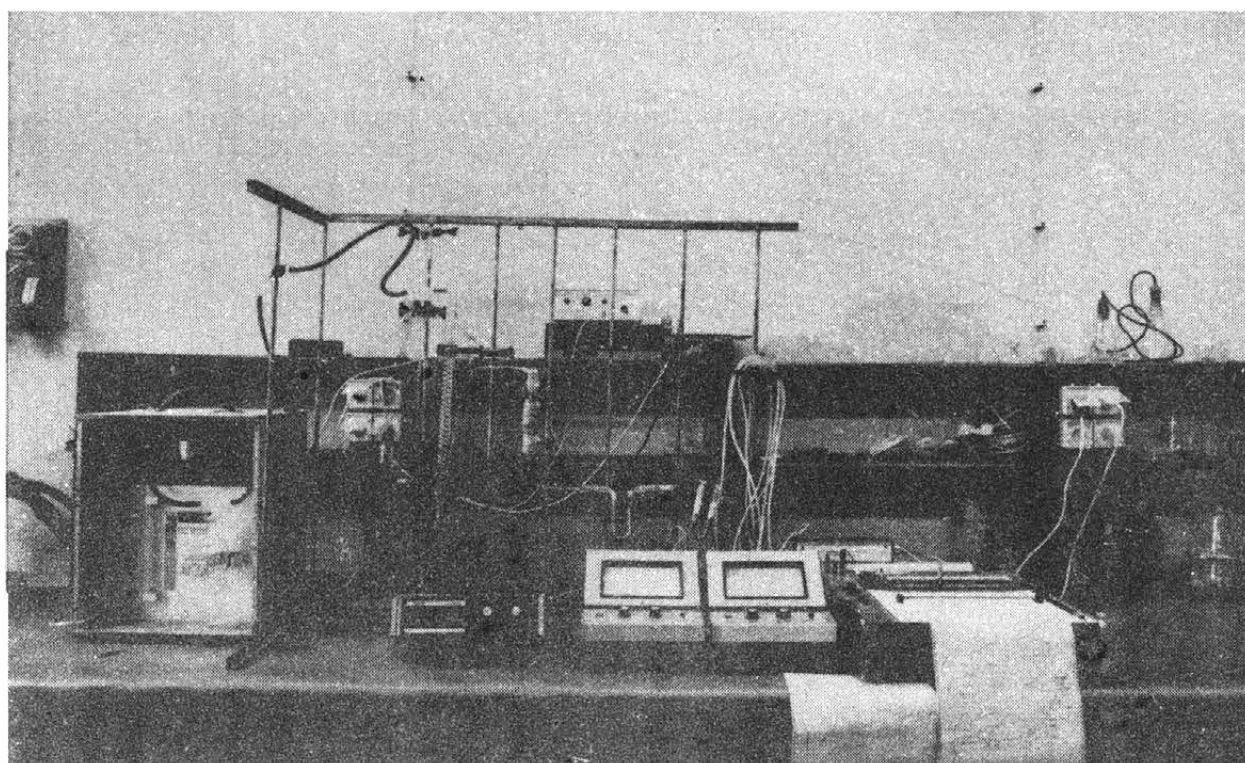
and oxidation, metal dispersion, the form of gases adsorbed on the surface, activity and selectiveness in catalytic reactions, reaction of different gases with the surface of the catalyst and metal-carrier interaction. These investigations are of both cognitive and practical importance, especially in the CO and CO<sub>2</sub> methanation reaction.



Enzymatic catalysis laboratory I-17

The main achievements of the X-Ray and Crystal Chemistry Team are related to the studies on structure and properties of biologically important molecules, especially steroids, modified nucleosides, amino acids, peptides, antiepileptic, antiarrhythmic and antihypertensive agents and complexes of N-alkylated porphyrins and copper /II/. The Team coordinates the project RP.II.10 from the Ministry of Higher Education; the studies are oriented towards better understanding of molecular properties conditioned by the structure. It is also engaged in designing new drugs in cooperation with pharmaceutical industry. A new drug belonging to the latest antacids generation, so called cytoprotectants, very efficient in the treatment

of gastric and duodenal ulcers, has been developed. The Team's ambition is to adapt all crystallographic and related (molecular mechanics, quantum chemistry) computer programs for microcomputers and to propagate them in the country. The modern equipment (monocrystal and powder diffractometers, exceptionally good computing facilities), highly qualified staff and full package of programs enable the Team to play the leading role in this field.



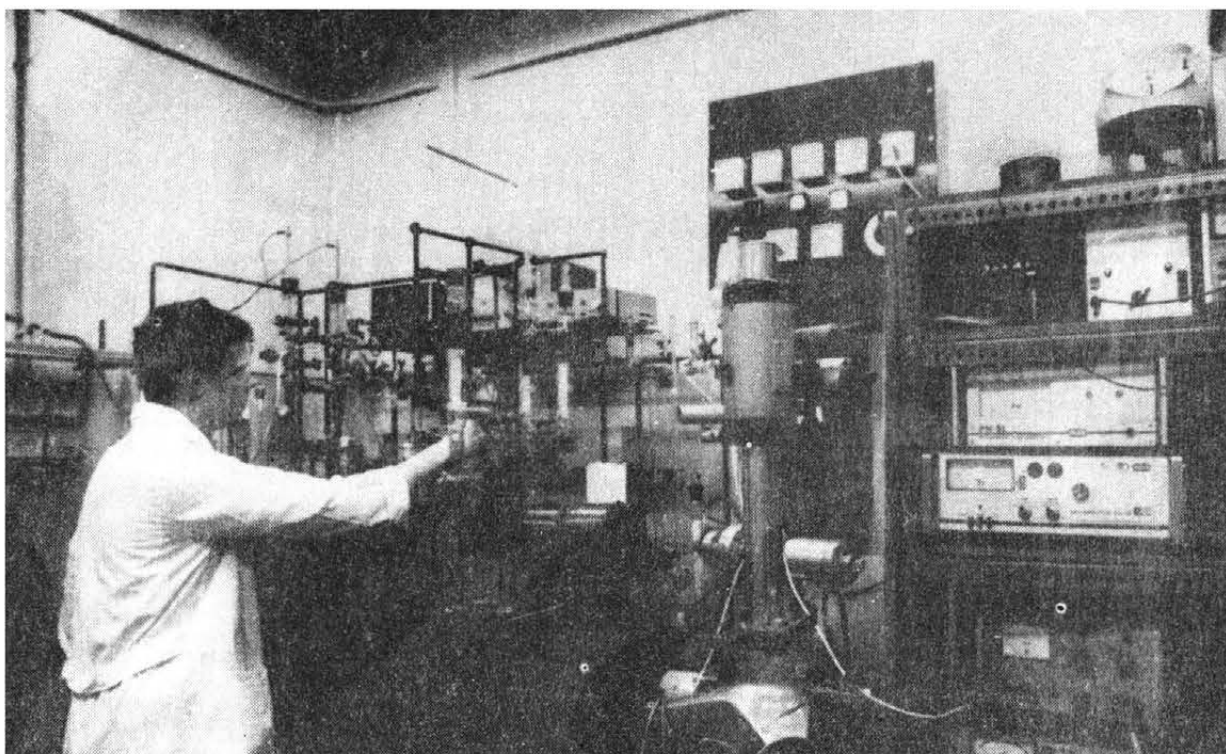
Thermal-conductivity set for gas analysis in flow system I-17

The Analytical Chemistry Group has worked out methods of determination of stink active substances in plants producing bone meal (Meat Processing in Wrocław) and in pulp and paper industry (Ostrołęka Pulp and Paper Plant). Thermo-spectrophotometric and spectrophotometric hypochlorito-salicylate methods are used to carry out several thousand analyses a year at the Institute of Plant Cultivation, Fertilizing and Soil Science.

The Chemical Technology and Environment Protection Group has worked out and implemented an ionite method of fluoro-borate sewage purification in ZPF "Kazel" in Koszalin, a technology for recovery of silver from washing water in photo-technical industry



(Film Print Producing Plant in Łódź), a new technology for rendering harmless industrial wastes containing high concentrations of detergents, oils and grease (Transport Equipment Factory of the Aviation Equipment Plant in Kalisz), a new method for regeneration of used chrome baths, for recovery of anthraquinone from dye industry waste, for rendering harmless waste gases containing toxic sulphur compounds (Organic Industry Plant "Organika-Rokita" in Brzeg Dolny) and many other technical innovations applied in industry in different plants all over the country.



Electrical conductivity and magnetic susceptibility detection unit for catalysts I-17

The Institute of General Chemistry teaches in the following Faculties: Chemical, Textile, Chemical Engineering, Mechanical, Civil Engineering and Architecture, Technical Physics and Applied Mathematics.

## THE INSTITUTE OF ORGANIC CHEMISTRY I-18

Director's tel. 36-25-42

The Institute of Organic Chemistry was created in 1970 as a result of fusion of former Chairs of Organic Chemistry and of Organic Synthesis. The Institute Director is prof. Mirosław Leplawy, and his assistants are: prof. Andrzej Zwierzak and dr Jan Wasiak. The Institute employs 2 professors, 2 docents, 2 senior lecturers, doctors-adiunkts (see: Introduction - University Staff) and 40 persons of technical and administrative staff. There are 8 teams and research groups at the Institute.

The Institute makes basic research in two main lines of specialization:

1) chemistry of phosphoro-organic compounds with special regard to the problem of new methods of synthesizing these compounds and the possibility of applying them as reagents in the organic synthesis;

2) chemistry of natural products (aminoacids, peptides, nucleosides, nucleotides, terpenes), especially the research concerning the synthesis and conformation of oligopeptides containing fragments of di-substituted aminoacids in their particles. The Institute also makes applied research concerning the development of new methods for synthesis of the drugs prepared for production by the pharmaceutical industry, and the synthesis of new phosphoro-organic pesticides. The following have already been implemented: Ibuprofen (Brufen) in "Polfa" Pharmaceutical Works at Pabianice, Pridinol in "Polon" Chemistry Co-operative, Orcyprenaline in "Polfa" Pharmaceutical Works in Łódź, and Bromofenwinfos at the Institute of Organic Industry in Warsaw.

The Institute co-operates with many research centres at home and abroad. The team run by prof. Leplawy, dealing with the chemistry of aminoacids and peptides, co-operates, among others, with the Universities in Padua, Tübingen (West Germany), and St. Louis, Missouri (USA).

The Institute of Organic Chemistry conducts basic classes in the subject of "organic chemistry" for the full-time students



of the Faculty of Chemistry, the Institute of Chemical and Process Engineering and for the students educated in Chemical Processing of Fibres of the Textile Faculty. It also conducts classes and lectures in three subjects: "Stereochemistry, electron structure and dynamics of organic systems", "Spectroscopic methods in organic chemistry" and "Bibliography" for the students specializing in Chemistry and Organic Technology.

The Institute has recently organized one-year post-graduate course. Lectures, seminars and laboratory classes deal with new achievements in drug technology, new methods of spectral analyses and new discoveries in the field of drug action.

The Institute of Organic Chemistry has well-equipped research laboratories for making organic syntheses on a bench scale. Besides these laboratories there are also specialist laboratories: laboratory of elementary analysis (the only one of that type at the University), the laboratory of nuclear magnetic resonance, the laboratory of spectroscopy (infrared and ultraviolet) and the laboratory of gas and liquid chromatography.

Over 200 students have graduated from the Faculty in the line of "Chemistry and technology of drugs" and "Chemistry and technology of pesticides" over the past 20 years. They are employed in pharmaceutical industry, in pesticide factories and in factories producing organic products and intermediate products. Many of them work in research centres dealing with the organic synthesis (industry, high schools and Polish Academy of Sciences).

THE INTERDEPARTMENTAL INSTITUTE OF APPLIED  
RADIATION CHEMISTRY I-19  
Director tel. 84-00-44

The Interdepartmental Institute of Applied Radiation Chemistry, including former Chairs of Radiation Chemistry and of Physical Chemistry, was established in 1970. The Institute is directed by Prof. Jerzy Kroh, deputy directors-Doc. Jerzy Gębicki and Prof. Władysław Pękala and deputy director in charge of administration, Jacek Jankowski.

The Institute employs 5 professors, 6 docents, 2 senior lecturers, 30 doctors, 10 senior assistants, 1 assistant and 59 research workers, engineers and technicians.



The building of the Interdepartmental Institute of Applied Radiation Chemistry I-19

- The Institute is divided into the six following research units:
- Research Unit for Fundamental Problems of Radiation Chemistry, encompasses ESR Laboratory, Laboratory of Spectrometry and LINAC Laboratory;
  - Research Unit for Radiochemistry, including Isotopic Laboratory;
  - Research Unit for Radiation Chemistry of Polymers;
  - Research Unit for Radiation Food Chemistry;
  - Research Unit for Radiation Chemistry of Solids, formed jointly with the Institute of General Food Chemistry;
  - The Radiation Chamber Laboratory.

For the purpose of education two teaching groups - the Teaching Group for Nuclear and Radiation Technique and the Teaching Group for Physical Chemistry - were formed.

Research activity of the Institute of Applied Radiation Chemistry encompasses the radiation chemistry, the radiochemistry and some areas of chemical physics, photochemistry, biochemistry and physical chemistry of polymers.

Some of the achievements of the Institute worth mentioning are: elaborations of several technologies of polymerization and modifications of polymers, as for example the technology of radiation initiated polymerization of resins of high electrical conductivity, of production of burn-dressing containing polyacrylamide hydrogels used in medicine to control release of drugs (the studies of bioactive hydrogels contribute to the international research program coordinated by the International Agency of Atomic Energy in Vienna), the technologies of sterilization (in radiation chamber) of medical equipment, preparations and packaging materials used for preservation of products during prolonged storage. The research efforts are focused also on the application of ionizing radiation to protect the natural environment (for example purification of waste water from textile industry).

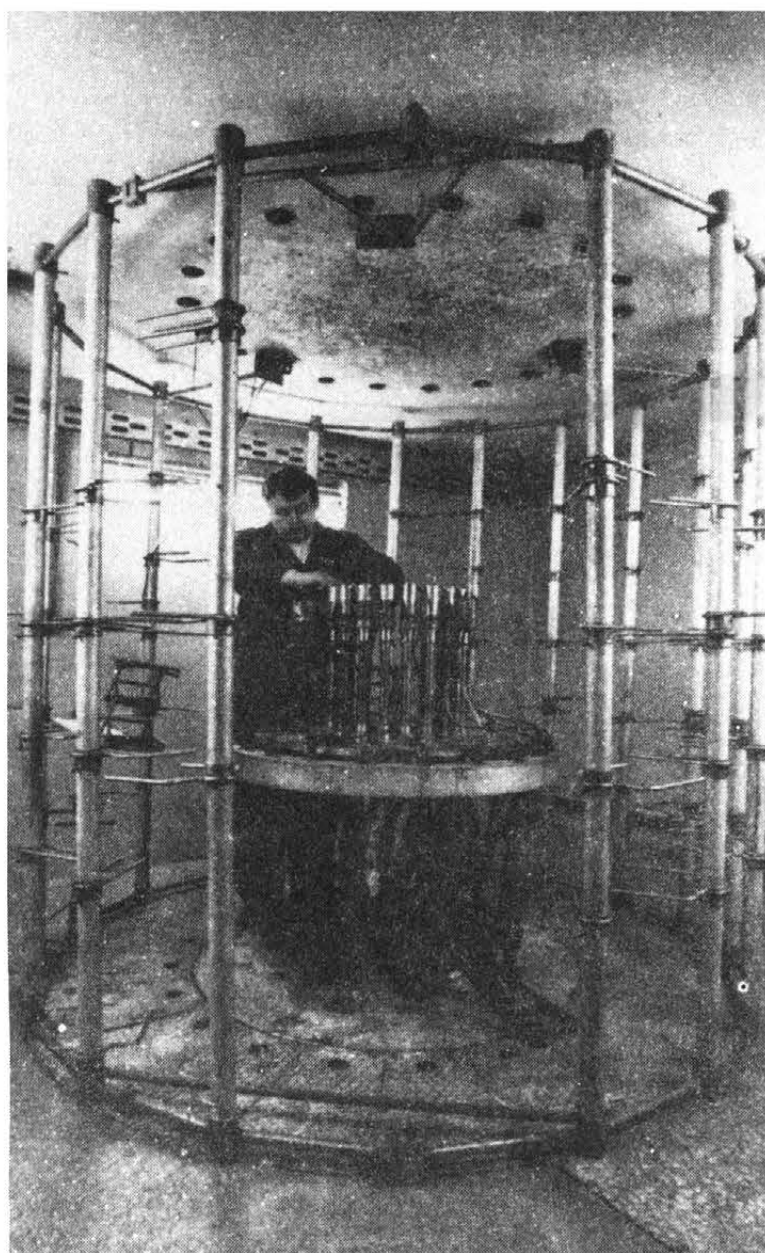
The technologies of prolongation of storage of fruits and mushrooms are important for the food industry. The results of studies on reduction of toxicity of mycotoxin and of sterilization of fodder are worth mentioning. The technologies of production of 34 compounds labelled with  $^{14}\text{C}$  have been developed and 60 different compounds with the total radioactivity about  $2 \cdot 5 \cdot 10^3$  MBq have been produced.

The Institute cooperates with numerous universities, National Atomic Agency, the Polish Academy of Sciences and many branches of industry.

The close cooperation in the research problem CPBP 01.19 "Fast processes and short lived intermediates in chemistry, physics and biology", coordinated by prof. J. Kroh, must be emphasized.

The Institute organized and coorganized both national and international meetings and conferences, like the series of conferences devoted to pulse methods in chemistry, physics and biology "Puls '85" (Łódź) and "Puls '88" (Częstochowa), the

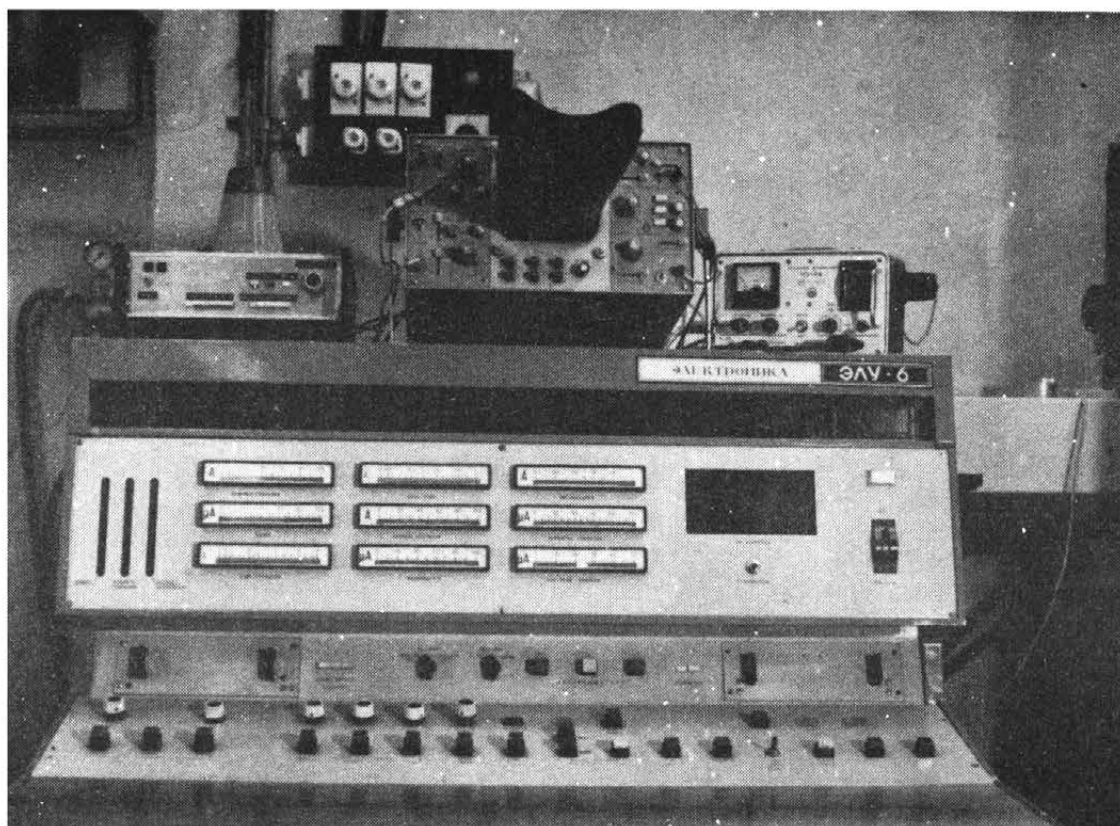
meeting "Radiation techniques in production and modification of polymeric materials" or "Autumn School of the Polish Radiation Research Society" in Zakopane 1985.



$^{60}\text{Co}$  radiation chamber I-19

According to the bilateral agreements, the Institute cooperates with the Central Institute of Isotopes and Radiation Research in Leipzig, GDR, University of Leeds, the Moscow's Institutes of Academy of Sciences of the USSR, the Research Institute of Electrotechnical Industry in Bucharest and many centers of radiation research in Great Britain, FRG, USA, Canada and Japan.

The Institute was visited by many foreign scientists invited to lecture, exchange information or participate in the experimental studies.



Control desk of LINAC I-19

In recognition of the role played by the Institute in radiation research prof. Kroh was invited in 1981 to edit the special volume of Radiation Physics and Chemistry. Two professors from the Institute, Jerzy Kroh, and Andrzej Płonka, were elected consultants of the International Association for Radiation Research.

One of the main obligations of the Institute is to prepare students for work in industry, institutions of education and for scientific research, therefore various teaching programs were designed. Physical chemistry is one of the basic subjects in chemical departments (Faculty of Chemistry, Faculty of Chemical Engineering) and other departments (Faculty of Engineering, Faculty of Architecture and Building Construction at the Technical University). There are lectures, seminars and laboratory courses.

For the Faculty of Chemistry the Institute offers a special course on nuclear and radiation techniques, on radiation chemistry of polymers and on isotopic techniques. The graduates are prepared for creative work in science and technology and in nuclear plants. The course includes lectures on radiation chemistry, radiochemistry and radiometry, pulse methods in radiation chemistry. All these amount to 135 hrs of lectures, 315 hrs of seminars and laboratory research leading to the diploma work. Besides, students have a four-week practice at the Institute of Nuclear Chemistry and Technique, the Institute of Atomic Energy or in the Central Laboratory of Radiological Protection. Up to now this course has been completed by 134 graduates.

#### THE INSTITUTE OF POLYMERS I-20

Director tel. 36-25-43

The Institute of Polymers was set up in 1970 as a result of fusion of the Chair of Organic Technology, Chair of Rubber Technology and Chair of Leather Technology and the group of Polymer Physics. The head of the Institute is Prof. Kazimierz Studniarski and his deputy directors are Doc. Ludomir Slusarski and Doc. Czesław Krawiecki. The staff of the Institute includes 5 professors, 3 docents, 21 doctors and 53 persons of technical and administrative staff.

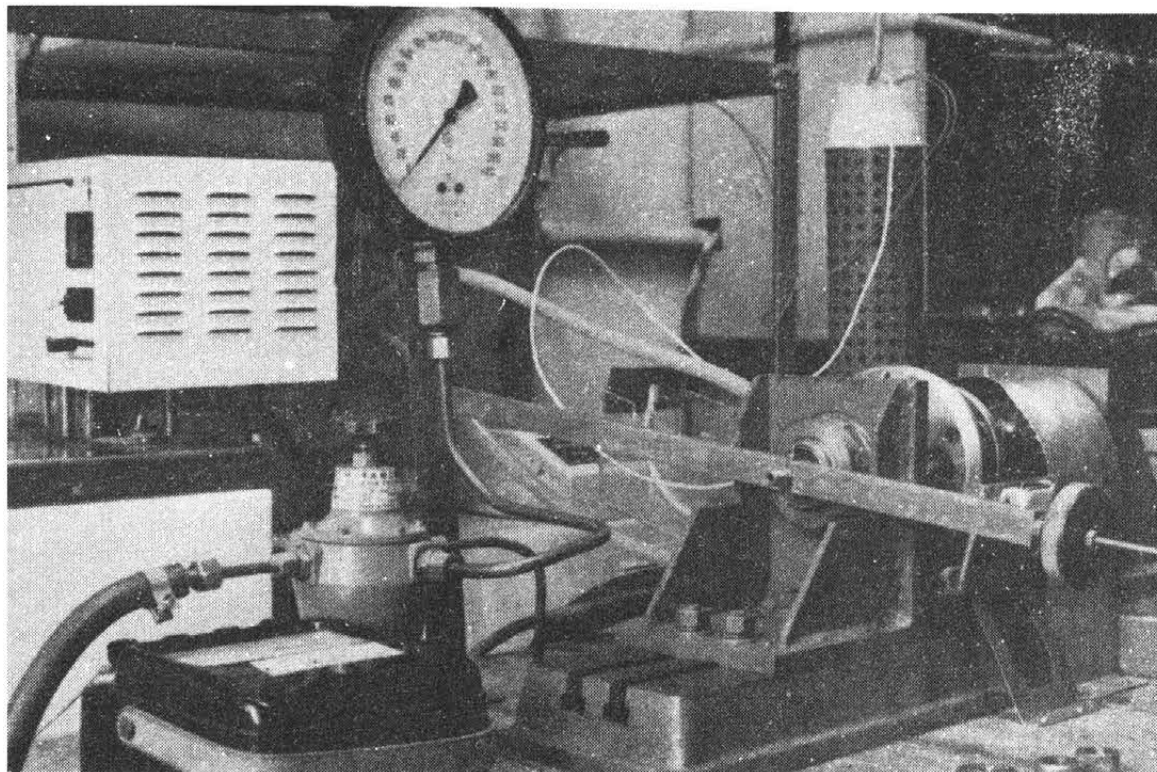
There are four divisions at the Institute: Rubber Technology, Leather Technology, Plastics Technology and Physics of Polymers.

The main scientific field of interest of the Leather Technology Division is chemical modification of commonly available natural proteins by grafting with vinyl monomers and the evaluation of structure and properties of the synthesized products. Applied studies in this field are connected with practical use of grafted casein and collagen preparations. They are applied as binding materials in finishes of leather or as adhesives in painting technology.

The important field of technological research is the evaluation of the continuous methods of realisation of pretannage,



tannage and posttannage processes in leather technology. An example of such activities is the development of two step continuous method of unhairing of hides with sodium hydroxide and sodium sulphide solutions. Research and development work in this field include also the designing of special apparatus and machinery.



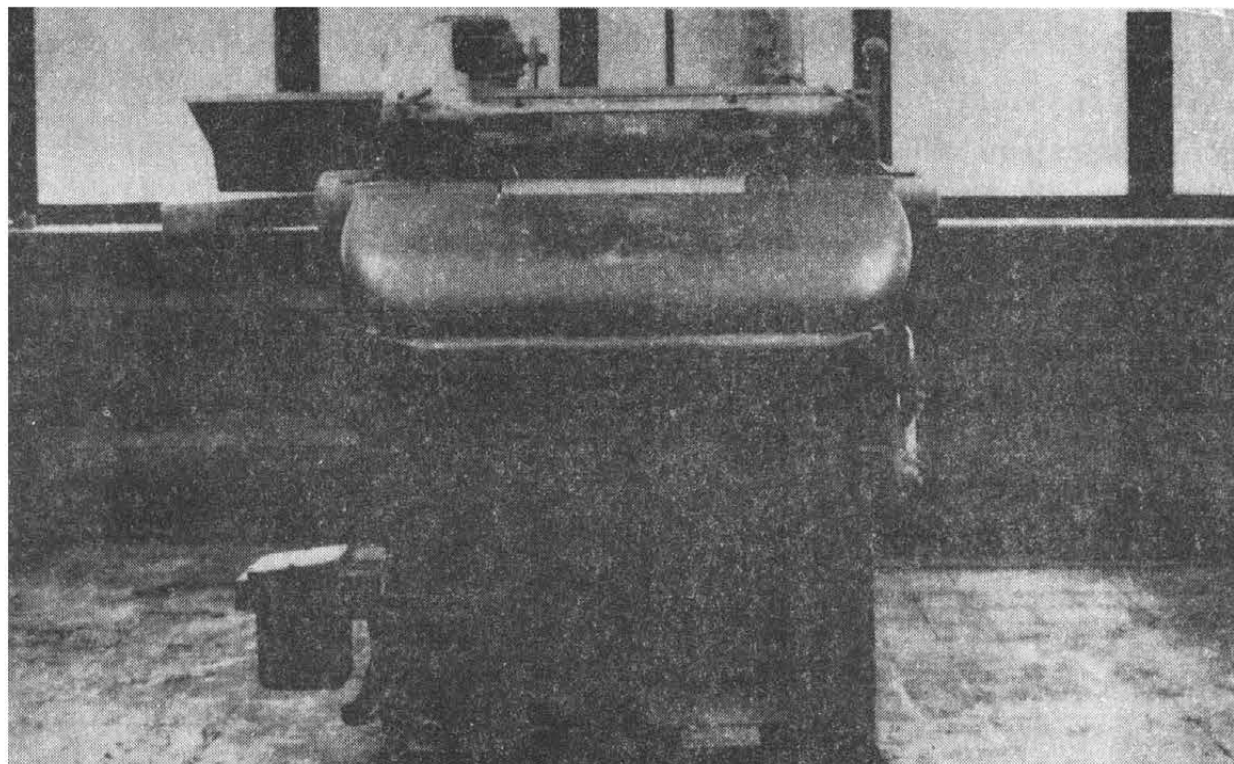
Trybology testing stand for polymers (own construction of Rubber Technology Division) I-20

Fundamental and applied research concern

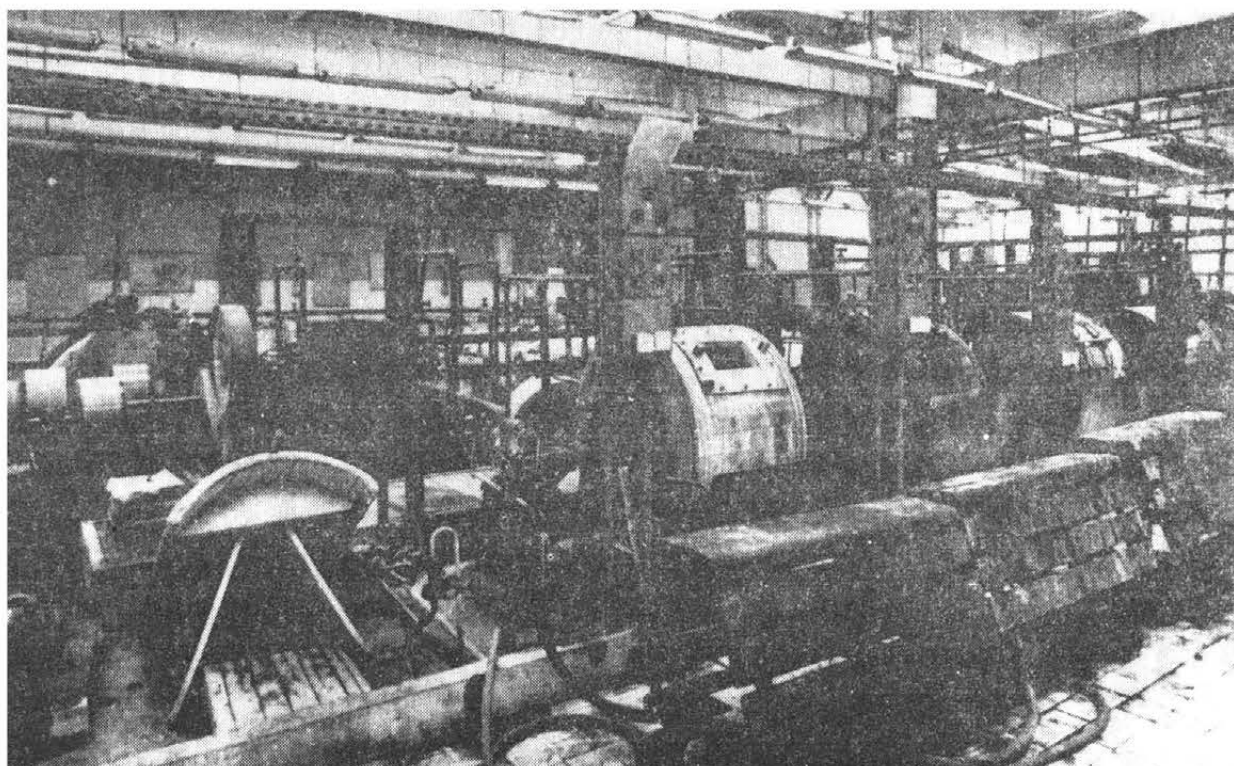
- 1) the preparation of highly active enzymatic products for bating and unhairing of hides,
- 2) the preparation for simultaneous tanning and fatting of leather and simultaneous fatting and filling of leather.

The main aim is to obtain multifunctional substances which permit to link 2 or 3 unit processes in one technological operation.

The highly active pancreatic enzymes - "pancreopon 5000" and "Dębazyn" for bating and unhairing of hides have been developed on full industrial scale.



Shaving machine in Leather Technology Division I-29



Technological room in Leather Technology Division I-20

The main aim of fundamental research realized in the Division of Rubber Technology is to get the knowledge of an interdependence between the structure and properties of elastomers and multicomponent elastomeric systems. New type of network with ionic or complex crosslinks has been developed. Among the fully realised technological projects the most important are: rubber rolls for textile machines, rubber - metal pans for pump aggregates, the technology of manufacture of microporous rubber soles, and technology of manufacture of special sealing for water pipe-line Pilica-tódź.

The research realized in the Division of Plastics Technology is rather fundamental but may find practical application in the following branches of chemistry: the chemistry and technology of synthesis of organosilicon monomers and polymers, homogeneous catalysis on polymeric matrix, the chemistry of microgels and the use of polyamides. Some methods of casting of polyurethanes and polyamides have been developed and realised on industrial scale in the workshops of Lignite Mine in Bełchatów.

The fundamental research realised by the group of the Physics of Polymers is the base of practical projects leading to obtaining polymers of definite and desired properties.

The most important achievements are: the determination of the influence of "metal organic" additives on electric behaviour of polymeric matrix, the evaluation of mechanism of photoconductivity of polymers made photosensitive with low molecular additives, the development of new polymeric materials exhibiting the photoconductivity behaviour and the investigation of the influence of the additives with charge transfer complex ability on the physical behaviour of polymer matrix.

The Institute of Polymers cooperates with several scientific and industrial centres at home and abroad.

The Division of Leather Technology is linked with appropriate divisions of Technical High School in Darmstadt (BDR), and Technical University in Karl-Marx-Stadt (DDR).

The Division of Rubber Technology cooperates with Technical University in Sofia, University of Haute-Alsace, and Research Centre in Mulhouse.

The Division of Plastics Technology cooperates with Technical University in Dresden, Lanquedoc University in Montpellier and with the Department of Pure and Applied Chemistry of the University of Strathclyde.

The Research Group of Polymer Physics continues the cooperation with Max-Planck Institut (Mainz), University of Lyon, University of Brussels and University of Strathclyde.

The students of "Chemistry and Technology of Polymers" take the courses in chemistry, physics and reology of polymers. These are the unique high diploma courses in Poland.

The Institute of Polymers has the following special laboratories: chemistry and technology of polymers, physics and reology of polymers, chromatography, laser laboratory, rubber and plastics technology and a technological plant for leather manufacture. Up to now 1662 students have completed the MSc and obtained the Engineer diploma in polymer science and technology.

The Institute of Polymers offers the postdiploma courses in leather, rubber and plastics science and technologies.

#### THE INSTITUTE OF DYES I-21

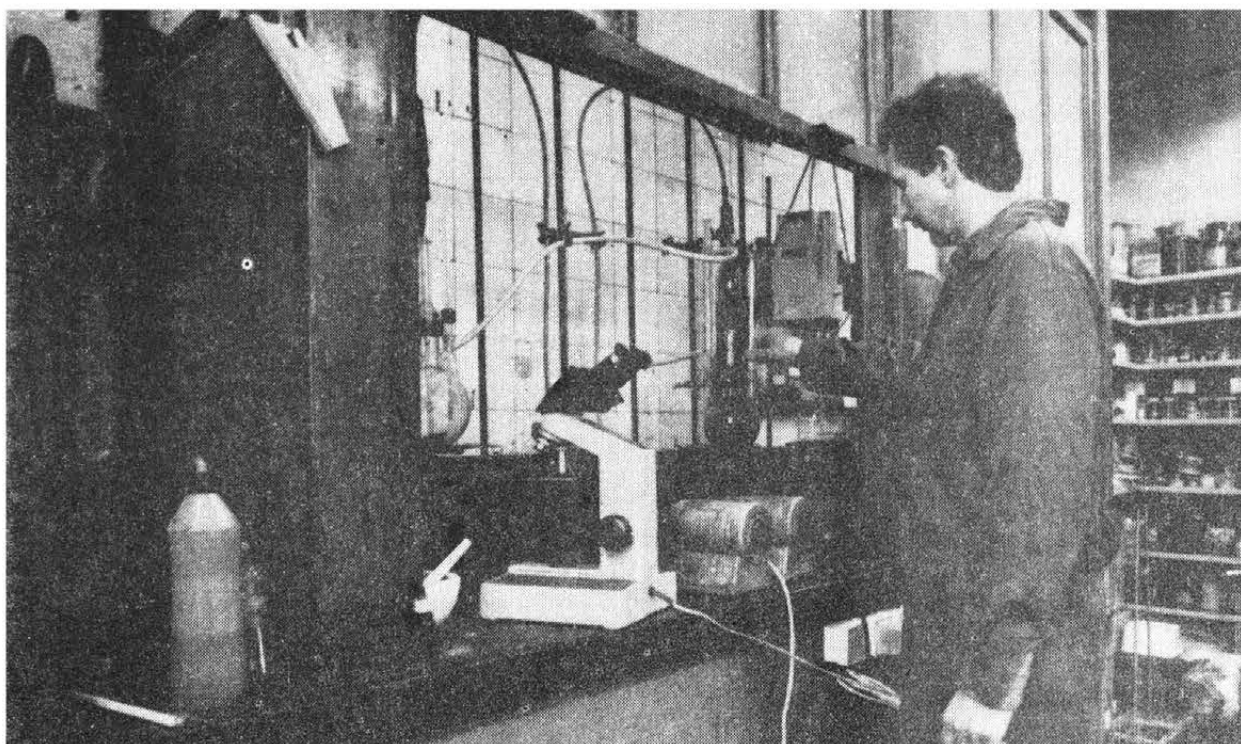
Director tel. 36-25-96

The Institute of Dyes continues the activity of the former Chair of Dyes Technology. The head of the Instytute is Prof. Jan Kraska. Lecturing staff includes 2 docents, 1 senior lecturer, 6 doctors and 1 senior assistant. Other staff includes 12 engineering, technical and administrative workers.

Research carried out by the Institute concerns both fundamental and applied problems connected with technology of dyes, dye intermediates and chemical auxiliaries. The most spectacular result of this research was a significant contribution to technology of modern fast organic pigments (especially so-called azo condensed pigments, perylene pigments and metal-complexed pigments) and also research papers on acid, metal-complexed, reactive and disperse dyes.

The Institute has close contacts with Polish dyestuff industry, especially with Organica-Boruta Dyestuff Plant,

Wola Krzysztoporska Dyestuff Plant and Pharmaceutical Works "Polfa". The result of these contacts are numerous industrial implementations as well as semi-commercial scale and laboratory-scale elaborations for industrial application in the nearest future.



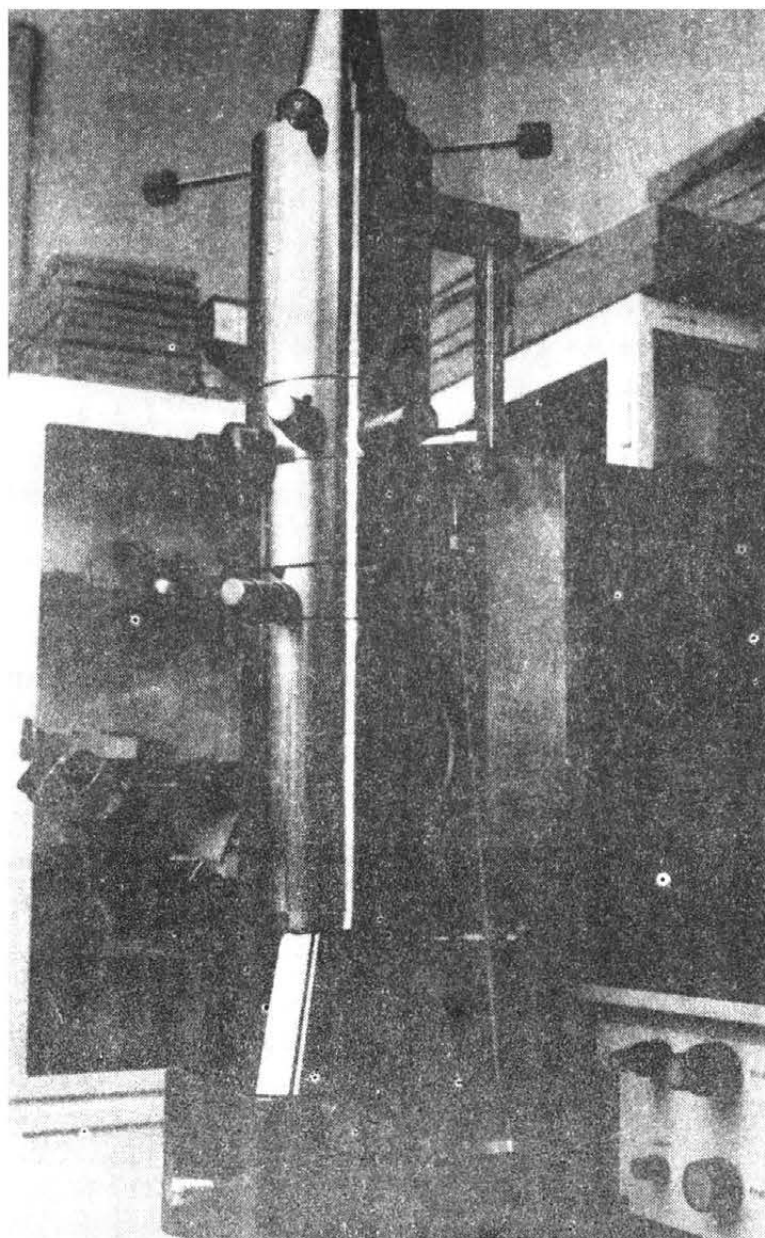
Dye synthesis laboratory I-21

The Institute of Dyes has also contacts with Centre Research and Development of the Dyestuff Industry in Zgierz and with other university institutes concerned with organic chemistry and organic technology. Close contacts are maintained with University of Łódź, Nicholas Copernicus University in Toruń, Maria Curie-Skłodowska University in Lublin, Technical Universities in Warsaw and Wrocław, the Agricultural Technical Academy in Bydgoszcz and also the Military Technical Academy in Warsaw. All these institutes participate in government research programmes co-ordinated by professor Jerzy Kraska.

The Institute of Dyes has scientific contacts with Department of Colour Chemistry at the University of Leeds (Great Britain), High Chemical Technological School in Sofia (Bulgaria) and High



Chemical Technological School in Pardubice (Czechoslovakia). The result of these contacts are exchange of publications, co-operation in research programmes and joint post-doctoral research fellowships.



Electron microscope I-21

The Institute of Dyes is the only Polish university institute providing education to students in the range of technology of dyes and chemical auxiliaries. Postgraduate courses in the same range are also offered.



Laboratories of the Institute are well equipped both for research and teaching with visible, ultraviolet and infrared spectrometers, equipment for structural studies (optical and electron microscopes) and also with facilities for colour application technology.

Over the years more than 500 students graduated from the Institute, both from normal and extramural courses. They found employment in dyestuff industrial plants, dyeing and finishing departments of textile industry plants and also in research and development institutes concerned with colour, colour applications, organic technology and textile industry.

Besides the normal course of studies students of the Institute participate as members of temporarily appointed research groups in some projects supported by industry.

## THE FACULTY OF TEXTILES W-4

Dean's office address: 90-543 Łódź, ul. Żeromskiego 116  
tel. 36-48-23

### 1. HISTORY OF THE TEXTILE FACULTY

The Textile Faculty at the Technical University of Łódź was founded in 1947. Its roots, however, reach as far in the past as the beginning of 20 th century. At that time education of textile specialists started at the Technical University of Lwów under the supervision of Prof. Władysław Bratkowski whose name since then has been inseparably connected with the academic textile science in Poland.

Between the World Wars I and II the academic education in textiles was continued at the Chair of Textiles of the Warsaw Technical University with Prof. Bratkowski as its Head, and after the Second World War at the Mechanical Faculty of the Technical University in Łódź established in 1945. On September 15, 1947, following the decree of the Ministry of Education, an independent Faculty of Textiles was set up at the Technical University of Łódź and separated from the Mechanical Faculty.

At that time the Faculty of Textiles consisted of 5 Chairs:

- Chair of Textile Raw Materials - directed by Prof. Tadeusz Żyliński,
- Chair of Textile Technology I - Prof. Władysław Bratkowski,
- Chair of Textile Technology II - Prof. Paweł Prindisz,
- Chair of Textile Industrial Equipment - Prof. Mieczysław Klimek,
- Chair of Theoretical and Applied Mechanics - Prof. Jerzy Leyko.



Main Building of the Textile Faculty

- In the years 1949-51 the following new Chairs were organized:
- Chair of Technology of Man - Made Fibres - headed by Prof. Atanazy Boryniec,
  - Chair of Textile Finishing - Prof. Józef Majzner,
  - Chair of Textile Engineering - Prof. Julian Hunka,
  - Chair of Weaving - Prof. Józef Grosman,
  - Chair of Knitting - Dr Leon Pfeifer.

In the academic year 1957/58 Chair of Physical Chemistry of Polymers was organized under the direction of Doc. Eligia Turska, the Chair of Industrial Economics headed by Doc. Jerzy Rachwalski, and in 1968 the Chair of Clothing with Doc. Włodzimierz Więźlak as its Head. In 1970/71 the Faculty of Textile was reorganized and at present - in place of 13 former Chairs - 6 Institutes together with a branch division, the Textile Institute in Bielsko-Biała, make the actual structure of the Faculty.

The Faculty of Textiles works under the supervision of the Dean and the Council of the Faculty composed of 15 professors and 21 docents.

During the past years the following Deans performed their duties:

Prof. Tadeusz Żyliński	1948-52
Prof. Józef Majzner	1952-53
Prof. Jan Szmelter	1953-54
Prof. Atanazy Boryniec	1954-62
Doc. Marian Malinowski	1964-66
Doc. Juliusz Zakrzewski	1966-69
Prof. Janusz Szosland	1969-75
Prof. Grzegorz Urbańczyk	1975-79
Doc. Włodzimierz Więźlak	1979-81
Doc. Tadeusz Kołaciński	1981-83

Since 1983 the Faculty has been directed by Doc. Janusz Lipiński.

The list of successive directors of the Institutes includes:  
Institute of Textile Metrology, Clothing and Nonwovens (tel. 36-15-38)

- Prof. Zbigniew Szałkowski 1970-80,
- Prof. Włodzimierz Więźlak since 1980,

Institute of Mechanical Technology of Textiles (tel. 36-32-74):

- Prof. Janusz Szosland since 1970,

Institute of Man-made Fibres (tel. 36-26-39),

- Prof. Eligia Turska 1970-73,
- Prof. Tadeusz Skwarski since 1973,

Institute of Fibre Physics and Chemical Processing of Textiles  
(tel. 36-27-62):

- Prof. Grzegorz Urbańczyk since 1970,

Institute of Textile Engineering (tel. 36-14-29),

- Prof. Juliusz Zakrzewski 1970-74,
- Doc. Jerzy Gluza 1974-76,
- Doc. Janusz Ziółkowski since 1976,

Institute of Economics and Management (tel. 36-28-24):

- Prof. Jerzy Rachwański 1970-76,
- Doc. Jerzy Nowakowski 1976-88,
- Doc. Henryk Gralak since 1988.

Textile Institute in Bielsko-Biała, Bielsko-Biała (tel. 270-61)  
(exchange code from Łódź 10-30).

## 2. THE PRESENT ORGANIZATION OF THE INSTITUTES IS AS FOLLOWS

1) Institute of Textile Metrology, Clothing and Nonwovens I-22 consists of 3 sections:

- Textile Metrology,
- Clothing Technology,
- Technology of Nonwovens.

2) Institute of Mechanical Technology of Textiles I-23 has 3 sections:

- Spinning,
- Weaving,
- Knitting.

3) Institute of Man-made Fibres I-24 comprises 2 sections:

- Technology of Man-made Fibres,
- Physical Chemistry of Polymers.

4) Institute of Fibre Physics and Chemical Processing of Textiles I-25 consists of 3 sections:

- Textile Physics and Fibre Science,
- Chemical Processing of Textiles,
- Maintenance of Textiles.

5) Institute of Textile Engineering I-26 is composed of 3 sections:

- Technical Mechanics,
  - Textile Engineering,
  - Exploitation of Textile Machinery,
- and of 2 teams:
- Thermal Plants,
  - Electrotechnics and Electronics in Textiles.

6) Institute of Economics and Management I-27 is an interdisciplinary Institute consisting of 3 sections:

- Organization and Management of Textile Industry,
- Organization and Management of Machine-building Industry,
- Labour Organization and Ergonomy,



The Council of the Textile Faculty



with 3 didactic teams:

- Sociology,
- Ergonomy.

7) The Textile Institute in Bielsko-Biała FI 3 has 3 sections:

- Fibre Science, Fibre Physics and Textile Metrology,
- Mechanical Technology of Textiles,
- Fibre Chemistry and Chemical Processing of Textiles.

### 3. TO THE STAFF OF THE FACULTY OF TEXTILES

(data for 31.02.1988) belong:

Profesors and Docents - 36, Doctors, Lecturers and Assistants - 140, Technical and Administrative Personnel - 136. Total 312.

### 4. DIDACTICS

During more than 40 years 8815 students have graduated from the Faculty of Textiles and obtained their M.Sc. or engineer diplomas. At present the Faculty provides a wide range of the following specializations and graduation directions:

- Mechanical Technology of Textiles: Spinning, weaving, knitting, clothing, technology of nonwovens, textile metrology, exploitation of textile machinery, automation of textile processes,
- Chemical Technology of Textiles: Chemical Processing of Fibres, Fibre Physics and Fibre Chemistry, Maintenance of Textiles.

The Faculty has several large laboratories, design studios and lecture theatres equipped with the most modern research apparatus and full scale industrial machinery as well as computers used to control technological processes and to design fabrics.

The best equipped laboratories are those of textile metrology, clothing I-22, weaving I-23 and fibre physics I-24, FJ 3. Every year postgraduate advanced and refresher courses are held at the Faculty, their programmes being adapted to the current needs of the industry and constantly updated. Moreover, postgraduate courses for the degree of Doctor of Techn.Sc. are also organized.

During a few last years about 340 postgraduates attended the above mentioned courses, and in the academic year 1987/88 there were 56 participants.



Computer stand in the Laboratory of Measuring Instruments - I 22

The graduates of the Textile Faculty make up the engineering and managing staff of all Polish textile enterprises, industrial research centres and educational establishments working for textile industry.

The Faculty actively participates in the education of foreign students and specialists. Two postgraduate courses for textile specialists from the developing countries were organized at the Faculty under the supervision of the United Nations Industrial Development Organization. Besides, many students from Greece,

Ecuador, Nigeria, Cyprus, Syria, Vietnam, Angola, Tunesia, Mongolia (Outer), Korean Peoples Republic, Albania, USSR, GDR, Hungary, Iraq, China, Yougoslavia, and Egipt attend full-time courses to obtain their M.Sc. or engineer diplomas and next - some of them - - to get their doctor degrees.

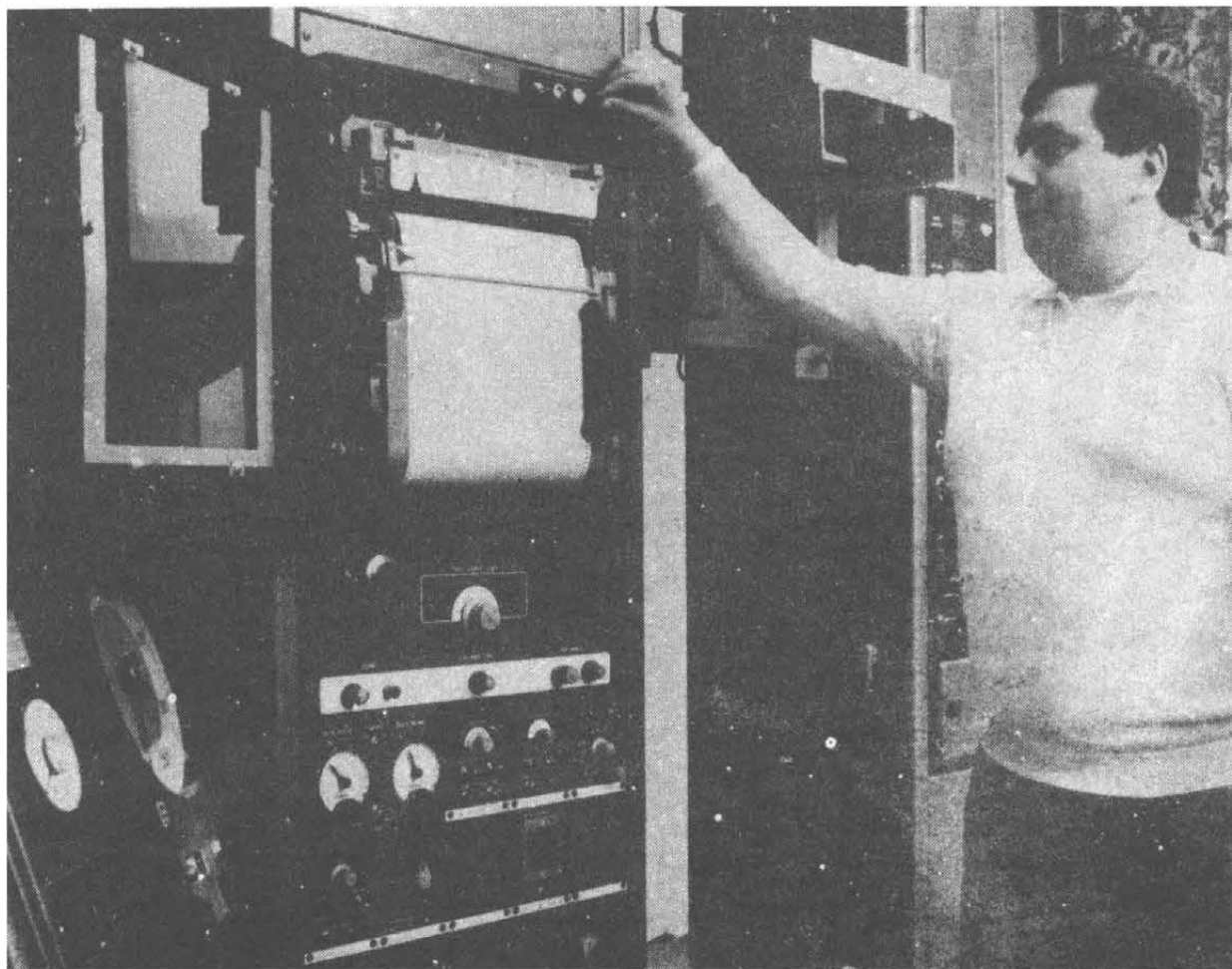
## 5. RESEARCH AND SCIENCE

So far the Textile Faculty Council has granted 39 docent and 257 doctor degrees, some of them to the participants of periodically organized special postgraduate courses. Undergraduates, on the other hand, can deepen their knowledge by taking part in research works of the particular Institutes and in the activity of 5 students scientific - research associations existing at the Faculty.

### Research directions

#### Institute of Textile Metrology, Clothing and Nonwovens

Examination of fibres and fibre properties. Studies on new analytical and interpretation methods. Development of new research methods and computing processes for designing fabric properties. Design of apparatus for textile metrology. Research on design and properties of new nonwoven fabrics, the effect of bonding agents included. New technologies and new kinds of nonwovens. Research on clothing design, exploitation of sewing machinery and physical phenomena observed in garment making-up.

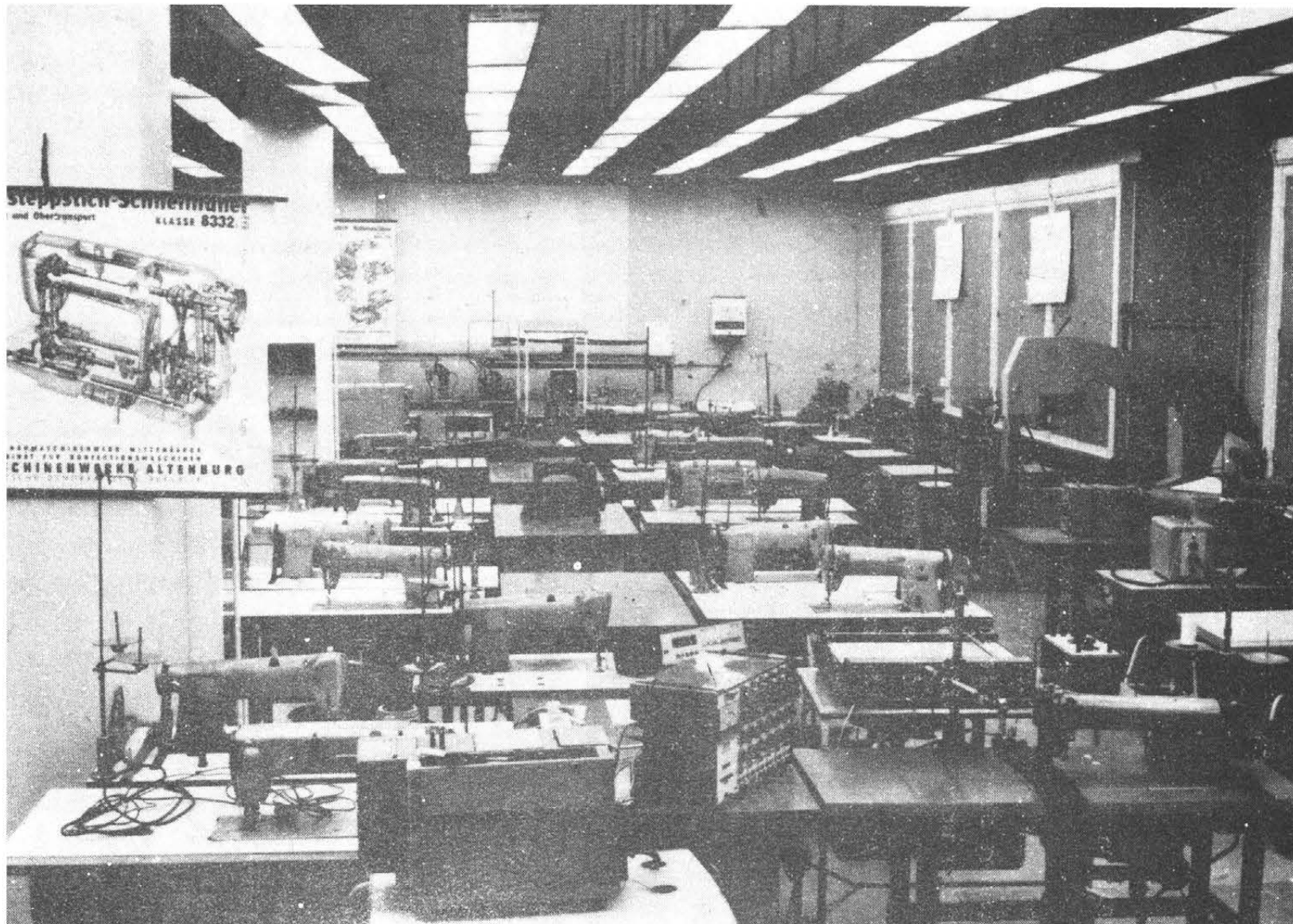


Measuring Stand in the Laboratory of Textile Metrology - I 22

Institute of Mechanical Technology of Textiles

Intensification and optimization of technological processes in spinning, weaving and knitting. Design and construction of new spinning, weaving and knitting machinery. Design of yarns, woven knitted fabrics. Application of wovens and weaving techniques for industrial fabrics. Planning new spinning, weaving and knitting plants.

Achievements: Analyzing and modelling phenomena occurring in spinning, weaving and knitting processes. Multicriterial optimization of computer-aided design of yarns and fabrics. Intensification of carding.



Clothing Laboratory - general view - I 22

Air-jet spinning. Weft beating-up by means of vibration and application of sinkers. Pneumatic weft insertion in converted shuttle looms. Industrial fabrics: woven resistors, textile reinforced concrete.

### Institute of Man-made Fibres

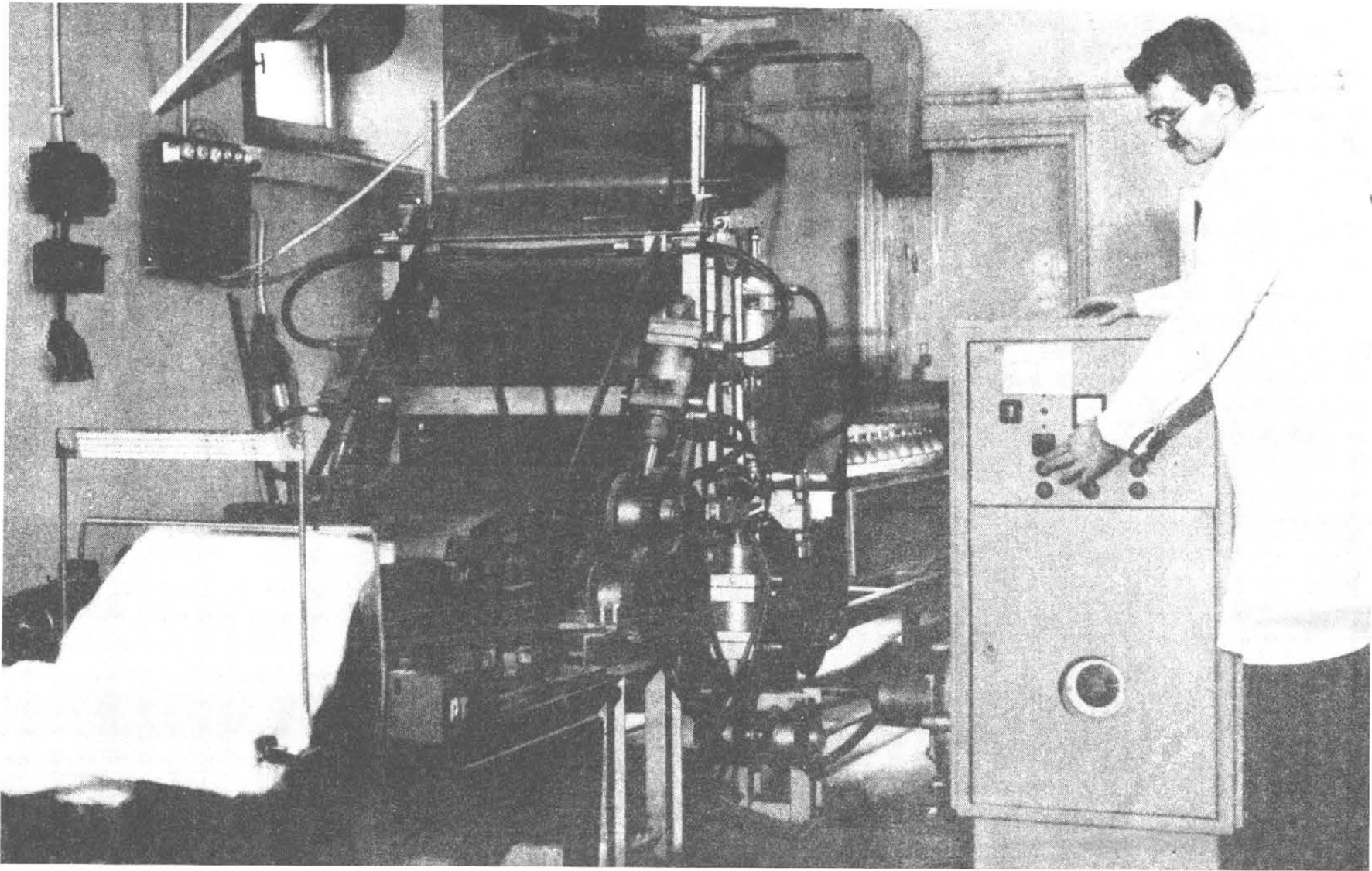
The research of the team of Man-made Fibres is mainly concerned with modification of fibre forming polymers and formation of fibres with specific properties. In particular a large-laboratory scale method of producing high-modulus precursor polyacrylonitrile fibres for further processing into carbon fibres has been developed. The research is also carried out on producing cellulosic fibres containing immobilized enzymes and viscose fibres with increased cellulose content, on thermo resistant polymers for films and coatings, on fibre-forming block copolymers of polyacrylonitrile, on application of natural polymers as the carriers of bio - active substances. In the team of Physical Chemistry of Polymers the main research subjects are: copolymerization processes, copolymer structure, synthesis of copolymers with defined structure, modification and chemical reactions on polymers, template polymerization and copolymerization, application of polymers and copolymers as the carriers of bio-active substances. The results of the research are published in Polish and foreign periodicals, patented and commercially applied in the industry.

### Institute of Fibre Physics and Chemical Processing of Textiles.

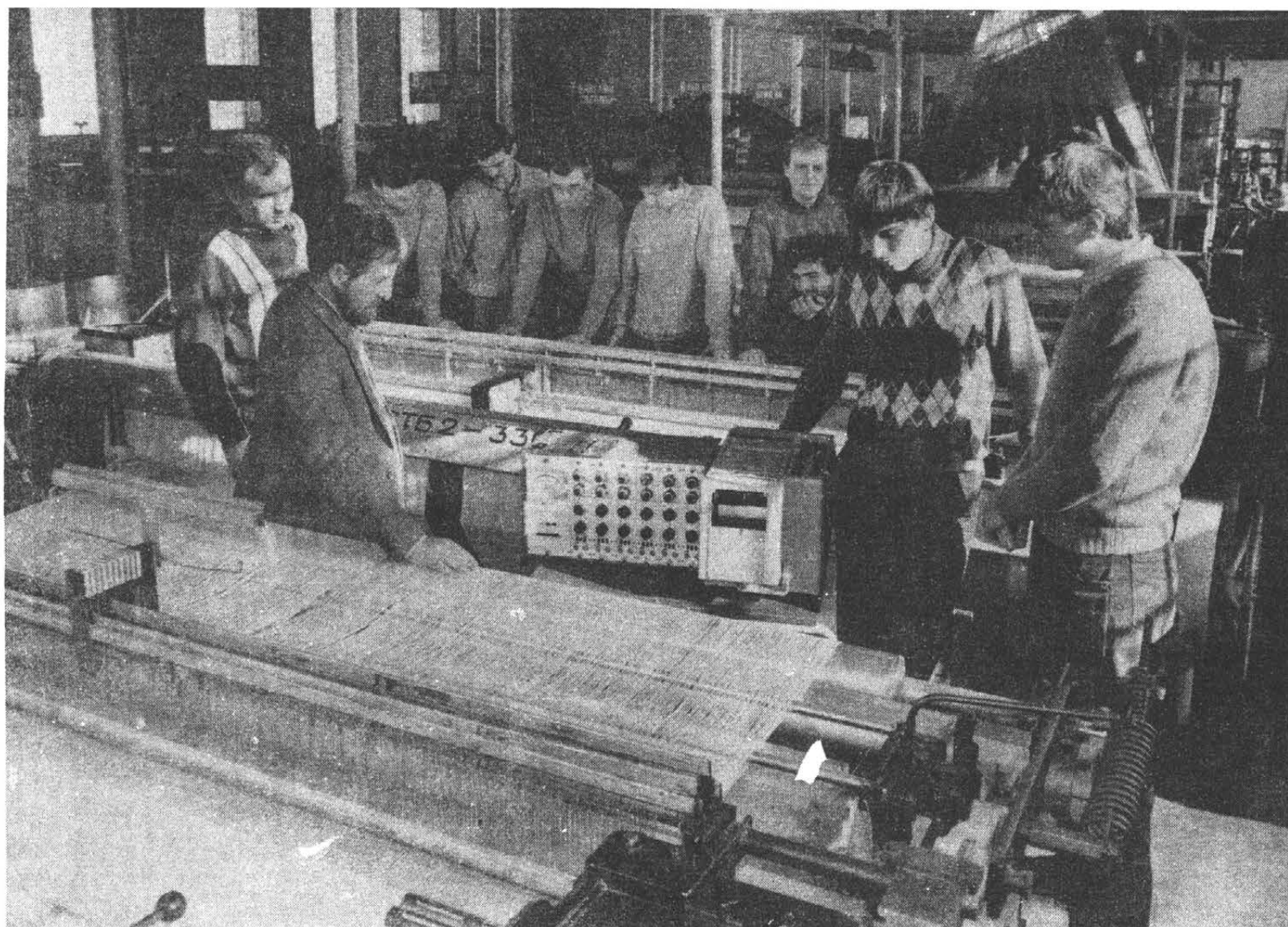
#### Research topics

Examination of physical microstructure and properties of fibres, physical and physico-chemical methods of instrumental estimation of fibre microstructure and properties, fundamental processes in fibre chemical processing and their optimization, soiling and soil removal in textiles.





Experimental Stand in the Laboratory of Non-wovens Technology - I 22



Weaving Laboratory; Optimization of weaving - I 23

### Institute of Textile Engineering

The research work includes general mechanical and electrical problems, designing and exploiting textile machinery, automation of textile processes.

The scientific profile of the Institute is determined by the following research directions: strength and optimization of constructions, effect of temperature and other external factors on resilient and brittle materials, textile machinery design parameters, exploitation and reliability of textile machinery, modernization of textile machinery, optimization of raw material flow in textile industry, automation of textile processes, thermal phenomena in textile machinery, ergonomics and environmental protection.

### Institute of Economics and Management

The research activity is centred around the problems of conditions and effects of technological and organizational progress in relation to: national economy, industry, industrial enterprise and, individual working stand.

As a result the following methods have been developed: method of evaluating work conditions and labour relations, method of assessment of organizational structures and working stands in industrial enterprises, methods of selecting and qualifying staff.

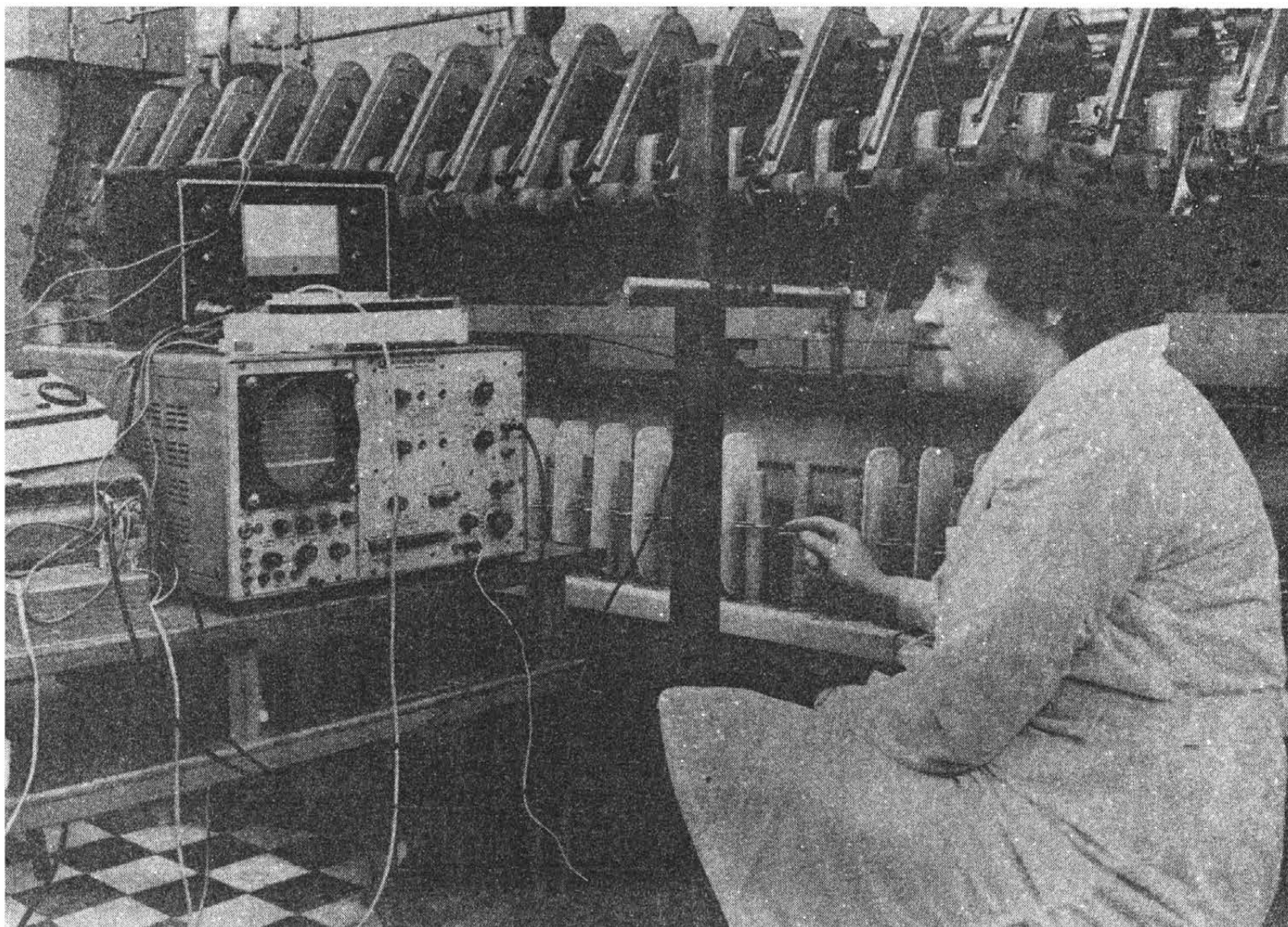
### The Textile Institute in Bielsko-Biala

The studies are carried out on:

Natural and chemical fibre structures, mainly on wool and carbon fibres and on fibres obtained from polymer and copolymer mixtures,

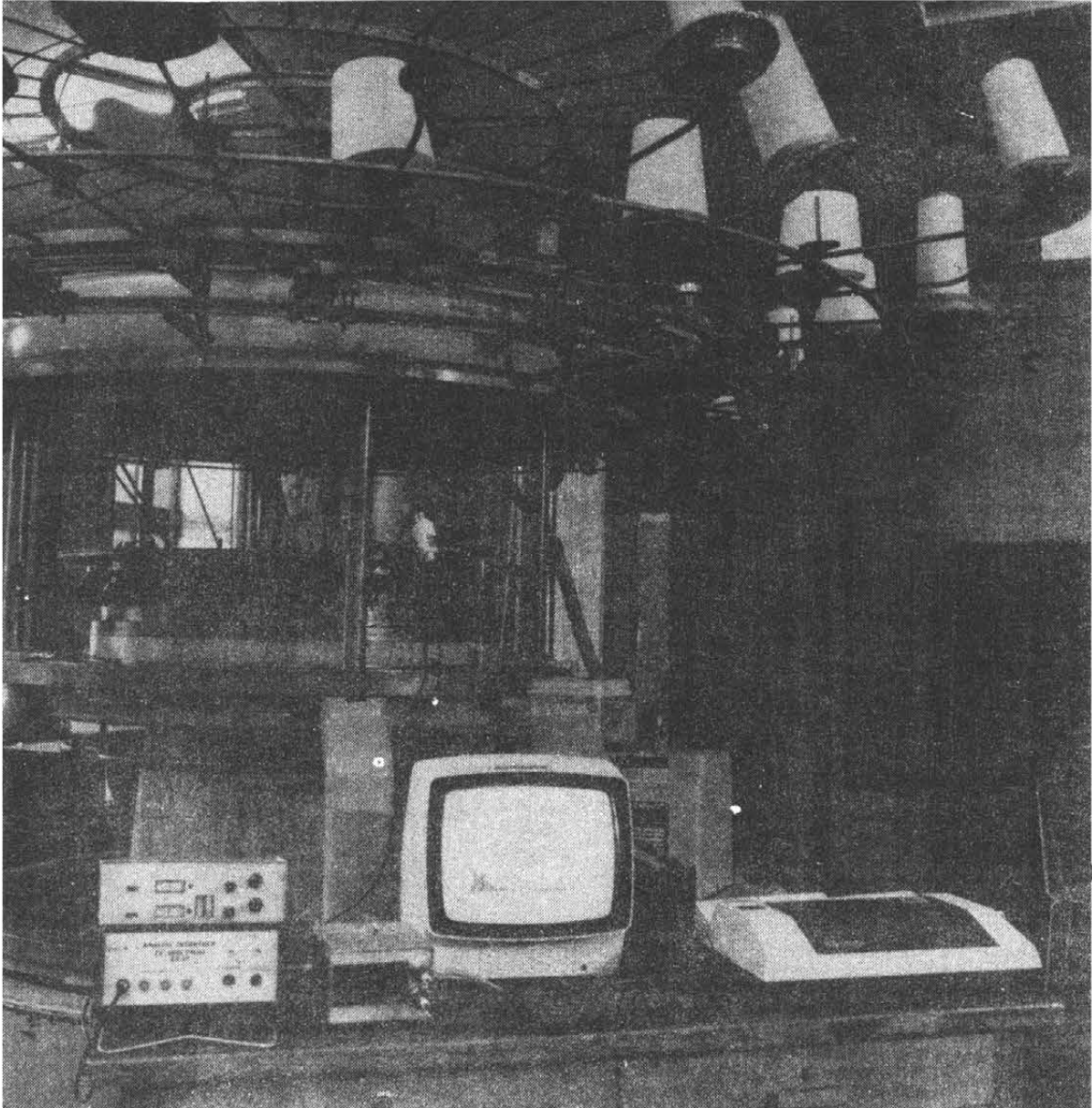
New techniques and technologies of converting fibres into textiles. Special attention is paid to raw material and energy economy and to the application of computerized techniques for the optimization of textile structures (yarn and fabrics).





Spinning Laboratory; Examination of Spinning of Ring Spinning Frame - I 23

Evaluation of various factors affecting fibre and fabric properties. Within this research topic dissertations for doctor and docent degrees are submitted. They concern the effect of thermal processing on selected physical and mechanical properties of textiles.



Knitting Laboratory - I 23

The Government - sponsored research works of the Textile Faculty include 32 projects and - in terms of money - constitute 58% of all financial resources of the Faculty.

The works and achievements of the Institute find approval of various authorities and many members of the staff have been awarded prizes.

The list of prize winners comprises: Prof. A. Boryniec, Prof. Wł. Bratkowski, - the State Prize, Prof. Wł. Bratkowski, Prof. A. Boryniec, Prof. M. Chwalibóg, Prof. P. Prindisz, Prof. J. Szosland, Prof. J. Rachwalski, Prof. W. Żurek, - City of Łódź Awards for Science. Besides Prof. J. Szosland has obtained the honorary degree of Doctor honoris causa from the Moscow Textile Institute.

## 6. COOPERATION WITH INDUSTRY

The Institute of Textile Metrology, Clothing and Nonwovens is particularly involved in studies on designing textiles and improving their quality, in constructing laboratory measuring equipment for industry and research centres.

In the field of nonwoven technology new fabrics are designed for sanitary purposes, for household, for filtration, clothing, etc. Patents for numerous filtration items obtained by the Institute are commercially exploited in the industry.

In the field of clothing technology the research is performed on industrial fabrics and garments with heating elements as well as on sewing and pressing machinery.

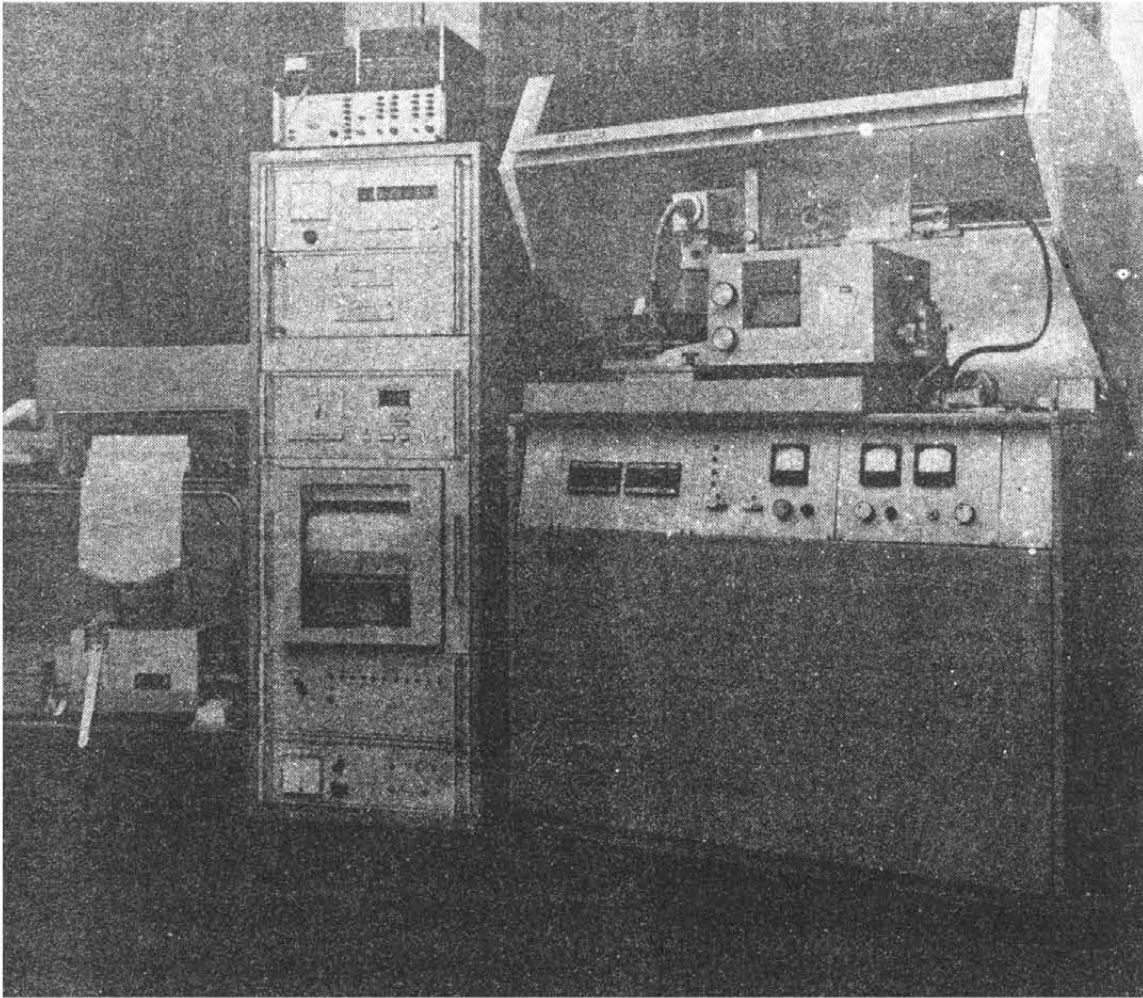
The Institute cooperates with such research centres as, for example, Textile Research Institute, research centres of Polish textile industry and with many academic establishments.

The Institute of Mechanical Technology of Textiles carries out research for industrial enterprises. The staff of the Institute participate in the works of councils of industrial research centres; some of the staff members are the chairmen of these councils.

Following the agreements with industrial and commercial firms numerous grants are received to be used for examination of some specific problems concerning particular firms. The Institute contributes to 6 Government-sponsored projects.

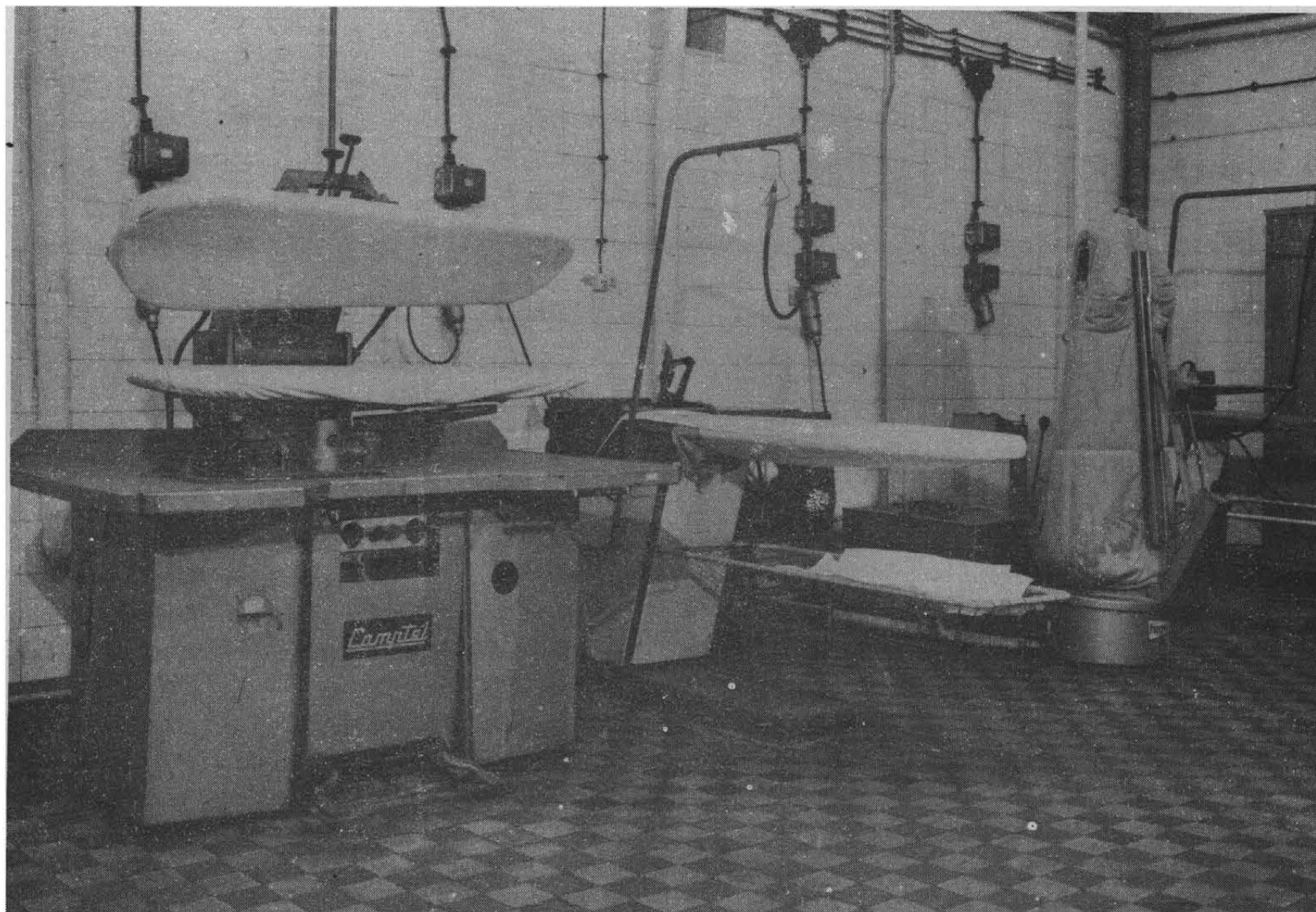
The Institute of Man-Made Fibres cooperates with the firms producing chemical fibres and exploiting on a commercial scale the research projects of the Institute, e.g. for the production of microcrystalline cellulose and its use, utilization of waste from the production of acrylic fibres etc. It also cooperates with the Institute of Chemical Fibres, institutes of the Polish Academy of Sciences and research centres of the industry.





Laboratory of Fibre Physics - I 25

The Institute of Fibre Physics and Chemical Processing of Textiles is engaged in the collaboration with the Research Institute of Chemical Fibres with the Textile Research Institute, with the research centres of various branches of textile industry and with many industrial enterprises. As a result of the collaboration many projects of the Institute have been accepted and commercially utilized by the textile industry. The research work of the Institute of Textile Engineering is carried out within the agreements signed with 3 major textile firms. It is of vital importance for Polish industry and economy as the elaborated methods of modernizing and renovating used machine elements will decrease the import of spare parts.



Laboratory of Textiles Renovation - I 25

The Institute also cooperates with the Institute of Basic Technical Problems of the Polish Academy of Sciences. The staff are members of the councils of all research institutes and research centres of textile industry.

The Institute of Economics and Management is mainly concerned in its research with the projects of organization of basic and auxiliary production processes, evaluation of organization structures, labour relations and working stand arrangement.

From the industrial enterprises numerous orders are received to examine the factors affecting the social-economic relations in the processes of administration and production, labour utilization, material flow rationalization and innovation.

The staff participate in the investigation at various research centres and universities (e.g. in the research topic "Man and Labour" undertaken by the University of Łódź).

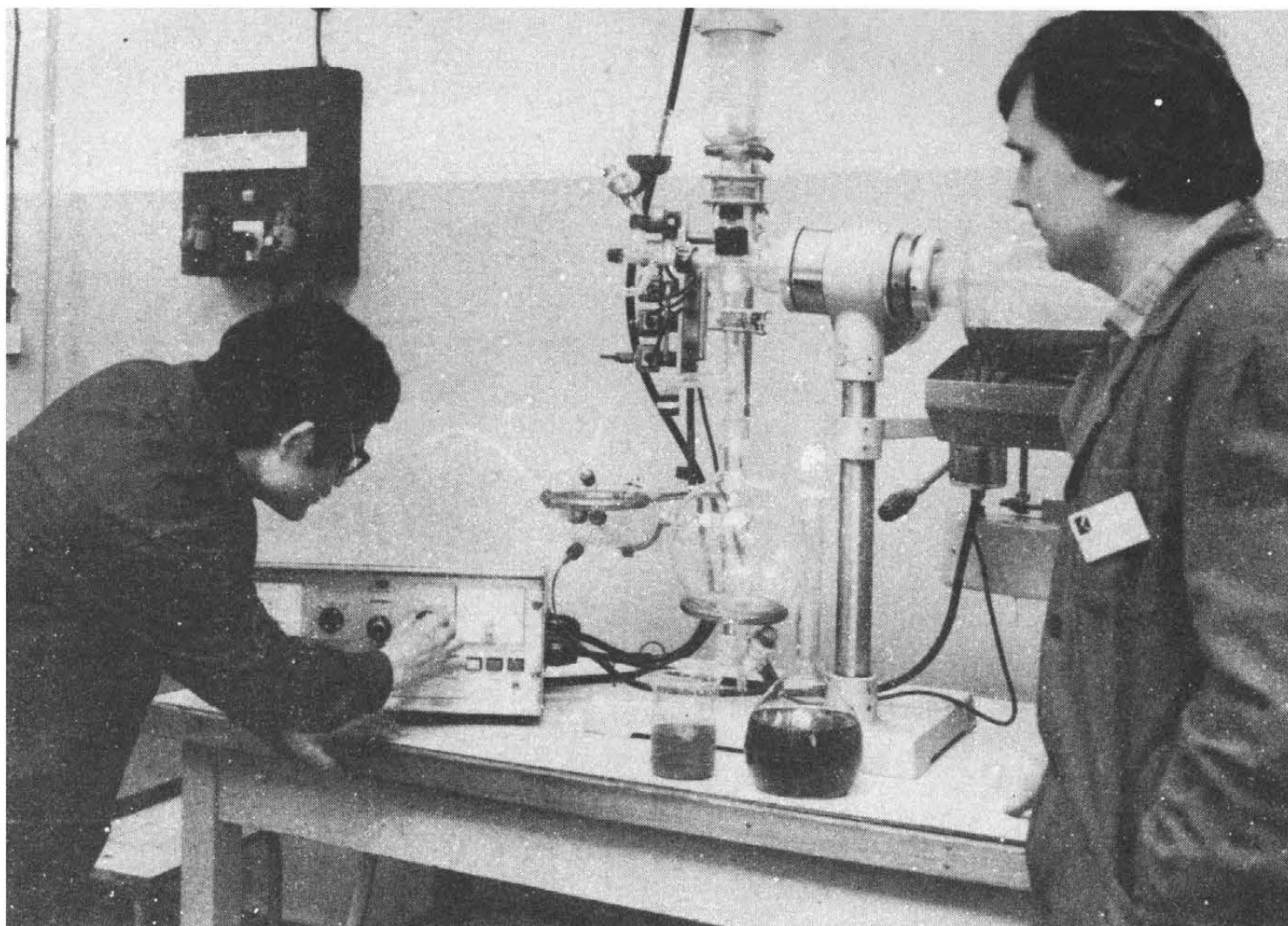
The Textile Institute in Bielsko-Biała closely cooperates with the industry of the region and is particularly active in the studies on:

- exploitation of textile machinery and power engineering, shortened spinning systems,
- application of fancy yarns for weaving,
- optimization of textile products,
- modernization of Saurer - type weaving looms,
- mechanical and physical properties of textile fibres and textile products,
- manufacture of carbon fibres from kerosene-tar pitch and coal-tar pitch.

The cooperation with some major cotton and wool fabric producers ("Finex", "Wega", "Adropol", "Bewelana", and others) resulted in the reduction of thermal energy consumption in textile finishing plants, economization of raw material use (wool, PE-fibres), increase of weaving loom productivity etc.

The collaboration with the scientific and research centres concerns the problems of:

- x-ray examination of molecular and supermolecular structures of polymers and fibres at small and large diffraction angles using DTA, TMA, TGA methods.



Laboratory of Chemical Processing of Textiles - I 25



- inversion gas chromatography,
- optical and electronic microscopy (both transmission and scanning),
- spectroscopy in the range of IR, UV, VIS as well as sonic and other methods.

## 7. FOREIGN RELATIONS AND EXCHANGE

The Institute of Textile Metrology, Clothing and Nonwovens runs longlasting cooperation with the Technical University of Dresden (GDR) relating to clothing design rationalization, factors affecting elastic properties of nonwovens and construction of measuring apparatus. Direct contacts with the Technical University in Karl-Marx-Stadt (GDR) comprise the research work on optimization of nonwoven fabric properties.

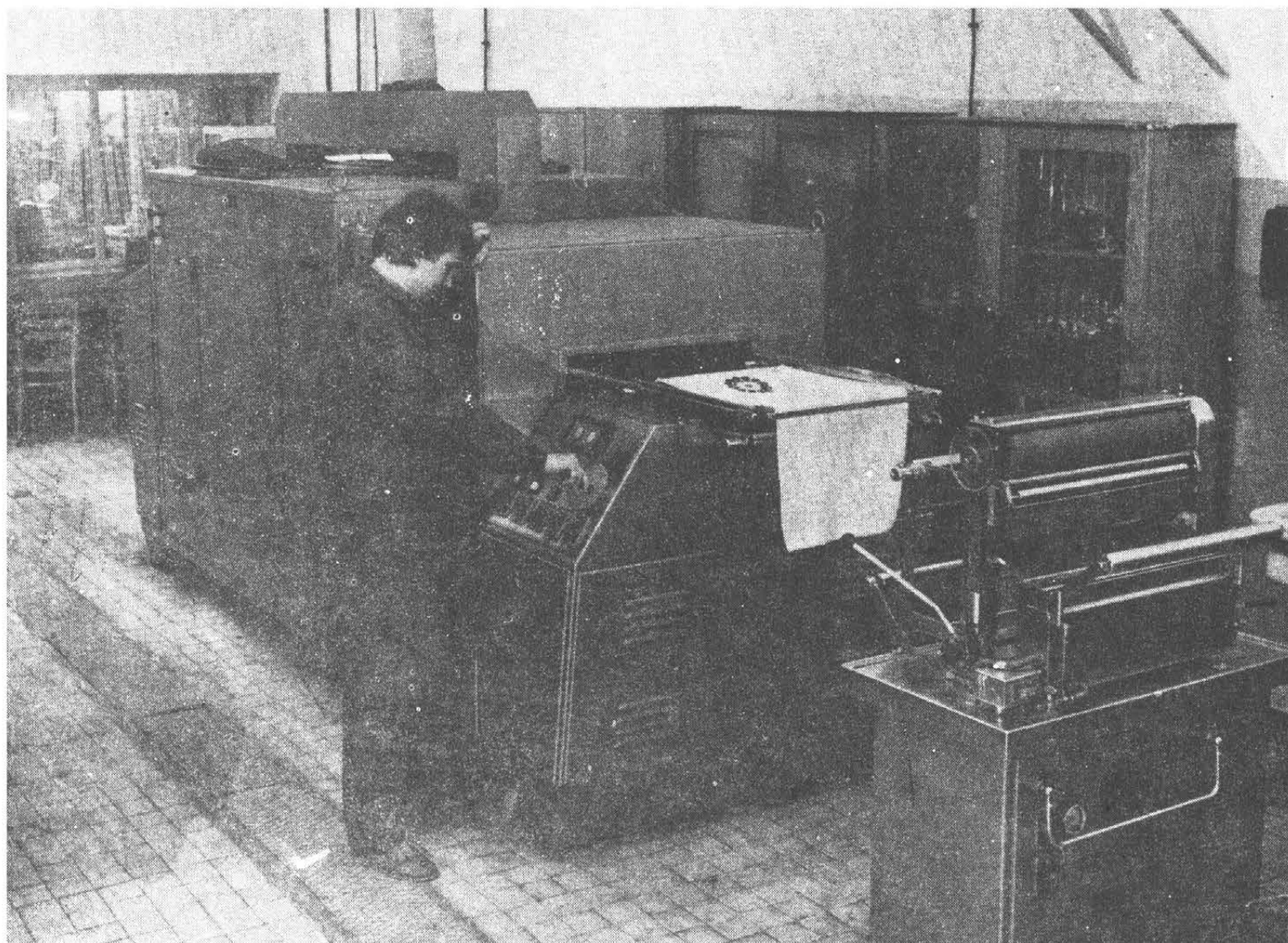
Close contacts are also kept with the Higher School of Textile Engineering and Technology in Liberec (Czechoslovakia) and with the Higher Technical School in Budapest (Hungary). Besides, the informal contacts should also be mentioned here. The research workers of the Institute attend international conferences, take part in cotton classification tests (calibration examinations) and exchange their experiences. The results of the research and joined efforts are published in many foreign periodicals.

The Institute of Mechanical Technology of Textiles cooperates with many university-level educational establishments in the Soviet Union, German Democratic Republic, Czechoslovakia, German Federal Republic, Great Britain and France. Exchange training for groups of students is organized with the universities in Tashkent, Lenin-grad and Moscow (USRR), Karl-Marx-Stadt (GDR) and Sophia (Bulgaria).

The results of common research efforts are published in Polish and foreign specialistic periodicals in the form of articles and monographs.

The Institute participates in organizing international conferences in Poland, e.g. "INTEX" 85.

Within the scope of cooperation with the United Nations Organization postgraduate courses are organized for specialists from the developing countries, supervised by UNIDO.



Laboratory of Chemical Processing of Textiles - I 25



The Institute of Man-made Fibres cooperates with the Moscow Textile Institute, Higher Technical School in Bratislava (Czechoslovakia), the University of Leeds, Strathclyde University (Gr. Britain) and others. The cooperation consists in the exchange of students and research fellows, in undertaking common studies and in the exchange of experiences in didactics and research work. The cooperation is also maintained through the groups of experts working together in the field of "radical Polymerization" and "Polycondensation Processes" as well as through the body of multilateral cooperation i.e. Academies of Science of socialist countries.

The Institute of Fibre Physics and Chemical Processing of Textiles cooperates with the Higher Institute of Chemistry and Technology in Sophia (Bulgaria). The scope of common interest embraces the research on fibre structure, physico-chemical dyeing and refining processes.

The Institute of Textile Engineering maintains contacts with the Moscow Textile Institute (USRR) and Higher School of Textile Engineering and Technology in Liberec (Czechoslovakia).

Following the multilateral agreements, research workers are exchanged, research problems and results are discussed and also exchanged.

The Institute of Economics and Management cooperates with 6 foreign research centres on the grounds of direct agreements. The purpose of cooperation is to solve certain methodological questions and to perform comparative studies of selected problems, including organization diagnosis methods, conditions for team - work implementation and its organizational forms, controlled forms of production organization and the conditions and effects of automated production.

The Textile Institute in Bielsko-Biała cooperates on the basis of bilateral agreements with the following foreign research and educational establishments:

- Moscow Textile Institute,
- Rhenisch-Westfälische Technische Hochschule in Aachen (GFR),
- University of Leeds (Gr. Britain),
- University of Upper Alsace (France),
- Strathclyde University in Glasgow (Gr. Britain),

- Technische Universitäten in Dresden und Karl-Marx-Stadt (GDR),
- Higher School of Textile Engineering and Technology in Liberec (Czechoslovakia),
- Higher Technical School in Bratislava (Czechoslovakia),
- Higher School of Chemistry and Technology in Pardubice (Czechoslovakia) and,
- Institute of Chemistry and Technology in Sophia (Bulgaria).



#### Laboratory of Chemical Processing of Textiles - I 25

The research and scientific workers of the Institute take part in conferences and conventions, where the results of studies performed at the Institute are presented and exchanged with the corresponding establishments abroad (mainly in Bulgaria, USSR, GDR and Czechoslovakia). Within the cooperation scope common investigation of research topics is carried out, manuals for students are published and the exchange of research workers, lecturers as well as the exchange of students for short-time training takes place.

## 8. LIBRARY

The libraries and reading-rooms in all the Institutes of the Textile Faculty offer numerous Polish and foreign specialistic periodicals, books and publications.

## 9. PUBLICATIONS

The research work performed in the Institutes of the Textile Faculty is reflected in various types of publications.

In 1987 120 articles were published in Polish periodicals and 30 papers in foreign scientific journals. 130 reports and abstracts were presented at congresses, conferences and conventions in Poland and abroad.

Between 1983-87 the average number of the patents obtained was 30 per year.

During last four years 1984-88 13 textbooks and monographs, as well as 14 mimeographic brochures were published.

## 10. ORGANIZATIONS

United Workers Party, Trade Union of Polish Teachers, Polish Socialist Youth Association, Polish Student Association, etc. present their programmes and offer opportunities for active participation in the life of the University and country.

About 30% of the staff members are active fellows of the Association of Polish Textile Specialists and some of them hold important functions in the Łódź Branch of the Association as well as at the Central Board of the Association, e.g. Prof. Janusz Szosland is the President of the Association of Polish Textile Specialists and the Chairman of the Central Council of the Chief Technical Organization in Warsaw.

## THE FACULTY OF FOOD CHEMISTRY W-5

Dean's office address: 90-537, ul. B. Stefanowskiego 4/10

tel. 36-48-37

The Faculty of Food Chemistry was established in 1950. Its organizer and first Head was Professor Stanisław Zagrodzki.

The function of the Department Head was performed by:

Prof. Stanisław Zagrodzki (1950-1952 and 1958-1960),  
Prof. Mieczysław Serwiński (1952-1956 and 1960-1962),  
Prof. Bolesław Bachman (1956-1958 and 1968-1970),  
Prof. Jerzy Kroh (1962-1966),  
Prof. Stanisław Masior (1966-1968),  
Prof. Edward Galas (1970-1972),  
Prof. Józef Góra (1972-1975 and at present from 1987),  
Doc. Piotr Moszczyński (1975-1981 and 1984-1987),  
Doc. Zdzisław Włodarczyk (1981-1984).

The Faculty consists of 4 Institutes:

- Institute of Fundamental Food Chemistry,
- Institute of Technical Biochemistry,
- Institute of Chemical Technology of Food,
- Institute of Fermentation Technology and Microbiology.

At present the Faculty carries on graduate studies with orientations "Chemical Technology" and "Biotechnology", specialization "Food Technology". In addition 4-post-diploma courses are carried on:



New building of the Faculty of Food Chemistry, ul. B. Stefanowskiego 4/10





Council of the Faculty of Food Chemistry



- Post-diploma course in Sugar Industry,
- Post-diploma course in Apparatus and Equipment in Sugar Industry,
- Post-diploma course in Fermentation Technology,
- Post-diploma course in Instrumental Food Analysis.

Graduates of the Faculty find their career employment in all the branches of the food industry, such as sugar, potato, fruit-vegetable, fermentation, dairy, herb, concentrated food, cosmetic and tobacco industries and also in pharmaceutical and chemical industries. Many graduates also work in design offices, research centres and secondary schools.

Up to 1988 the Faculty educated 2688 Masters of Science (including 19 foreigners) and 655 engineers. 290 persons completed post-diploma courses. At present there are 506 students studying for the degree of M.Sc. and 60 persons attending post-diploma courses.

The Faculty Staff consists of 8 professors, 8 docents, 77 doctors, 4 senior lectures, 19 assistants and 151 engineers, operating and administrative workers (see Introduction-University Staff).

The Faculty carries on basic and applied research within biotechnology, chemistry and technology of foodstuffs and food analysis.

The Faculty is authorized to confer academic degrees of doctor and docent in chemical technology (chemical technology of food). The number of postgraduate degrees conferred at the Faculty by the beginning of 1988: doctors 177 and docents 20. At present dozen or so of postgraduate studies for the degree of doctor and docent are in progress.

The Faculty possesses its own library, large and small lecture rooms, laboratories and workshops.

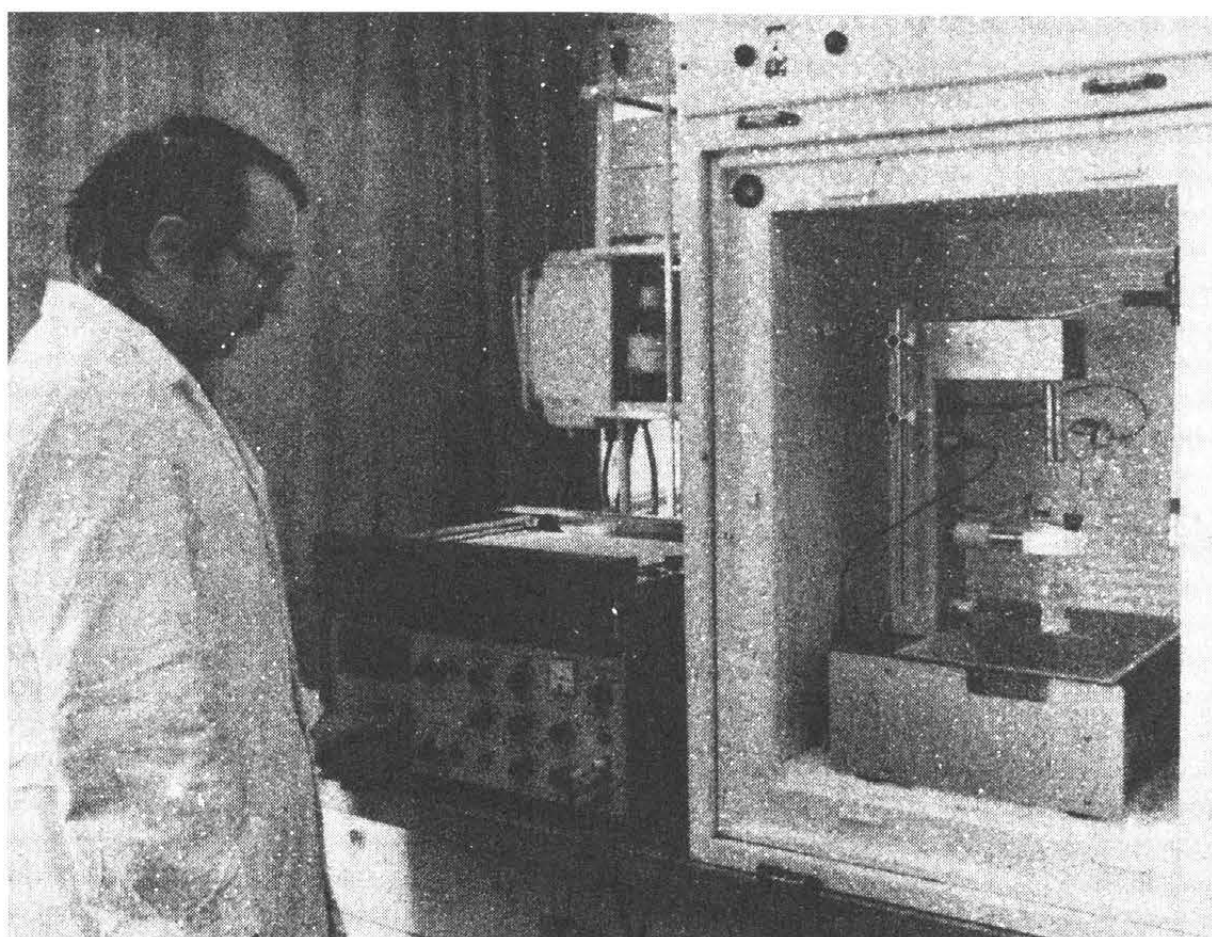
Buildings of the Faculty are located in 171/173 Wólczajska Street and 4/10 B. Stefanowskiego Street, comprising an area of 21 210 m<sup>2</sup>.

## THE INSTITUTE OF FUNDAMENTAL FOOD CHEMISTRY I-28

Director's office tel. 36-28-60

The Institute consists of four educational-research groups:

- Bioinorganic and Analytical Chemistry Group,
- Bioorganic Chemistry Group,
- Physical Chemistry and Colloids Group,
- Herbs, Fragrant Substances and Tobacco Technology Group.



A fragment of the electrochemical Laboratory in the Bioinorganic and Analytical Chemistry Group

Director of the Institute: Prof. Józef Góra, tel. 36-28-60.  
Assistant Director for educational affairs: Doc. Jerzy Podlejski  
Assistant Director for research: Prof. Joanna Masłowska.

The Institute Staff: Prof. Józef Góra, Prof. Joanna Masłowska, Prof. Henryk Sugier, Doc. Jerzy Podlejski, 18 doctors, 1 senior lecturer, 12 assistants, 32 engineers and technicians and 4 administrative workers.

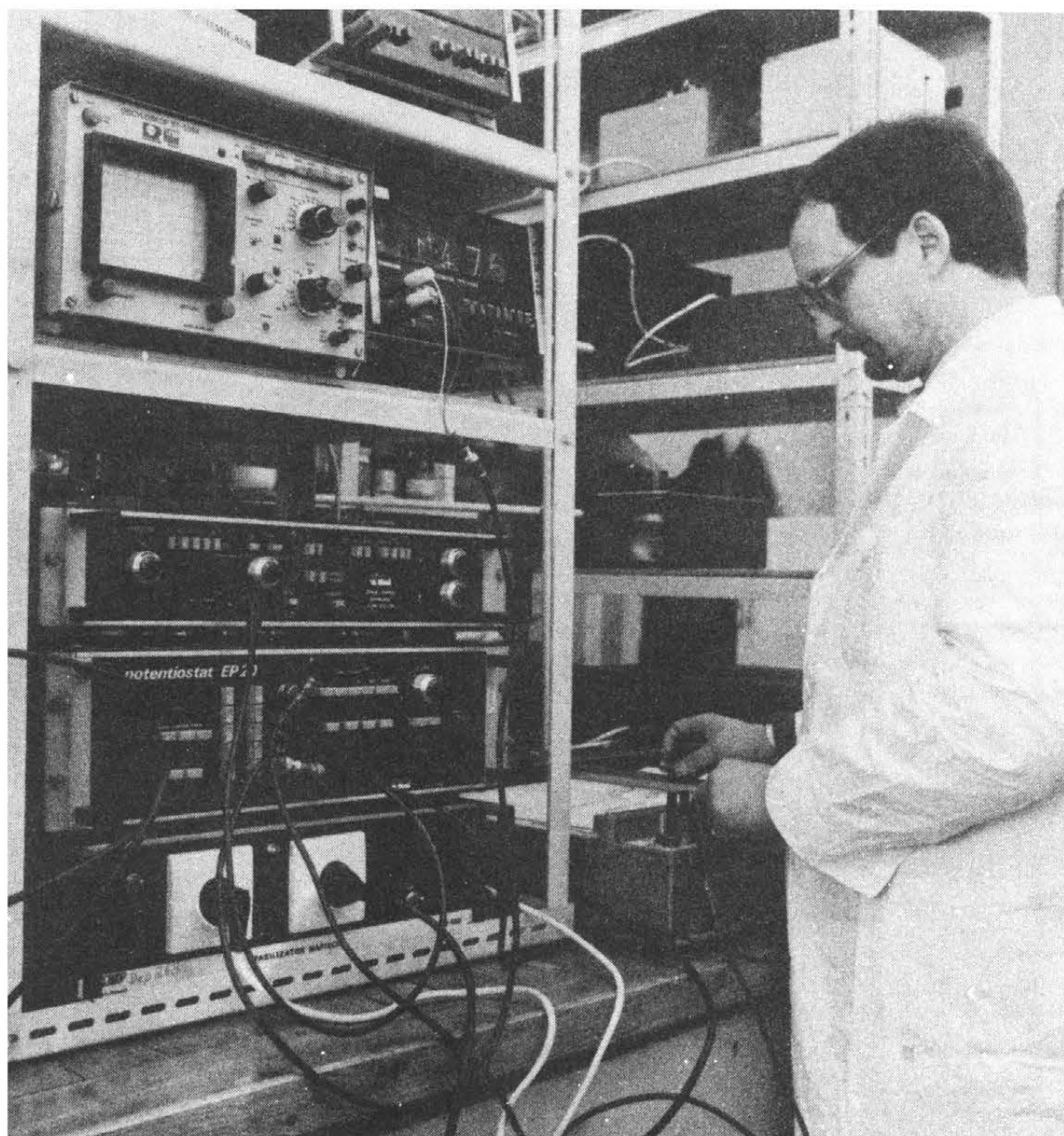
The Institute carries out basic and applied research in the following fields: synthesis of fragrant substances and biologically active agents for cosmetics, biotechnological processes for preparation of fragrant intermediates and products, organic electrosynthesis, enriching tobacco with enzymes, enzyme immobilization and enzymatic reactions, utilization of enzyme activation and inhibition for the trace analysis of inorganic compounds, interactions of bioelements in bioligand systems, chemical and thermodynamic examinations of equilibrium processes in complex-forming systems, instrumental food analysis.

Within the Central Coordinated Research Programs the Institute cooperates with: the Institute of Technical Biochemistry, the University of Łódź, the Curie-Skłodowska University at Lublin, University of Wrocław, the Technical Universities of Gdańsk and Wrocław. This cooperation embraces such problems as electrode processes, redox reaction kinetics, cell optimization and mixture separation processes. In addition, the cooperation with the Institute of Radiation comprises radiational processes for the modification of metal oxide surface.

The results of the Institute research activity are published in more than 200 scientific papers and 100 patents including 16 patents granted abroad.

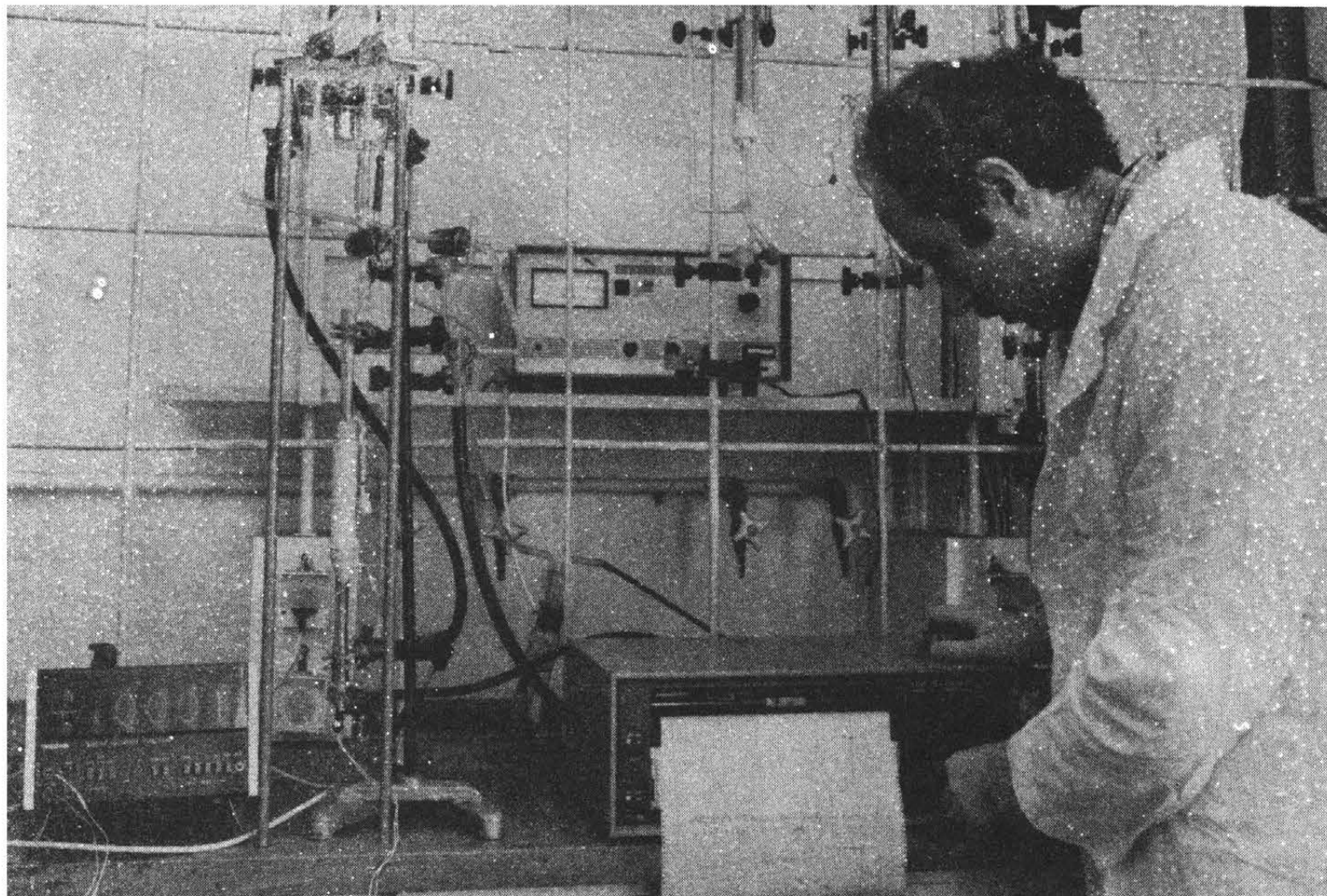
One of the major achievements of applied research is the development and implementation of several new and modified technologies of fragrant compounds ( - terpinyl, dihydroterpinyl and linalyl acetates, rose oxide, propylene acetyl trimer, cyclic ketals and acetals, - terpineol, fionone, biologically active extracts for cosmetics, vitamin F, lipides from the spinal cord of slaughter animals). The new methods of analysis of trace metals and carcinogenic compounds in food and cosmetics, developed at the Institute, have been widely used in industrial laboratories in this country.

The Institute cooperates with numerous foreign research centres such as the Higher School of Technology at Bratislavia, the Institute of Chemistry at the Ukrainian Academy of Science in Kiev, University of Strathclyde in Glasgow, the Institute of Food Industry at Plowdiv, the All-Union Institute of Synthetic and Natural Fragrant Compounds in Moscow.



Apparatus used for the measurements of organic electrosynthesis  
I-28





A fragment of the laboratory of the Physical Chemistry and Colloids Group I-28



The Institute offers basic classes in inorganic, bioinorganic, analytic, organic, bioorganic and physical chemistry as well as special classes relating to the diploma orientations, such as Technology of Herbs and Fragrant Substances and Technology of Tobacco. The Post-Diploma Course in Instrumental Food Analysis is also conducted by the Institute.

#### THE INSTITUTE OF TECHNICAL BIOCHEMISTRY I-29

Director's office tel. 36-77-04

The Institute of Technical Biochemistry was established by combining the Chair of Technical Biochemistry and Chair of Nutriente and Concentrated Vitamins Technology.

Director of the Institute: Prof. Edward Galas, D.Sc.

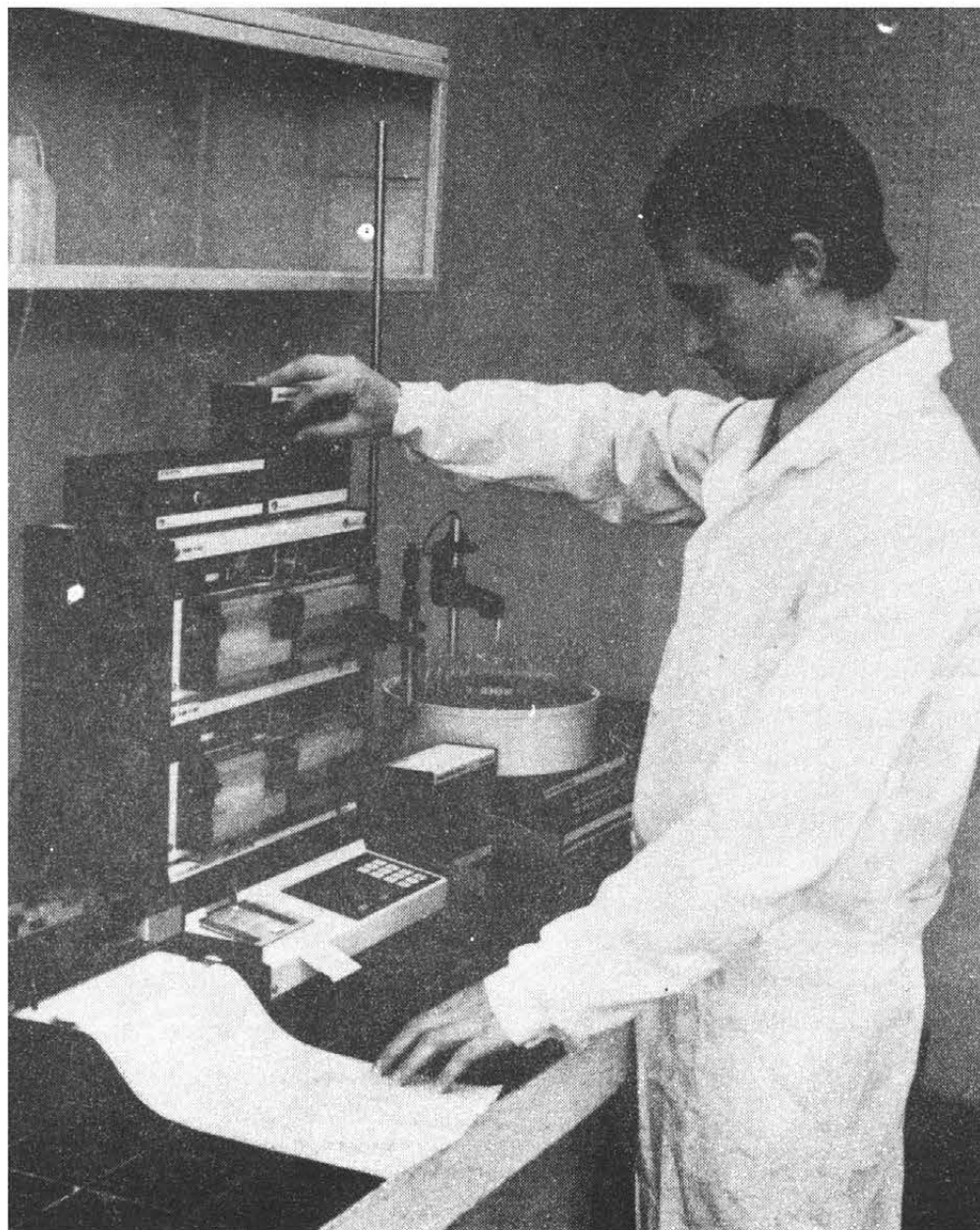
tel. 36-77-04,

Assistant Director for educational affairs: Prof. Jadwiga Wilska-Jeszke, Assistant Director for research, Doc. Piotr Moszczyński.

The Institute Staff: Prof. Edward Galas, Prof. Jadwiga Wilska-Jeszke, Doc. Piotr Moszczyński, 16 assistants, 41 technical and administrative workers.

The main research subjects realized at the Institute: selection and improvement of microbe strains, microbiological screening, mutagenization, genetic engineering and its use, microbiological biomass, preparation and purification of enzymes and their use in biotransformation of various bioproducts, microbiological polisacharides, immobilization of enzymes and cells, enzymatic processes in organic solvents, continuous processes of ethanol fermentation under the influence of immobilized yeast cells, biodegradation of lignocelluloses and scleroproteins, enzymes from antarctic krill, computerization of biotechnological processes, preparation of biologically active substances (aminoacids, vitamins and coenzymes) with the use of immobilized biocatalysts, examination of stability of the products being prepared and methods for its improvement, adaptation of the known and development of new methods for the determination of

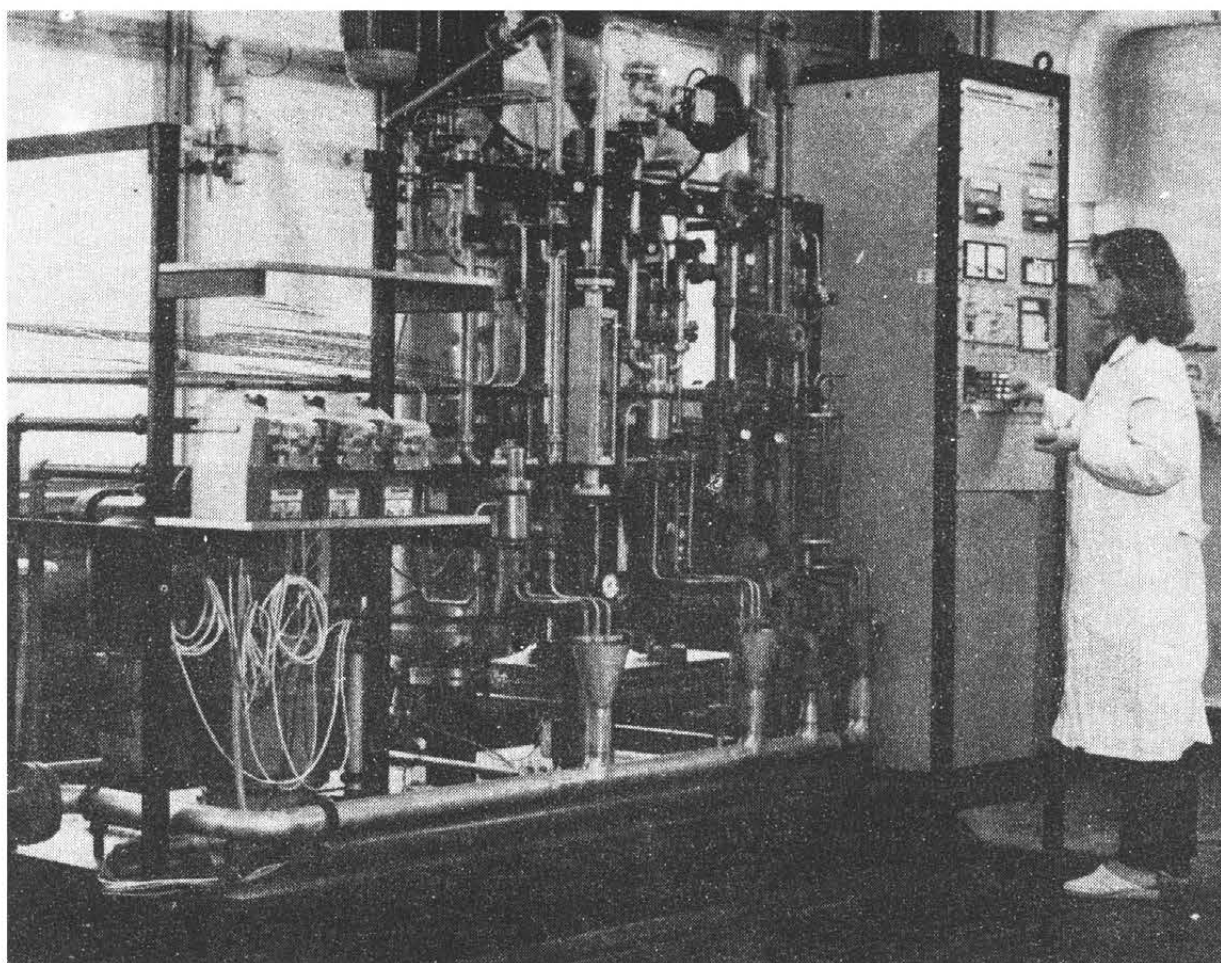
vitamin content in food, pharmaceutical and feed products, preparation, properties and stabilization of natural vegetable dyes, characteristics and examination of conversions of polyphenol compounds in fruits.



A liquid chromatograph of "Farmacia" for fast separation of proteins I-29

Within the CPBP 04.11 program comprising biotechnological projects under the supervision of Professor Edward Galas, the Institute cooperates with 12 universities in this country. The cooperation regarding the preparation of natural red dyes for

the food industry is performed with the Zakłady Przemysłu Owocowo-Warzywnego (Fruit and Vegetable Industry Works) at Tymbark. The stability of canned vegetable-meat food is the subject of cooperation with the Zakład Przemysłu Owocowo-Warzywnego at Łowicz. Scientific contacts are maintained with the Institute of Pomiculture at Skierniewice.



A fermenter of "Chemap" with a volume of 150 . I-29

Within the CMEA program (Council for Mutual Economic Aid) the Institute cooperates with the All-Union Research Institute "Biotechnologia" in two projects associated with biosynthesis and the use of enzymes. The Institute maintains close contacts with the Mach Institute of Biochemistry (Academy of Science USSR) and with the Centre of Biotechnology (Academy of Science GDR) in Lipsk (Leipzig).

For many years the Institute has cooperated with the University of Strathclyde in Glasgow; joint research on genetic engineering and its use in *Bacillus* transformation has been carried out. Permanent contacts are maintained with the International Scientific Society "Groupe polyphenols" and the same concerns such research centres as JNRA at Narbonne and Montpellier, France and Szeged, Hungary.

The main orientation of education at the Institute is biochemistry and biotechnology. The Institute also offers classes in three diploma specializations: technical biochemistry, technology of vitamins and food concentrates and technology of fruit and vegetable products.

The Institute has at its disposal a technological room provided with equipment and apparatus for biotechnological processes to be carried out in semi-pilot scale as well as laboratories fitted for biochemical classes and experiments.

In 1958-1988, 430 graduates received their M.Sc. degrees.

#### THE INSTITUTE OF CHEMICAL TECHNOLOGY OF FOOD I-30

Director's office tel. 36-74-88

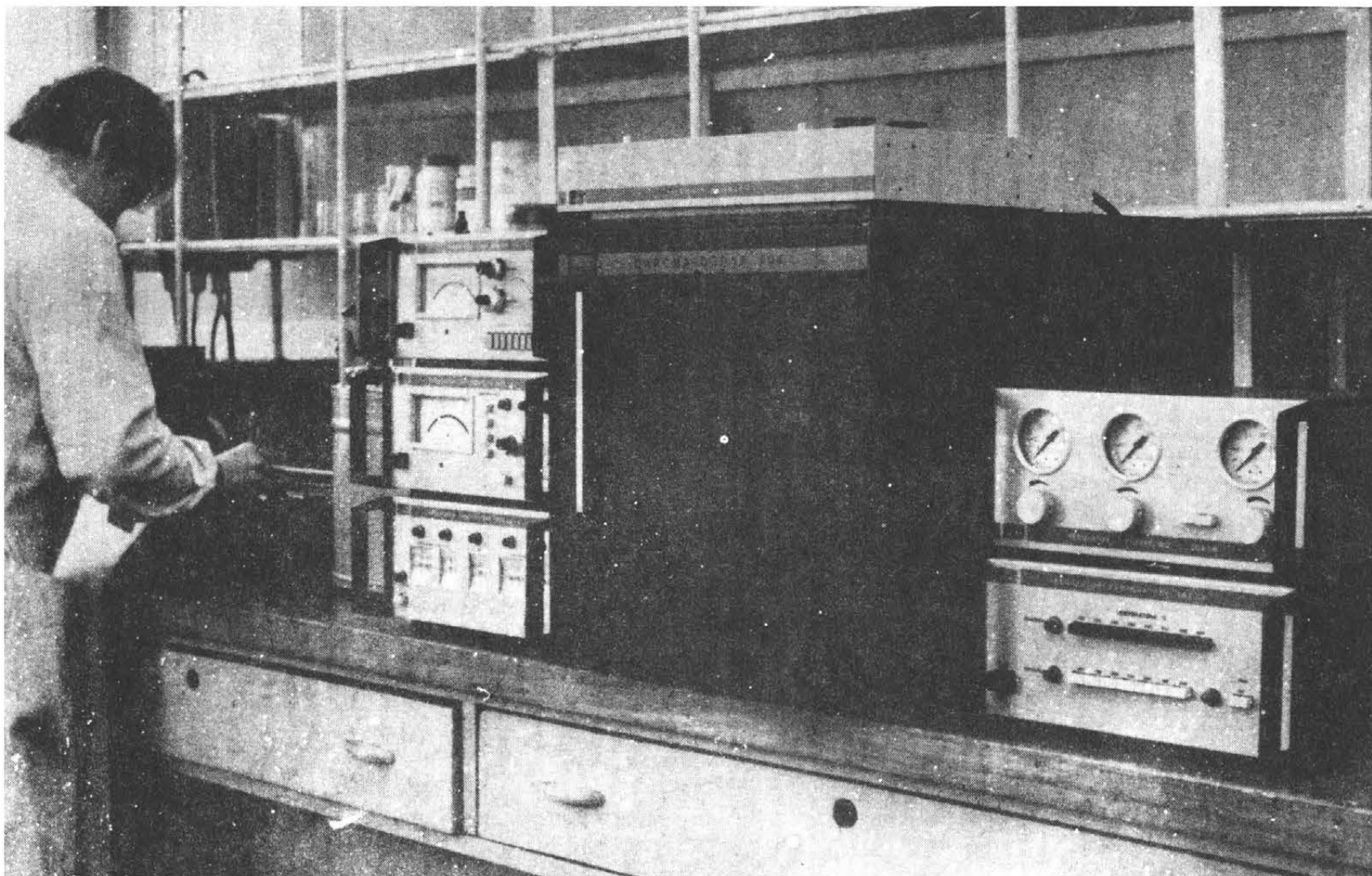
The Institute is composed of the Sugar Industry Division, Starch and Confectionery Technology Division, Food Refrigeration Technology Division, Foodstuffs Technology Group and Measurement and Automation Group.

Director: Doc. Mieczysław Boruch, tel. 36-74-88  
Assistant Director: Prof. Zygmunt Niedzielski.

The staff of the Institute includes prof. Helena Zaorska.

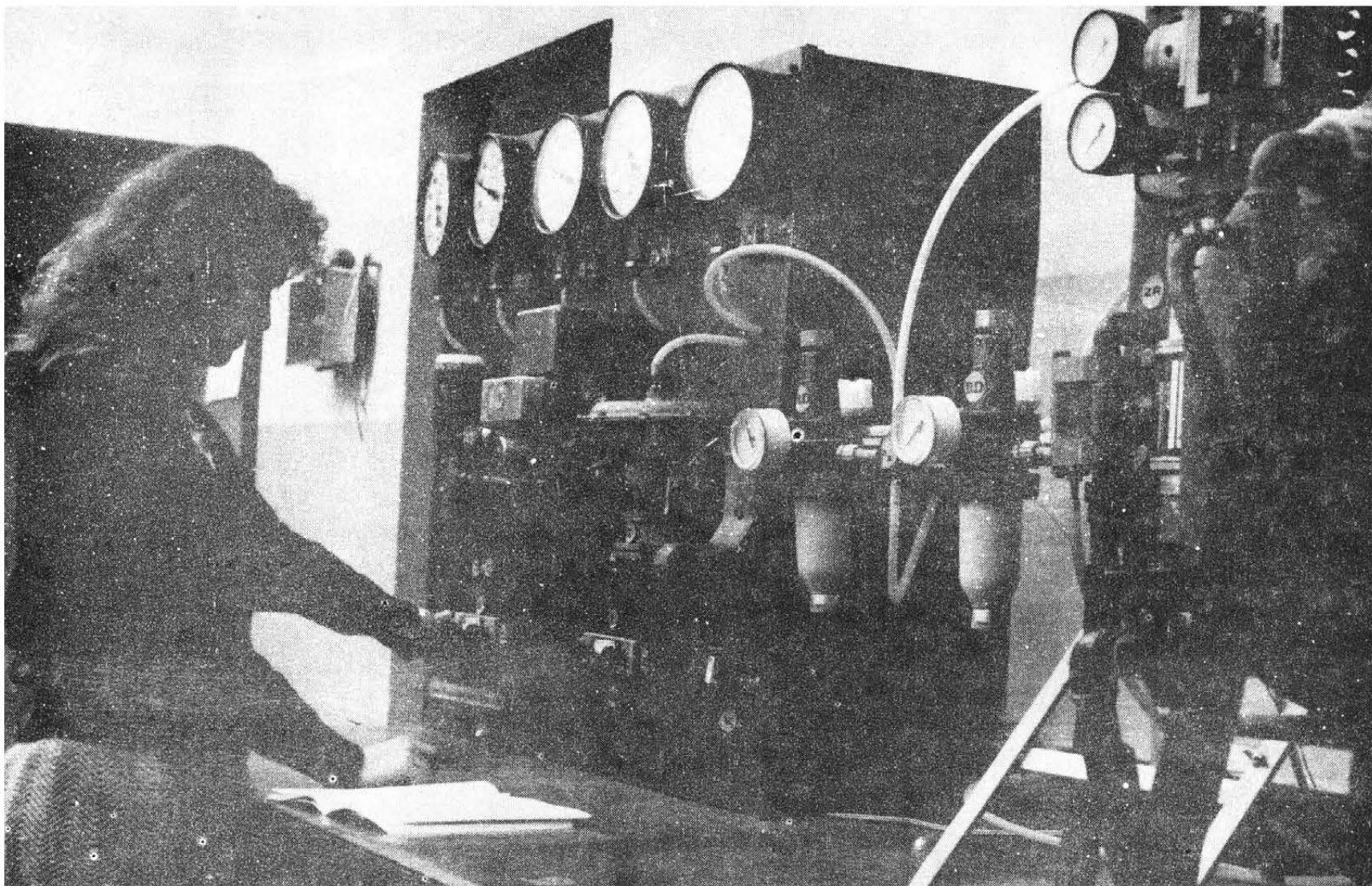
Doc. Jan Iciek, and 21 doctors, 4 assistants, 2 senior lectures and 31 technical and administrative workers.

The Institute carries on research studies on kinetics of beet chips extraction, purification of crystallization juice, drying and cooling of sugar, saccharose complexes, protein recovery from potato juice, rheology of confectionery products, freezing conditions for foodstuffs.



Determination of carbohydrates by the method of liquid chromatography I-30





Testing the static and dynamic properties of an air-operated PJD controller I-30

Research workers of the Institute have obtained 60 patents. Under an agreement with the industry more than 140 problems have been solved, e.g. a potentiometric calcium salts analyzer and a device for electrochemical measurement of the infection degree in extractors have been implemented in the sugar industry. The saccharose extraction has been improved by inoculation of crystal nuclei. Serial production of a sugar conductometer has been started. An ultrafiltration process has been developed and implemented into the potato industry to recover protein and to reduce the harmfulness of wastes. Products of oxidation of starch hydrolyzates have been introduced into the caramel manufacture. The work on a device for electronic measurement of moisture content and density of suspensions in the confectionery, potato and bakery industries has also been started. A new method for precooling and storage of poultry meat in the atmosphere of protective gases has been implemented.

The Institute cooperates with domestic and foreign research centres, while some of the research workers cooperate with international scientific societies as permanent members.

The educational studies comprise the following orientations: sugar industry, starch technology (starch and bakery), technology of confectionery and technology of food refrigeration. Specialization lectures include sugar chemistry, technology, machinery and energetic problems.

The post-diploma studies in the orientation of sugar technology, carried on from 1972, have been completed by 160 persons. In 1988 a post-diploma course in sugar machinery was started.

The analytical, technological and the measuring and automation laboratories are provided with modern specialistic apparatus.

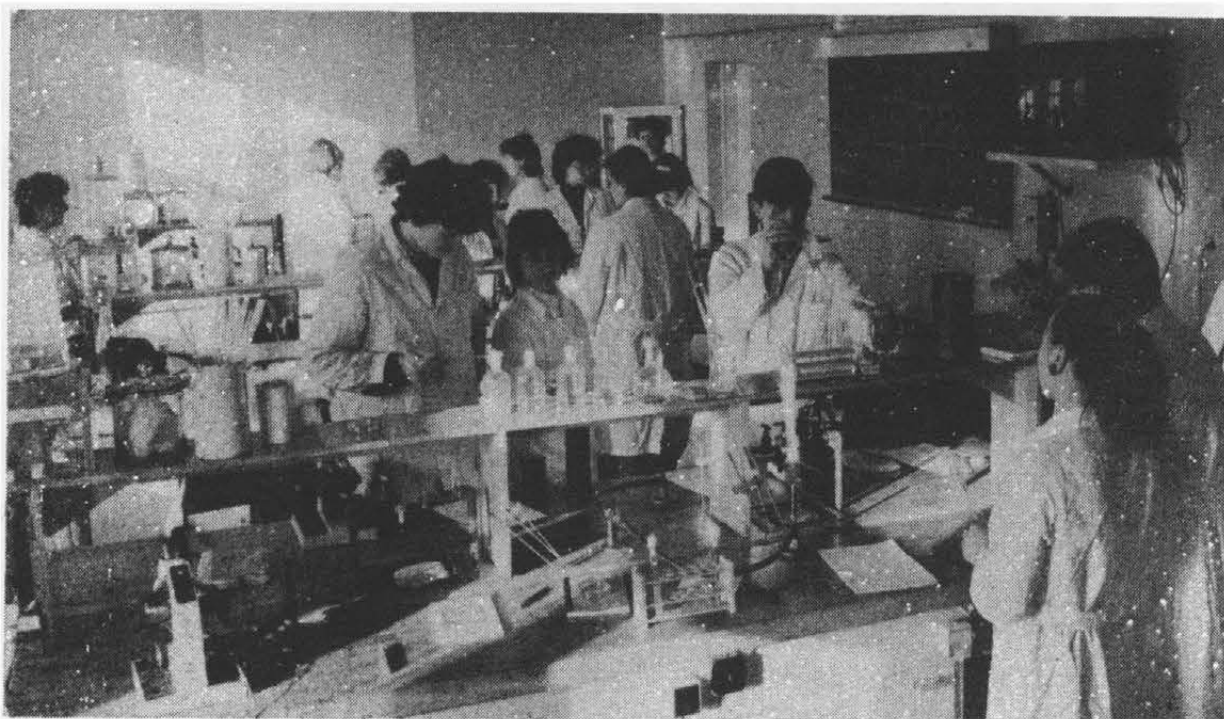
In 1950-1987, 1200 graduate specialists were educated at the Institute, including 600 sugar experts, 400 technologists in starch and confectionery and 180 food refrigeration technologists; 56 postgraduate research works have been presented for the degree of doctor and 3 research dissertations for the degree of docent.

THE INSTITUTE OF THE TECHNOLOGY OF FERMENTATION  
AND MICROBIOLOGY I-31

Director's office tel. 36-55-22, ext. 342

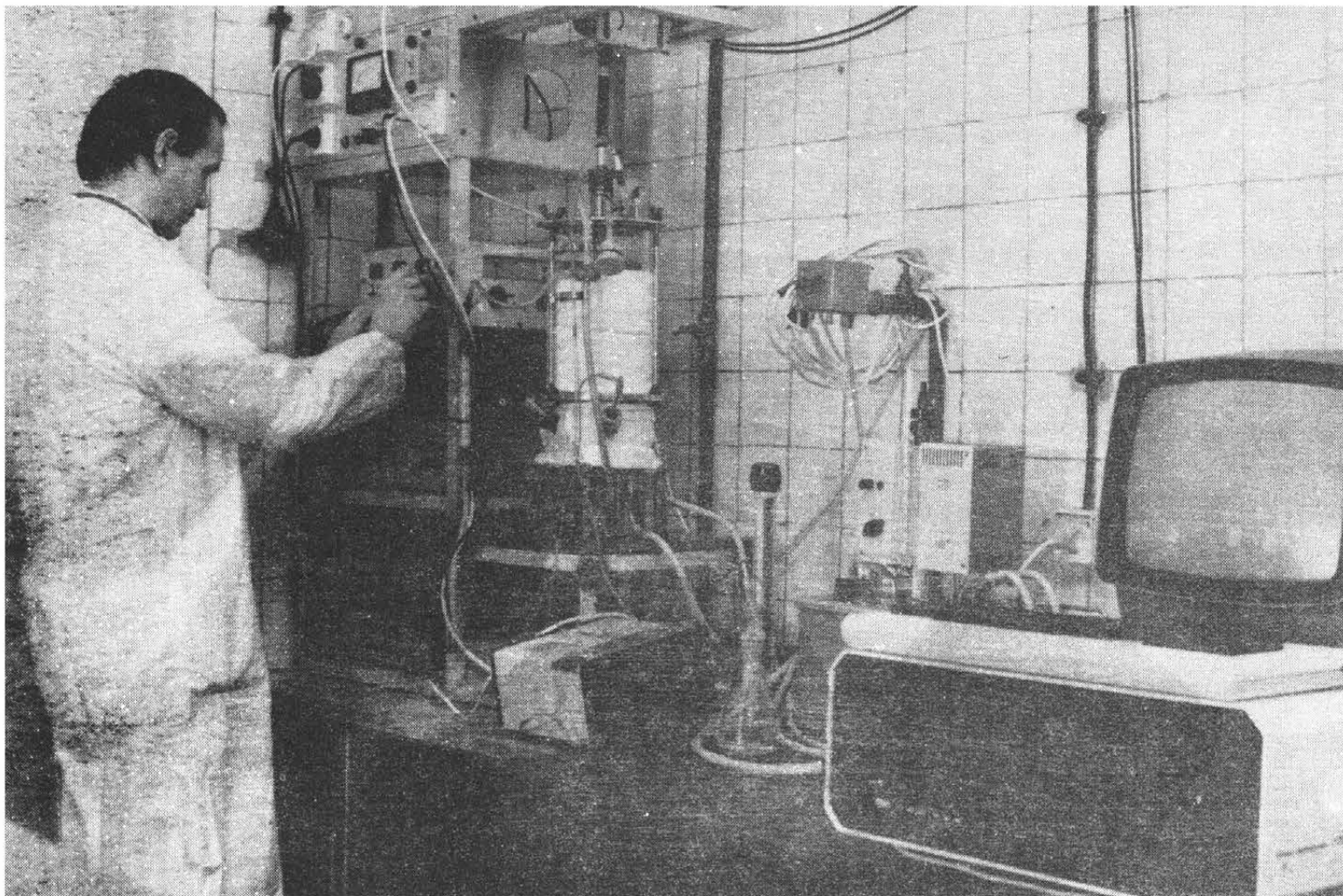
The Institute was set up by the fusion of the Chair of Fermentation Technology, Division of Spirit and Yeast Technology and the Chair of Technical Microbiology. The Director is Prof. Helena Oberman, tel. 36-55-22 ext. 342 and the function of Assistant Director is performed by Doc. Zdzisław Włodarczyk.

The Staff includes: Prof. Helena Oberman, Doc. Józef Szopa, Doc. Magdalena Włodarczyk, Doc. Zdzisław Włodarczyk and 19 academic teachers, 33 engineers, technicians and administrative workers.



Classes at the Laboratory of Technical Microbiology I-31

The Institute comprises three educational-research groups: Fermentation Technology Group, Spirit and Yeast Technology Group and Technical Microbiology Group. An auxiliary unit is the Collection of Industrial Microbes.



Microbe culture control system I-31



The Institute carries out basic and applied research on new and modified technologies of alcoholic beverages, wine and beer, fermentation of bakery starters, improvement of the technology of agricultural and industrial distillery as well as the distillation and rectification processes, improvement of the manufacturing processes and cultures of bakery and feed yeasts, purification of industrial effluents, microbiological utilization of lignocellulose wastes, and physiology and storage of industrial microorganisms.

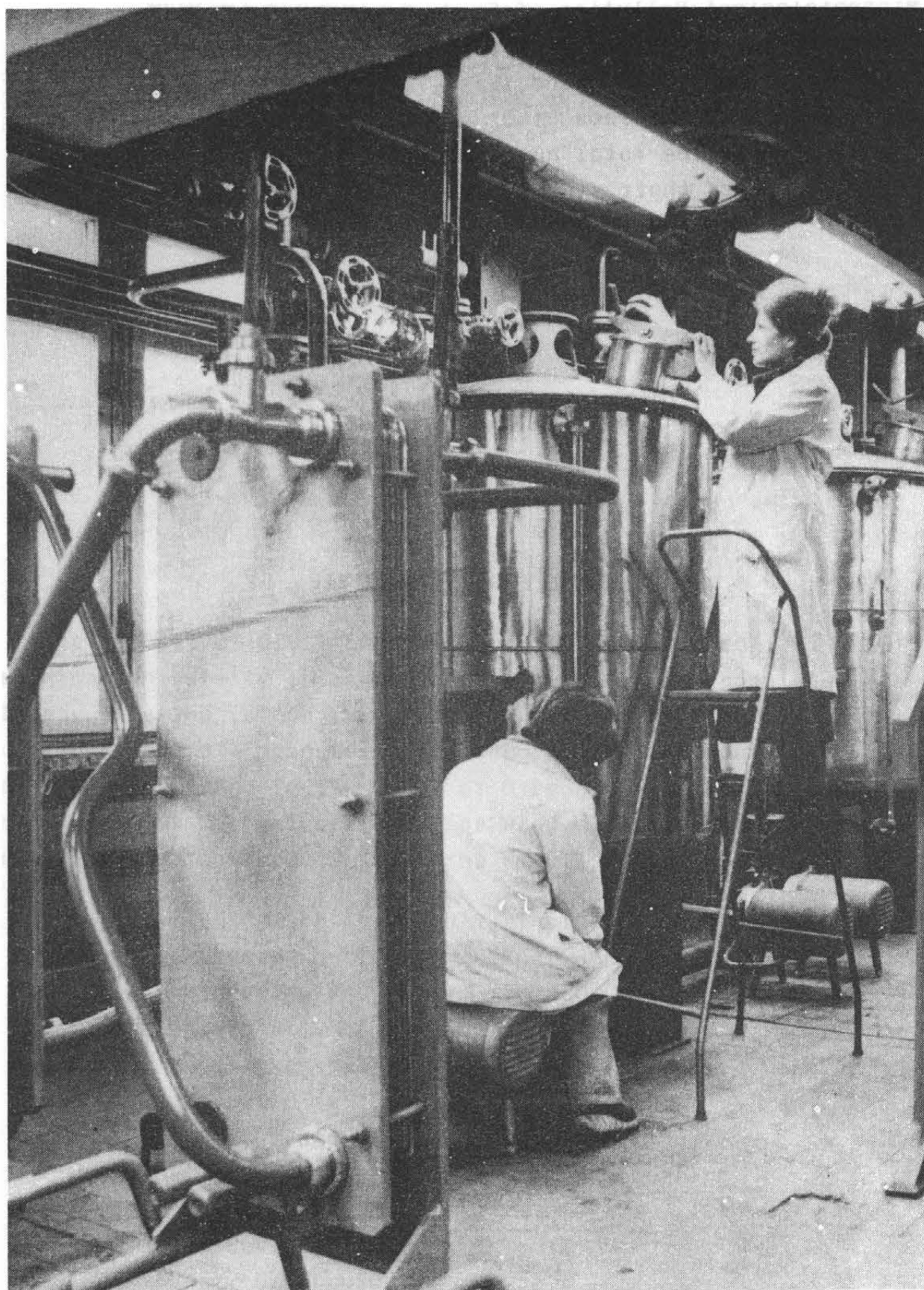
The main achievements of the Institute: development of the manufacturing process for maize soak, a method for remote control of temperature measurement of spirit in industrial tanks, methods of yeasting liquid and solid fractions of crude oil and methanol, yeasting vinasse, technology of bread acid concentrate, effective utilization of hop in the production of beer, production of red wines from colour fruit pomace, technology of promoted production of stable apple wines, manufacturing technology of Madeira wines and of plum and apple ports, development of a new form of dairy starters as concentrated and freezed biomass, new modifications of bakery yeasts, new strains of yeast in the production of ethanol from waste sulphate liquor, development of the basis for production of selected organic acids, optimization of the water waste economics in the meat industry. In 1982-1987 the implementation of all these brought 80 million zł.

The Institute cooperates with the Zakłady Przemysłu Spirytusowego i Drożdżowego (Spirit and Yeast Industry Works), Zakłady Przemysłu Farmaceutycznego (Pharmaceutical Industry Works), Zakłady Celulozowo-Papiernicze (Pulp and Paper Industry Works), and with numerous dairy works where technological developments and patents have been implemented.

The Institute cooperates also with foreign research centers, such as the Agriculture Department of the USA, Higher Chemical Technology School in Praha, the Humboldt University in Berlin and the University of Strathclyde in Glasgow.

Classes offered by the Institute include: Biotechnology of Foodstuffs, Technical Microbiology, Natural Environment Protection, Water Waste Economy in industries of food and plastics,





Production of the bakery yeast I-31

Microbiological Pollution of Food. Besides specialization classes connected with the following diploma orientations - Fermentation Technology, Spirit and Yeast Technology, Technical Microbiology and Post-Diploma Studium in Spirit and Yeast Technology - are offered. The total number of postgraduate specialists who have completed their studies at the Institute amounts to 1136.

# THE FACULTY OF CIVIL ENGINEERING AND ARCHITECTURE W-6

Dean's office address: 93-590 Łódź, al. Politechniki 6  
tel. 36-86-64

## 1. HISTORY OF THE FACULTY

The Faculty of Civil Engineering was established at the Technical University in Łódź on May 11, 1956. It consisted of already existing (since 1950) Faculty of Civil Engineering at Evening School of Engineering and Laboratory of Structural Engineering established in the Chair of Strength of Materials at the Faculty of Mechanics. Professor Władysław Kuczyński was its organizer and the first Dean of the Faculty.

In those first years the Faculty included:

- Chair of Reinforced Concrete Constructions,  
Head: Prof. Władysław Kuczyński,
- Chair of Fundamental Civil Engineering,  
Head: Doc. Jan Niewęgłowski,
- Chair of Theory of Structures,  
Head: Prof. Jerzy Mossakowski,
- Chair of Soil Mechanics and Foundation Engineering  
Head: Prof. Bolesław Rossiński,
- Chair of Steel Constructions,  
Head: Doc. Jerzy Czechowicz.

At the end of the sixties new Chairs were established:

- Chair of Industrial Building and Prefabrication,

- Head: Doc. Roman Dowgird,
- Chair of Geodesy,
- Head: Doc. Jan Wereszczyński,
- Chair of Theoretical Mechanics,
- Head: Prof. Marian Suchar.



Building of the Faculty of Civil Engineering and Architecture

The successive Deans of the Faculty were:

- Prof. Władysław Kuczyński - in the years 1956/58, 1961/63,  
1965/68,
- Prof. Bolesław Rossiński - 1958/65,
- Doc. Jan Niewęgłowski - 1960/61,
- Prof. Marian Suchar - 1968/73, 1971/73, 1987/89,
- Prof. Tadeusz Godycki-Ćwirko - 1973/75,
- Doc. Tadeusz Przeddecki - 1975/77, 1977/79,
- Prof. Jerzy Sułocki - 1979/81, 1981/84,
- Doc. Piotr Klemm - 1984/1987.



Council of the Faculty of Civil Engineering and Architecture



In 1970 the structure of the Faculty was reorganized. Two Institutes were established: the Institute of Construction Engineering and the Institute of Municipal Engineering.

In 1973 the Institute of Architecture and Town-Planning was established. The name of the Institute of Municipal Engineering was changed into the Institute of Environmental Engineering. The name of the Faculty itself was changed into the Faculty of Civil Engineering and Architecture.

## 2. THE STRUCTURE OF THE FACULTY

The present structure of the Faculty of Civil Engineering and Architecture was established in 1985. The Faculty consists of sections, units and institutes.

### THE INSTITUTE OF CONSTRUCTION ENGINEERING I-32

#### Management:

Director: Prof. Marian Suchar, tel. 36-19-64

Vice-Director for scientific research: dr Czesław Malinowski

Vice-Director for education: dr Bogdan Rogowski

- Unit of Fundamental Civil Engineering and Building Structures,
- Unit of Physics of Construction and Building Materials,
- Unit of Metal Constructions,
- Unit of Theory of Structures with EDP room,
- Unit of Mechanics of Materials,
- Section of Technology and Management of Civil Engineering.

#### Academic and non-academic staff:

3 professors, 8 docents, 41 doctors (adiunkts), 5 senior assistants, 5 senior lecturers, 1 lecturer, 1 junior assistant, 23 technicians, 8 administrative workers (see: Introduction - University Staff).

THE INSTITUTE OF CIVIL  
AND SANITARY ENGINEERING I-33

Management:

Director: Doc. Tadeusz Przedecki, tel. 36-81-73.

Vice-Director for scientific research: Prof. Stefan Przewłocki.

Vice-Director for education: Doc. Michał Żukowski

- Unit of Roads and Bridges,
- Unit of Geodesy and Descriptive Geometry,
- Unit of Geotechnics,
- Unit of Environmental Engineering,
- Unit of Heating and Ventilation Engineering.

Academic and non-academic staff:

2 professors, 5 docents, 18 doctors (adiunkts), 9 senior assistants, 4 assistants, 8 senior lecturers, 1 lecturer, 23 technicians, 6 administrative workers (see: Introduction - University Staff).

THE INSTITUTE OF ARCHITECTURE  
AND TOWN-PLANNING I-35

Management:

Director: Prof. Zygmunt Świechowski, tel. 36-78-73.

Vice-Director for education: Doc. Irena Popławska,

Vice-Director for scientific research: Doc. Radosław Dębski.

- Unit of History of Architecture and Preservation of Monuments,
- Unit of Region and Village Designing,
- Unit of Housing Architecture,
- Unit of Public Architecture,
- Unit of Industrial Designing,
- Unit of Town Planning,
- Unit of Drawing and Painting,
- Unit of Sculpture.

Academic and non-academic staff:

2 professors, 6 docents, 3 doctors (adiunkts), 20 senior assistants, 5 assistants, 8 senior lecturers, 4 lecturers, 10 technicians, 5 administrative workers (see: Introduction - University Staff).

### 3. EDUCATION

At present there are 836 full-time students and 76 extramural students. In the years 1954-1987 the Faculty promoted 1548 civil engineers and in the years 1961-1987, 2835 graduates were awarded a Master's degree.

- Civil Engineering is offered to both full-time and extramural students.

Specialization: - Building and Engineering Constructions.

Diploma in: - Town and Industrial Building,

- Realization of Building and Engineering Constructions,

- Engineering Transport Structures,

- Mechanics of Building Structures.

Post-graduate studies: - Modernization, repairs and preservation

- Environmental Engineering is offered to full-time students only.

Specialization: - Sanitary Facilities.

Diploma in: - Water Supply and Sewage Systems,

- Heating and Ventilation.

Post-graduate studies: - Town Engineering,

- Coordination of Building-Installation Problems.

- Architecture - full-time studies, no specialization offered. The Faculty has the right to qualify for doctor and docent degrees.

### 4. LIBRARY

The Faculty has its library. There are two reading-rooms with 42 seats and the majority of books are available on loan to students and academic staff.

The Library has 17 089 volumes, 4637 volumes of periodicals and 2818 cards of building catalogue. Special collections include books and periodicals on building engineering, sanitary engineering, architecture, art, town-planning, environment protection, geodesy, encyclopaedias and dictionaries. Moreover, basic publications on mathematics, mechanics, physics, chemistry and EDP are available. Students of the first year are instructed by the library staff how to use the library facilities.

The Faculty of Civil Engineering and Architecture has its sections of the Chief Technical Organization (NOT) such as the Polish Association of Civil Engineers and Technicians, the Polish Association of Sanitary Engineers and Technicians and the Association of Architects of the Polish Republic. The Faculty staff actively participate in the works of these associations. Dr A. Nowakowski from the Institute of Construction Engineering is the chairman of Provincial Section of the Polish Association of Civil Engineers and Technicians. Dr K. Muszyński from the Institute of Architecture and Town-Planning, is the chairman of Łódź Section of the Association of Architects of the Polish Republic.

## 5. THE INSTITUTE OF CONSTRUCTION ENGINEERING I-32

### Education

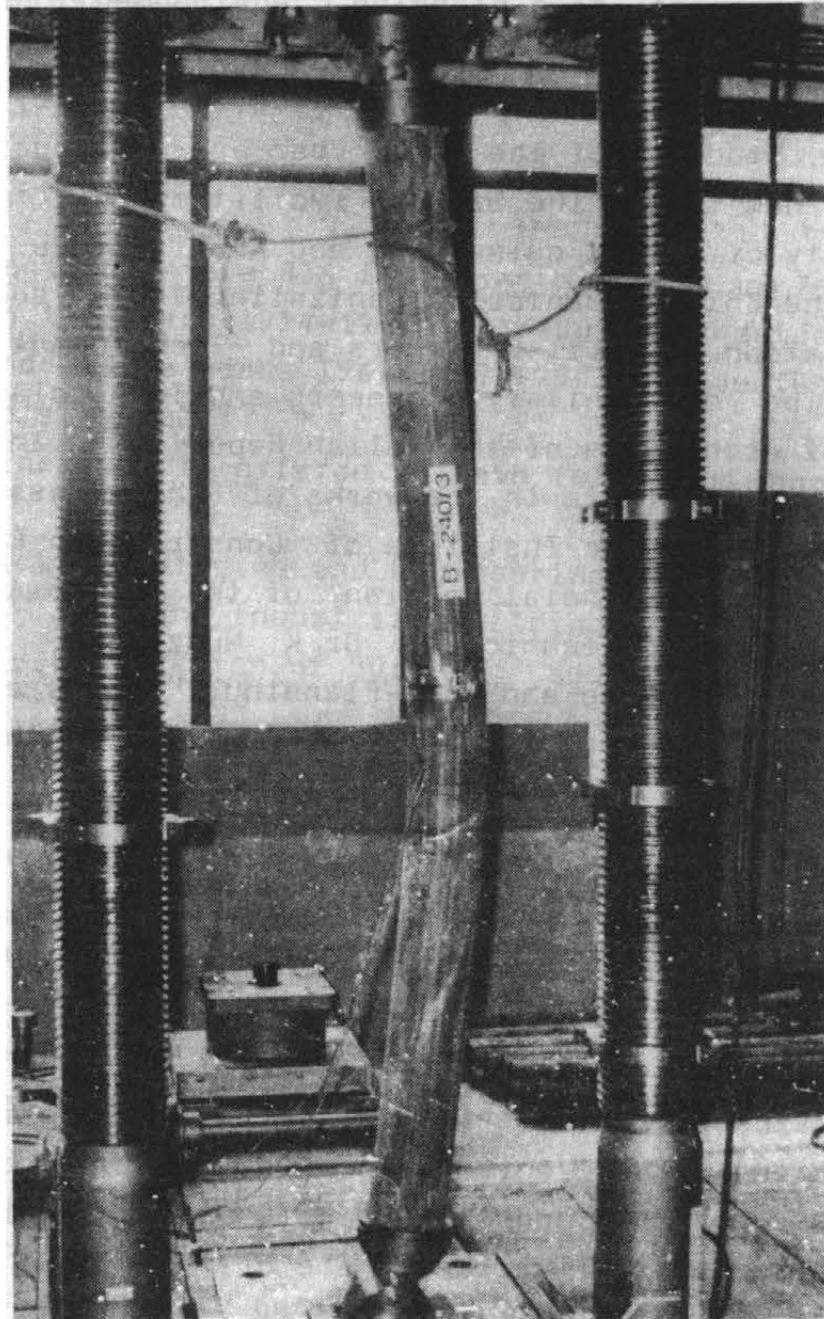
Students are offered Master's degree in Building and Engineering Constructions. The program of studies includes broad knowledge of basic technical and theoretical subjects which constitute the base for specialization in one of the four possible diploma courses.

To finish the course (5 years) a student must attend 4305 hours of lectures and classes, obtain 83 signatures and pass 30 examinations. A part of the program (120-150 hours) is optional.

Institute laboratories:

- laboratory of strength of materials,
- laboratory of physics of constructions,

- laboratory of building materials,
- laboratory of metal constructions,
- laboratory of concrete constructions.

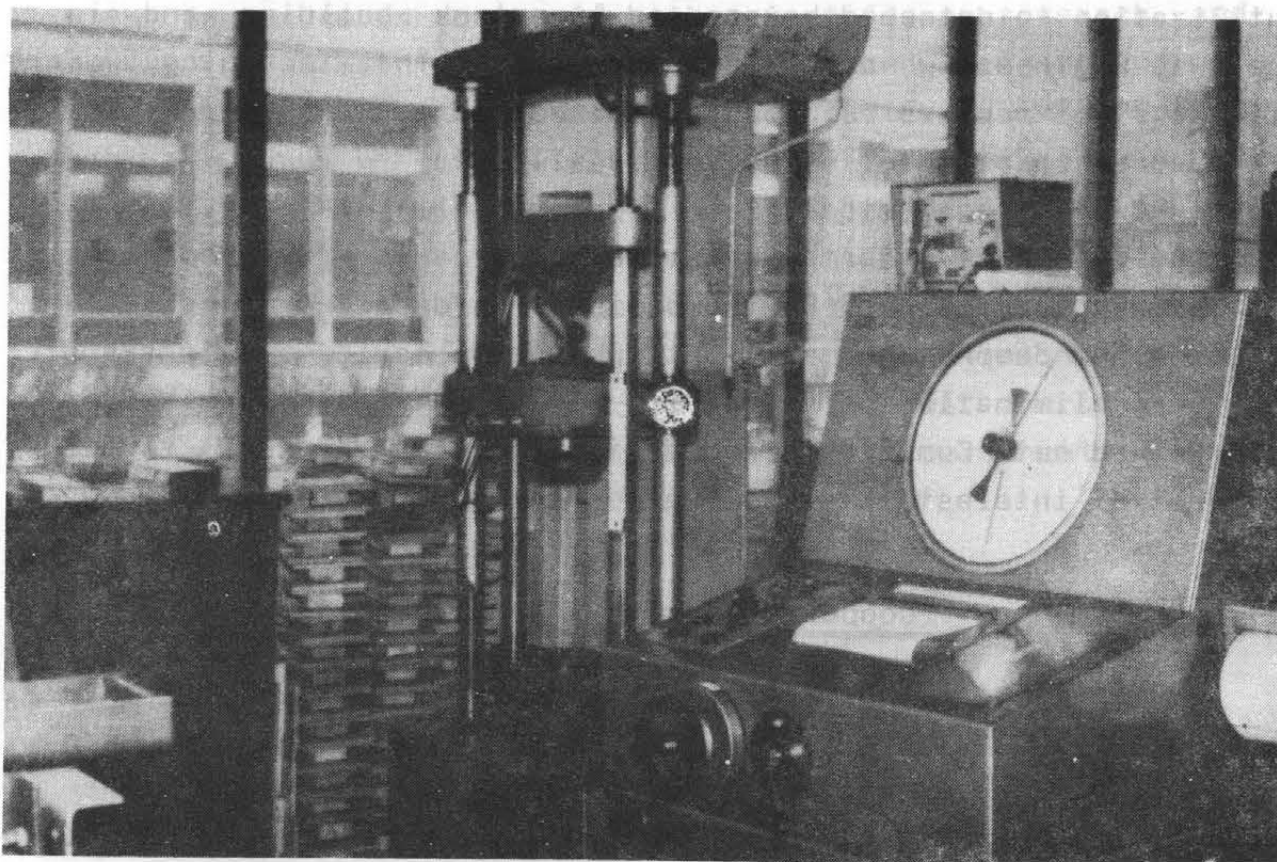


Combined pole load-carrying ability testing at the Institute of Construction Engineering I-32

The Institute has a computer studio and a central laboratory of construction and building materials testing at students' disposal for their diploma research. Diploma works are of high standard, many of them awarded by the Minister of Education.



Students' Scientific Club of Construction Engineering offers a varied program of social activities, including attractive scientific summer camps.



Resistance testing machine at the Institute of Construction Engineering I-32

### Research

Having the possibility of testing the strength of materials, elements and whole constructions in a natural scale, the Institute solves problems in order to specify or modernize the method of dimensioning.

The research work concerns so far unsatisfactorily examined materials (sand-concrete, modified gypsum and cement materials), ware (cold bended sections, spiked inserts) or construction structures (slab-column constructions, frames in complex state of effort). Reliability of the proposed methods of measurement is frequently verified through the examination of the completed objects.

Research on monolithic slab-column technology reflects the search for new technological-constructural solutions. Such technology can be found in Widzew housing estate in Łódź. Studies on new solutions of joints in timber constructions and their utilization in detached houses and livestock building and in railway engineering, are being carried out. The technology of timber floor repairs reinforced with concrete, already successfully introduced in a number of buildings all over the country is being improved both analytically and experimentally.

The Institute undertakes complex studies on the properties of building partitions. On the basis of a detailed description of heat and dampness motion, optimum energy-saving solutions and rational elimination of defects in already utilized partitions are worked out. Computer aided designing (CAD and CAE) is the subject of interest in civil engineering.

#### Cooperation with industry

The Institute cooperates with industry and building enterprises working out expertises of the technical state; evaluates the safety of building constructions; makes analyses of the possibility and conditions of modernization, continuation of stopped investments, harmful effects of vibrations in buildings, also tests materials, elements and joints.

The list of enterprises the Institute cooperates with is long and comprises practically all branches in several regions of the country. The Institute cooperates with majority of respected scientific centres in the field of civil engineering eg. the Institute of Fundamental Engineering Problems of the Polish Academy of Sciences, the Institute of Construction Engineering, the Institute of Timber Technology, the Research Centre of Steel Constructions "MOSTOSTAL", Research Centre of Timber Constructions Industry. This cooperation enables joint solving of the problems included in central research programs.

## 6. THE INSTITUTE OF CIVIL AND SANITARY ENGINEERING I-33

### Education

The Institute is concerned with scientific research and teaching in two main specializations: civil engineering and sanitary engineering. As regards teaching activity, the Institute participates in the realization of programs of civil engineering, engineering and architecture. The Institute is concerned with the development of design skills and utilization of water supply systems, technology of water and waste water treatment, town cleaning, waste utilization, central heating in buildings, ventilation, recovery of heat from air and other low-temperature sources, purification of air of permanent impurities, urban and industrial heating systems.

Institute laboratories:

- laboratory of cartography,
- laboratory of soil mechanics,
- laboratory of sanitary biology,
- laboratory of road surface,
- laboratory of sanitary chemistry,
- laboratory of water, sewage, waste and sludge technology,
- laboratory of heating and installation engineering.

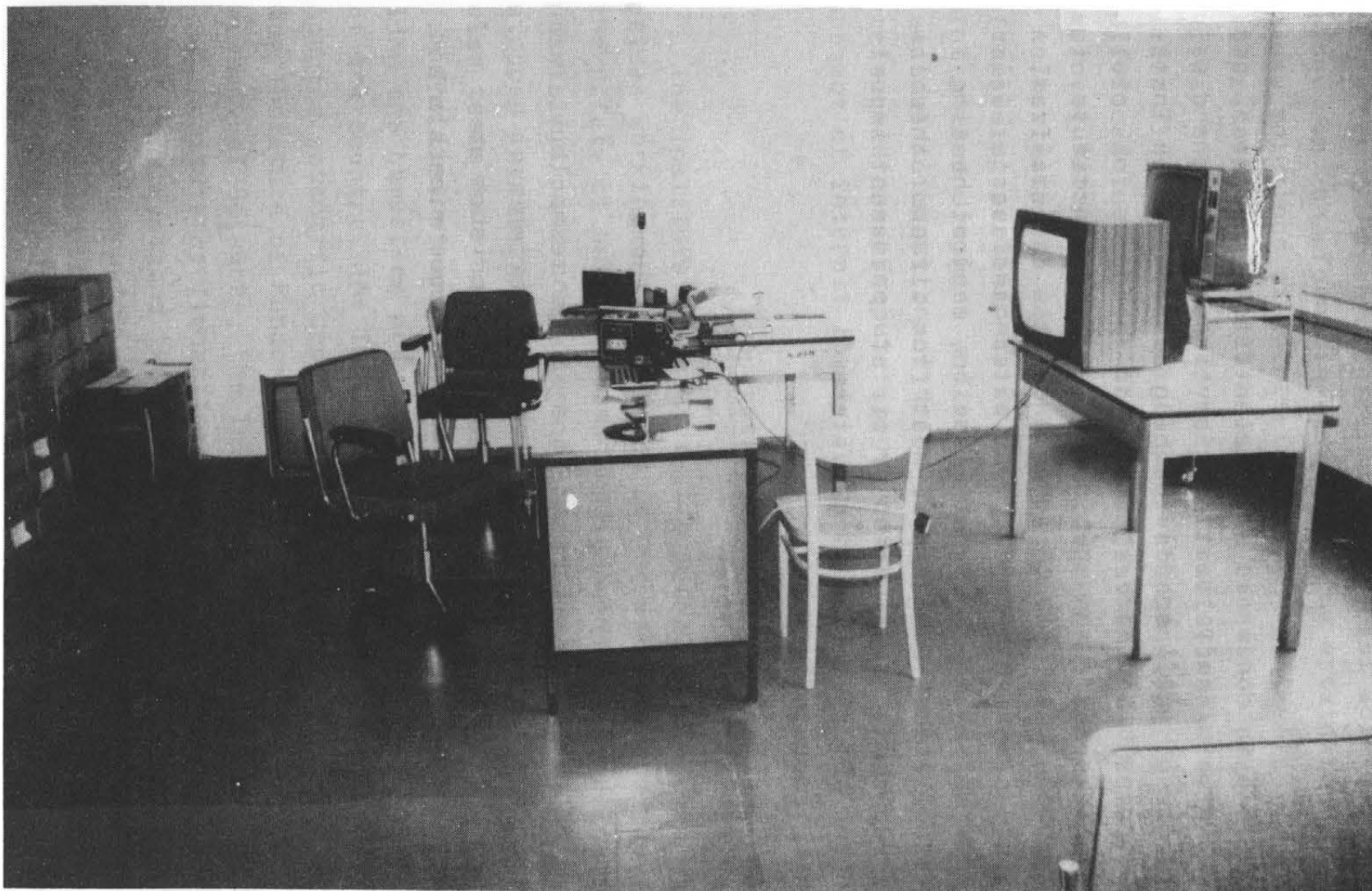
Moreover, the Institute has several workshops such as:

- geological workshop with a collection of unique minerals and rocks,
- descriptive geometry workshop,
- EDP workshop.

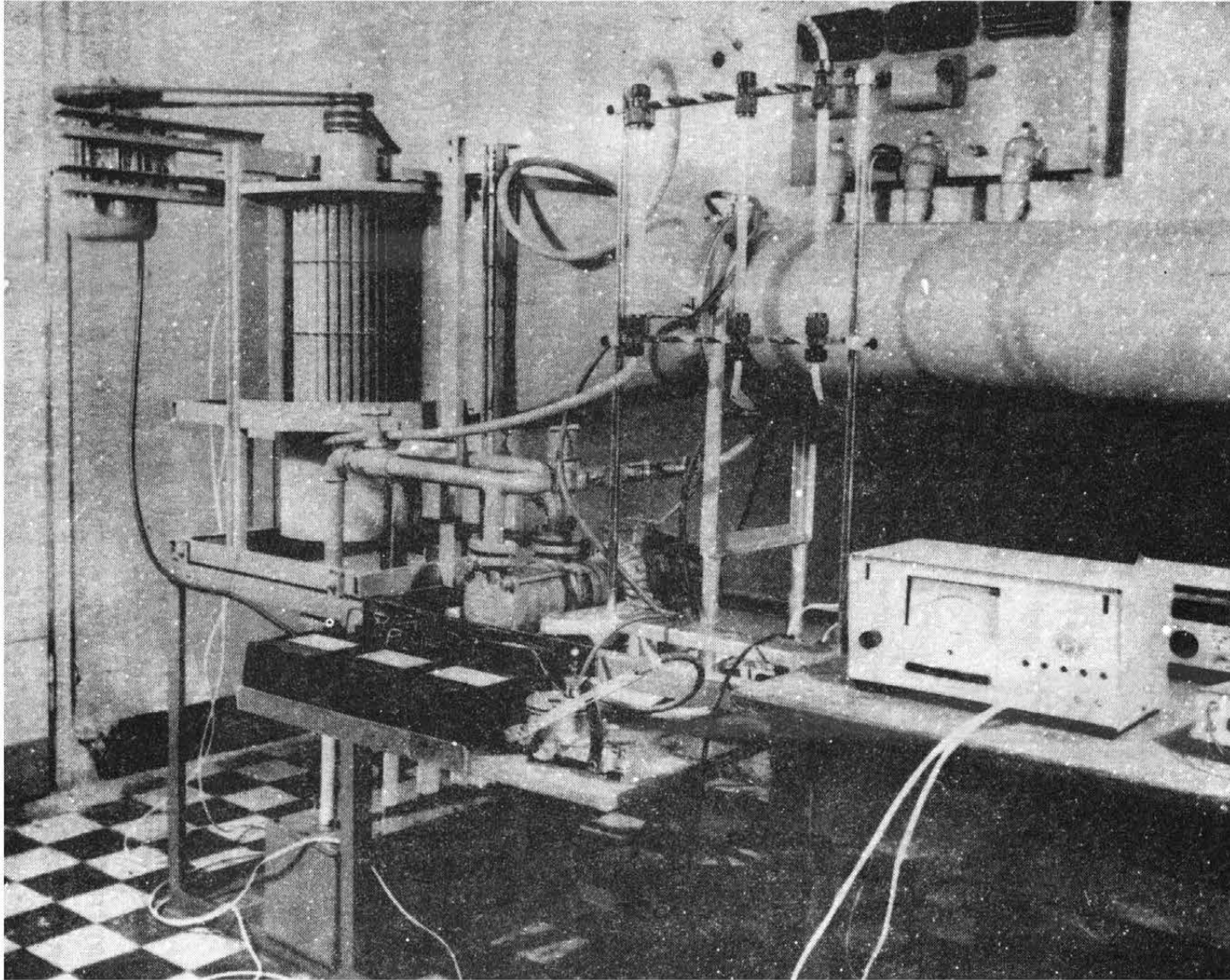
### Research

The Institute research work includes:

- optimization of geodetic measurements for prophylactic and diagnostic needs in the process of the utilization of objects,
- studies on soil mechanics with regard to nonlinear and variable-in-time characteristics,
- studies on properties of waste materials from power plants and mineral aggregate mines,



EDP workroom at the Institute of Civil and Sanitary Engineering I-33



Testing of supersaturation system with dimetral fan at the Institute of  
Civil and Sanitary Engineering I-33



- studies on road surface life,
- dimensioning of bridge constructions with regard to nonlinear shrinkage phenomenon,
- studies on water economics in ecosystems,
- water and waste water technology,
- waste and sludge disposal,
- town cleaning,
- air protection and ensuring the optimum indoor microclimate,
- blow-in - blow-away blocked system,
- effect of relative air dampness on the dust extraction effectiveness,
- aerial curtains testing.

#### Cooperations with industry

The Institute cooperates with scientific centres in the field of geodesy, heating and ventilation engineering and sanitary engineering all over the country. It participates in the realization of two problems coordinated centrally, cooperates with the City of Łódź Office, "ENERGOINŻ" Industrial Complex in Bełchatów, Hydrological Enterprise in Łódź - testing and giving opinion on soil characteristics for the needs of underground railway, District Head Office of Public Roads, Water Supply and Sewage System Enterprise of Łódź region, "Uniprot" Enterprise, Institute of Occupational Medicine and several Technical Universities in Poland.

#### Cooperation with scientific centres abroad

The Institute cooperates with the Institute of Civil Engineering in Kiev, the Section of Geodesy of Technical University in Dresden and Higher Technical School in Bratislava.

## 7. THE INSTITUTE OF ARCHITECTURE AND TOWN-PLANNING I-35

### Education

The Institute of Architecture and Town-Planning is concerned with scientific research and the realization of teaching programs of both, Architecture and Civil Engineering. A graduate from the Faculty of Architecture - M.Sc. acquires broad knowledge in the field of human environment shaping and is prepared to deal with the problems of architectural and town-planning, preservation and revalorization of the monuments of architecture and town-planning. Diploma works are of high standard; many of them were awarded in regional and national competitions.

Institute laboratories:

- laboratory of artistic photography,
- laboratory of sculpture,
- laboratory of freehand drawing and painting,
- laboratory of modelling.

Since 1983, with the collaboration of IAESTE, the Institute has organized a number of summer drawing courses for foreign students.

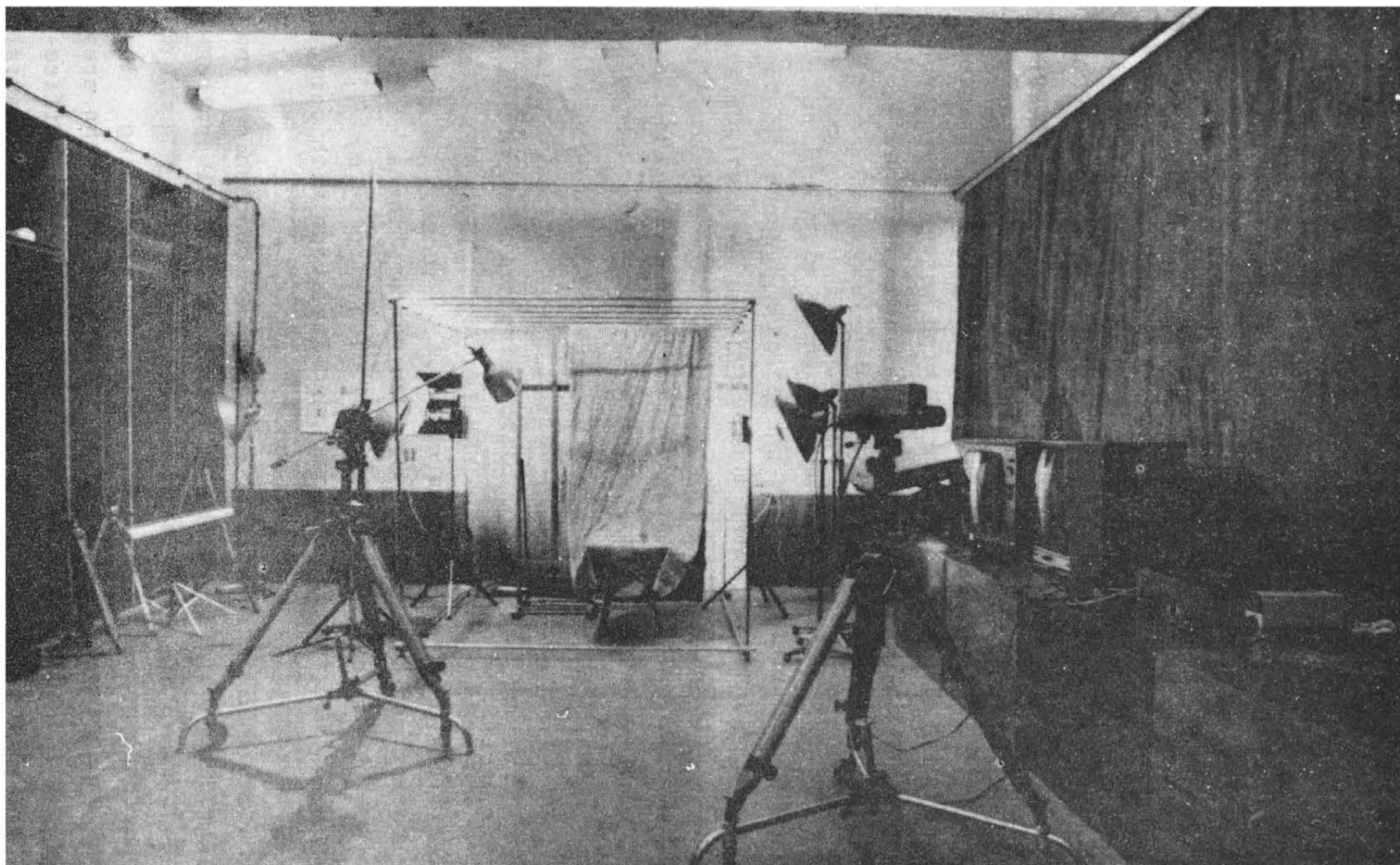
### Research

The Institute undertakes research in:

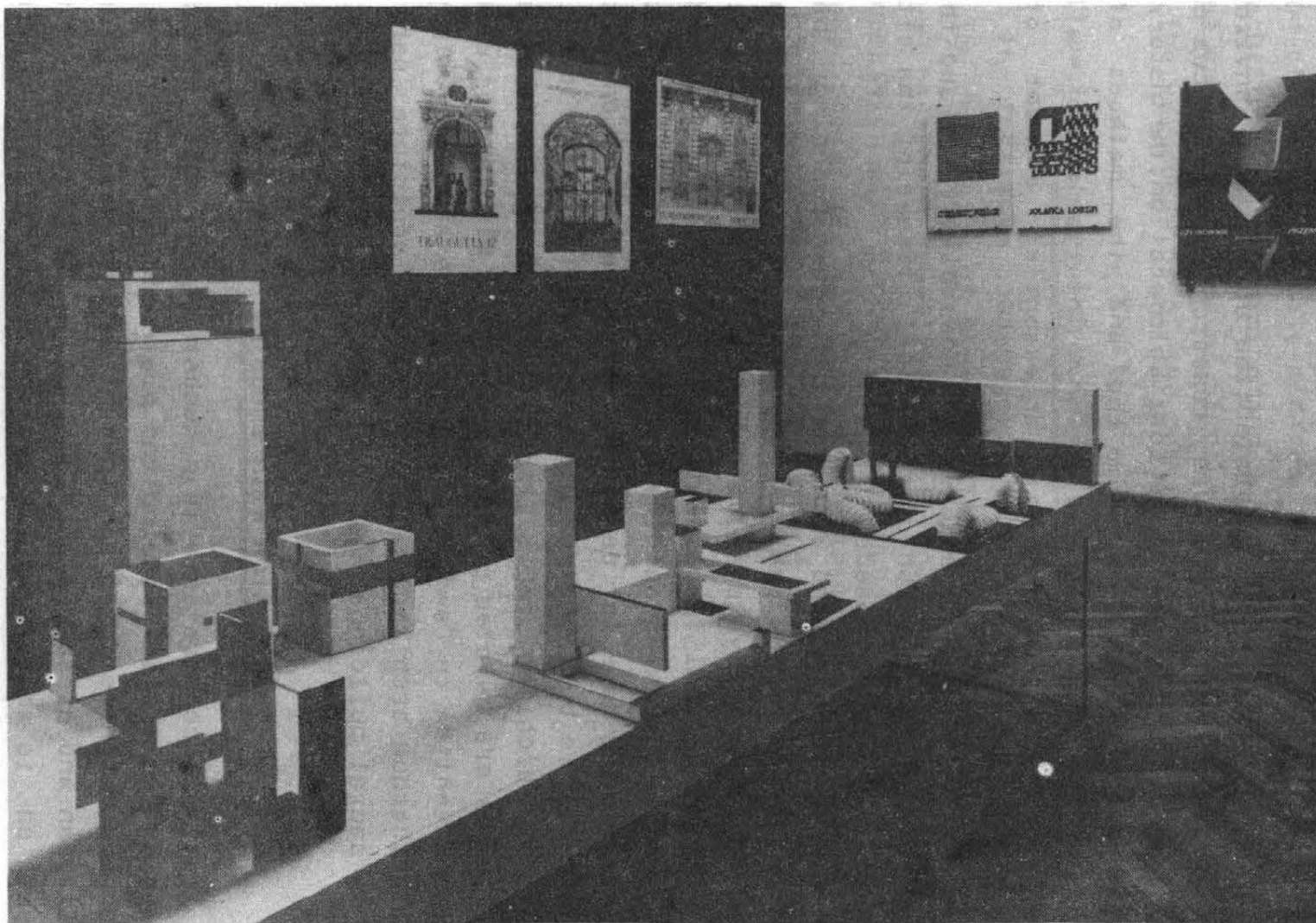
- revalorization and modification of 19th century towns,
- problems of new tissue of the city building structure,
- planning of little towns, villages and landscape with particular regard to central macroregion.

The Institute is engaged in the research concerning the shaping of modern building tissue of a town, practical application of new systems of realization in public building.

In industrial architecture the research concerning the arrangement and network of industrial enterprises in the area of Łódź is carried out. Modernization and functional modification of the existing buildings and enterprises and the spacial



Photography workroom at the Institute of Architecture and Town-Planning I-35



Interior Design and Modelling Workroom at the Institute of Architecture and Town-Planning I-35

modification in the surrounding of industrial enterprises are dealt with. Studies concern folk and regional architecture, revalorization of village landscape and the housing estate role of communal centres.

In the field of shaping and protection of natural environment and the landscape architecture, research studies focus on designing recreation areas in the Łódź agglomeration, the history of the development of green areas in Łódź and the methods of planning green areas in urbanized regions. The typology of small town spacial forms of Łódź region is an essential element of the research work.

Another subject of interest is the possibility of and the conditions for the adaptation of historical tissue of the city of Łódź for contemporary needs.

Research on the 19th and 20th century town-planning and architecture concerns the analysis of development and modification of town-planning systems, both industrial and housing, in Łódź and the industrial towns nearby. In the theoretical aspect, the works lead to working out the methodology of structural studies providing the base for designing and revalorization works of the city-centre building and historical parts of the town.

History of architecture is also an important part of the research. Studies are devoted primarily to early Middle Ages with particular attention to Central Europe, France and Italy. They concern Romanesque architecture, architectural sculpture, particularly in sacral buildings.

#### Cooperation with industry

The Institute cooperates with a number of scientific research and designing centers in: shaping and protecting environment, town planning, architectural and town-planning designing and revalorization and preservation of monuments. One of the projects it focuses on is that of revalorization of the old town centre in Dąbrowa. The Institute cooperates with the City of Łódź Office, Voivodeship Offices of adjacent voivodeships and with



a few towns of central macroregion. Cooperation includes participation in the works of organs giving opinion on town-planning, in research studies on ecological problems, village settlement, the development and modification of towns, and the revalorization of historical city-centres. The Institute cooperates with the Office of Programming and Designing of the Development of Łódź and with Offices of Studies and Documentation of Monuments in the voivodeships of the central macroregion.

#### Cooperation with the scientific centres abroad

The Institute cooperates with the Faculty of Architecture at the University of Glasgow. Since 1987, seminars "five by five" have been organized by both universities. Several years' cooperation with Higher Technical School in Mainz has not been signed officially yet. Contacts with the Faculty of Architecture at the University of Pavia have been initiated and an agreement is being prepared.



## **THE FACULTY OF TECHNICAL PHYSICS AND APPLIED MATHEMATICS W-7**

**Dean's office address: 93-005 Łódź, ul. Wólczańska 223  
tel. 84-80-01**

The Faculty of Technical Physics and Applied Mathematics of the Technical University of Łódź was created in 1976 originating from two previously established divisions: Technical Physics in 1974 and Applied Mathematics in 1975. The Faculty included the Institute of Physics and the Institute of Mathematics. The Institute of Computer Science joined the Faculty in 1980 and in 1988 the decision of forming of the Laboratory of Computer Networks was undertaken.

Prof. Jan Karniewicz was the organizer and the first Dean of Faculty of Technical Physics and Applied Mathematics (1976-1981). Subsequently, Doc. Andrzej Lipiński (1981-1983) and Prof. Edward Kącki (1983-1986) held this post.

At present, students are educated in Technical Physics in the field of Solid State Physics and Applied Mathematics, in the field of Statistics, Differential Equations and Computer Science. 191 students study in the Faculty in academic year 1988/1989. There is also an opportunity of postgraduate studies in the Faculty.

Graduates of the Faculty are employed at universities and research institutes of Polish Academy of Sciences, industrial laboratories, design offices and institutions of Health Service.



First Solemn Inauguration of Academic Year of Faculty

There are 305 graduates of the Faculty, 168 graduated in Technical Physics and 137 in Applied Mathematics. It is worth mentioning that 33 of them graduated with honour degree. A big number of graduates of the Faculty work abroad or study as postgraduate students at foreign universities. That proves the right selection of subjects at the Faculty.

The academic staff of the Faculty consists of 6 professors, 10 docents, 16 senior lecturers, 84 doctors, 43 senior assistants and 5 junior assistants, 93 non-academic workers are also employed at the Faculty. (see Introduction-University Staff).

Since 1987 the post of the Dean of the Faculty of Technical Physics and Applied Mathematics has been held by Doc. Antoni Drobniak, the post of the Dean of Scientific Research by Prof. Maciej Krakowski and the post of the Dean of Education by Doc. Celina Malinowska-Adamska.

The Faculty's Council consists of Doc. Przemysław Adamski, Doc. Czesław Balcerzak, Doc. Antoni Drobniak, Prof. Izidor Dziubiński, Prof. Jan Karniewicz, Prof. Edward Kącki, Prof. Andrzej Lipiński, Doc. Celina Malinowska-Adamska, Doc. Roman Małecki, Doc. Włodzimierz Nakwaski, Doc. Andrzej Opanowicz, Doc. Tadeusz Sródka, Prof. Tadeusz Świątkowski. Moreover, the Council includes delegates of political and social organizations, Division of Military Study, and deputies of the rest of academic staff. The representatives of student organizations also take part in the Faculty Council.

Research activities of the Faculty are developed by its institutes and cover both fundamental and applied studies.

The Institute of Computer Science carries out research in computerization of technological processes with application of microprocessors, applying computers for digital simulation and digital algorithms for optimization of processes. The Institute takes part in two Central Programs for Development and Research.

The Institute of Mathematics carries out research in real and complex analysis, theory of optimal control and probability. The Institute takes part in Central Program for Fundamental Research.

The Institute of Physics carries out theoretical and experimental research in Solid State Physics with special attention



paid to fundamental processes during formation of inorganic and organic crystals including liquid crystals. Investigation of physical properties of solid state materials and interaction with electromagnetic radiation is another branch of research activity of the Institute. The Institute takes part in four Central Programs for Fundamental Research and six Central Programs for Development and Research.



First Graduates of the Faculty of Technical Physics and Applied Mathematics

The Laboratory of Computer Networks started research program on Local Area Networks including particular needs of Technical University of Łódź. They also collaborate with industry and Polish and foreign research institutes. This unit cooperates with the Institute of Computer Science in education of computer science experts.

Since the foundation of the Faculty, 6 persons have received degree of docent and 66 of doctor. Two persons received the title of professor.

The Faculty has closed links with many research institutes and industry, particularly the Institute of Physics which has scientific

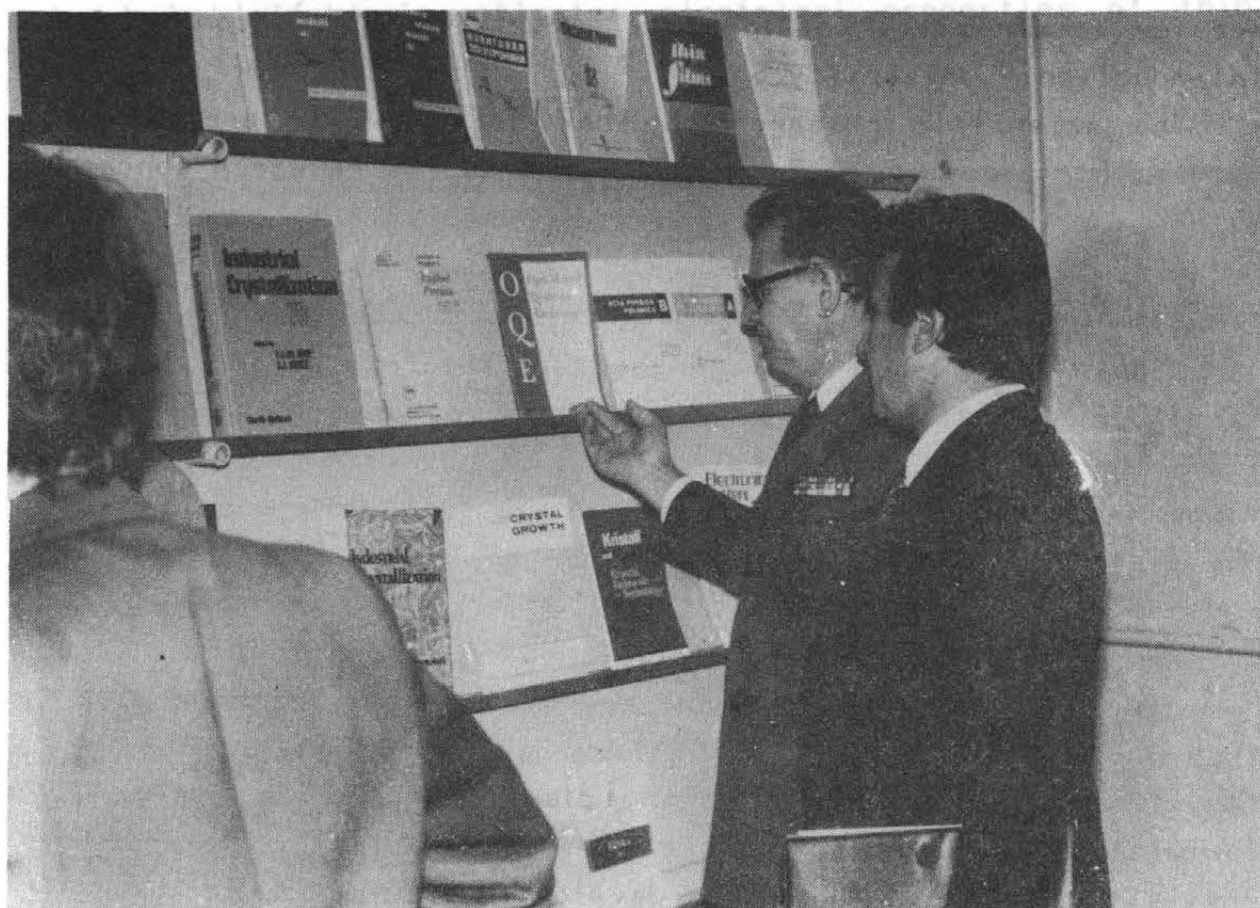
relations with many countries. This results in the close contact with leading laboratories in all of the disciplines represented by the Institutes of the Faculty.

There are three students' scientific societies in the Faculty: Society of Physicists, Society of Mathematicians and Society of Computer Scientists. Their activities are closely linked to research projects conducted by the Institutes.

The Activity of political and social organizations is very significant. Special attention should be paid to achievements of members of Students Sport Association, who participated successfully in university competitions.

#### THE INSTITUTE OF PHYSICS 1-3

The Institute of Physics of the Technical University of Łódź is temporarily situated in the old building, 219 Wólczańska Street, tel. 36-31-39.



The Ceremony of the Tenth Anniversary of the Institute of Physics

The Institute was organized in 1970 by fusion of two Chairs: the Technical Physics Chair of the Electrical Engineering Department and the Physics Chair of the Chemistry Faculty. Both Chairs had existed since 1945. The Institute of Physics was organized by Prof. Jan Karniewicz who was also its first director from 1970 to 1983. From 1983 to 1986 these duties were performed by Doc. Andrzej Lipiński.

Since 1986 Doc. Antoni Drobniak has been the director of the Institute. Vice - director for scientific research. Doc. Andrzej Opanowicz, and Doc. Andrzej Lipiński vice - director for education, and dr Tadeusz Majchrzak for management and technical matters.

The staff of the Institute includes: Doc. Przemysław Adamski, Doc. Czesław Balcerzak, Doc. Antoni Drobniak, Prof. Jan Karniewicz, Doc. Andrzej Lipiński, Doc. Cecylia Malinowska-Adamska, Doc. Włodzimierz Nakwaski, Doc. Andrzej Opanowicz. 5 senior lecturers, 31 doctors, 13 senior assistants, 10 assistants, 1 trainee assistant, 33 engineers and technicians, 6 office workers and 7 service workers. Its total number amounts to 114 persons. (see Introduction - University Staff).

The scientific research in the Institute is carried out within the framework of Technical Physics. The research concerns mainly specialization of Solid State Physics. It is carried out in six research groups.

1. The Group of Monocrystal Physics is supervised by Prof. Jan Karniewicz. The group is engaged in theoretical and experimental investigations of crystal growth mechanisms (focusing on elementary processes), investigations of physical properties of monocrystals (e.g. electrooptical phenomena) and modelling of physical phenomena taking place in solid-state emitters of radiation.

The main achievements of the group are: elaboration of manufacture technologies of tens of monocrystals utilized in science and technology, development of theoretical and experimental methods for investigation of processes taking place during crystal growth, formulation of the theory connecting electrooptical phenomena in crystals with their structure, development of the theory of the self-consistent field for investigations of dynamic and thermodynamic

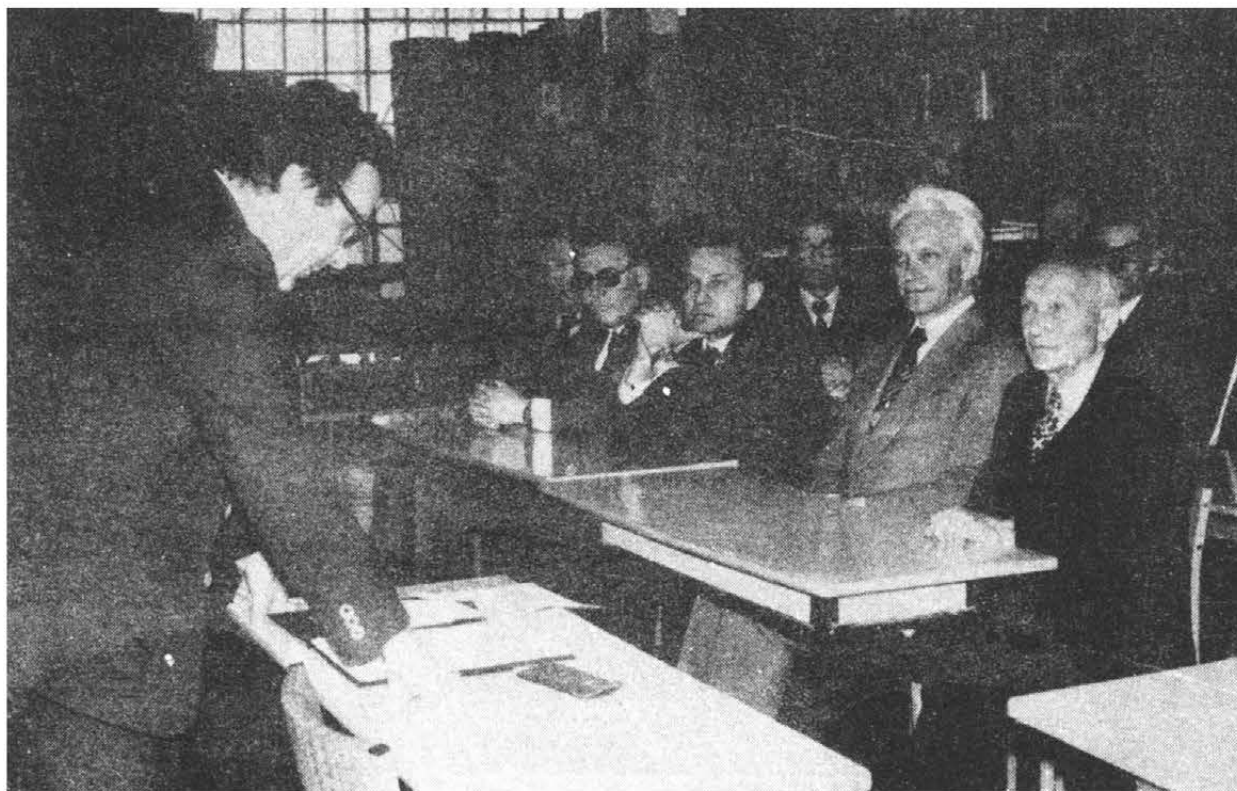
properties of a lattice of atomic crystals as well as formulation of an entire set of thermal models of solid-state emitters of thermal models of solid-state emitters of radiation.

The group has created the scientific Łódź School of Crystal Physics.

2. The Quantum Electronics group supervised by Doc. Antoni Drobnik carries out investigations of interaction of laser beam with matter (including biological tissues) and investigations in the field of quantum electronics and nonlinear optics.

The main achievements of the group are: elaboration of the technology for producing diamond-like layers applied in mirrors of CO<sub>2</sub> lasers, elaboration of the method for protection of optical elements against atmosphere influence, application of laser beams to modify the surface properties of metals and dielectrics, application of lasers for treatment of skin abscess and port vein stains.

3. The Group of Physics of Dielectrics managed by Doc. Andrzej Lipiński investigates electrical properties of thin organic films and macroscopic properties of liquid crystals as well.



The Ceremony of the Tenth Anniversary of Institute of Physics  
Scientific Session

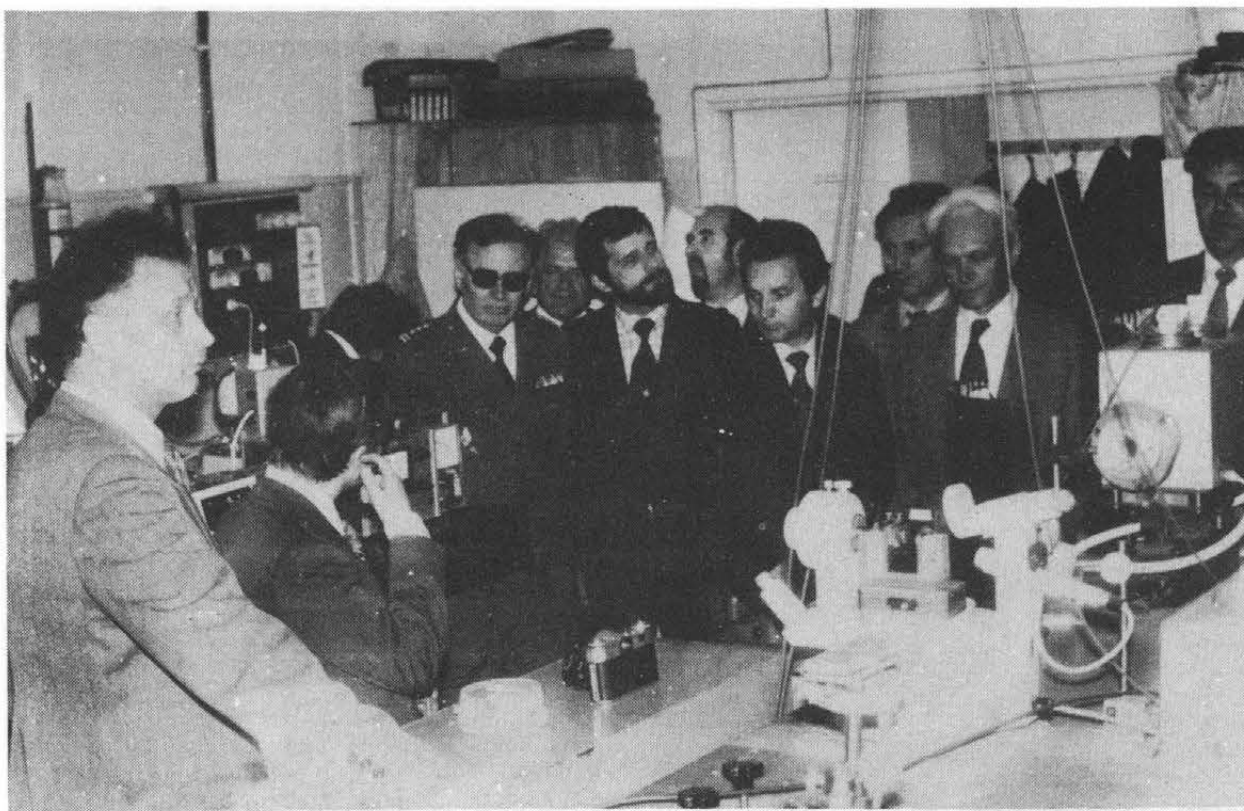


The main achievements of the Group are: description of electron transport mechanism and dielectric dispersion in wide range of frequency in organic films; preparation of thermographic indicators for diagnostics.

4. The group of physicists "Liquids and Solutions" managed by Doc. Przemysław Adamski investigates physical properties of cholesteric liquid crystals. The main achievements of this group are: determination of temperature dependence of molecular order parameter  $S$  in cholesteric and smectic mesophase, determination of temperature dependence of polarisability and birefringence of liquid crystals layers.

5. The group of Semiconductor Physics is concerned with the investigations of the physical properties of semiconductors and insulators. The head of this group is Doc. Andrzej Opanowicz.

The development of the new method of the analysis of electron thermostimulated processes in semiconductors and insulators and the determination of the electronic structure of the  $\text{In/p-CuInS}_2$  and  $\text{In/p-CuInSe}_2$  rectifying contacts are the main achievements of this group.



The Ceremony of the Tenth Anniversary of the Institute of Physics

6. The Biophysics group, managed by Doc. Czesław Balcerzak, is engaged in investigations of ionic transport through artificial and in natural membranes and in other biophysical problems.

During the existence of the Institute 35 persons received PhD degrees, 7 - docent degrees, 9 - expect to be promoted for docents and 1 to become professor. The scientists from the Institute are the authors and co-authors of 2 monographs, many university textbooks, hundreds of papers and conference reports. Most of the publications appear in well known international scientific journals. Only in 1987 there were 32 papers published abroad, 15 reports presented during international conferences and 22 papers being in print.

The Institute cooperates with the Polish Academy of Sciences and with many Universities and Technical Universities in Poland. The effects of this cooperation are numerous publications and conferences (local and international), reviews of publications etc.

During the current 5-year plan the Institute takes part in realization of 10 topics of the central programs of the fundamental (CPBP) and applied (CPBR) research.

The Institute cooperates with industry, especially in constructing unique apparatus or making specialized measurements.

For many years the Institute has cooperated with foreign scientific centres. This cooperation is based on exchange of experience, joint research, contributions to international conferences and designing of research apparatus. The latter is realized in the Interkosmos program in cooperation with the institutes of the Soviet Academy of Sciences. The results of this cooperation are joint publications, a few PhD degrees received abroad and an opportunity of close contacts with the world of science.

The Institute offers lectures on physics and laboratory lessons to all faculties of the Technical University of Łódź. The laboratory lessons take place in the laboratories of classic and modern physics.



The scientists from the Institute organize lectures for postgraduates of some faculties of the Technical University of Łódź and in some other Universities in Poland and abroad.

The Institute organizes all the lectures on physics for the Department of Technical Physics and Applied Mathematics - the fundamentals as well as specialized topics for the Technical Physics and Physics of the Solid State specializations. Apart from the lectures, the laboratory classes are specially important - the laboratories of Solid State Physics, Solid Crystals Physics, Liquid Crystals Physics, Low Temperature Physics, Vacuum Physics and Quantum Electronics were organized.

The Institute supervises the MSc theses on Technical Physics and Solid State Physics. They are carried out in the laboratories of the scientific groups. Their topics are most often parts of more general research problems of the Institute.

So far the Institute has educated 168 graduates with titles of MSc engineers of Fundamental Problems of Technics specialized in Technical Physics. Many of them are employed by the Institute of Physics at the Technical University of Łódź, by other institutes of the Technical University or other Polish Universities, by industrial laboratories, medical centres etc. Many graduates continue their education at postgraduate studies in Poland and abroad.

In the Institute works the Young Physicist Scientific Circle. Its members take part in national symposia of the Students' Scientific Associations. The Association organizes a number of scientific camps, during which its members present their papers.

THE INSTITUTE OF MATHEMATICS, 1-2  
Al. Politechniki. tel. 36-11-14

The Institute was established in 1970, when the Mathematical Divisions of the Mechanical Engineering Department (run successively by Professors Witold Pogorzelski, Zygmunt Charzyński and Lucjan Siewierski), the Chemical Department (run successively

by Professors Edward Otto, Witold Janowski and Włodzimierz Krysiński) and the Electrical Engineering Department (the head of which was Doc. Danuta Sadowska) were merged into one body.

The first Head of the newly established Institute became Doc. Izydor Dziubiński. Now, this office has been held for the second term by Prof. Tadeusz Świątkowski. His deputies are: Prof. Izydor Dziubiński who is in charge of the research activities and Doc. Tadeusz Sródka who is responsible for teaching.



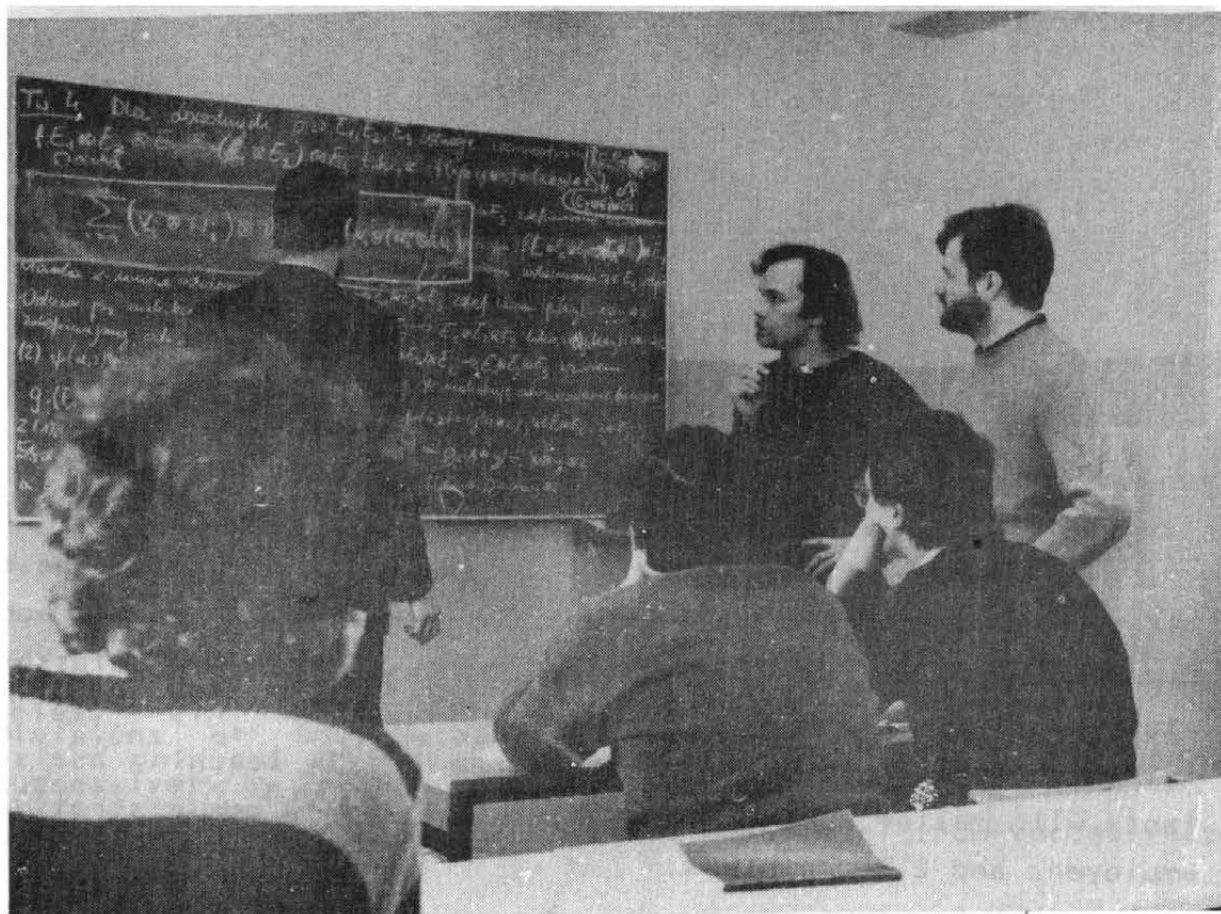
Group of workers of the Institute of Mathematics

The staff of the Institute includes, apart from these mentioned above Prof. Włodzimierz Waliszewski and Prof. Leon Mikołajczyk, who work part-time here, Emeritus Professor Włodzimierz Krysiński, still very active in his field, 49 mathematicians with doctor's degree and 14 teaching assistants with master's degree. Besides, there are 4 administrative employees and 2 technicians.

The main areas of research activities of the Institute are: real and complex analysis, partial differential equations, probability theory with mathematical statistics. The results of its investigations are presented on a number of seminars held weekly, the most interesting of which are: Seminar on Real Function Theory, supervised by Prof. Świątkowski, Seminar on Differential Equations, Supervised by Prof. Izydor Dziubiński and Seminar on the Probability Theory, supervised jointly by Prof. Włodzimierz Kryszicki and Doc. Tadeusz Sródka.

Moreover, a number of research works are carried out in Differential Geometry, Optimal Control Theory, Topology and Functional Analysis.

The basic activity in Real Analysis is concentrated upon the properties of functions and functional sequences in various topological spaces. Several results, concerning uniform and quasi-uniform convergence and compactness tests, formulated in terms of Dini-type theorem are widely recognized by specialists in this area.



Session of Society of Mathematicians

The particular interest of the analytic function division lies in the investigation of some important subclasses of Cartheodory functions and other classes of holomorphic functions and also in deriving of estimations of certain functionals, appearing in this theory.

Among the results, which have been recently obtained by the members of our Institute are: the theory of differential equations, the method of solving differential equations by means of functional series of a special type, the theory of abstract differential equations in Banach spaces and the theory of mixed boundary value problems.

The research activity in statistics includes: problems of estimations, compositions of distributions, investigations of properties of certain classes of distributions and some questions of the theory of reliability. One can mention results concerning the theory of estimations for both finite and infinite dimensional parameters.

Moreover, an interesting result has been recently obtained in the optimal control theory.

The Institute of Mathematics has been editing for several years its own scientific journal, entitled "Scientific Bulletin of the Technical University of Łódź, series Mathematics". All papers, appearing there are mentioned and reviewed in both "Mathematical Reviews" and "Referativnyj Zhurnal".

The Institute has close links with several Universities in Poland and abroad. Usually these have no formal character, individual cooperation and exchange take place.

More than one hundred doctoral degrees have been awarded by the Board of our Institute, the majority of them to mathematicians from other Universities.

It should be mentioned that within the framework of the agreement between Strathclyde University in Glasgow and Technical University of Łódź one member of our Institute has successfully completed his thesis in Glesgow and received Doctor's Degree of University of Strathclyde.

Moreover, the members of our Institute take active part in realization of Master's and Doctor's Projects of other workers of our University.



Publications of the workers of the Institute of Mathematics



For teaching purposes, the Staff of the Institute is divided into five groups, each of them is attached to a different Faculty. The most important is the Faculty of Technical Physics and Applied Mathematics, where we instruct future mathematicians and future members of the Institute.

Students of Applied Mathematics are offered courses leading to the Master's Degree in one of the following areas: mathematical statistics, differential equations and informatics.

Graduates in statistics are prepared to work either in scientific institutes or in industry, in units concerned with the quality control, reliability, data design.

Graduates in differential equations are prepared to work in institutes and laboratories, where the theoretical foundation of technical problems involves differential or integral equation, and in units concerned with hydro-and gasodynamics.

Outstanding students are offered the possibility of working according to the individually designed programs under personal supervision of the members of the Staff. Their interests can be developed thanks to participation in various forms of activity of Students' Mathematical Association.

The Institute has awarded more than 120 Master Degrees, 25 graduates have found jobs in our University - not only in the Institute of Mathematics.

One Master's Thesis was awarded a prize in the competition for "The Best Student's Work in Probability Theory and Applied Mathematics".

Two of our graduates, presently workers of the Institute have received a prestigious "Award of the Polish Mathematical Society for the Young Mathematicians".

Members of the Institute have written several lecture notes, handbooks, problem books and books popularizing mathematics,

INSTITUTE OF INFORMATICS I-1  
OF THE TECHNICAL UNIVERSITY OF ŁÓDŹ  
Director tel. 36-50-66

The Institute of Informatics is situated in Łódź, at 220 Piotrkowska Street.

The director of the Institute is Prof. Edward Kącki, the vice-director for didactic affairs - Dr. Krzysztof Bareła.

The academic staff of the Institute includes: Prof. Maciej Krakowski and Prof. Edward Kącki, and 4 senior lecturers, 10 doctors, 10 assistants, 14 engineering-technical workers, 4 administrative workers 2 charwomen (46 persons altogether). (see Introduction - University Staff).

The research carried out in the Institute is focused mainly on the following issues:

- a) use of computers in technological processes,
- b) computer techniques in engineering with the special emphasis on digital simulation methods,
- c) digital optimization algorithms for technological processes,
- d) computer analysis of electromagnetic fields,
- e) data collecting, filtering and exchange in multicomputer systems,
- f) basic software.

The Institute designs and implements computer - aided management systems in industrial plants.

The Institute cooperates with the Research and Development Centre for Textile Machine Building in Łódź and the Research and Development Centre for Cotton Industry in Łódź, with the Institute of Electrotechnics in Warsaw, with the Polish Mother's Health Centre and with the Brown Coal Mine in Bełchatów.

The seminars offered by the Institute for postgraduate students cover the following problems: 1) digital optimization algorithms for distributed parameters processes, 2) error detecting algorithms for logical networks and network reliability

testing methods, 3) computer simulation languages and their application to control systems analysis and synthesis, 4) computer control of technological processes, 5) functional analysis methods in technical and physical problems.

The Institute cooperates with the Process Automation Department of the Higher Chemical Institute in Sophia, with the Department of Computer Science of the University of Strathclyde in Glasgow, the Institute of Electronics and Informatics in Hanoi, with the Kiev Institute of Technology, and the Technical University in Dresden. Periodically, Polish-Bulgarian seminars are held aiming at exchange of scientific information and achievements.

The Institute conducts lectures, classes and laboratory classes teaching computer science to students of all departments (except Electrical Dept) and all kinds of studies. The hardware in the Institute includes: Odra 1305 computer with multiaccess and microcomputers: IBM PC/XT/AT, Amstrad 6128 and Maritum.

Since 1983 the Institute has been educating students who specialize in applied mathematics and major in computer science; in 1988 first students received their M.Sc. degrees in informatics. Graduates from the Institute can find employment in industry, administration, trade, and in research centres.

The Institute also offers two different two-semester post-graduate courses: Application of Informatics to Engineering and Informatics for Teachers, the latter designed for those teaching fundamentals of computer science in grammar schools. Moreover, training in microcomputers and their applications is conducted by the Institute members within the Open University.

Under cooperation agreement with the Higher Chemical Institute in Sophia, the two Institutes exchange student groups and organize practical training for them.

Members of the Student Informatics Society at the Institute take active part in seminars on construction and application of computers and microprocessors as well as in national conferences of student scientific societies.

## LABORATORY OF COMPUTER NETWORKS Z-1

The Laboratory of Computer Networks is the youngest research - teaching unit of the Technical University of Łódź. It was called into being on July 18-th, 1988, as a result of intensive preparations to a national high school computerisation programme developing The National Academic Computer Network.

The Laboratory, presently on the fourth floor of the Electrical Faculty building. 18/22 Stefanowskiego St., is to be moved to a separate residence at 187 Wólczajska St. The staff of the Laboratory consists of 12 persons: 1 docent, 3 doctors (adiunkts), 3 assistants, 4 technicians, 1 secretary (see Introduction - University Staff).

The research interests of the Lab focus on the theory, design and application of the Local Area Networks, including particular needs of the University itself. It develops projects in this field.

The teaching activity concentrates on lectures and classes in "Foundations of Computer Science" for students of Electrical and Textile Faculties, and some special lectures for students of Faculty of Technical Physics and Applied Mathematics. The Lab cooperates with the Institute of Computer Science in educating computer science engineers. Preparations to start a new course in "Control and robotics", in cooperation with the Institute of Control, are being made.

## **THE INSTITUTE OF CHEMICAL AND PROCESS ENGINEERING I-34**

**Director's office address: 90-537 Łódź, ul. Stefanowskiego 4-10  
tel. 36-49-23**

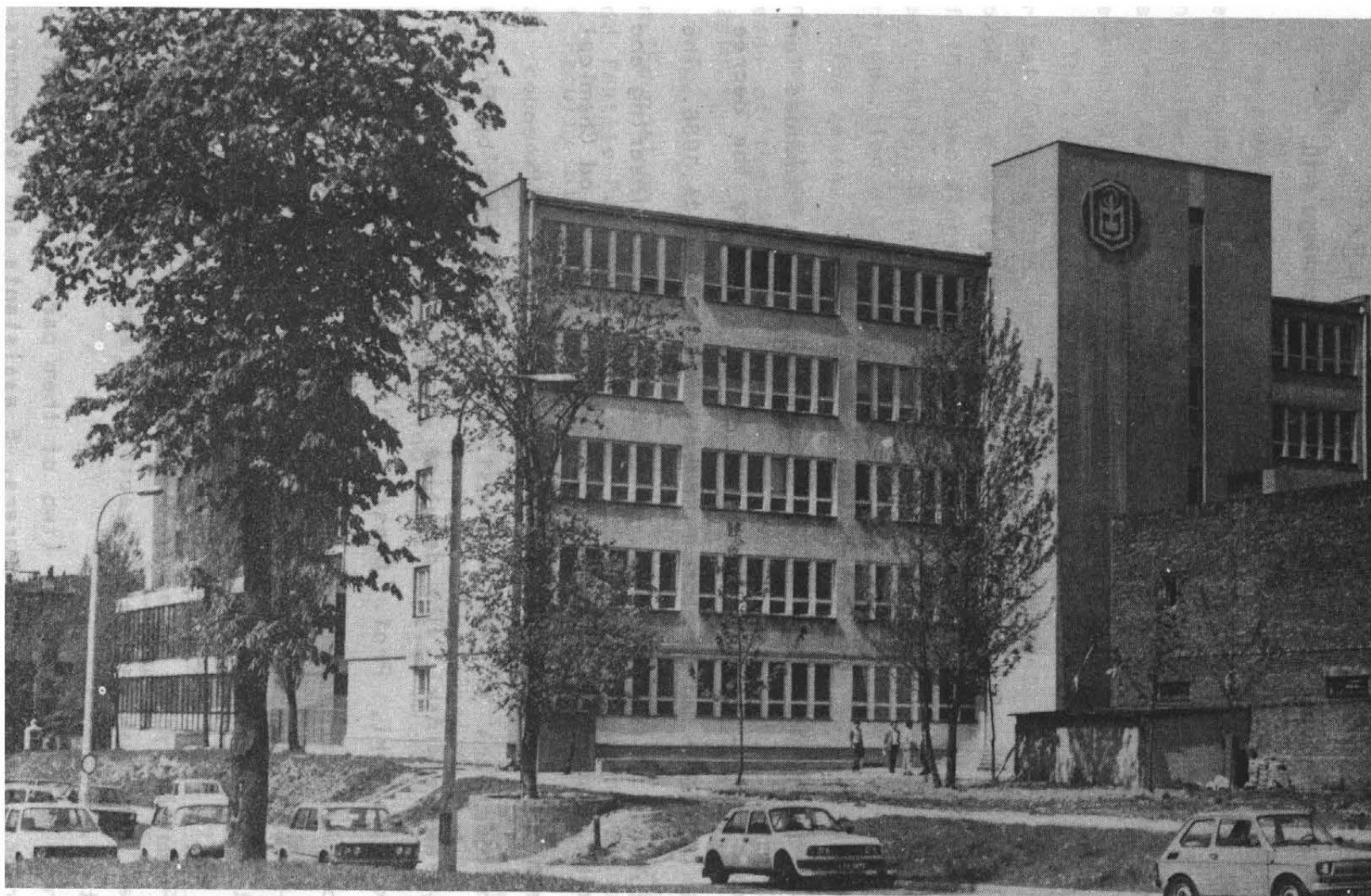
The Institute of Chemical Engineering was founded on September 1, 1970. It was given its present name by the decree of the Minister of National Education of June 14.1988. The Institute is a fusion of the Unit of Chemical Engineering and Equipment, Faculty of Food Technology and the Unit of Chemical Equipment, Faculty of Chemistry. It has faculty status.

In the years 1970-87 the Institute was directed by Prof. Mieczysław Serwiński. His deputies in that period were Prof. Henryk Błasiński, Prof. Czesław Strumiłło, Prof. Zdzisław Kembłowski, Prof. Stanisław Michałowski, Doc. Andrzej Heim, Doc. Henryk Michalski and Doc. Roman Zarzycki.

At present Prof. Zdzisław Kembłowski is the director and dean. Prof. Stanisław Michałowski deputy director for research, Doc. Roman Zarzycki, director for education and vice-dean, and Mr Adam Słoniowski, deputy director for administration of the Institute.

There are 5 professors (two of them part-time), 4 docents, 33 senior lecturers, 4 lecturers, 5 assistants and 74 members of technical staff and administration. (see Introduction - University Staff).





Institute of Chemical and Process Engineering: the main building

Research and education are realized in the Institute by the following divisions and research groups:

1. Chemical Equipment Division, Head: Doc. Andrzej Heim.
2. Bioprocess Engineering and Thermal Processes Division,  
Head: Prof. Czesław Strumiłło,
  - a) Thermal Processes Group,  
Head: Prof. Czesław Strumiłło,
  - b) Bioprocess Engineering Group,  
Head: Doc. Henryk Michalski.
3. Process Engineering Division,  
Head: Prof. Zdzisław Kemblowski,
  - a) Distillation and Extraction Group,  
Head: Prof. Mieczysław Serwiński,
  - b) Fluid Dynamics Group,  
Head: Prof. Zdzisław kemblowski,
  - c) Diffusional Mass Transfer and Chemical Reactors Group,  
Head: Doc. Roman Zarzycki.

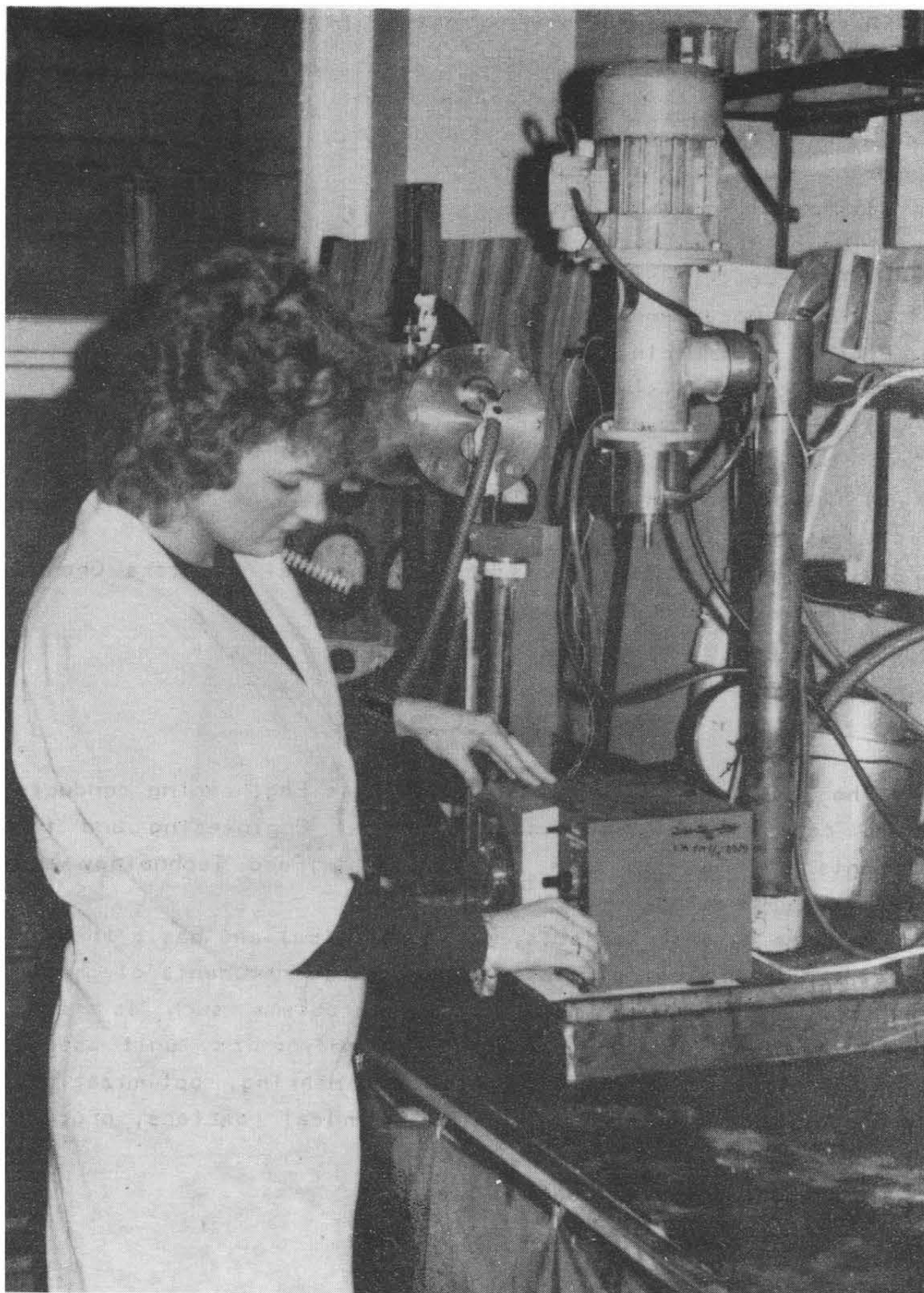
### Education

The Institute of Chemical and Process Engineering conducts M.Sc. courses for students of Chemical Engineering and for students of the Faculties of Chemistry, Food Technology and Textile Engineering.

Besides general subjects, socio-political and basic theoretical and technological classes, courses for students of Chemical Engineering deal with specific problems such as fluid mechanics, heat transfer, process thermodynamics, unit operations, process equipment, process engineering, optimization, technology and systems engineering, chemical reactors, process dynamics and control.

There are three graduation fields:

- chemical engineering,
- process equipment,
- bioprocess engineering.



Testing stand for grinding in perl mills

Before the Institute was founded the members of the staff of the former Unit of Chemical Engineering and Equipment and the Unit of Chemical Equipment conducted courses in Chemical Engineering at the Faculties of Chemistry and Food Technology. In this specialization 191 students and 42 extramural students were graduated in the years 1951-74. In 1974 first graduates of the Faculty of Chemical Engineering were promoted. In the years 1974-1988 the Institute graduated 497 students. In the academic year 1988/89 there are 176 students at the Faculty of Chemical and Process Engineering. In the Institute there is the Students' Scientific Society with about 30 members.

### Research activity

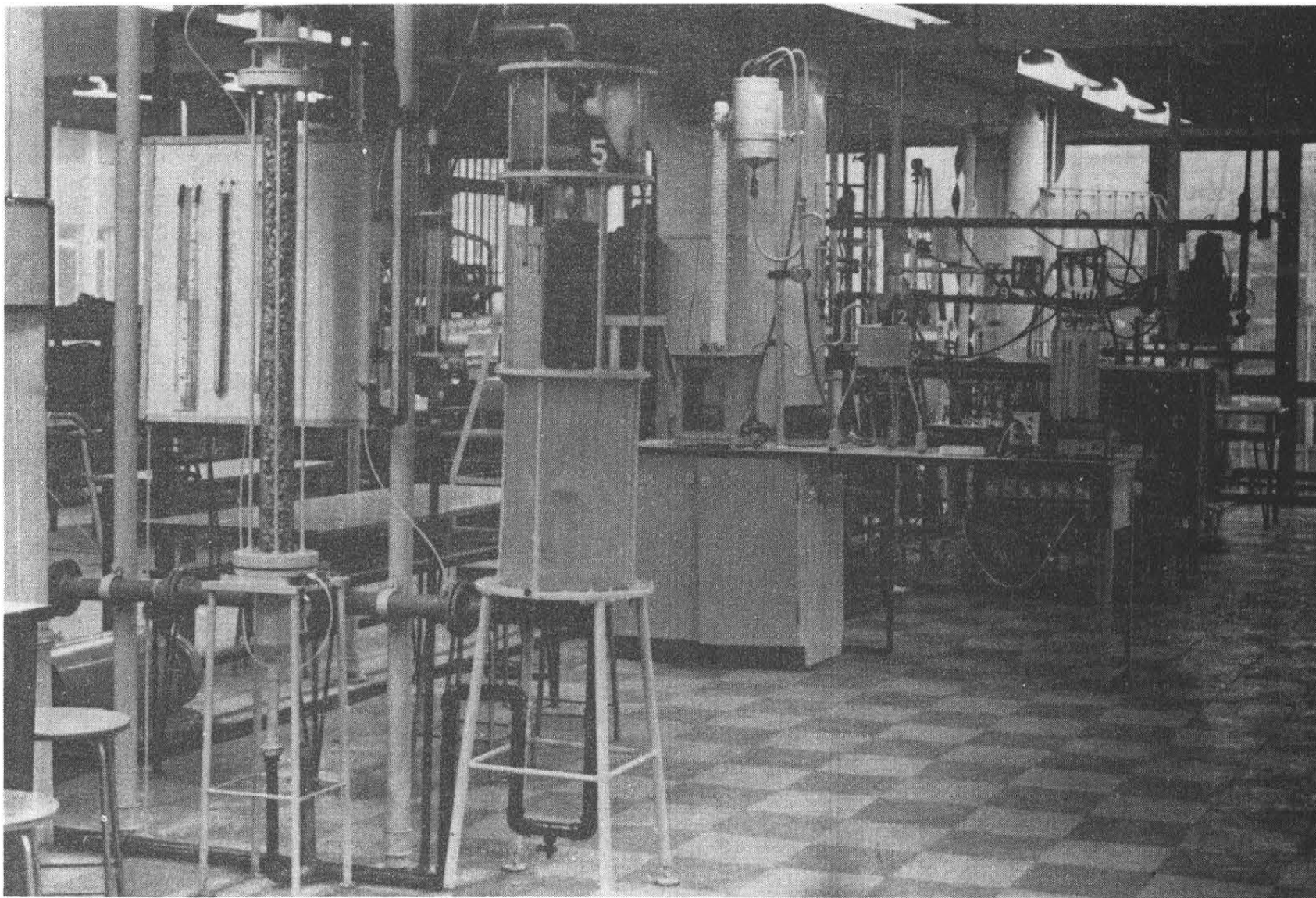
The main subjects of research carried out in the Institute of Chemical and Process Engineering are:

- mixing and mechanical operations on granular material (grinding, granulation, particle size distribution),
- non-Newtonian fluid engineering,
- drying theory, modelling and optimization of dryers,
- diffusional mass transfer in the processes of distillation, absorption, adsorption and extraction,
- chemical reaction engineering,
- bioprocess engineering.

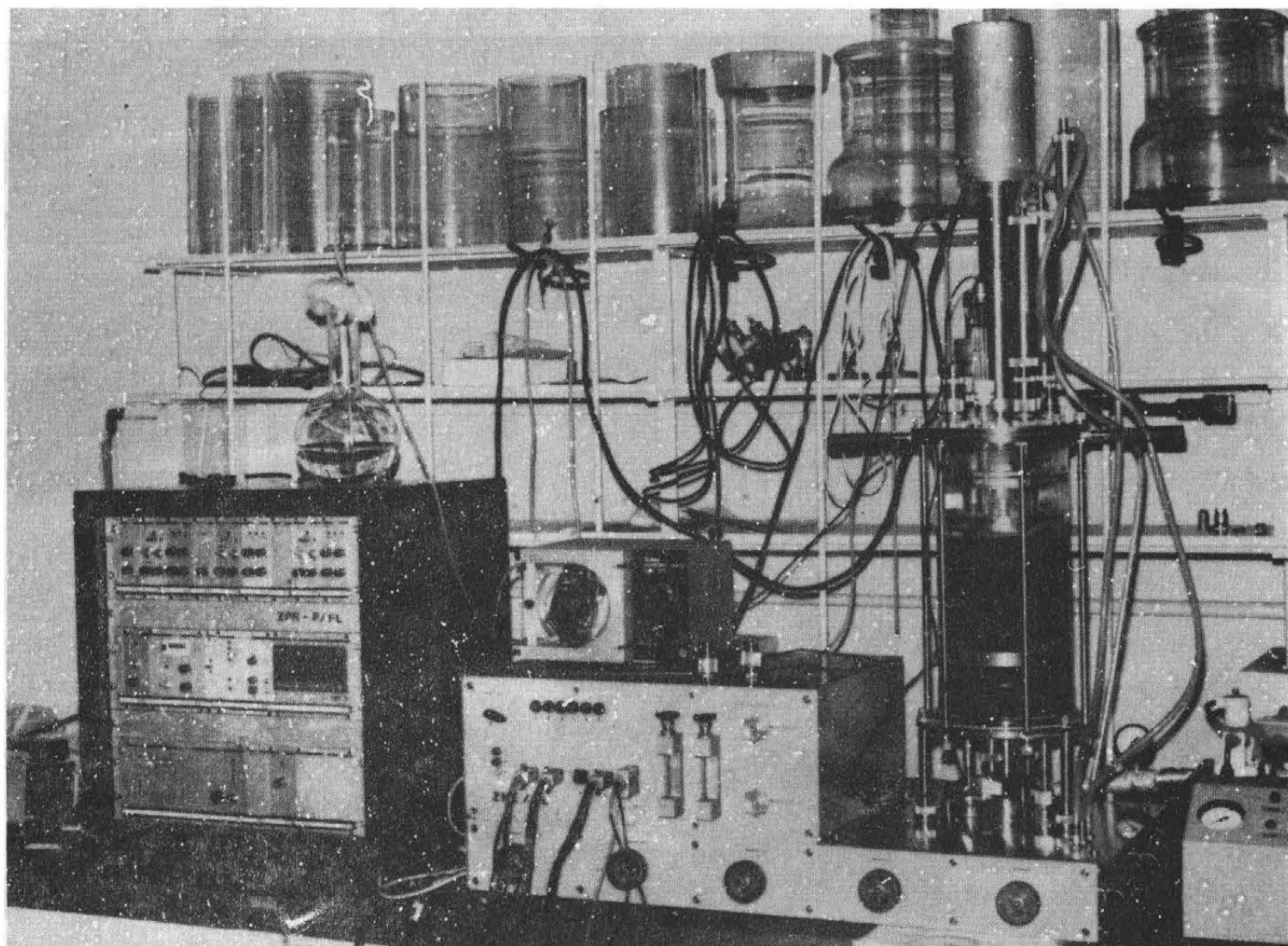
Until the year 1976, when the Scientific Board of the Institute acquired the right to confer PhD degrees, in the former Unit of Chemical Engineering and Equipment and the Unit of Chemical Equipment, and then in the Institute of Chemical Engineering, 26 PhD theses were prepared. In the period from 1976 to 1987 the Scientific Board of the Institute conferred 51 PhD degrees. Nine members of staff of the Institute obtained docent degrees.

Research carried out in the Institute is strictly connected with the Central Research and Development Programmes, particularly with:





Students lab of unit operations



Apparatus for testing mass transfer in bacteria growth processes



- CPBP 04.11 "Improvement of Biotechnological Processes"
- CPBR 3.20 "Scientific Foundations of Chemical Processes"
- CPBR 3.14 "Chemical and Bioprocess Engineering and Equipment"



Assembly of MULTIVIR dust separator in the mechanical workshop

Within the latter programme the Institute is the coordinator of the sub-programme "Bioprocess Engineering and Equipment for Biotechnological Processes".

Besides, the Institute cooperates with many branches of industry, such as sugar, pharmaceutical, dyes and man-made fibre industries for which it prepares numerous design projects.

The Institute of Chemical and Process Engineering cooperates closely with three universities in the United Kingdom, academic centres in West Germany, Canada, Czechoslovakia, Bulgaria and with the Hungarian Academy of Sciences.

In the years 1983-1988 the members of the Institute published 8 monographs, (7 abroad), 4 books, 8 handbooks for students, 51 papers in foreign scientific journals and 64 papers in Polish scientific journals. They obtained 48 patents.

#### Facilities

In the Institute there is a mechanical workshop with 11 workers whose task is to construct experimental set-ups for student laboratories and for research projects carried out by particular research groups.

In the library there are about 11.500 volumes, one half of which are monographs and scientific literature and the other handbooks for students. The collection includes 61 scientific journals, catalogues, standards, diploma theses and other works.

Political and social organizations active in the Institute are: Polish United Workers Party, Polish Teachers' Union and Polish Students' Association.

Dean's office, being at the same time the bureau of the Institute, is located in the building at 175, Wólczańska Str. The Institute owns two main buildings: one contains offices, auditoria and undergraduate laboratories, the other is a high-ceiling laboratory building of 1000 m<sup>2</sup>. Additionally, the Institute occupies rooms at the 3rd and partly on the 4th floor of the buildings at 12/16 Stefanowskiego Str. (Chemical Equipment Division) and at 4/10, Stefanowskiego Str. (Bioprocess Engineering Group).



# **THE INSTITUTE OF PAPERMAKING AND PAPER MACHINES I-4**

**Director's office address: 93-005 Łódź, ul. Wólczańska 219-223  
tel. 36-88-22**

## **1. HISTORY - DATES AND FACTS**

Short after establishment of the Technical University of Łódź in May 1945 Prof. Henryk Karpiński organized the Chair of Papermaking at the Mechanical Faculty. In 1949 the Chair of Paper Machines came into existence. It was headed by Prof. Józef Łapiński.

In 1952 at the Chemical Faculty of the University the Chair of Pulp and Paper Technology was organized and headed by its initiator Prof. Edward Szwarcztajn.

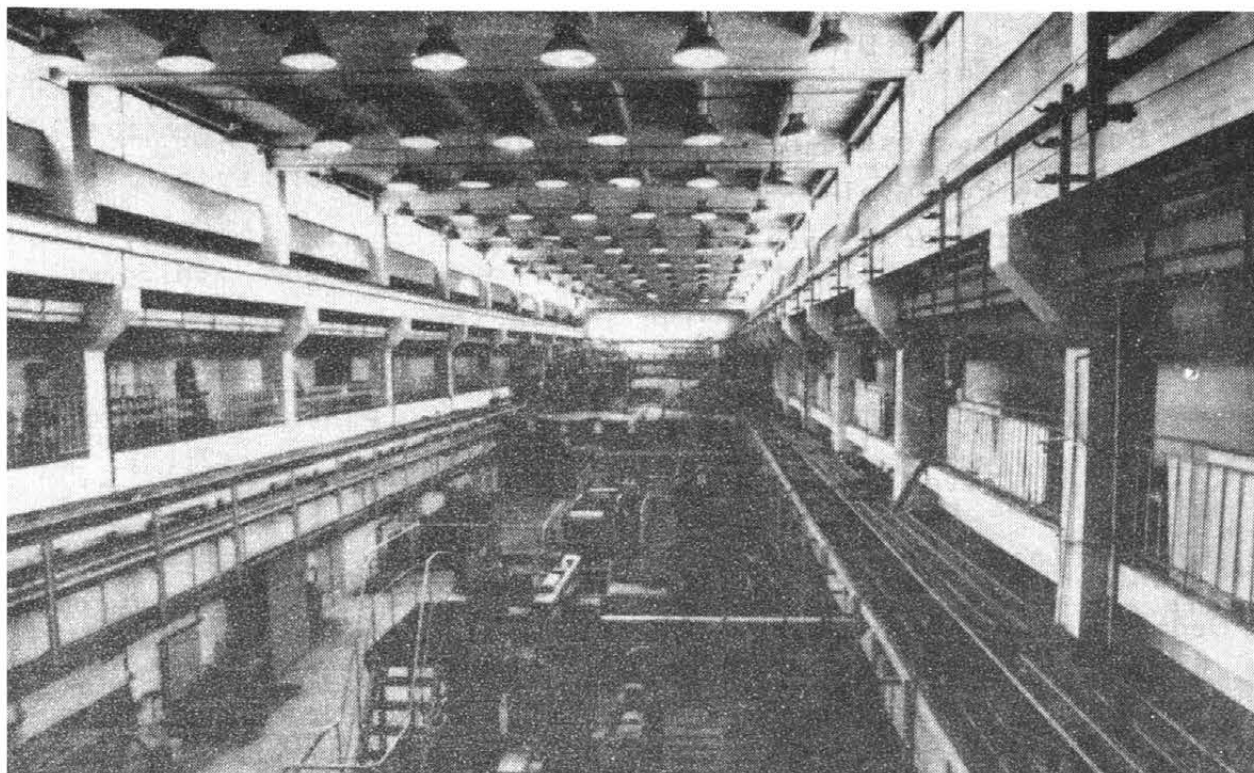
In 1970 as a result of fusion of the chairs engaged in papermaking research an interdepartmental Institute of Papermaking and Paper Machines was called into being, its head was Prof. Edward Szwarcztajn. At present the Institute is the only academic centre educating engineers in pulp, paper and paper converting technologies, construction and operation of machines and equipment for pulp and paper industry, as well as for fiber- and particle board, and for printing industries.

In 1979, thanks to the support of Polish paper industry, the Institute of Papermaking and Paper Machines received a new Building of Papermaking. It consists of 8-story building dedicated to scientific and educational activities, and the technological hall together with laboratory equipment and pilot installations.



Building with the technological hall of the Institute





Technological hall - inside



Apparatus for measuring the fibre length



## 2. DIRECTORS OF THE INSTITUTE

Prof. Edward Szwarcasztajn	1970 - 1979
Prof. Czesław Pustelnik	1979 - 1986
Doc. Kazimierz Modrzejewski	1986

## 3. ORGANIZATION

The Institute is composed of the following departments and teams:

- Department of Pulping - in charge of Prof. J. Rutkowski,
- Department of Papermaking - in charge of Doc. K. Przybysz,
- Department of Paper and Fibreboard Machines - in charge of Doc. W. Kawka,
- Department of Thermal Equipment and Converting Machines of Paper and Fibreboard Industries - in charge of Doc. W. Tarnawski,
- Team of Printing Machines - in charge of Doc. K. Stępniewski.

## 4. STAFF

The staff of the Institute includes 89 persons: professors - 2, docents - 5, senior lecturers - 3, doctors - 9, assistants - 4, administration staff - 7, technicians - 14. (see Introduction - University Staff).

## 5. EDUCATION

The Institute educates engineers with master of science degree in two faculties of the Technical University:

- a) Chemical Faculty - specialization in "Chemistry and Technology of Pulp and Paper" with three fields of graduation:
- pulp technology,
  - papermaking technology,
  - paper converting technology;

b) Mechanical Faculty - specialization in "Machines and Equipment of Paper and Woodworking Industries" with three Fields of graduation:

- machines and equipment of the fibre- and particle board industries,
- machines and equipment of the paper converting industry,
- machines and equipment of the printing industry.

Specialization studies are conducted in the Institute for full-time students, extra-mural students and evening studies. 920 full-time students graduated from the Institute. This number includes 485 engineers with specialization in mechanics and construction, and 435 engineers with specialization in chemical technology, 39 foreigners, mostly Hungarians, also a few Koreans and Hindoo are among them.

The extra-mural studies are conducted in the Chemical and Mechanical Faculties. This type of study is organized in dependance on industry requirements. Up till now 43 students graduated after completion of these studies.

Postgraduate courses create a possibility for improvement of qualification of technical personnel. The completion of these courses is required for getting the professional specialization by an engineer. 131 engineers completed postgraduate courses (50 chemists and 81 mechanics).

## 6. SCIENTIFIC RESEARCH

The Institute participates in realization of Central Research and Development Program - CPBR 15.4 - "Technology of Pulp and Paper" by carrying out 13 projects. Three additional projects are realized in three following subjects (1 in each):

- CPBR 3.1 Coking processes and technologies based on chemistry of coke,
- CPBR 6.5 Material-saving processing of wood (co-ordination of II stage of the project No. 121),
- CPBR 3.6 Auxiliary agents.

Basic research projects are carried out mostly as Institute's own projects or by order of Polish Academy of Sciences (PAN). Present research works are directed towards the following problems:

- basic studies and improvement of technology of processes in pulp and paper industry,
- improvement of design of paper, paper converting and printing machines,
- research in fraction of neutral compounds of sulfate soaps (work carried out by order of PAN).

During last 5 years 2 works qualifying for docent and 5 doctor's dissertations were completed in the Institute.

## 7. COOPERATION WITH INDUSTRY

The research works meeting the needs of national economy are being carried out within the CPBR or by direct orders of enterprises of:

- pulp and paper,
- paper- and fibreboard machine building, and
- printing industries.

The co-operation with industry resulted in several achievements, e.g.:

- development and implementation of a method for pulping the mixtures of hardwoods (Pulp and Paper Mill in Kwidzyn), allowing to obtain chemical pulps of full value;
- improvement of water and effluent management (pulp and Paper Mill in Swiecie);
- implementation of a new method for conditioning the paper machine press felts (Warsaw Paper Mills in Jeziora);
- application of home-made steam chambers (Paper Mills in Krapkowice);
- development of a device for manufacturing of photopolymeric printing plates (GRAFMAZ, Warsaw);
- design of the defiberizing screen (licence sold to FAMPA).

## 8. CONTACTS WITH OTHER COUNTRIES

For many years the Institute has cooperated with the following universities and academies educating personnel for pulp, paper and printing industries:

- Leningrad Technological Institute of Paper Industry,
- Technical University in Dresden,
- Technical University in Karl Marx Stadt,
- Academy of Chemistry and Technology in Sophia,
- Academy of Chemistry and Technology in Pardubice,
- Technical University of Slovakia, Bratislava,
- Technical University in Graz,
- Technical University in Darmstadt.

The co-operation with the above mentioned universities and academies comprises both teaching and research problems. The exchange of scientific workers and students is carried out. With partners in socialist countries the exchange of graduates has been started up with Leningrad Technological Institute of Paper Industry. Joint scientific sessions are organized, reports of common research works are published and common patents are developed.

## 9. LIBRARY

The Institute Library contains 4854 books and 1447 bound journals (32 titles). The Library also contains research reports, student theses and dissertations, standards and trade literature.

## 10. PUBLICATIONS

During last 5 years the employees of the Institute published 205 research reports (these include 25 reports in foreign journals), issued 2 sets of lectures run off on the duplicator and 1 monograph.



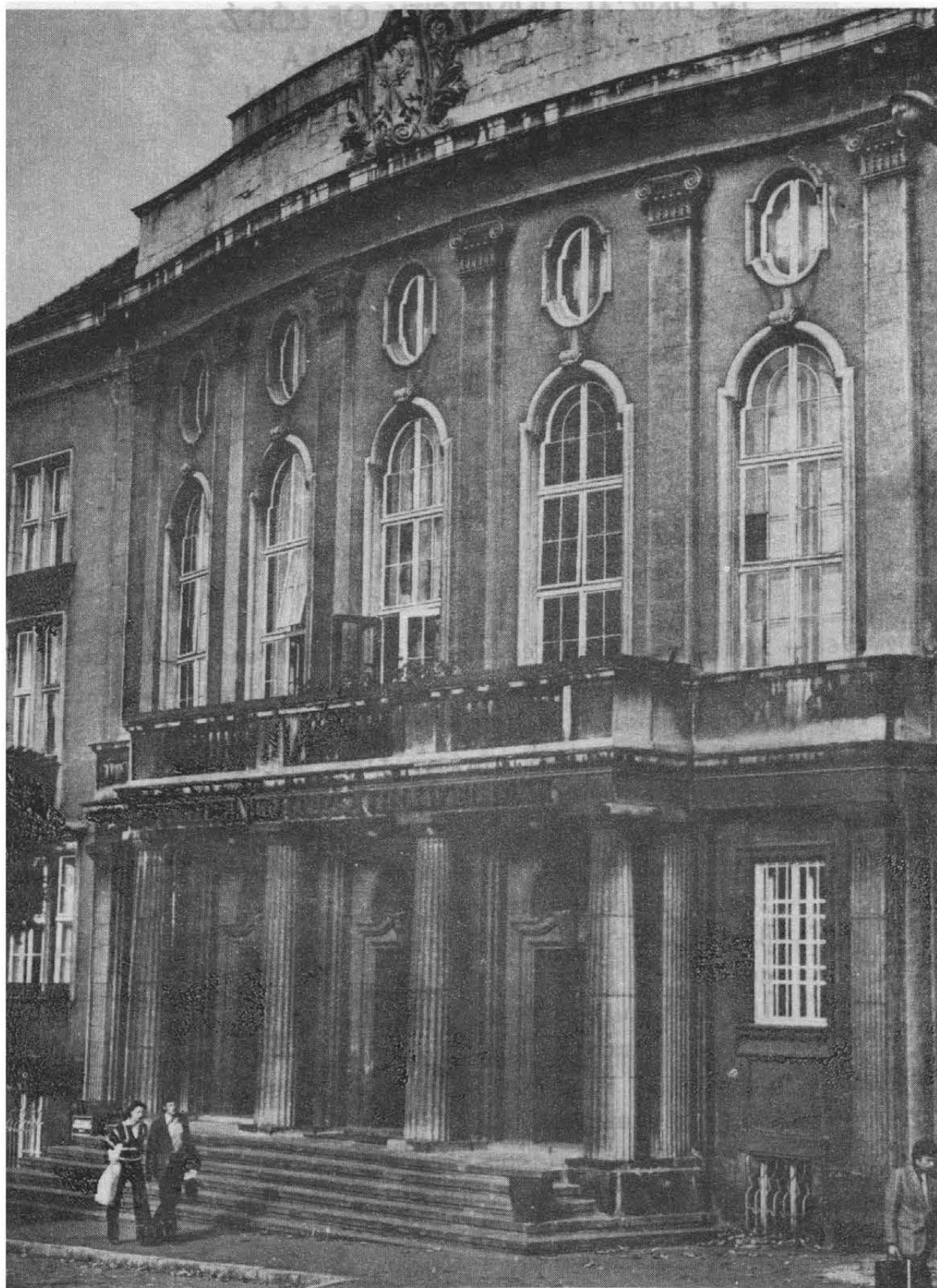
**TECHNICAL UNIVERSITY OF ŁÓDŹ  
BRANCH IN BIELSKO-BIAŁA  
FACULTY OF MACHINE DESIGN**

**Address: 43-300 Bielsko-Biała, ul. Findera 32  
tel. 270-61**

**HISTORY**

- 19.02.1966 - The Consulting Center of full-time and extramural studies of Textile Faculty is organized.
- 1969 - Łódź Technical University-Branch in Bielsko-Biała with two branches of faculties: Mechanical and Textile is established (Minister's decision on April 11<sup>th</sup>, 1969).
- 1971 - Branches of Institutes come into existence (including those of Applied Mechanics and of Construction).
- 1.10.1973 - New organization structure of the Branch is introduced.  
The Institutes: IT-S, IM-K, IW  
The Departments: Mat-Phy-Chem, Social Science, Foreign Languages, Physical Education and the Branch of Main Library are created.
- 1.11.1981 - Establishment of the separate Machine Building Faculty in which IT-S, IM-K, and Mat-Phy branches are included.
- 1985 - The chairs of Thermodynamics and Mathematics come into existence within Machine Building Faculty.
- 1988 - The new specialization of studies-Electrotechnics is set up (as a branch of Electric Faculty).





Faculty of Textiles - Bielsko-Biała Division. Main Building

Executive post: Branch: 1969 - 1970 - Prof. Grzegorz Urbańczyk (Chief of the Branch), 1970 - 72 - Doc. Przemysław Wasilewski; 1972 - 1978 - Doc. Przemysław Wasilewski (Prorector for Branch matters); 1979 - 80 - Prof. Jan Szadkowski; 1981 - 87 - Doc. Przemysław Wasilewski, since 1987 - Doc. Marek Trombski.

Machine Building Faculty: 1969 - 73 - Prof. Jan A. Wajand (1.9.1969 - 31.8.1971 vice dean of Mechanical Faculty for engineer's studies, 1.10.1970 - 31.8.1971 chief of branch of Mechanical Faculty; 1.2.1972 - 31.8.1973 vice dean of Mechanical Faculty); 1973 - 81 - Doc. Marek Trombski (vice-dean of Mechanical Faculty: (1981 - 87 - Doc. Marek Trombski, dean of Machine Building Faculty) since 1987 Prof. Jan Wajand. Vice-deans of Machine Building Faculty: Prof. Jan Szadkowski (1981 - 87), Doc. Kazimierz Maczyński (1981 - 87), Doc. Tadeusz Berowski (since 1.9.1987), Doc. Tadeusz Wojciechowski (since 1.9.87).

Textile Institute: 1969 - 73 Mr Euzebiusz Sobiczewski MSc, chief of Textile branch in Bielsko-Biała, since 1973 Prof. Andrzej Włochowicz Manager of the Institute; also in the years 1975 - 87 vice-dean of Textile Faculty for the Bielsko-Biała Branch, Doc. Janusz Bogusławski assistant manager of the Institute; since 1.9.1987 vice-dean of Textile Faculty for the Bielsko-Biała Branch.

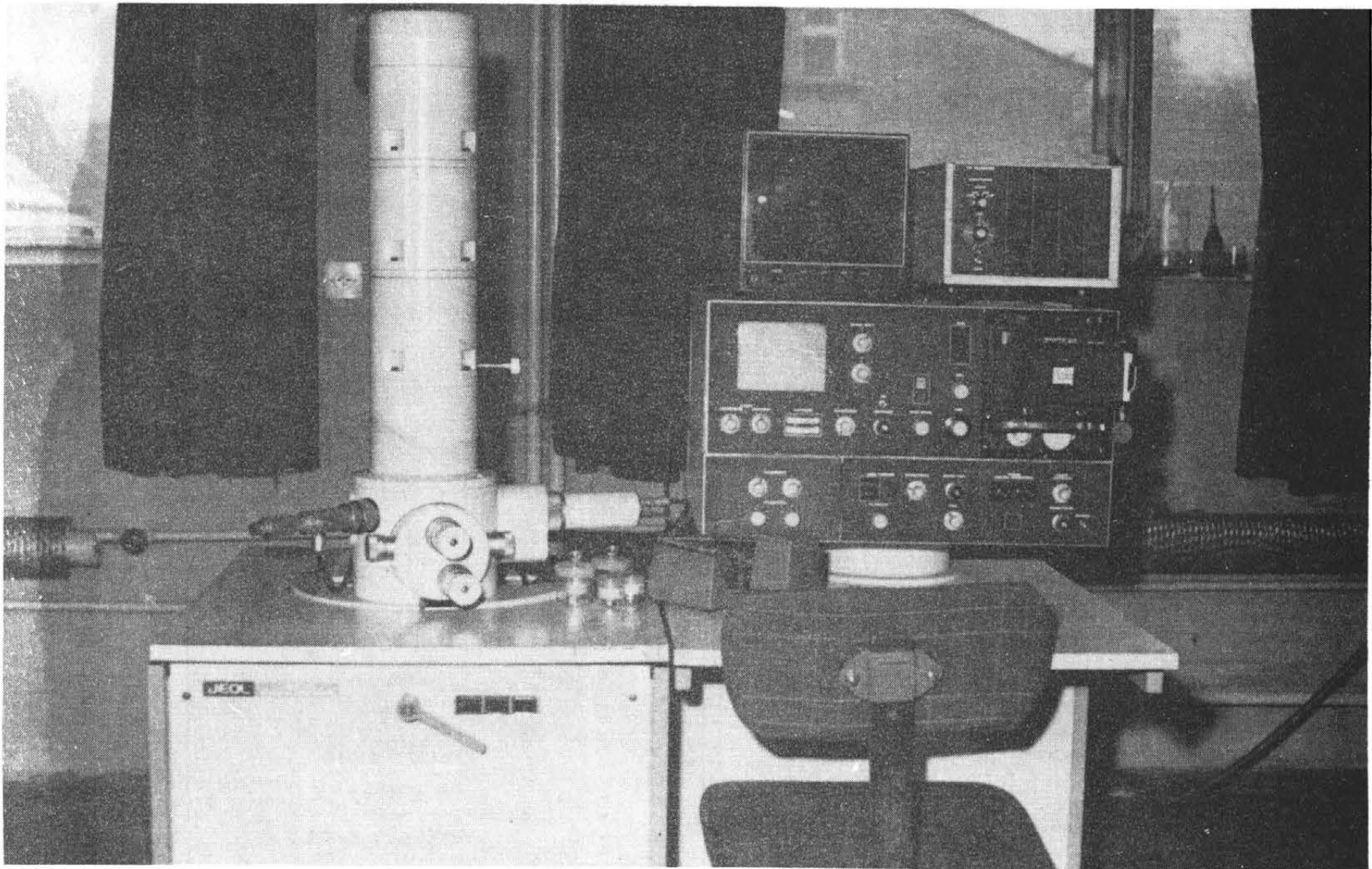
## THE PRESENT ORGANIZATION

### Organization Units

#### 1. Machine Building Faculty.

The Institute of Technology of Automobile Design: manager of the Institute - Doc. Przemysław Wasilewski, assistant manager - Prof. Jan Wajand.

Staff: total 159, including 30 research and teaching workers (2 professors, 3 docents, 15 doctors, senior lecturers 2, 2 lecturers, 6 assistant), 26 engineers and 3 members of administration,



Joel Scanning Microscopy ISH 15

The Institute of Mechanics and Construction: manager: Doc. Marek Trombski, assistant manager for teaching and education matters Doc. Andrzej Kowalski, assistant manager for scientific research and cooperation with industry Doc. Janusz Pacałowski.

Staff: total 160, including 30 members of academic staff, 1 professor, 8 docents, 14 doctors, 5 assistants, 1 senior lecturer, 1 lecturer, 28 engineers, 2 members of administration,

The Chair of Mathematics: manager: Prof. Janusz Matkowski.

Staff: total 12, including 10 members of academic staff, 1 professor, 6 doctors, 2 assistants, 1 senior lecturer 2 members of administration.

The Chair of Thermodynamics: manager: Prof. Stanisław Gdula.

Staff: total 9, including 6 members of academic staff (1 professor, 2 docents, 1 doctor, 2 assistants).

## 2. Textile Faculty.

The Textile Institute: manager: Prof. Andrzej Włochowicz; assistant manager Doc. Janusz Bogusławski.

Staff: 48, including 24 members of academic staff (2 professors, 3 docents, 14 doctors, 1 senior lecturer, 3 assistants, 1 research worker) 21 engineers, 3 members of administration

## 3. Interfaculty Units:

The Department of Political Science: manager: Dr Ludwik Hejny, Staff: total 8, including 5 doctors, 1 senior lecturer, 1 lecturer, 1 member of administration

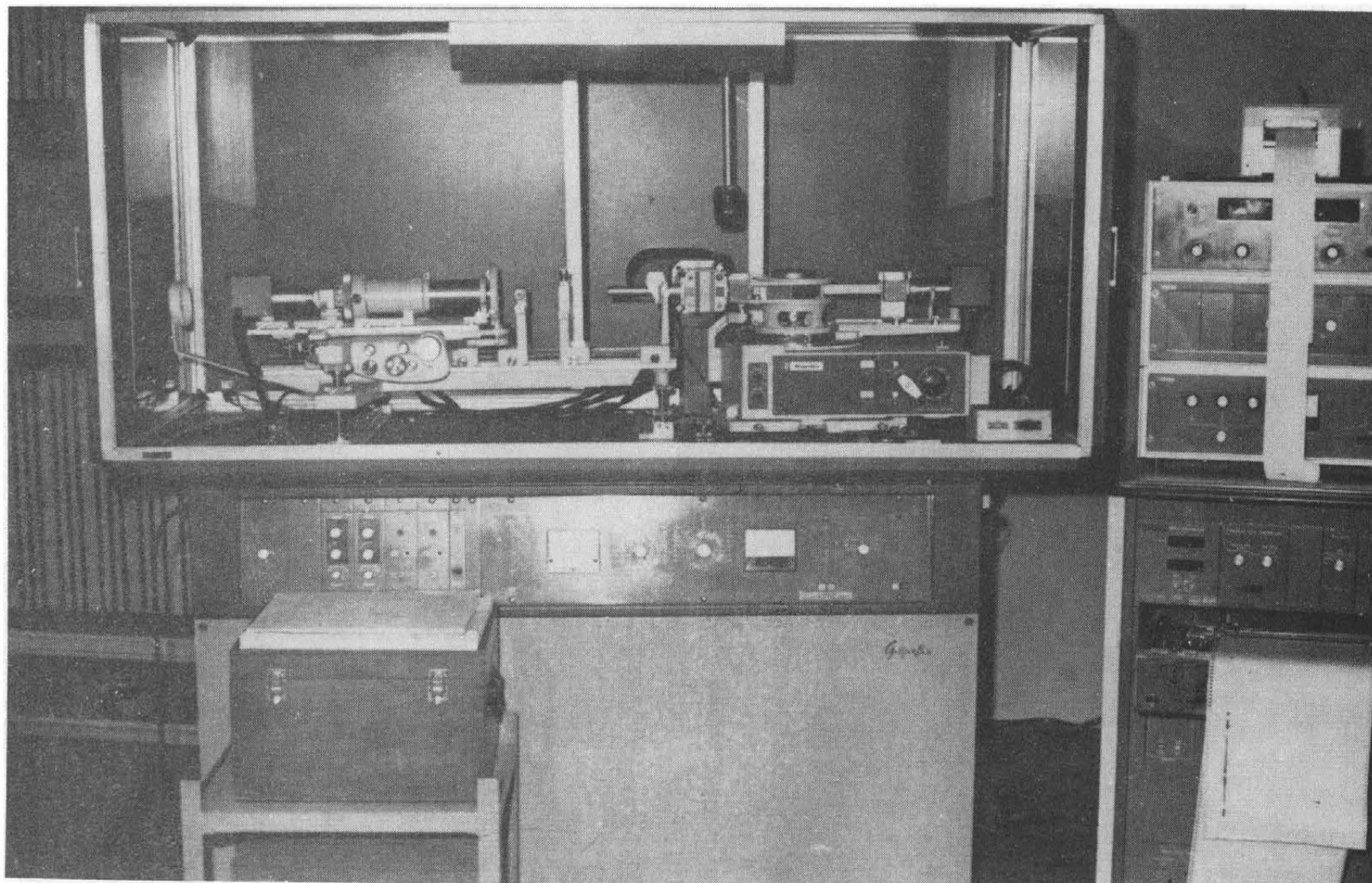
The Department of Foreign Languages: manager - Mrs. Teodora Twardawa, M.A. Staff: 6 (senior lecturers 2, lecturers 4).

Department of Physical Education: manager Mr. Jerzy Cwynar, M.A., Staff 4 (1 senior lecturer, 2 lecturers, 1 teacher) 1 administrative worker,

The Department of Military Training: manager Maj. J. Burad M.A., 4 (1 senior lecturer, 1 lecturer, 1 teacher 1 administrative worker

Library: manager Mrs. Halina Góral, M.A., 3 senior librarians, 1 librarian, 3 junior librarians).





Rigaku - Denki Roentgen Diffractometer (Japan)

## EDUCATION

1. Forms and Branches of Study. There are full-time, evening, extramural, University Extension courses granting both engineer and Master's degrees and post-graduate studies (facultative pedagogic studies for students). There are also forms of education to improve qualifications of the staff and industrial workers e.g. post-graduate studies of Organization and Administration in Metal Industry

### Branches of Study

- Mechanics; specializations: Motor-cars and tractors (diploma fields: construction of cars and tractors, utilization and repair technology of cars and tractors; construction and technology of motor-car body), -Textile Machine and Equipment (diploma fields: processing natural and mixed fibres machines), Power system and equipment (diploma fields: internal combustion engines, pneumatic and hydraulic equipment), Machine technology (diploma fields: founding, machining)
- Elektrotechnics,
- Textile Industry: specializations: Product Engineering of fibre (diploma fields: spinning, weaving, knitting), Chemical technology of fibre.

2. Graduates and Students. The total number of graduates exceeded 2000, including 1294 persons who graduated from the Machine Building Faculty (616 graduated since separate Machine Building Faculty was established, 77 in 1987/88) and Textile Faculty 730/45 in 1987/88). Most of the graduates (about 90%) are employed in Bielsko region industry.

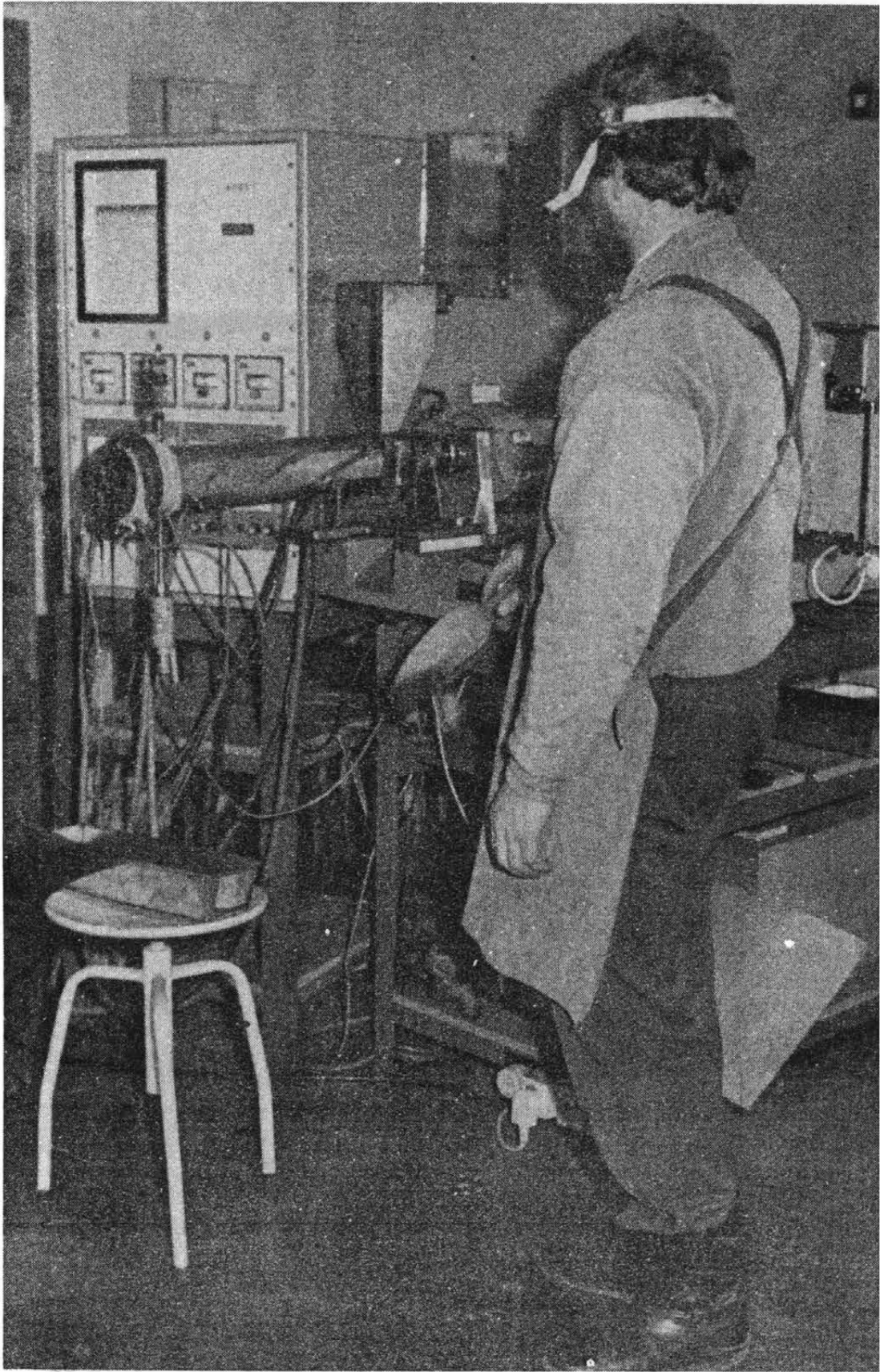
At present 575 students are studying, including 369 at Machine Building Faculty and 25 at Electric Faculty which is now being organized, 472 students are full-time students.

96 - attend evening studies

7 - attend University Extension.

In 1988 142 students were admitted, 122 as full-time students.





Brabender Extruder (GFR)

## SCIENTIFIC RESEARCH

1. Main areas of research

- Resistance, stability and dynamics of machine construction,
- Construction and utilization of vehicles (mainly fuel prime mover, power-transmission and braking systems),
- Construction, production and utilization of textile machines,
- Substitutes for machine production,
- Optimization of manufacturing processes (founding, machining, plastic working),
- Analytic and numeric problems dealing with thermal conduction,
- Rationalization of energy utilization,
- Structural research of chemical and natural fibres (woolen, carbon, polymer mixtures, copolymers),
- New techniques and technologies of fibre processing into textile goods,
- Assessment of changes in fibre quality and textile goods (among others caused by heat treatment).

2. Contribution to general research work:

CPBP: total-10 subjects including:

- Institute of Technology and Cars-3,
- Institute of Mechanics and Construction-2,
- Textile Institute-2,
- Institute of Thermodynamics-3,

CPBR: total-14 subjects including:

- Institute of Technology and Cars-6,
- Institute of Mechanics and Construction-4,
- Textile Institute-4,

RPBP: 2 subjects:

- Institute of Mechanics and Construction-1,
- Department of Politics and Social Science-1,

RPBR: 4 subjects:

- Institute of Technology and Cars-2,
- Institute of Mechanics and Construction-2.

### 3. Cooperation with industry

The total profit from projects carried out for industry and its research institutions is showing a tendency to increase - 1983 - 16,8 mln zł, 1984 - 27 mln zł, 1985 - 52 mln zł, 1986 - 90 mln zł, 1987 - 136 mln zł, 1988 - over 230 mln zł.

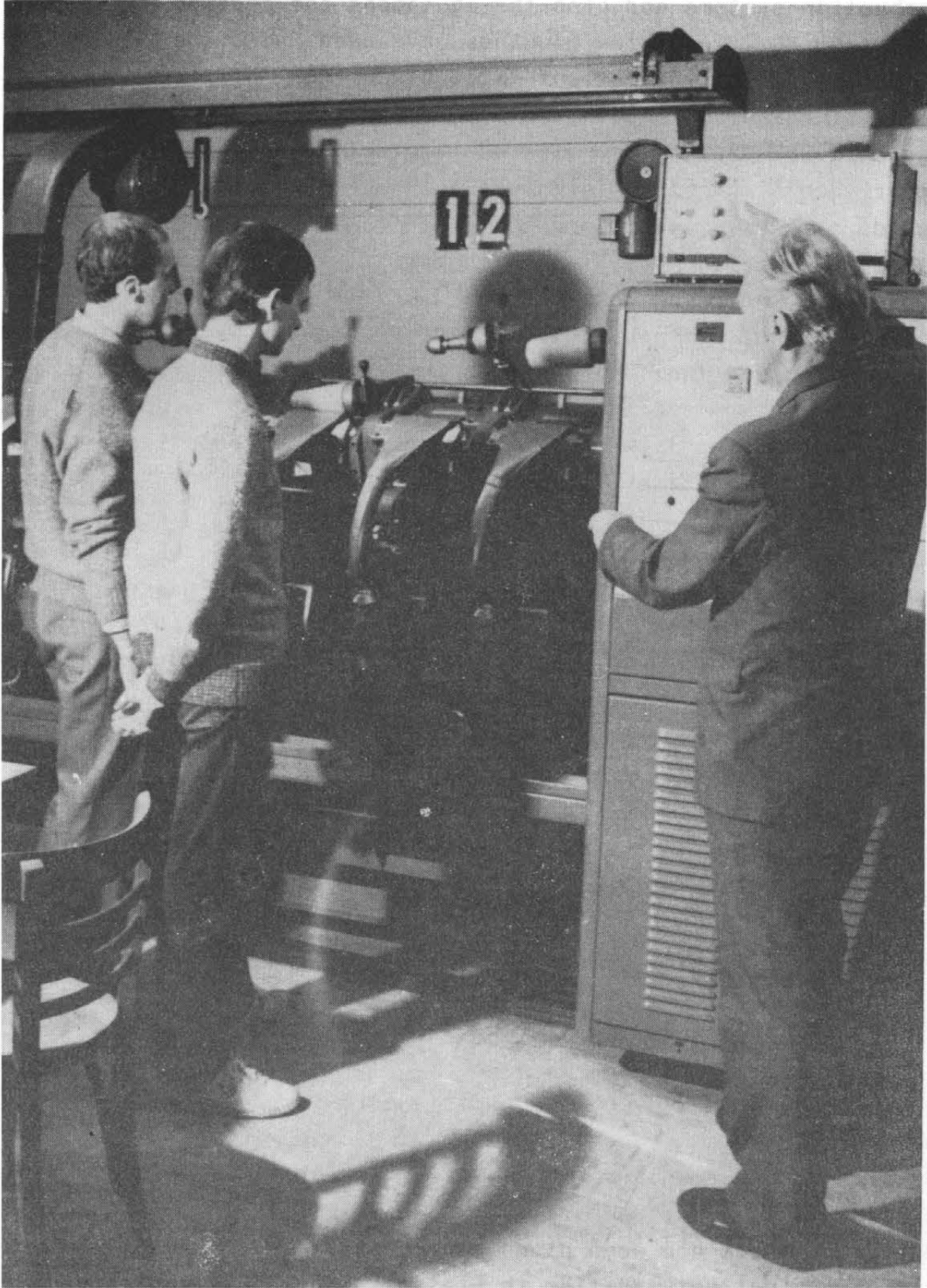
For many years such projects have been ordered by Center of Research and Development in FSM, Center of Research and Development of Textile Industry "Południe", Center of Research and Development of Spinning Machines Industry "Befametex", "Fenix", "Wega", "Bewelana", "Andropol", Coal Mine Knurów, Mining Tools Factory, WSW in Andrychów and many others.

### 4. Results

Many valuable results have been obtained of both basic and development nature. Methodology of cracking resistance and coefficient of intensity of stresses measurement have been worked out in the field of basic construction of textile and crane machines. Besides basic factors and values of main parameters for diffusive metalization of cutting tools steel with chromium carbide and titanium coatings have been established in order to prolong their durability.

In the sphere of optimalization of technological processes some new solutions (protected by patents) and software for computer aided design have also been worked out. In research works on mechanic and thermic properties of silumins, we have established the influence of modifiers content (salt, stontium, antimony) on the technological alloy properties. The use of antimony as a silium modifier (patent) and the interesting measurement work-stands such as: for testing of electrical conductivity of silumins (applied in "Wadop" factory in Wadowice) have been worked out at our University.

Several domestic and foreign patents have been obtained in the field of construction of stamping dies which enable material-saving stamping of rolled products (technology applied in "Polam" plains in Bielsko Mysłakowice). Prototypes of engines with modified



Textile Machinery Laboratory - Automatic Winder RAS-15

combustion systems and also the equipment for testing of quick-altering duty in piston machines have been made. The elaboration of several prototypes of automatic blocks for differential, of power distribution mechanisms and of breaking systems (specially for caravans) must be considered as great technological achievements. Other technological achievements, such as the construction and building of calorimetric chamber for transient processes examinations in electric accumulation heaters (the second such equipment in Europe) should be mentioned.

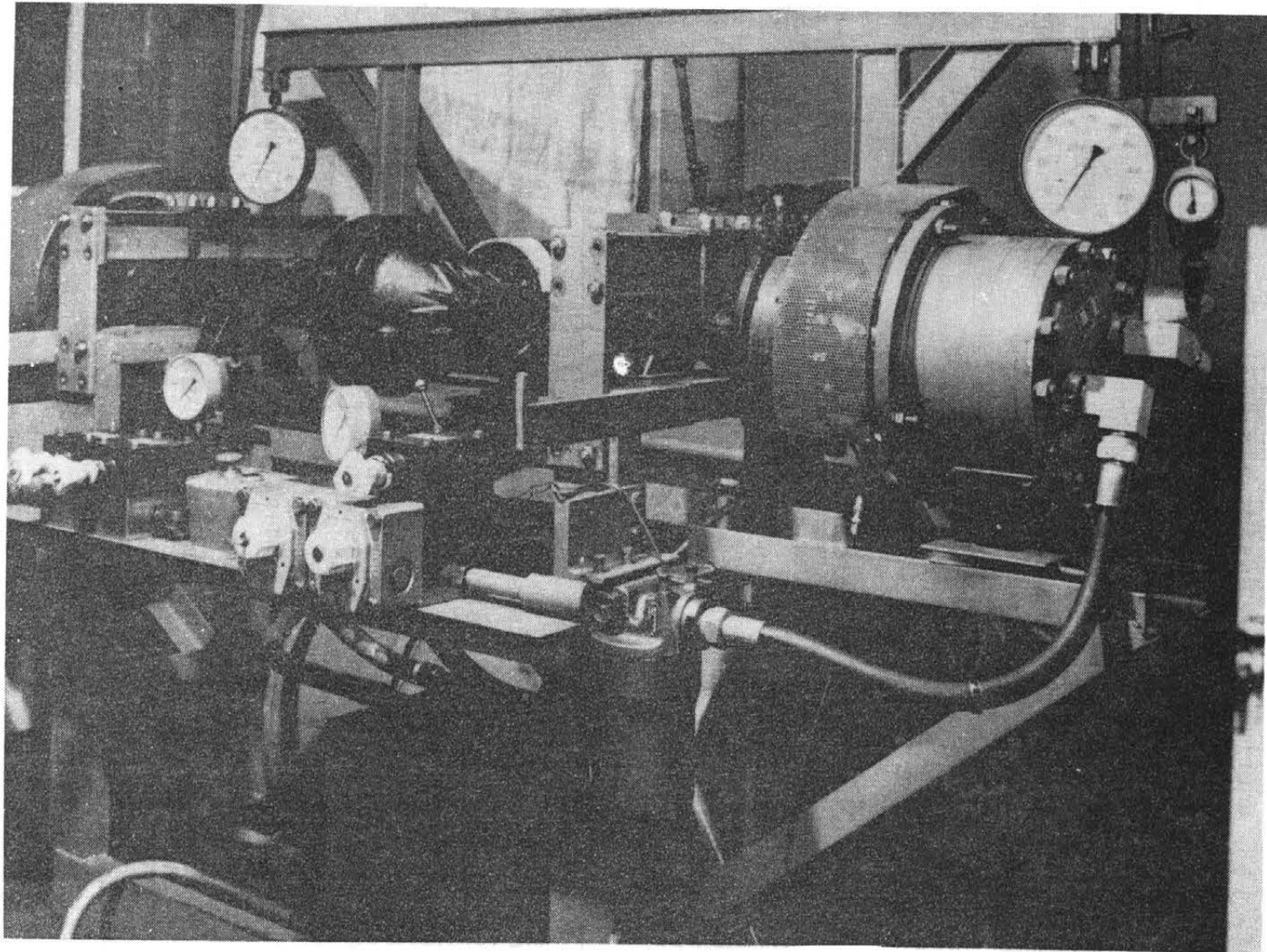
As a result of cooperation with FSM and WSK we have increased the duration of tools (new steels for aluminium alloy forging have been introduced) and some sub-assemblies for cars (new spring steels for springs); we have also achieved the reduction of the cost of the production costs, by limiting export and decreasing labour costs.

Cooperation with the mining industry and mining machines industry enabled us to improve transport (constructional changes of transport equipment) and to produce mining tools which can work safely in methan mines (new, light, non-sparking alloys have been elaborated). As a result of works done for textile industry the quality and the efficiency of the machines have been improved with the significant saving of energy at the same time (Befama); production and regeneration of, previously imported, spare parts for machines, have been introduced; (ZPW "Welux") thermal energy consumption and the consumption of textile materials have been lowered, efficiency of looms has been increased and the influence of poisonous agents in work-stands has been eliminated.

#### 5. Cooperation with foreign partners

Cooperation is being held with the following foreign technical universities: Technical University of Machine Construction and Textile in Liberec in Czechoslovakia, Technical University in Karl-Marx-Stadt and Magdeburg in GDR as well as in the USSR and Bulgaria. There are some plans of scientific and didactic exchange with Technical Universities in Riasan in the USSR, in Kragujevac in Yugoslavia and in Offenburg in West Germany. Many international scientific conferences are organized by the Branch.





Experimental Stand for Self-locking Differential Gears



#### 6. University Staff.

Our University staff consists of 344 employees, including professors (7), docents (19), assistants (17), doctors (59), lecturers (21), teachers of foreign languages (4), teachers (2), total 130 of academic staff and (89) engineers; administration staff (57) and technicians (71).

Within 19 years of existence of the Branch in Bielsko-Biała 6 doctors have been conferred the degree of docent and 60 MSc achieved the doctor degree.

#### 7. Publications

The total amount of publications by the staff of our University amounts to 1253 including 16 monographs and books, 725 articles, 31 reviews and 470 scientific reports.

An editorial series entitled "Construction and Exploitation of Machines" is issued within ZNPŁ.

#### 8. Laboratories and Scientific Research Organizations

Institute of Mechanics and Construction: lab of mechanics and materials, lab of machines construction basis, lab of mechanics, lab of textile machinery construction, lab of mechanics of fluids, lab of flow and hydraulic machines, lab of heat treatment, lab of non-destructing examinations, lab of mechanics properties examinations, lab of mechanics of cracking.

On the basis of the above mentioned laboratories, the General Laboratory of Mechanics of Materials and the Science of Materials has been created at the University, at the Institute of Mechanics and Construction. This Laboratory has been registered as one of officially recognized laboratories of the Technical Supervision Office.

Institute of Technology and Cars: lab of machine tools and machining, lab of founding, lab of foundry and science of materials, lab of plastic working of materials, lab of plastics, lab of welding technology, lab of technical metrology, lab of exhaust gases engine pistons, lab of electrotechnics and electronics,

Departament of Thermodynamics: lab of heat exchange phenomena,

Departament of Mathematics: computer laboratory

Textile Institute: lab of chemical fibre shaping, lab of electron and optical microscopy, lab of X-ray radiography.

9. Research groups: group of flow machines, group of textile machines "Micridrive" (with appliance of microcomputers to the theory of machines and vibrations), group of technological processes design, research group of Textile Institute students.

## LIBRARY

The Library consists of 10 rooms of 305 m<sup>2</sup>, including two reading-rooms (the main one for 30 people). Collection of books is about 69 447 volumes (including 36 702 tight prints), also 437 periodicals.

For the needs of research and teaching the specialized library has been created. About 34% books are foreign literature.

## OTHER ACTIVITIES

Research groups, camps and training camps include also secondary school pupils. "Beanus" camp has been organized exactly for this purpose. There are also meetings with the young people organized in two sections (mathematics and computers).

Many organizations are active at the University: Polish United Workers Party, Democratic Party, National Revival Movement, Polish Students Association, Polish Teachers' Union, Polish-Soviet Friendship Society, Accademic Sports Association (esp. volley-ball team hand-gliding).



# THE MAIN LIBRARY OF ŁÓDŹ TECHNICAL UNIVERSITY BG

Address: 90-924 Łódź, ul. Żeromskiego 116  
tel. 36-31-65

The Main Library was founded almost simultaneously with the Technical University. The decision about its creation was taken in September 1945. The needs and tasks of the University determined the shape and the development of the Library. The Library owes its rapid development to the generosity and commitment of the first creators and to the hard work of the library staff.

Initially the Library was under the care of the Library Committee and its chairman prof. B. Konorski. In 1950 dr Stanisław Peliński was appointed the First Librarian (1950-1957). Next, this function was performed by: Irena Augustyniakowa (1959-1965, without nomination), mgr Jan Walewski (1963-1973), dr Jadwiga Przygocka (1974-1988), and mgr Czesława Garnysz.

Unfavourable housing conditions of the Library had a great influence on its development and organization. Therefore, a few faculty branches of the Main Library were created: Library of the Civil Engineering and Architecture (1981), the Chemical Library (1954), the Food Chemistry Library (1976), the Electrical Engineering Library (1982) and the Belletristic Library. (annex 1)

Increasing book collection and the growing needs of the Library allowed to change it gradually from one-department organization into the University unit with developed internal struc-

ture, capable of serving both scientific and educational purposes (photo 1). The Main Library and its branches occupy 3.315 m<sup>2</sup>, employ 102 persons. The structure and the tasks of the Main Library are described in the rules set up in 1983.

The Library collects the basic book stock in Polish and in foreign languages as well as the student handbooks. Subject matter of the book collection corresponds with the lines represented at the University, but the needs of the engineering and technical staff in the region are also taken into account.

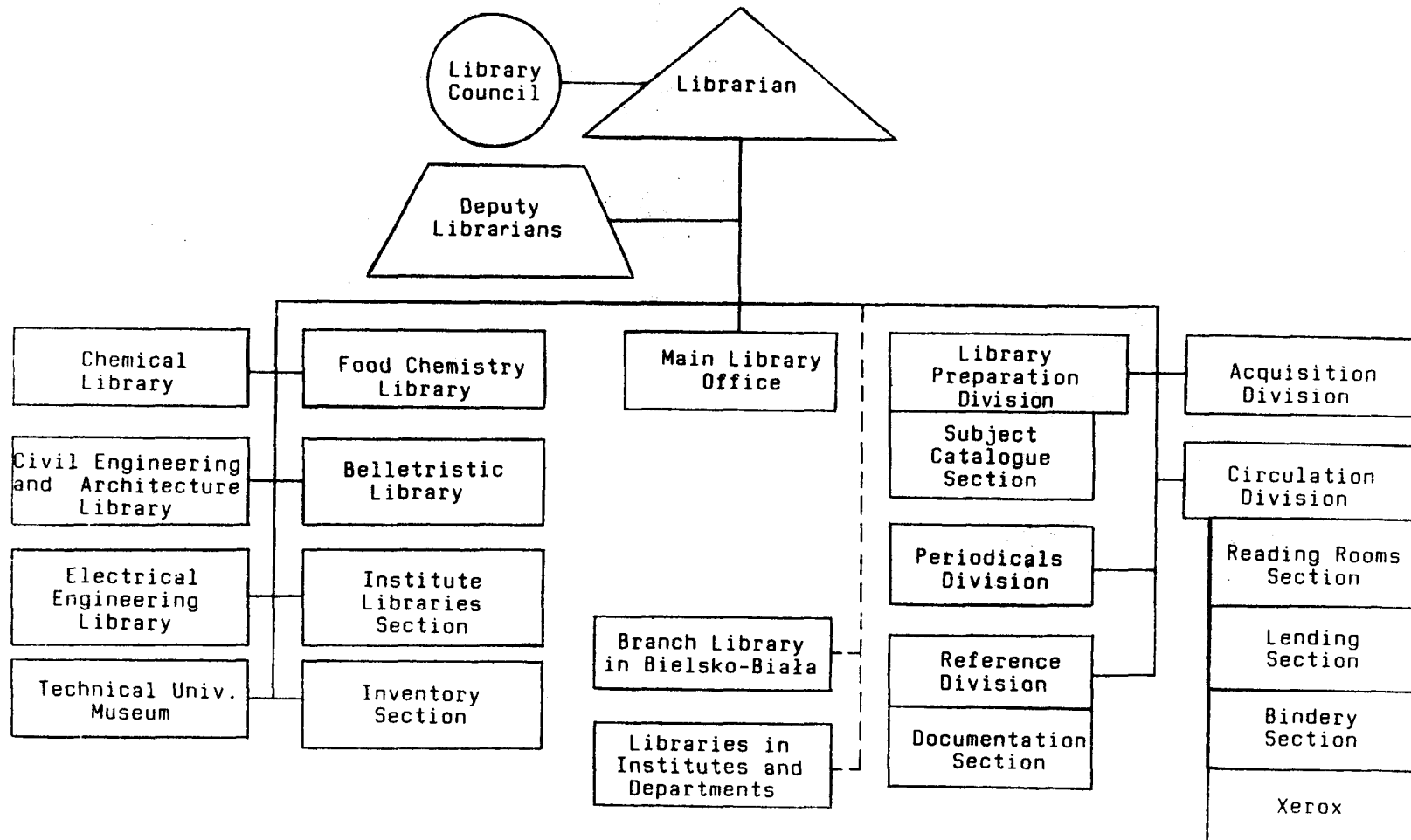
On the 31st of December 1988 the total stock in the Main Library amounted to 246.439 vols of books, 98.472 bound vols of periodicals and 159.221 items of special collection (standards, patents, etc.).

Special attention should be paid to the periodicals collection (more than 3.400 titles) among which we can find such valuable titles as *Annalen der Chemie* (from 1832), *Journal of the Chemical Society* (from 1863), *Chemical Abstracts* (from 1907), *ETZ Elektrotechnische Zeitschrift* (from 1911).

The basic source of book acquisition is purchase. Scientific books and journals are also obtained by means of donations and exchange (about 300 book vols and over 200 periodical titles each year). At present the Library has exchange relations with 308 institutions in Poland and abroad. The basis for the exchange are the publications of our University.

The content of the book collection is reflected both in the alphabetical and subject catalogues. The Main Library catalogue is supplemented by the alphabetical catalogue of Institute libraries' collections. Additionally, all reading rooms run the selective catalogues of their own collections. All library materials are available in 11 reading rooms in the Main Library or in branch libraries. The Main Library also runs the Inter-Library Lending Division. The Reference Division carries on documentation activities such as registration of research work at the University and business trips abroad. It also compiles the bibliography of the scientific workers' publications of our Technical University. This Division also helps the readers in finding what they want.

# THE MAIN LIBRARY DIAGRAM





Though the main task of the Library is to serve the University's readers, it also fulfills a duty of a regional scientific library. It cooperates with many libraries especially with the First Central Technical Library in the Technical University in Warsaw but also with several foreign University libraries.

Since 1986 the Main Library has begun automatization of the scientific information system CDS/ISIS. It was possible thanks to ZETO Łódź (Computer Centre). Within the above mentioned system there have been created three data bases: Journals, Symposia, Bibliography. At present, data loading takes place in the Library through terminals. Last year UNESCO gave us software package of Micro ISIS system, which is more convenient and effective in use. Utilization of the package will start after acquisition of suitable equipment. Moreover, the Main Library takes part in creating and utilizing of the national and regional scientific information systems SAZAPS, SYNABA and Lekinbad. It coordinates the utilization of BRIOLIS service in Łódź region.

The Main Library takes part in the teaching process in our Technical University. The qualified library staff organize:

- library training which is obligatory for all the first year students,
- seminars on scientific information and methodology of research work for the last year students and young research staff from chosen faculties.

The Main Library takes charge of the Technical University Museum which was founded in 1985 due to University authorities' and Senior's Club initiative. A permanent part of the exhibition is devoted to the University's history, and a temporary part is exposed occasionally.

Apart from the Main Library and branch libraries there are also 28 minor libraries working at the Institute Chairs and Departments. All these units constitute a library-information system. The Library Council is the Librarian's consultative and advisory body, whose members come not only from the library staff but faculties' representatives as well. The Library Council's composition and powers are set by the University Statute.



Main Library. Catalogue Room and Cheque-Out Room



Main Library. Main Reading Room



Civil Engineering and Architecture Library





Chemical Library



Main Library. Reference Division





Main Library. Technical University Museum

# THE DEPARTMENT OF MILITARY TRAINING S-1

**Address: 90-361 Łódź, ul. Piotrkowska 266**

**tel. 84-79-93**

## ACTIVITIES AND EDUCATIONAL AIMS

The Department of Military Training was founded in 1949 as an interdepartmental unit.

The objective of the Department was to provide military instruction for students during their course of studies and to train reserve officers.

Since 1973 to the present day, the instruction has been carried out one day weekly during the period of one year. After graduation the alumni are recruited for one year to either military units or special training centers (initially Schools for Reserve Officers, presently Officer Cadet Schools), and after taking the final exams are promoted to the rank of officers, presently to the rank of noncommissioned officers.

This system of training was obligatory for students who were declared fit for it by the Military Medical Board.

Civil Defence training was introduced for female students and those male students whose health did not allow for regular military service. Initially, the training lasted two years, now one year, one day in a week.

The aim of the instruction is to prepare the alumni to take command in Civil Defence Centers in different institutions.

The training is carried out periodically in various areas: medical and nursing, industrial and defensive.

## HEADQUARTERS AND STAFF

The first director of the Department was Capt. Witold Lenczewski (presently Col. ret.). In the first period, the staff included part-time instructors (officers from military units and training centers) and full-time military instructors'- retired officers. Since 1957 the Department has employed regular officers and the teaching requirements for students have increased. Better qualified for the teaching work, the new staff represents various fields of military training, complying with the needs of the new teaching programme. The successive directors of the Department were: Col. Czesław Kowalczyk, Col. Longin Łysik, Col. Maciej Brzeziński, Col. Wiesław Gwizdowski; the present director of the Department is Col. Dr Wojciech Szmidt.

The staff of the Department were awarded for their didactic activities individually and as a group by military authorities and were given the awards of the 2nd and 3rd degree by the Minister of Higher Education and Technology.

Officers improve their qualifications in Military and Civil Schools and doctoral and postdoctoral studies.

## TEACHING PROCESS

The educational activity has always been in the center of interest for military and university authorities. During their training in military units, students have frequently been visited by superior authorities of the high rank from the Ministry of National Defence.

The presidents, the deans and other officials of Łódź Technical University, frequently accompanied by higher military officials, have often visited students during their military training classes. The alumni of Łódź Technical University doing their military service on a yearly basis are engaged in technical improvement activities, producing various instruments for military purposes according to their fields of study (Officers' Motoring College, Quartermasters' College). Some of these in-

ventions have been used in military equipment. While carrying out this teaching programme, both students and officers design educational aids and equipment for classrooms.

### WELFARE WORK

These activities embrace various areas. Blood donation campaign organized in commemoration of the 35th anniversary of the Polish People's Republic was highly estimated (54 l of blood).

Both the staff and the students took active part in different welfare work activities for the benefit of the city, the University and the Department of Military Training.

Money was collected for the following funds:

- Pediatric Hospital,
- Children's Health Center,
- restoration of the monuments of Cracow,
- Youth Center,
- Polish Mother Monument Hospital.

Students of the Civil Defence units have initiated a campaign of collecting toys, clothes and books which were later given to children during the students' visits to the Orphanage House.

While officers participated in the work of Faculty Boards of the University, research workers cooperated with commanding officers of Military and Civil defence training. Officers from the Department of Military Training took active part in the activities of the Committee for Youth Affairs. In cooperation with Academic Sports Association, Student Union and Department of Physical Education, the Department of Military Training organized and carried out defensive sports tournaments obtaining good results especially in summer competitions.



# THE DEPARTMENT OF FOREIGN LANGUAGE TEACHING S-2

Address: 93-590 Łódź, al. Politechniki 11  
tel. 36-32-06

From 1945 till 1953 The Department of Foreign Languages of the Technical University in Łódź, founded by prof. Wilkoszewski acted on the basis of language section.

The starting year was 1953 and Mr Arno Will was the first headmaster of the department. His followers were Mrs Wanda Piątkiewicz, Mrs Danuta Miller, and presently Mr Ryszard Pawlak.

The head of the department - Ryszard Pawlak (M.A.)  
Deputy head - Wanda Derska (M.A.)

Language section masters -

English section - Mirosław Flis (M.A.)  
German section - Anna Malinowska (M.A.)  
Russian section - Teresa Skirtun (M.A.)

Staff of the Department of Foreign Languages  
senior lecturers - 28  
lecturers - 14

Language laboratory - modern language laboratory  
Made by Tesla

Department library - 4870 volumes

Address: Łódź - 93-590; al. Politechniki 11, tel. 36-32-06





## THE DEPARTMENT OF PHYSICAL EDUCATION FS-3

Address: 93-590 Łódź, al. Politechniki 11  
tel. 36-32-30

The Department of Physical Education is an inter-departmental unit. Its highly qualified staff work both at the University and at the College Club of Academic Sports Association of Poland. It cooperates with the students organizations in the field of physical education, helps organize sports and recreational activities for the staff of the University.



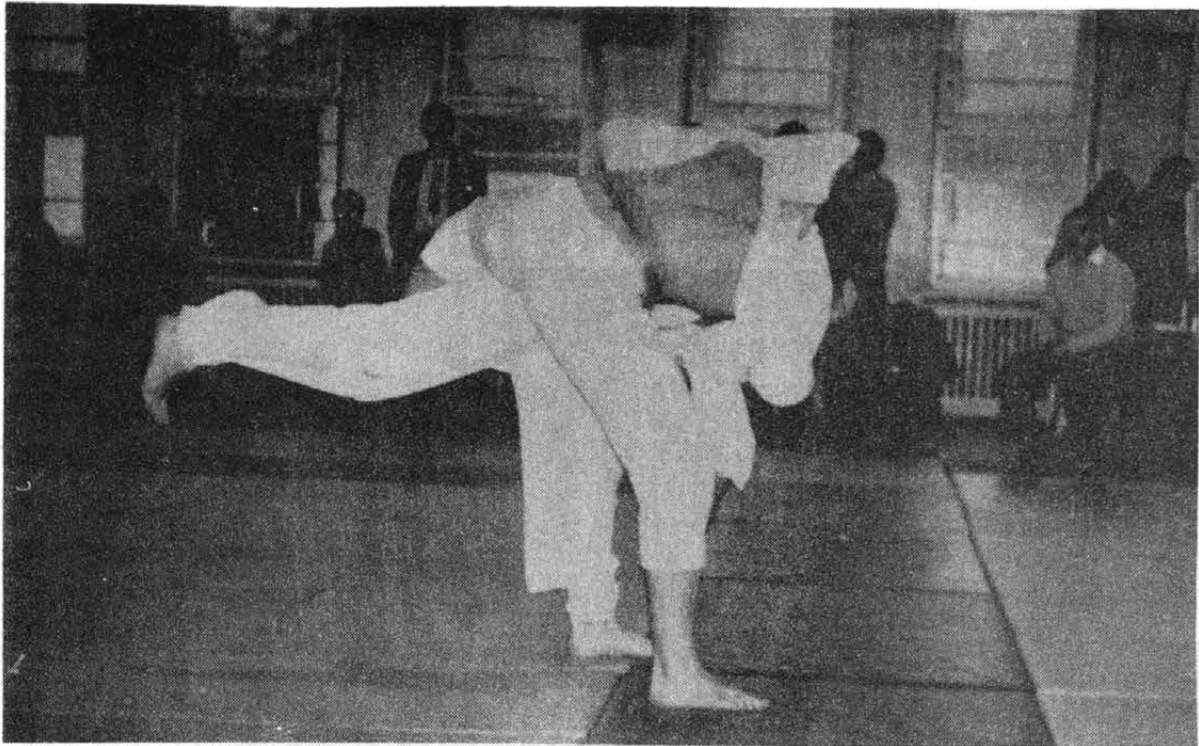
Sport fascinates not only young people - academic teachers in  
gymnasiums

The Department employs 24 teachers, a physician, an accompanist, 3 administration workers and 6 attendants.

The Department organizes physical training for the students of all the faculties during four years of their studies.

Sports section of the College Club of University Sports Association has been very successful. There are twenty sections, seven of them take part in national championships: badminton, chess, men's volley-ball, women's volley-ball, men's basketball, football and handball. Best results have been achieved by the badminton section, which is at the top of the Second Division.

The College Club of Academic Sports Association was third at the latest national championship of Technical University students.



Judo academic championship

The section keeps in touch with other universities both in our country and abroad, for example in Czechoslovakia, East Germany or Yugoslavia.

The Department with the help of youth organizations is also propagating mass sports and tourist camping.

The Department of Physical Education has at its disposal the following buildings:

gymnasium - 11 Politechniki Avenue,  
gymnasium - 4/10 Stefanowskiego Street,  
sports field - 246 Wólczańska Street.



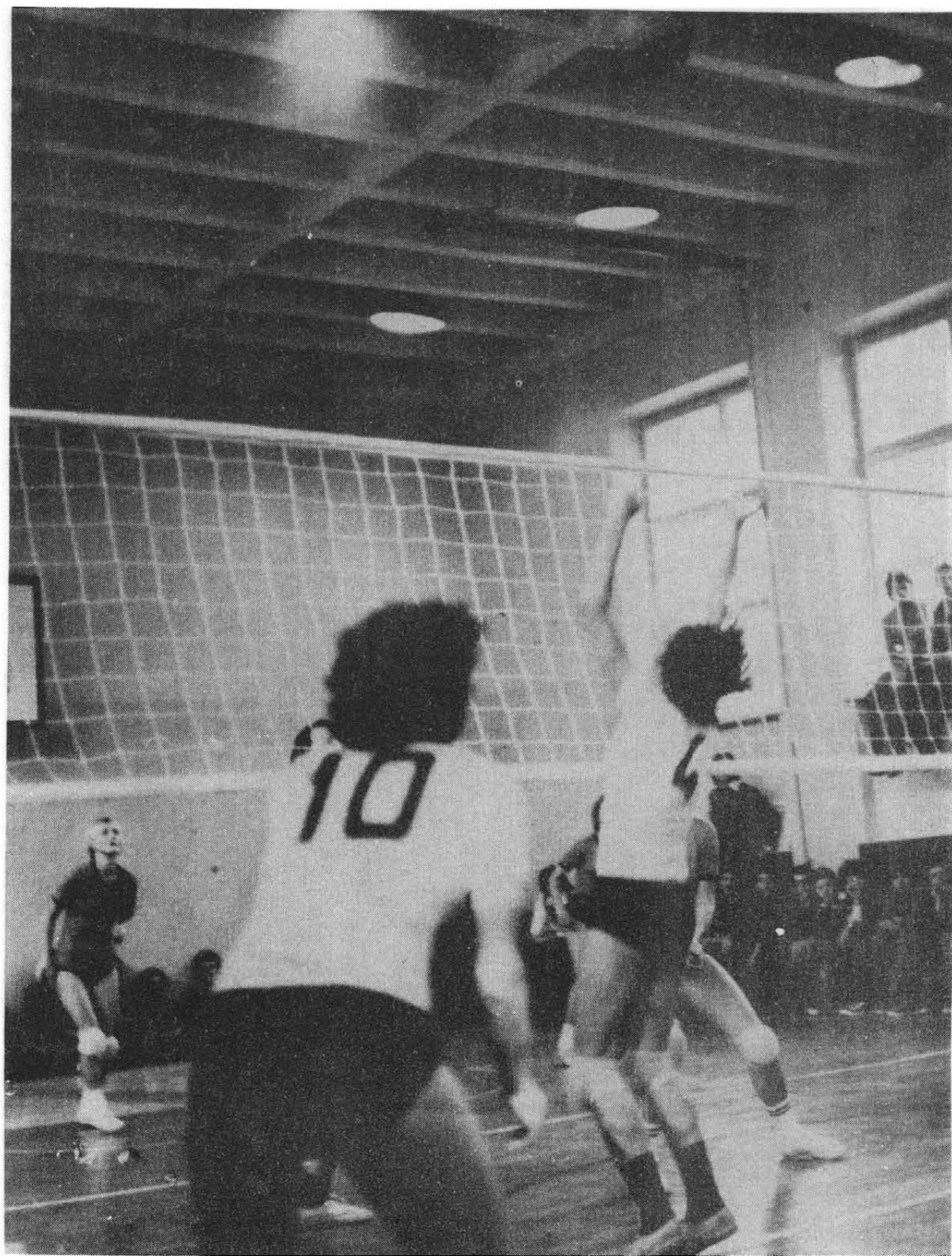
Hand-ball tournament





Two generations - a student and professor at the chess-board





Volley-ball cup competition

## THE UNIVERSITY HOUSING ESTATE OA

Director's office address: 93-590 Łódź, al. Politechniki 3a  
tel. 36-41-77

The University accommodation service offers accommodation to 2750 students in 8 student hostels. There are also two university canteens catering for over 2000 people a day and 10 snack - bars situated in the University Housing Estate.



Academic Housing Estate - the north side

Each hostel accommodates both men and women. The accommodation is chiefly in the form of double study - bedroom, with communal kitchen - lounge facilities on each floor. There are also common rooms, study rooms, guest rooms in each hostel.

Three student hostels (III, IV, V) house big student clubs offering a great variety of social and cultural events, but there are also smaller clubs in other hostels providing entertainment on a smaller scale - video - shows, for example.



Academic Housing Estate - the south side

There are also two clubs for those interested in tourism - "Płazik" and "Kajtek" and numerous students' scientific associations - such as Students' Scientific Association of Electronics, for example. Students can make use of dark - rooms, work in tool-rooms and workshops, rent tents and sport equipment. The social and athletics facilities of the University comprise a cinema, television rooms, a book - shop, libraries, a quiet room, playing - fields, tennis courts and sport - halls.

Students broadcast their own local radio program and their broadcasting studio "Żak" deals mainly with information, social issues and entertainment.

As the estate is the center of student life all students' organizations and associations have their offices here. There are the Polish Students' Association (ZSP). The Polish Youth Socialist Association (SZSP) and Academic Sports Association (AZS).

Day - to-day life of the University housing estate is organized by the Council of the Estate, a branch of students' self - government.

Students' Health Service is situated in the estate and every student is entitled to free medical care and dental service for both routine and emergency treatment. One can also mention some services run by students, such as "Student Service", "Puchatek" or "Siódemka".

## **THE DEPARTMENT OF MARXIST PHILOSOPHY S-4**

**Address: 93-590 Łódź, al. Politechniki 9a**

**tel. 36-65-88**

Head of the Department: senior lecturer Dr Władysław Leśny

Staff: 13 persons of academic staff

3 persons of non-academic staff

## **THE DEPARTMENT OF POLITICAL SCIENCES S-5**

**Address: 93-590 Łódź, al. Politechniki 9a**

**tel. 36-65-88**

Head of the Department: Doc. Krzysztof Baranowski

Staff: docent - 1, senior lecturer - 1, doctor - 7,  
senior assistants - 3, assistants - 2.

Major research areas pursued by the Department:

Polish Political Thought 1918-1980, Political Culture.



## SENIOR'S CLUB

Senior's Club associates 380 members - pensioners, former employees of Łódź Technical University and their wives who are the Club fans.

The Club's activity is directed according to its regulations by the Board of 14 members elected by the General Assembly.

There are the following sections: Entertainment Section, Excursion Section, Social Section, Organization and Economical Section, Bridge Section.

The Club's activity is financed from the budget funds contributed by its members monthly as well as from other sources, such as fairs, lotteries etc.

The Senior's Club initiated the opening of the University Museum and appointed the Museum Board cooperating with the Director of the Main Library.

All information can be obtained from the Club's office - open every day from 10 am. till 2 pm. in the building of the Chemical Faculty (room 146).

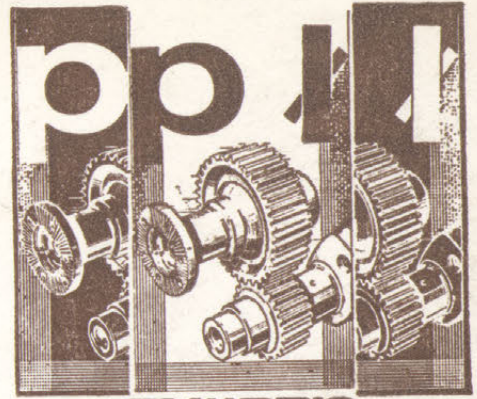
The Club makes one big family: its members help each other and its activity has been highly appreciated by the authorities and the employees of the University.



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