

TECHNICAL UNIVERSITY
OF ŁÓDŹ

GUIDEBOOK



TECHNICAL UNIVERSITY OF ŁÓDŹ

GUIDEBOOK

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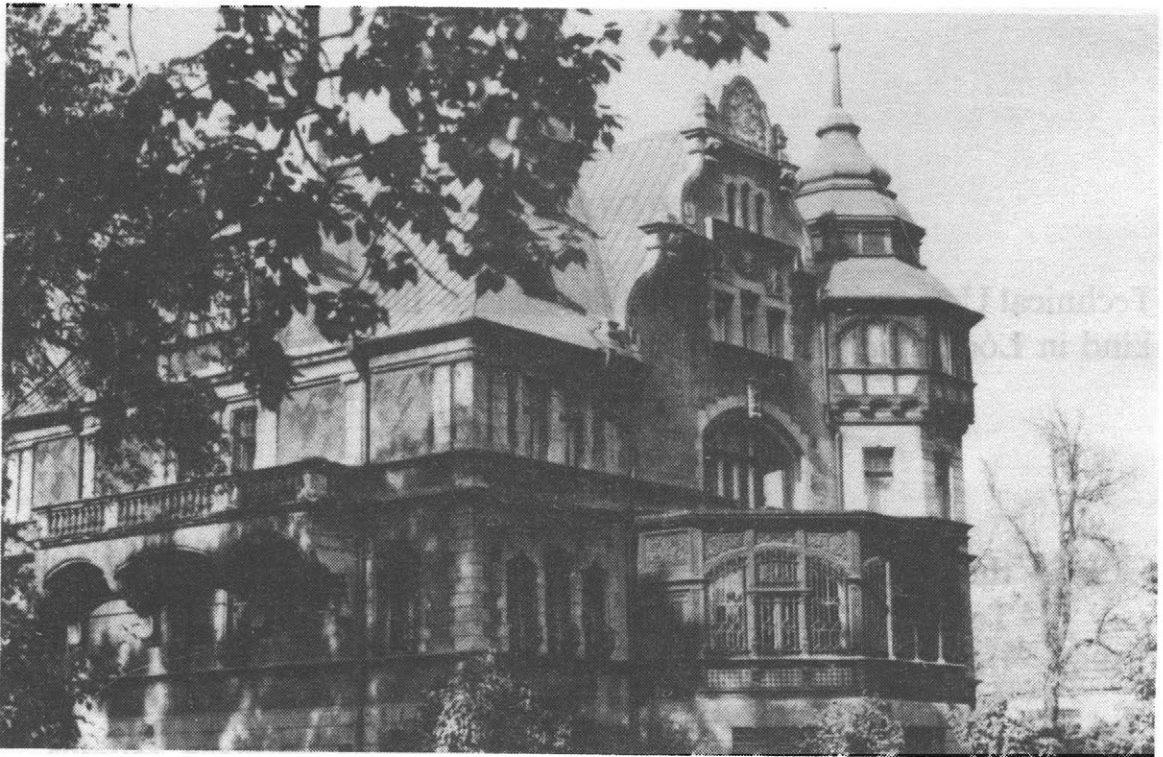
INTRODUCTION

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

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 Chemistry),
 - academic staff: professors - 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., Radwańska St. and Stefanowski St.
- 01.10.1947 - transformation of the Textile Section of the Faculty of Mechanical Engineering into the Textile Engineering Faculty (the fourth at the University, the only one of this kind in Poland).

- 1950 - organizing the Faculty of Food Chemistry (the fifth faculty at the University).
- 1956 - creating the Faculty of Civil Engineering (the sixth faculty at 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, Electrical Engineering and Civil Engineering and for Radiation Chemistry, Dyes and Chemical Engineering Institutes; erecting of student hostels, canteens and other facilities was also planned.
- 1969 - creating the Bielsko-Biała Branch of the Technical University of Łódź.



Rector's Office building

- 1970 - changing of the organizational structure of the University. 28 faculty and interdepartmental institutes were created besides the Institute of Chemical Engineering with a faculty status. The Institute of Papermaking and Paper Machines moved to its new building.
- 1973 - transforming of the Faculty of Civil Engineering into the Faculty of Civil Engineering and Architecture.
- 1976 - creating the Faculty of Applied Physics and Applied Mathematics (the seventh Faculty at the University). The Institute of Electronics

in the Faculty of Electrical Engineering started M.Sc. course in Electronics.

1982 - Bielsko-Biala Branch was transformed into an independent Faculty of Machine Construction and the Institute of Textile Engineering.

1990 - creating the Division of Computer Networks.

RECTORS

1945 - 1948 Professor Bohdan Stefanowski

1948 - 1952 Professor Osman Achmatowicz

1952 - 1953 Professor Bolesław Konorski

1953 - 1962 Professor Mieczysław Klimek

1962 - 1968 Professor Jerzy Werner

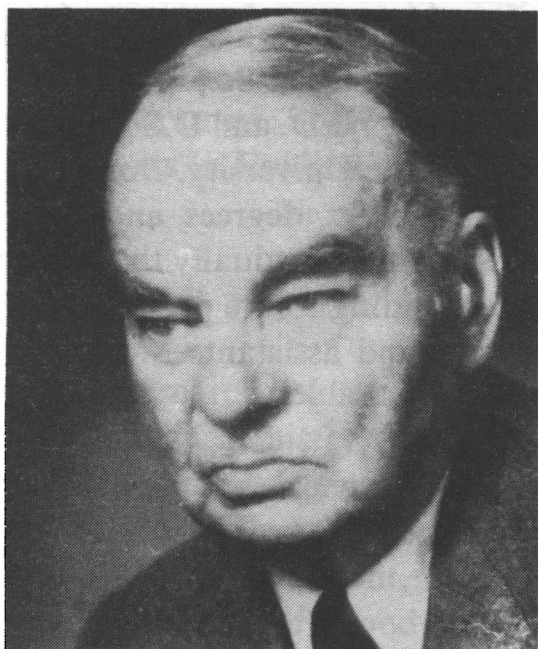
1968 - 1975 Professor Mieczysław Serwiński

1975 - 1981 Professor Edward Galas

1981 - 1987 Professor Jerzy Kroh

1987 - 1990 Professor Czesław Strumiłło

1990 - Professor Jan Krysiński



Professor Bohdan Stefanowski



Professor Jan Krysiński

FACULTIES AND INSTITUTES OF THE TECHNICAL UNIVERSITY OF ŁÓDŹ

Faculty of Mechanical Engineering
 Faculty of Electrical Engineering
 Faculty of Chemistry
 Faculty of Textile Engineering
 Faculty of Food Chemistry
 Faculty of Civil Engineering and Architecture
 Faculty of Technical Physics and Applied Mathematics
 Bielsko-Biała Faculty of Machine Construction
 The Institute of Papermaking and Paper Machines
 The Institute of Chemical and Process Engineering (with a faculty status).

UNIVERSITY STAFF

The academic staff of the University is composed of full professors, professors, associate professors, *docents* (equivalent to the post of reader in U.K.), senior lecturers and assistants. The title of full professor and professor is conferred by the President of the Republic on application of University Senate, confirmed by a special Ministerial Commission. This title is held as life tenure. In principle the professor title is conferred on those having M.Sc., Ph.D. and D.Sc. degrees. Associate professors must also have M.Sc., Ph.D. and D.Sc. degrees but are appointed to their positions by the Rector of the University. *Docents* had to have M.Sc. and Ph.D. or M.Sc., Ph.D. and D.Sc. degrees and had been appointed to their positions till the end of 1990 only. Gradually the position of *docent* will disappear. Senior lecturers (corresponding to the post of *adiunkt* in Poland) have to have M.Sc. and Ph.D. degree and assistants M.Sc. or M.A. degrees only.

University staff in numbers: (1.4.1991):

Full professors - 22
 Professors - 84
 Associate professors - 33
 Docents - 107
 Senior lecturers - 891
 Assistants - 306
 Non-academic staff - 1035
 Administration and technical service - 1172
 Librarians - 86

DEGREES

Since its creation the University has awarded the following numbers of degrees:

D.Sc. - 221

Ph.D. - 1756

M.Sc. and B.Sc. - 38 099

TEACHING

The main mode of teaching is through courses of lectures of varying length. These are supplemented by tutorials, seminars and laboratory work.

The University offers 15 different courses, subdivided into 32 specializations and still further into 105 graduation fields.

The total number of students in the academic year 1990/1991 is about 5300.

M.Sc. degrees are awarded after five-year courses and B.Sc. degrees after three and a half year extramural courses.

Also the post-diploma refreshing courses for engineers from industry are offered in different specializations.

Ph.D. degree courses are sporadically offered to smaller groups of students, as three-year courses. Some of them, in chosen specializations, are offered to foreign students in English.

RESEARCH

The main research fields at the University are as follows: Food Chemistry and Food Processing Chemistry, Biological Active Compounds, Chemistry of Dyes, Radiation Chemistry, Chemistry and Physics of Polymers, Electrical Machines and Transformers, Electrical Equipment and Apparatus, Electroheat, Processing Machines and Equipment, Mechanical and Chemical Textile Technology, Chemical Technology of Wood and Paper, Chemical and Process Engineering. Apart from the research mentioned above the University carries out other research work and projects, frequently unique in the country. Further information can be found in research reports of Institutes and Departments.

SCIENTIFIC COOPERATION WITH FOREIGN PARTNERS

The University cooperates with about 40 research centres in 15 countries and its institutes organize numerous home and international conferences, sessions and symposia.

The honorary degree of „Doctor Honoris Causa” of Łódź Technical University was conferred on 12 outstanding scientists from Poland and abroad and 7 of the University professors were conferred the honorary degrees by foreign universities.

The honorary degree of „Doctor Honoris Causa” of the University of Strathclyde, Glasgow

Professor Jerzy Werner 1973

Professor Mieczysław Serwiński 1977

Professor Edward Galas 1978

Professor Jerzy Kroh 1983

Professor Czesław Strumiłło 1989

The honorary degree of „Doctor Honoris Causa” of the Textile Institute of Moscow

Professor Janusz Szosland 1979

The honorary degree of „Doctor Honoris Causa” of Université Paul Sabatier Toulouse

Professor Władysław Pełczewski 1983

LIBRARIES

At the University there are: one Main Library, four Faculty Libraries and many smaller libraries in the Institutes.

PUBLISHING

The University has its own publishing office and its own printing house. The following Series of Scientific Papers are published:

1. Civil Engineering
2. Chemistry
3. Thermal Turbomachinery

4. Electrical Engineering
5. Physics
6. Chemical and Process Engineering
7. Mathematics
8. Mechanics
9. Organization and Management
10. Food Chemistry
11. Textiles
12. Informatics
13. Theses

Text books and other teaching material are published also each year.

UNIVERSITY BUILDINGS

The University has 75 buildings, most of them situated on the University grounds between Wolczanska Street and Aleja Politechniki, all within an easy walking distance. Their total usable floor area is about 250 000 m².

ACCOMMODATION

There are 8 hostels which provide residential accommodation for over 2500 students. They are linked by a communal block containing a cinema, a student union office, and a canteen. There are also 4 student clubs.

STUDENT HEALTH SERVICE

All the students and University employees are entitled to make use of the Health Centre 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 administers four holiday rest-houses for its employees-Jastrzębia Góra (at the sea-side), Wiartel (Mazurian Lakes), Konopnica, Szklarska Poręba (in the mountains).

FACULTY OF MECHANICAL ENGINEERING, W – 1

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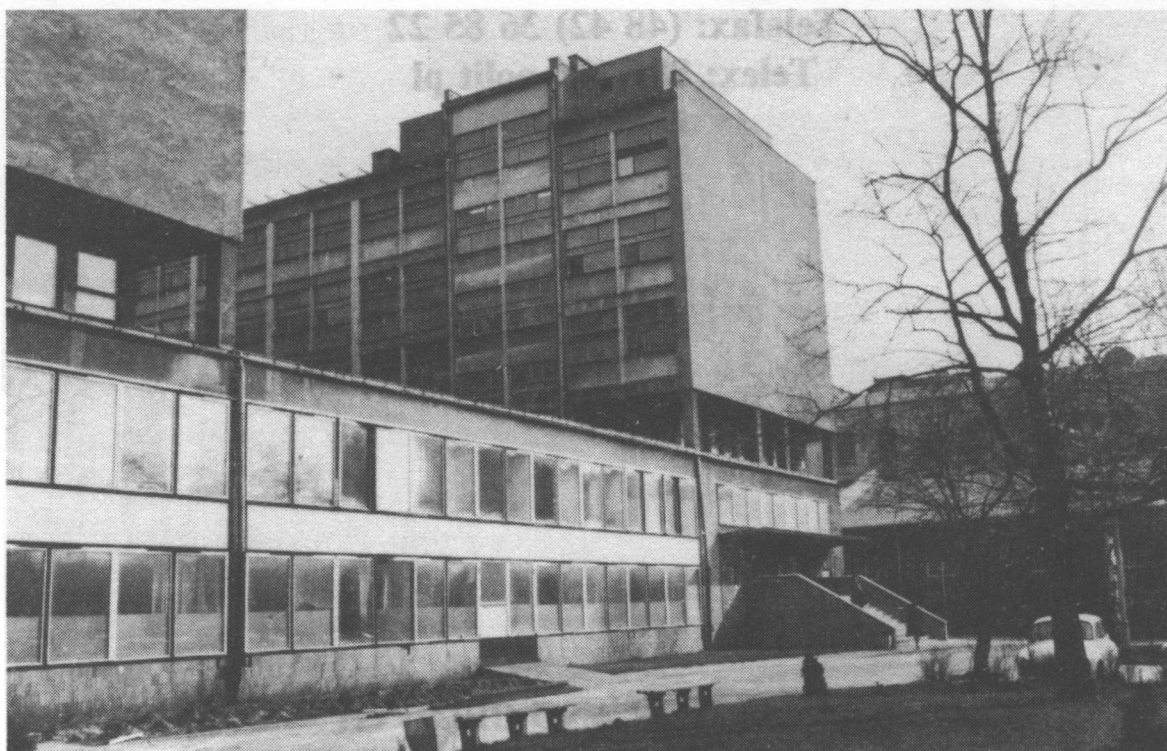
FOUNDATION AND GROWTH

The Faculty of Mechanical Engineering 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 Faculty which was held on June 26, 1945. Those professors were very active in organizing the Faculty.

Professor Bolesław Tolłoczko was elected the first Dean of the Faculty of Mechanical Engineering. It was decided that in the academic year 1945/46 courses on all four years of studies at five specializations – energy conversion and design, 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 Waclaw Moszczyński, Witold Pogorzelski, Bolesław Tolłoczko, Czesław Witoszyński, Kazimierz Zembrzuski, Ludwik Żarnowski, and engineers Jerzy Młodziński and Wiktoria Mrozowska were the most active in establishing the activity profile of the Faculty of Mechanical Engineering, preparing the programmes and organizing the classes.

An exceptional contribution in the development of the Faculty was brought by the first Rector, Professor Bohdan Stefanowski and by his close co-worker, Marian Mieszkowski.



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

Initially, the staff of the Faculty numbered 49 persons, among them 16 professors, 7 senior lecturers and 26 assistants. In the years 1945-46 sixteen departments 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 there 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 in 1969 its section in Bielsko-Biała where, by the decree of the Minister of Higher Education, the Technical University of Łódź founded its branch. In 1981 this section was transformed into an independent unit, the Faculty of Machine Construction.

In 1970 a significant change at the Faculty took place as a result of the decree of the Minister of Higher Education; instead of the departments, seven institutes

were formed: Applied Mechanics, Machine Design, Materials Science and Technology of Metals, Machine Tools and Production Engineering, Thermal Engineering and Refrigeration, Turbomachinery, Vehicle Research. This system has been valid until now.

STRUCTURE

The Faculty consists of 7 units subdivided into divisions or groups.

Institute of Applied Mechanics, I-5

- Division of General Mechanics
- Division of Strength of Materials
- Division of Theory of Mechanisms, Machines and Fundamental Automatics

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

Institute of Materials Science and Technology of Metals, I-7

- Group of Surface Layer Engineering
- Group of Materials Science, Metal-Matrix Composites and Sintered Alloys
- Group of Plastic Technology and Welding
- Group of Casting Engineering, Foundry Engineering and Equipment

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

Institute of Turbomachinery, I-10

- Division of Fluid Mechanics
- Division of Thermal Turbomachinery
- Division of Metrology, Pneumatics and Hydraulics

Institute of Vehicle Research, I-11

- Group of Theory and Design of Vehicles
- Group of Internal Combustion Engines
- Group of Vehicle Maintenance

DEANS OF FACULTY

1945 - 1946	Professor	Bolesław Tolłoczko
1946 - 1948	Professor	Kazimierz Zembrzuski
1948 - 1952	Professor	Aleksander Uklański
1952 - 1954	Professor	Jan Werner
1954 - 1955	Professor	Jerzy Werner
1955 - 1956	Professor	Michał Skarbiński
1956 - 1958	Professor	Aleksy Piątkiewicz
1958 - 1960	Professor	Jerzy Leyko
1960 - 1962	Professor	Jerzy Werner
1962 - 1964	Professor	Janusz Szreniawski
1964 - 1966	Professor	Włodzimierz Merc
1966 - 1969	Professor	Zdzisław Parszewski
1970 - 1971	Professor	Władysław Gundlach
1971 - 1975	Professor	Jerzy Lanzendoerfer
1975 - 1977	Docent	Ryszard Przybylski
1977 - 1981	Docent	Mirosław Banasiak
1981 - 1987	Professor	Zbyszko Kazimierski
1987 - 1990	Professor	Jan Krysiński
1990 -	Professor	Andrzej Koziarski

STAFF OF FACULTY

Academic staff:	243
professors:	19
docents:	30
senior lecturers with D.Sc. degree:	5
senior lecturers:	189
Technical and secretarial staff:	291

The total number of employees at the Faculty of Mechanical Engineering is 534 people.

EDUCATION

In the years 1945-1990 8658 students graduated from the Faculty: 3018 graduates obtained B.Sc. degree and 5640 M.Sc. degree.

The Faculty of Mechanical Engineering is authorized to award Ph.D. and D.Sc. degrees in the field of Mechanics and Machine Construction and Exploitation. In the period 1945-90 403 Ph.D. and 48 D.Sc. degrees were awarded.

The following courses are conducted at present at the Faculty:

M.Sc. full-time courses in:

- Mechanical Engineering,
 - Material Engineering,
- B.Sc. courses for working students:

- extramural courses,
- university extension courses
- complementary M.Sc. courses

Ph.D. courses

Post-graduate courses

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

- Applied mechanics-by the Institute of Applied Mechanics
- Heavy machines,
- Machines and equipment for textile industry,
- Hydraulic and pneumatic drives and control - by the Institute of Machine Design
- Technology of machines (foundry engineering),
- Machine tools and technological equipment (design),
- Materials engineering - by the Institute of Materials Science and Technology of Metals
- Technology of machines (machining processes),
- Machine tools and technological equipment (metal machining system),
- Robotics - by the Institute of Machine Tools and Production Engineering
- Machines and equipment for chemical and food industry by the Institute of Thermal Engineering and Refrigeration
- Cars and tractors-by the Institute of Vehicle Research.

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 extramural courses is 9 semesters. The university extension and complementary M.Sc. courses have been introduced to enable engineers who completed so-called 1st level 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.

Education at the Faculty of Mechanical Engineering includes basic subjects necessary for mechanical and materials engineers e.g. technical mechanics, principles of machinery design, materials science, as well as specialized fields characteristic for individual studies.

In the academic year 1990/91 1072 students have carried out their studies in all types of courses.

The students of the Faculty of Mechanical Engineering 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 in the institutes.

RESEARCH

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

- Analysis of stresses, strength and ultimate load of structures taking into account stability and post-buckling behaviour of elasto-plastic materials and fracture mechanics,
- 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,
- 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 diesel engines.

INSTITUTE OF APPLIED MECHANICS, I-5

90-924 Łódź, Stefanowskiego 1/15

Telephone: (42) 36-49-85, 36-55-22 ext. 231

Director: Docent Mirosław Banasiak Ph.D

Academic staff:

Professor Marian Królak Ph.D., D.Sc.

Professor emeritus Jerzy Leyko Ph.D.

Professor Michał Edward Niezgodziński Ph.D.

Professor Marek Trombski Ph.D., D.Sc.

Assoc.Professor Tadeusz Gałkiewicz Ph.D., D.Sc.

Assoc. Professor Władysław Walczak Ph.D.

Docent Kazimierz Grossman Ph.D.

Docent Tomasz Kapitaniak Ph.D., D.Sc.

Docent Andrzej Młotkowski Ph.D.

Docent Jerzy Roszkowski Ph.D.

Jan Awrejcewicz Ph.D., D.Sc.

Tadeusz Niezgodziński Ph.D., D.Sc.

Senior lecturers: 25

Assistants: 2

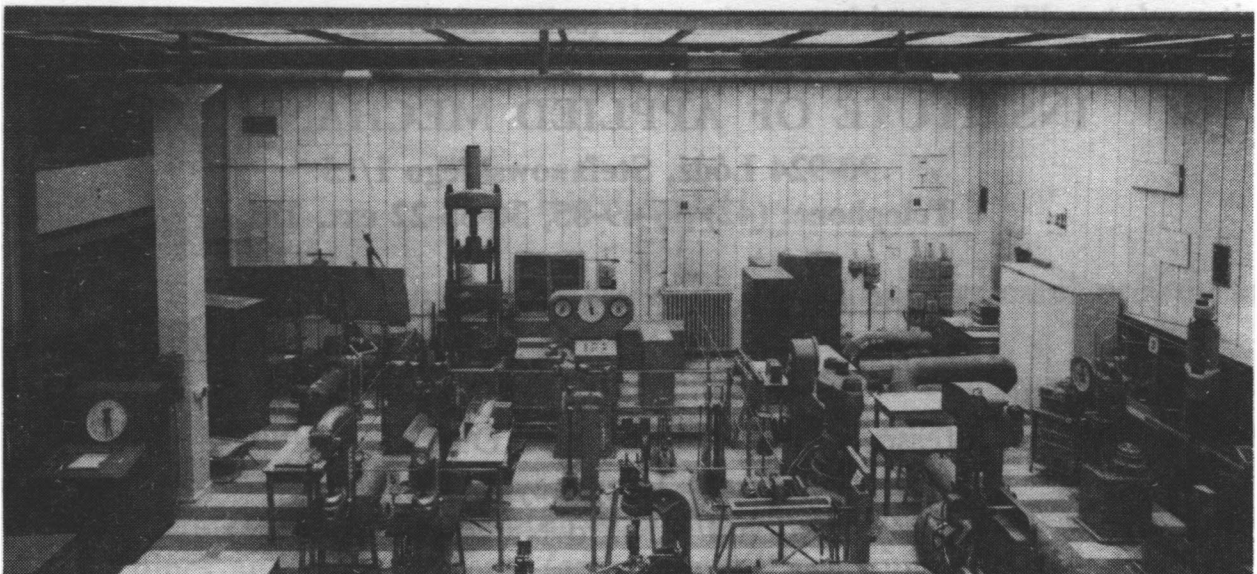
Technical and secretarial staff: 25

List of Divisions and their Heads:

- Division of General Mechanics, Professor Marek Trombski
- Division of Strength of Materials, Professor Marian Królak
- Division of Theory of Mechanisms, Machines and Fundamental Automatics, Docent Kazimierz Grossman

Main subjects of research:

- stability, post-buckling analysis and ultimate strength of thin walled structures,
- dynamics and vibrations of machines and their elements, vibrations of structures,
- theoretical and experimental analysis of stresses and strains in structural elements including fracture mechanics in composite materials.



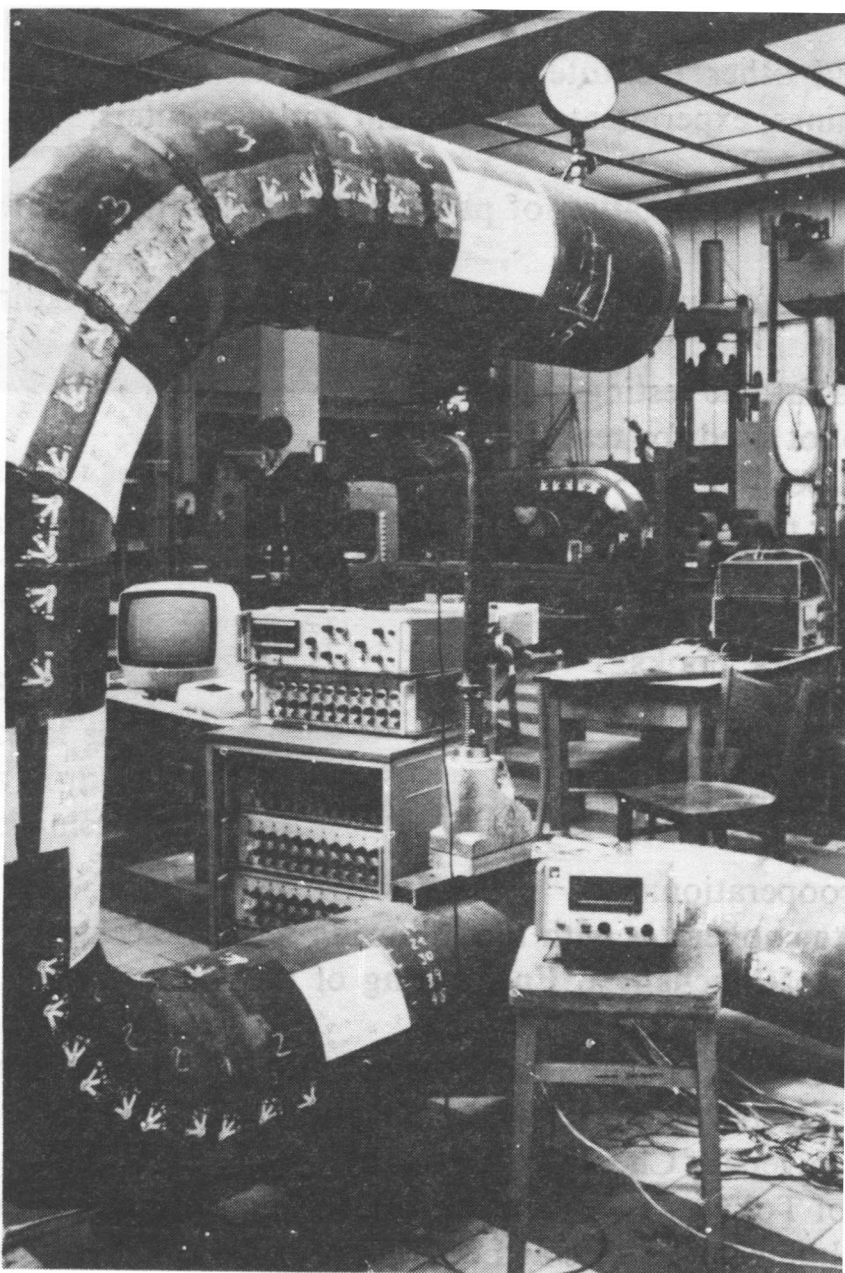
Students' Laboratory of Strength of Materials

Cooperation with industry:

The Institute of Applied Mechanics carries out research works for industrial plants and other industrial units in the Łódź region. The goal of these research projects is to improve durability and reliability of machines and equipment. The main subjects of these projects are:

- determination of strength, stability of vibrations and stiffness of machines and structures,
- theoretical and experimental investigations of vibrations of mechanical systems,

- static, kinematic and dynamic calculations of machines and mechanical equipment,
- investigations of mechanical properties of materials,
- strain gauge and photoelastic investigations of strains and stresses,
- design and manufacturing of prototypes of machines and equipment (e.g. applied in razor blades production),
- calculation of shock-resistance of high-power transformers,
- calculation of the resistance of transformer winding against large magnetic forces during shorting.



Experimental set for automatic registration and numerical elaboration of strain gauges readings

Of special significance for the Institute of Applied Mechanics is the cooperation with: „ELTA” Factory of Transformers and Traction Equipment in Łódź, „WIZAMET” Metal Works in Łódź, „ENERGOPROJEKT” General Office of Studies and Design of Power Engineering Industry in Warsaw, Brown Coal Colliery in Rogowiec, Chemical Plant in Bydgoszcz, „CHEMITEX – ANILANA” Chemical Plant in Łódź.

Laboratory equipment:

Each division of the Institute of Applied Mechanics has its own educational laboratory in which course exercises are carried out. Some of the test rigs are standard, some of them are self-manufactured unique experimental stands. The laboratories and other Institute research units are equipped also with the following machines, experimental equipment and computers:

- computers IBM-PC,
- polariscopes for examination of photoelasticity models in transmitted and reflected light,
- experimental set for automatic registration of strain gauges readings and their computer elaboration,
- strength and fatigue testing machines,
- model of robot used for teaching,
- laboratory lasers,
- equipment for measurement and elaboration of mechanical vibrations based on piezoelectric gauges.

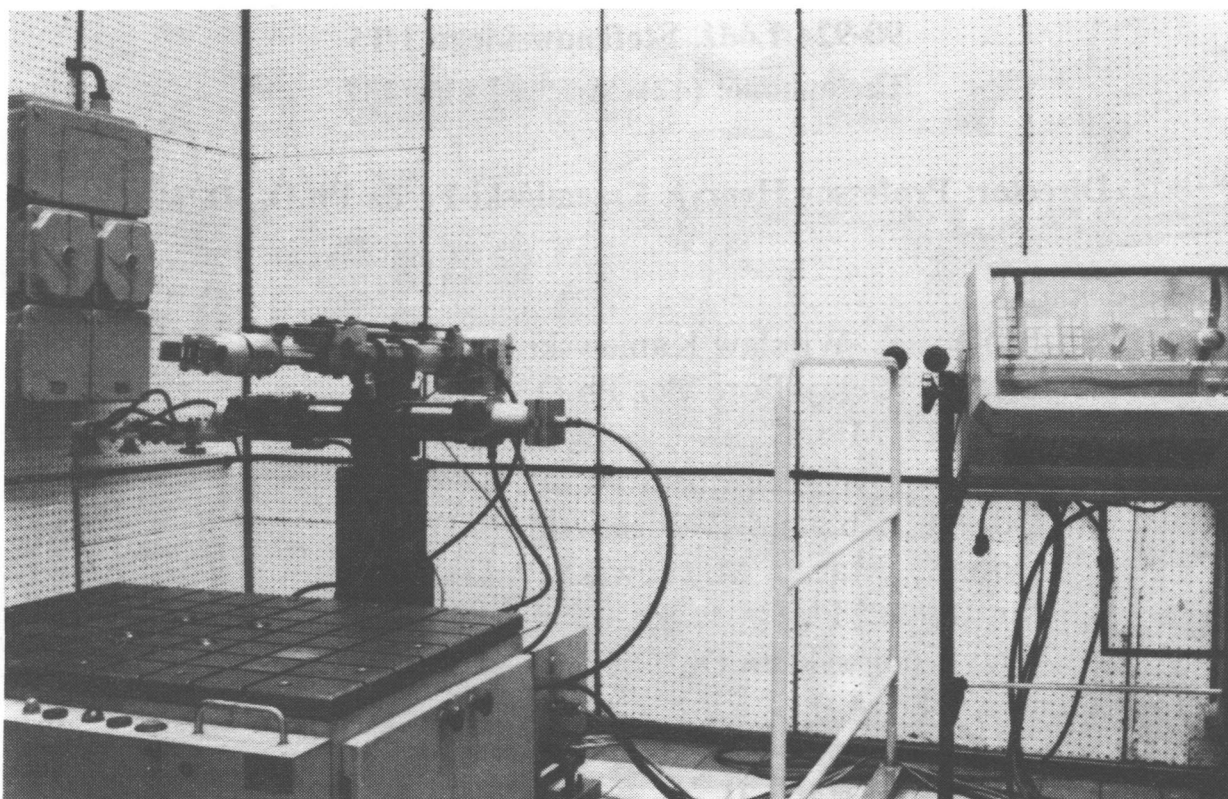
Publications, papers, books:

- books - 25
- published papers - 226
- conference papers - 248

International cooperation:

The Institute cooperates with the following scientific centres:

- Department of Mechanical Engineering of the University of Strathclyde, Glasgow, Great Britain,
- Dniepropetrovsk Chemical Technology Institute, Dniepropetrovsk, USSR,
- Technical University Dresden, Germany,
- Technical University Chemnitz, Germany,
- University of Tokyo – Department of Mechanical Engineering, Japan,
- Centre of Nonlinear Studies at Leeds University, Great Britain,
- Laboratoire Central des Ponts et Chaussées, Paris, France,
- University of Metz, France.



Model of robot used for teaching in Students' Laboratory of Dynamics of Machines

The effects of this cooperation are joint research projects, joint Ph.D. projects and publications.

Offered M.Sc. courses:

- mechanics of solids,
- dynamics of machines,
- fluid mechanics.

INSTITUTE OF MACHINE DESIGN, I-6**90-924 Łódź, Stefanowskiego 1/15****Telephone: (42) 36-55-22 ext. 487****Director: Professor Henryk Krzemiński-Freda Ph.D., D.Sc.****Academic staff:**

Professor Wiesław Kaniewski Ph.D.

Docent Jerzy Borowicz Ph.D.

Docent Mieczysław Czyżewski Ph.D.

Docent Jerzy Lewiński Ph.D.

Docent Zbigniew Wrocławski Ph.D.

Docent Marian Markowski Ph.D.

Jan Burcan Ph.D., D.Sc.

Jerzy Tomczyk Ph.D., D.Sc.

Senior lecturers: 37

Assistants: 3

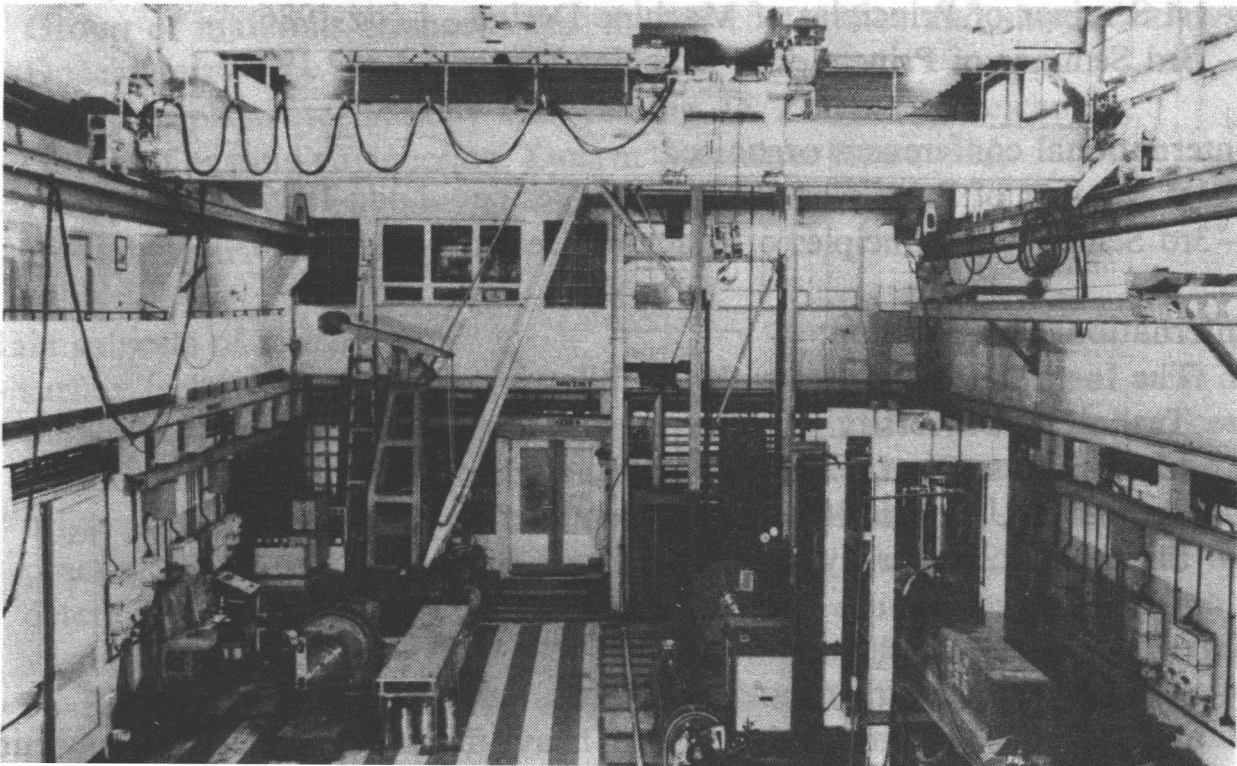
Technical and secretarial staff: 31

List of Divisions and their Heads:

- Division of Descriptive Geometry and Engineering Drawing,
Professor Henryk Krzemiński-Freda
- Division of Principles of Machine Design, Professor Wiesław Kaniewski
- Division of Heavy Machines, Docent Mieczysław Czyżewski
- Division of Textile Machines, Docent Zbigniew Wrocławski

Main subjects of research:

- computer-aided design (CAD) of typical machine elements and assembly,
- thermohydrodynamic theory of lubrication - theoretical and experimental investigations,
- rolling bearings - the elements of design and optimization of main roller races,
- bearings of mechanisms of high precision,
- worm gear - load carrying capacity, efficiency, exploitation wear,
- electrohydrostatic and electromechanical drives of heavy machines: dynamics, control, optimization, automation,
- mechanisms of textile machines - dynamic stability, impact, vibroinsulation.



Heavy Machines Laboratory

Cooperation with industry:

The Institute of Machine Design cooperates with the factories of rolling bearings and gears, textile machine factories, research centres for cranes and transportation, design offices with CAD-CAM systems.

Laboratory equipment:

- Laboratory of the Division of Heavy Machines is equipped with the test rigs of automatically controlled electromechanical and electrohydraulic drives and devices for measurement and registration of dynamic parameters,
- Laboratory of the Division of Textile Machines is equipped with the experimental rigs for model testing and computer aided sets for measurement and examination of mechanical parameters of textile technology,
- Laboratory of slide and rolling bearings models is equipped with rigs also for durability examinations,
- Microcomputer workshops equipped with SM4 and IBM-PC units.

Publications, papers, books:

- books - 23
- papers - 551

International conferences organized:

- 1st Seminar of Principles of Machine Design - Łódź 1986,
- 3rd Seminar of Principles of Machine Design - Łódź 1988.

International conferences organized:

- 1st Seminar of Principles of Machine Design - Łódź 1986,
- 3rd Seminar of Principles of Machine Design - Łódź 1988.

International cooperation:

The Institute cooperates with the following scientific centres:

- Technical University of Brno - Department of Machine Design and Mechanisms, Brno, Czechoslovakia,
- Technical University Chemnitz, Germany,
- Strathclyde University, Glasgow, Great Britain.

Offered M.Sc. courses:

- heavy machines - cranes and conveyors, earth working machines;
- hydraulic and pneumatic drives – in heavy machines, vehicles and machine tools,
- machines and equipment for textile industry (for processing natural and artificial fibres).

**INSTITUTE OF MATERIALS SCIENCE
AND TECHNOLOGY OF METALS, I-7**

90-924 Łódź, Żwirki 36

Telephone: (42) 36-20-65, 36-55-22 ext. 379

Director: Professor Zdzisław Haś Ph.D., D.Sc.

Academic staff:

Professor emeritus Zofia Wendorff, Ph.D.
 Professor emeritus Waław Piotrowski, Ph.D., D.Sc.
 Professor emeritus Janusz Szreniawski Ph.D., D.Sc.
 Docent Zdzisław Gutowski Ph.D.
 Docent Andrzej Jopkiewicz Ph.D., D.Sc.
 Docent Jerzy Nowacki Ph.D., D.Sc.
 Docent Stanisław Pietrowski Ph.D., D.Sc.

Senior lecturers: 20

Assistants: 11

Technical and secretarial staff: 41

List of Research Groups and their Heads:

- Group of surface layer engineering, Professor Zdzisław Haś,
- Group of materials science, metal-matrix composites and sintered alloys, Docent Jerzy Nowacki,
- Group of plastic technology and welding, D. Zbigniew Chejchman,
- Group of casting engineering, Docent Stanisław Pietrowski,
- Group of foundry engineering and foundry equipment, Docent Andrzej Jopkiewicz

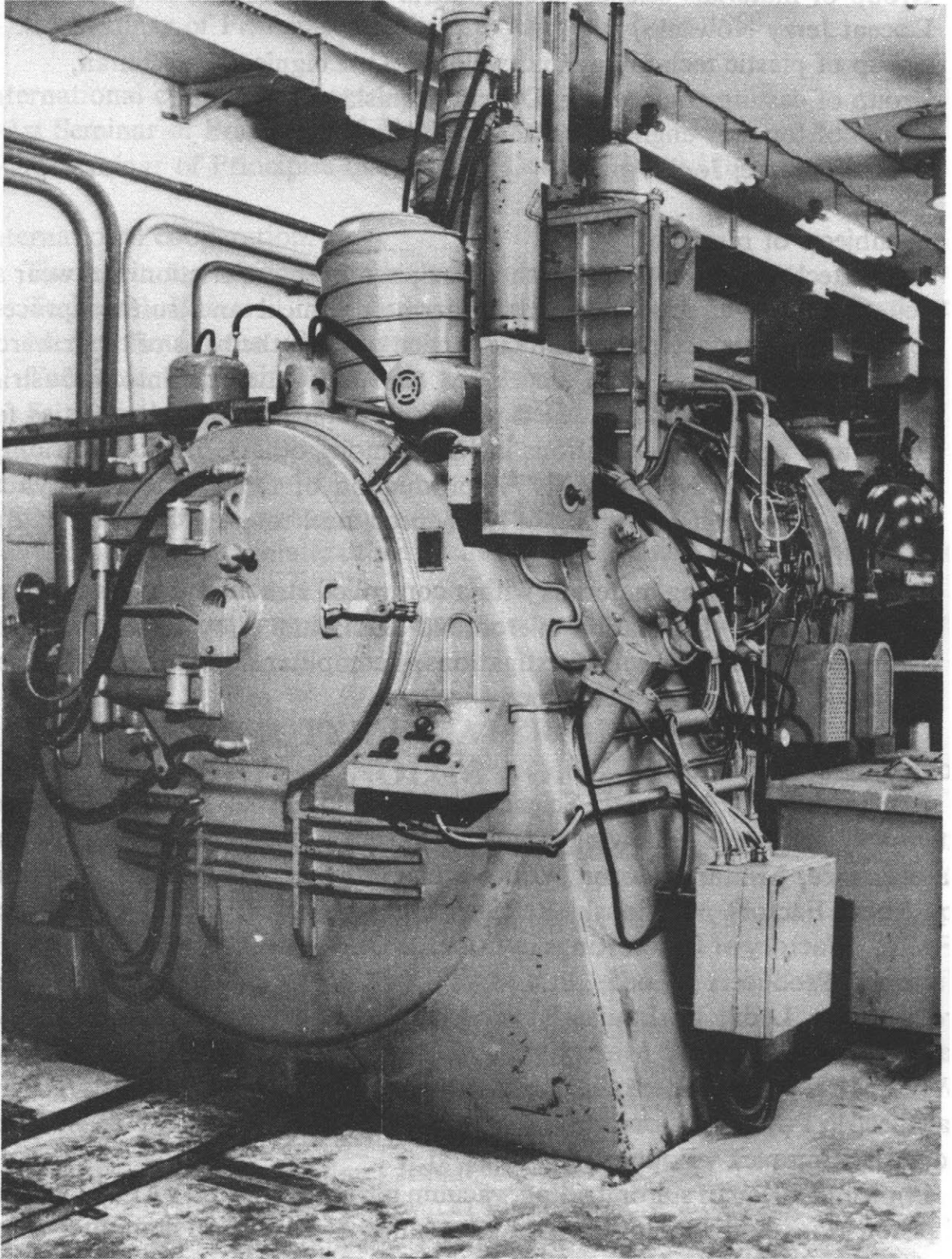
Main subjects of research:

- surface technology: basic research of the phenomena of friction and wear as well as of the effects of thermal, thermo-chemical and surface process conditions on surface phenomena is carried out. On the basis of the research original technologies were developed and implemented into industrial practice. The technologies which permit to obtain required properties for determined operating conditions include, among others, gas sulfonitriding, vacuum nitriding NITROVAC'79, production of thin layers by physical methods, induction hardening of high-speed steel tools, production of dry lubricants,
- production of casting materials with a controlled structure: basic studies on the process of crystallization of iron and aluminium alloy are carried out,
- casting equipment control: investigations of computer simulation of cast iron melting in a cupola are performed.

Cooperation with industry:

The Institute of Materials Science and Technology of Metals cooperates extensively with the following factories: Trucks Factories in Lublin and Starachowice, Military Motor Works-3 in Głowno, „HYDROSTER” Ship Equipment Factory in Gdańsk, Refrigeration Equipment Factory at Dębica, „FAPIT” Factory of Piston Rings in Łódź, „POLMATEX-WIFAMA” Textile Machinery Producers in Łódź, „POLMATEX-MAJED” Silk Textile Machinery Producers in Łódź, Hydraulic Power Plant in Łódź, Repair Workshop of Railway Stock at Mińsk Mazowiecki, „FONICA” Radio Producers in Łódź, „WIZAMET” Metal Works in Łódź, Municipal Transport Enterprise, Thermal-Electric Power Stations, Metal Works at Kutno, „STALOWA WOLA” Industrial Complex - Foundry at Koluszki.

Implementation of sulfonitriding, vacuum nitriding NITROVAC'79, casting of piston rings and development of new kinds of cast iron, computer-aided manufacturing of high quality cast iron and protective coating of casting moulds are, for these factories, the source of substantial savings on production costs.

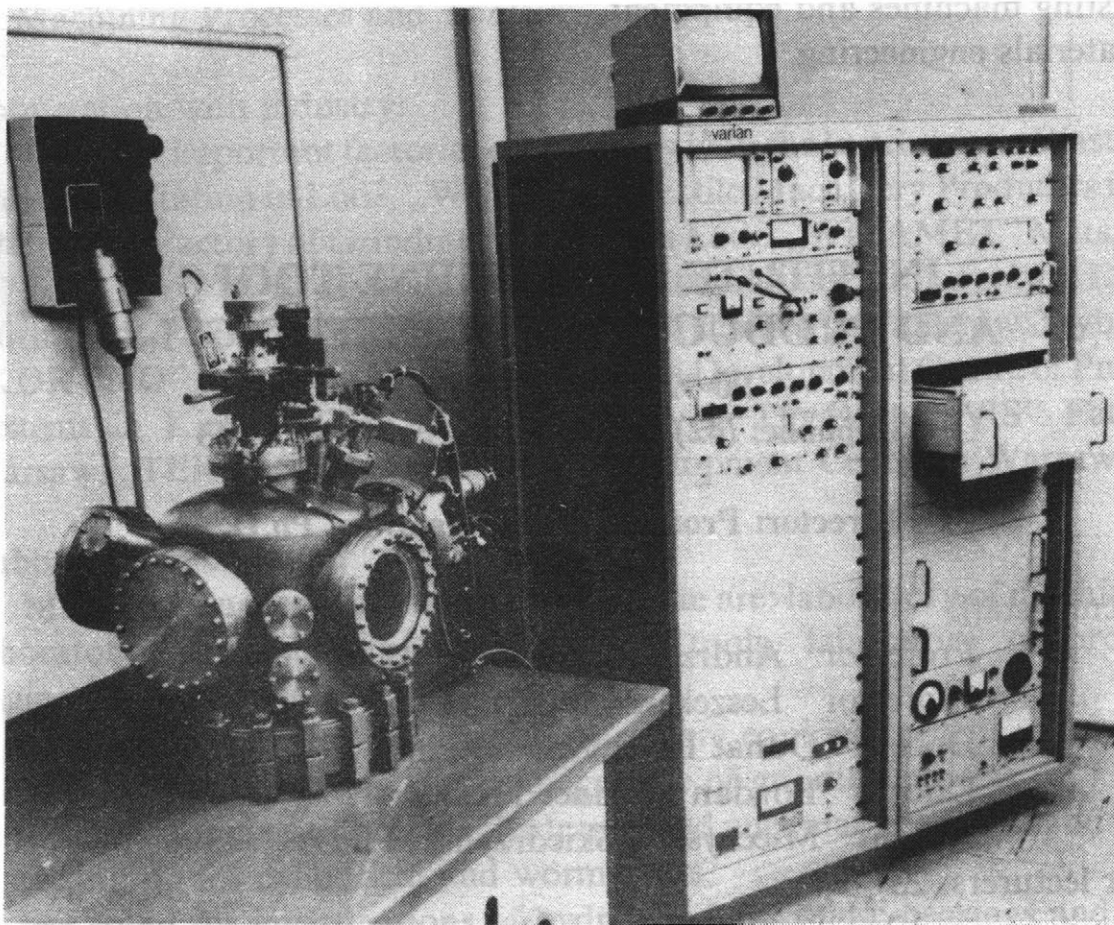


Vacuum furnace for thermal treatment

Laboratory equipment:

The laboratory of the Institute of Materials Science and Technology of Metals is equipped with the following instruments:

- scanning electron microscope,
- Auger spectrometer,
- vacuum furnaces for heat and thermochemical treatment,
- induction furnaces for melting of ferrous alloys and non-ferrous metals,
- „Cristalldigraf” – for differentiation of liquidus curves of metals and alloys.



Auger electron spectrometer

Publications, papers, books:

- books - 3
- published papers - 425
- conference papers - 456
- The members of academic and technical staff of the Institute of Materials Science and Technology of Metals are the authors of 61 patents, majority of which have been applied in industry.

International cooperation:

The Institute cooperates with the following scientific centres:

- Institute of Super-Hard Materials of the Academy of Sciences in Kiev, USSR,
- Automobile and Highway Engineering Institute in Kharkov, USSR,
- Technical University of Liberec, Czechoslovakia.

Offered M.Sc. courses:

- foundry engineering,
- casting machines and equipment,
- materials engineering.

**INSTITUTE OF MACHINE TOOLS
AND PRODUCTION ENGINEERING, I-8**

90-924 Łódź, Żwirki 36

Telephone: (42) 36-20-91, 36-55-22 ext.12-43

Director: Professor Jan Rafałowicz Ph.D.

Academic staff:

Professor Andrzej Koziarski Ph.D.

Professor Leszek Kwapisz Ph.D.

Docent Donat Lewandowski Ph.D.

Docent Bogdan Meldner Ph.D.

Docent Mieczysław Skiedrzyński Ph.D.

Senior lecturers: 23

Assistants: 12

Technical and secretarial staff: 28

List of Divisions and their Heads:

- Division of Machine Tools, Professor Leszek Kwapisz
- Division of Machine Tools Automation, Professor Jan Rafałowicz
- Division of Production Engineering, Professor Andrzej Koziarski
- Division of Machining Processes and Tools, Docent Mieczysław Skiedrzyński

Main subjects of research:

- adaptive and numerical control of machine tools, computer-aided design and manufacture (Division of Machine Tools Automation);
- hydro- and aerostatic bearings of spindles and ways, drives and pneumo-hydraulic control of machine tools (Division of Machine Tools);
- shaping and estimation of the properties of active face of grinding wheel, investigations of working properties of grinding wheel (Division of Production Engineering);
- technology of gears, design and technology of cutting tools (Division of Machining Processes and Tools).

Cooperation with industry:

The most important factories cooperating with the Institute are: Waste Water Treatment Station in Łódź, „WIFAMA” Textile Machinery Producers in Łódź, „PONAR” Factory of Grinding Machines in Łódź, „WIZAMET” Metal Works in Łódź, „HYDROS” Hydraulic Power Factory in Łódź, Ironworks in Dąbrowa Górnicza, „PIOMA” Factory of Mining Machines in Piotrków Trybunalski, „KORUND” Factory in Koło, Research and Development Centre of Pneumatic Systems in Kielce, „GERLACH” Factory in Drzewica, „VIS” Factory in Warsaw, „TEKOMA” Research and Development Centre in Warsaw.

Laboratory equipment:

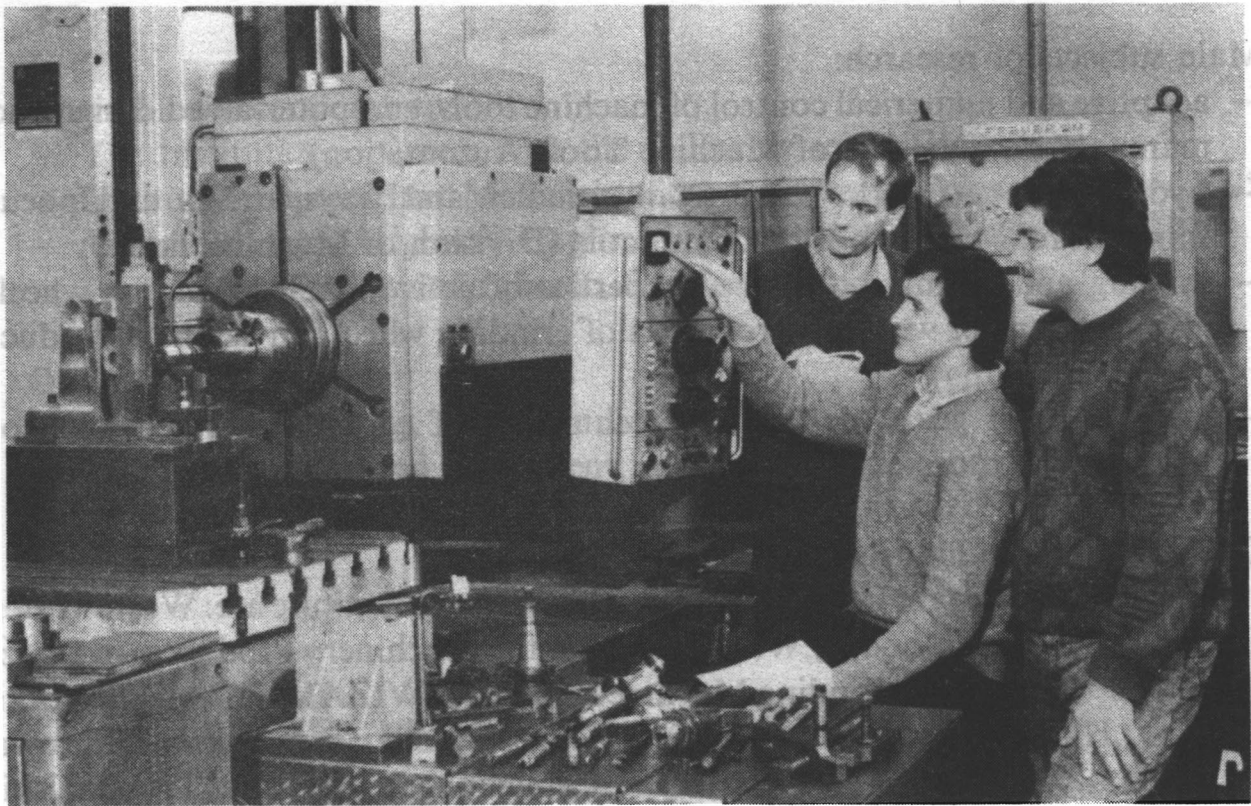
Main teaching laboratories in the Institute are: laboratory of machine tools, laboratory of machining processes and tools, laboratory of production engineering and laboratory of metrology.

Laboratories for experimental research are equipped with:

- computer-aided testing rig for diagnostic of grinding process,
- test stand for investigations of hydraulic and pneumatic elements and systems,
- testing rig for cylindrical and worm gears,
- test stand for investigations of hydro- and aerostatic bearings and ways,
- computer-aided testing rig for estimation of properties of grinding wheel active face,
- test stand for investigations of machining processes and exploitation of cutting tools.
- computer workshop with terminals.

Publications, papers, books:

- books - 5
- papers - 200



Numerically controlled drilling machine

International cooperation:

Within the exchange of research workers and professional experience the Institute cooperates with the following scientific centres:

- Technical University of Moscow, USSR
- Technical University of Odessa, USSR
- Technical University of Chemnitz, Germany
- Technical University in Aachen, Germany
- Technical University of Havana, Cuba
- University of Strathclyde in Glasgow, Great Britain
- Arizona State University in Phoenix, USA.

Offered M.Sc. courses:

- machining processes,
- machine tools,
- robotics.

Offered post-graduate courses:

- production engineering and machine tools.

INSTITUTE OF THERMAL ENGINEERING AND REFRIGERATION, I-9

90-924 Łódź, Stefanowskiego 12/16
Telephone: (42) 36-74-81, 36-55-22 ext.238

Director: Docent Jacek Kulesza Ph.D.

Academic staff:

Professor Stefan Wiśniewski Ph.D., D.Sc.
Docent Tadeusz Bratek Ph.D.
Docent Andrzej Kapitaniak Ph.D.
Docent Marian Mieszkowski M.Sc.
Docent Jan Żelazny Ph.D.

Senior lecturers: 16

Assistants: 3

Technical and secretarial staff: 26

Main subjects of research:

- basic research in thermodynamics and heat and mass transfer,
- research projects of refrigeration equipment and machines and equipment of food industry,
- research projects of air conditioning and ventilation,
- design and research projects of thermal measuring apparatus.

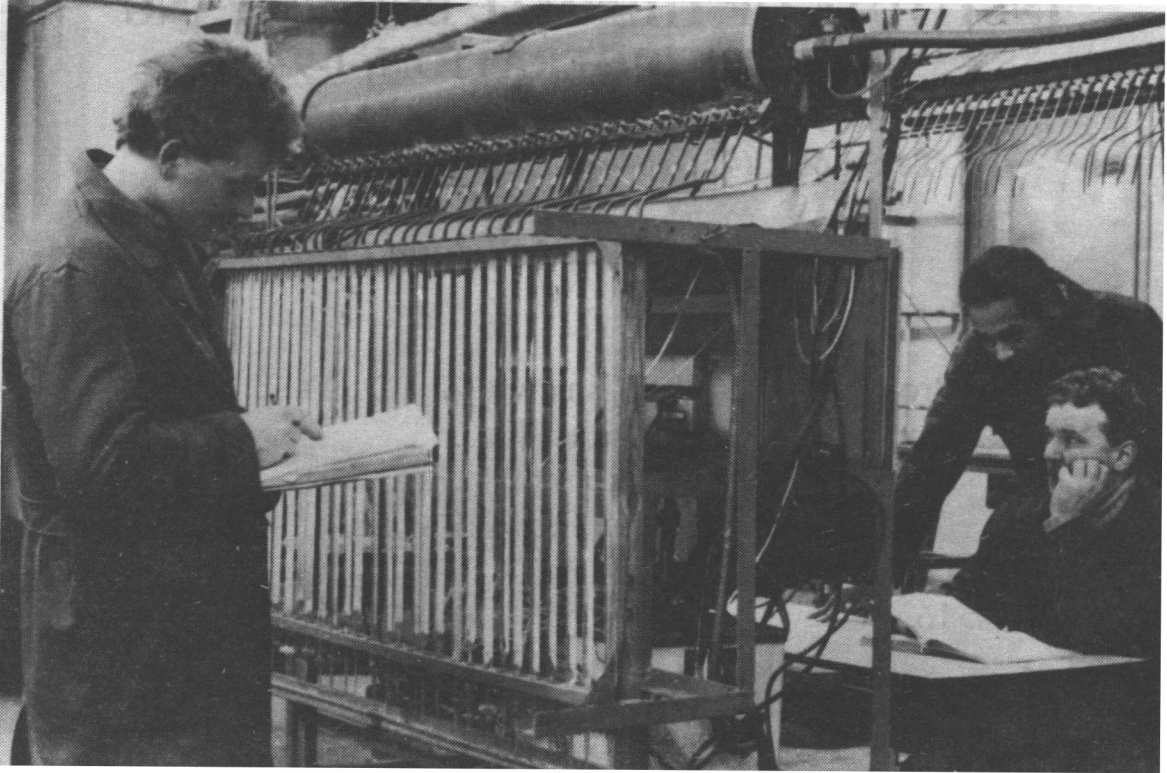
Cooperation with industry:

The Institute cooperates in the fields of optimization of energy utilization, increase of refrigeration cycles efficiency, improvement of working conditions - with National Meat Processing Plants, Food Freezing Plants, Factories of Food Machines and Equipment such as „SPOMASZ” in Łódź, „MOSTO-STAL” and „POLAR” Works in Wrocław.

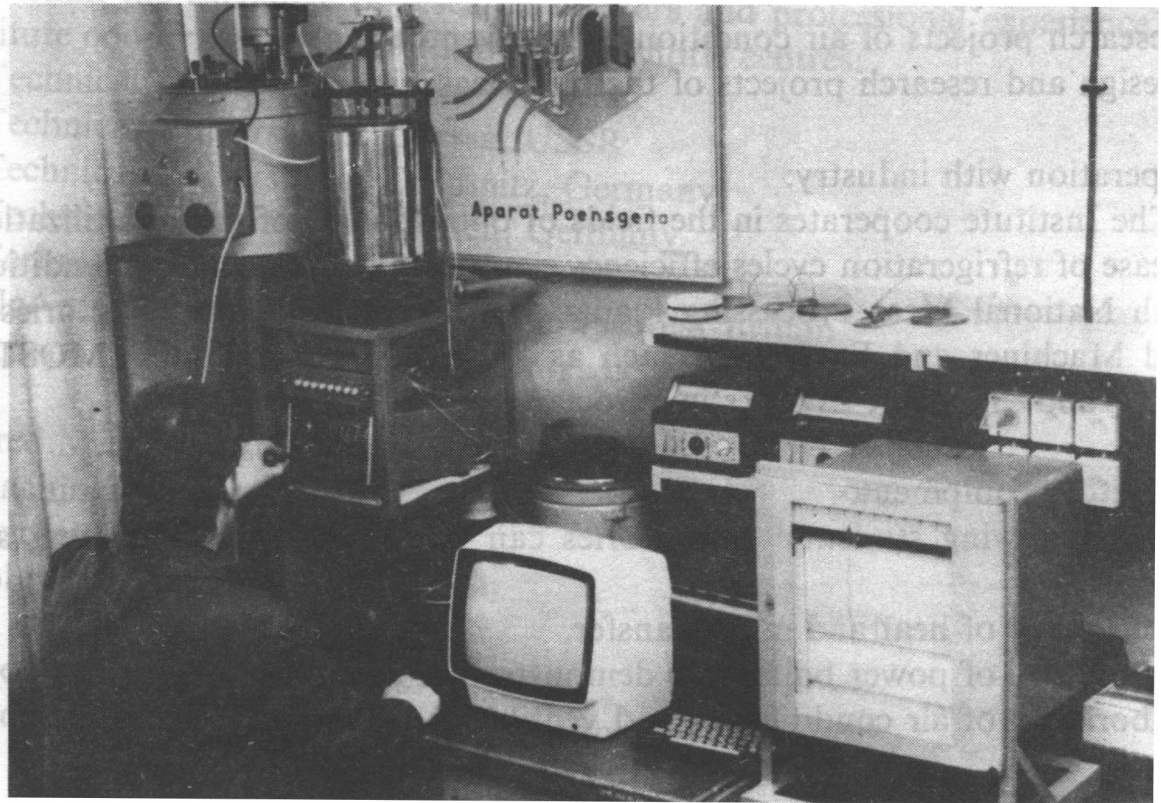
Laboratory equipment:

The following students' laboratories can be regarded as interesting and modern:

- laboratory of heat and mass transfer,
- laboratory of power boiler (for demonstration only),
- laboratory of air conditioning and ventilation.



Students' Laboratory of Heat Transfer



Experimental set for numerical indication of compressors

Publications, papers, books:

- books - 21
- published papers - 164
- conference papers - 128

International cooperation:

The Institute cooperates with the following scientific centres:

- University of Bitola, Yugoslavia,
- Institute of Technology of Refrigeration Industry in Leningrad, USSR,
- Institute of Technology of Food Industry, Kiev, USSR.

This cooperation results in joint research projects, dissertations and papers and also in the regular exchange of members of staff and students.

Offered M.Sc. courses:

- machines and equipment for food industry,
- refrigerating engineering,
- air conditioning engineering,
- low-temperature technology,
- machines and equipment for rubber industry (organization in progress).

Offered post-graduate courses:

- in the field of refrigerating engineering.

INSTITUTE OF TURBOMACHINERY I-10

90-924 Łódź, Stefanowskiego 1/15

Telephone: (42) 36-13-83, 36-55-22 ext. 247

Director: Professor Władysław Gundlach Ph.D.

Academic staff:

Professor Zbyszko Kazimierski Ph.D., D.Sc.
 Professor Jan Krysiński Ph.D., D.Sc.
 Professor emeritus Stanisław Kuczewski Ph.D.
 Professor emeritus Zdzisław Orzechowski Ph.D.
 Docent Jerzy Porochnicki Ph.D.
 Docent Andrzej Potapczyk Ph.D.
 Docent Ryszard Przybylski Ph.D.
 Docent Andrzej Werner Ph.D.

Senior lecturers: 25

Assistants: 2

Technical and secretarial staff: 87

List of Divisions and their Heads:

- Division of Fluid Mechanics, Professor Zbyszko Kazimierski
- Division of Thermal Turbomachinery, Docent Jerzy Porochnicki
- Division of Metrology, Pneumatics and Hydraulics, Professor Jan Krysiński

Main subjects of research:

- thermodynamics of fluids, thermodynamic properties of working agents, flow structures of a variety of homo- and heterogeneous fluids,
- mass and energy transport and dissipation processes in the fluid subjected to various actions,
- identification of phenomena occurring in fluid flow, measurement of physical values in the flow processes, design of measuring devices, visualization of flow and design of apparatus for this purpose,
- automation of measuring processes, making-up and improving of a computer control system for research processes, development of computer programmes and procedures,
- development of the theory of fluid flow machines and equipment on the basis of experimental and theoretical investigations and working out of the calculation methods and computer-aided design,
- experimental and theoretical investigation of the profiles of turbine and compressor blades in a wind tunnel, stages and systems of stages of thermal turbines tested in a double-shaft turbine rig, stages of microturbines, pumps, compressors and exhaust fans and microcompressors, fluid atomizing systems and fluid beds,
- novel design and modernization projects of steam and gas turbines, flow compressors, water pumps of special destination (submerged pumps and mine drainage pumps), gas bearings for various purposes (high-speed drives, turbodetanders, fibre producing and processing machines, grinders and fans), thermal wheels, atomizers,
- utilization of flow phenomena in pneumatic spinning and texturing, production of insulating material fibres,
- hydraulic and pneumatic systems including automatic systems, power hydraulics and pneumatics,
- medical equipment (turbine drills with air bearings, elements of artificial kidney),
- cogeneration, combined cycles, gasification,
- expertises and evaluations prepared for the national economy.

Cooperation with industry:

The Institute of Turbomachinery cooperates with many industrial plants, among others with „ABB–ZAMECH” Mechanical Works at Elbląg, Petrochemical and Chemical Plants in Płock, Włocławek, Inowrocław, etc. Machines designed by the Institute are being manufactured in the following factories:

- compressors in „WIROMET” Mechanical Works of Mining and Power Industry at Mikołów,
- exhaust fans in „FAMPA” Factory of Paper Machines at Cieplice,
- special pumps in „POWEN” Mining Machines Factory at Zabrze.

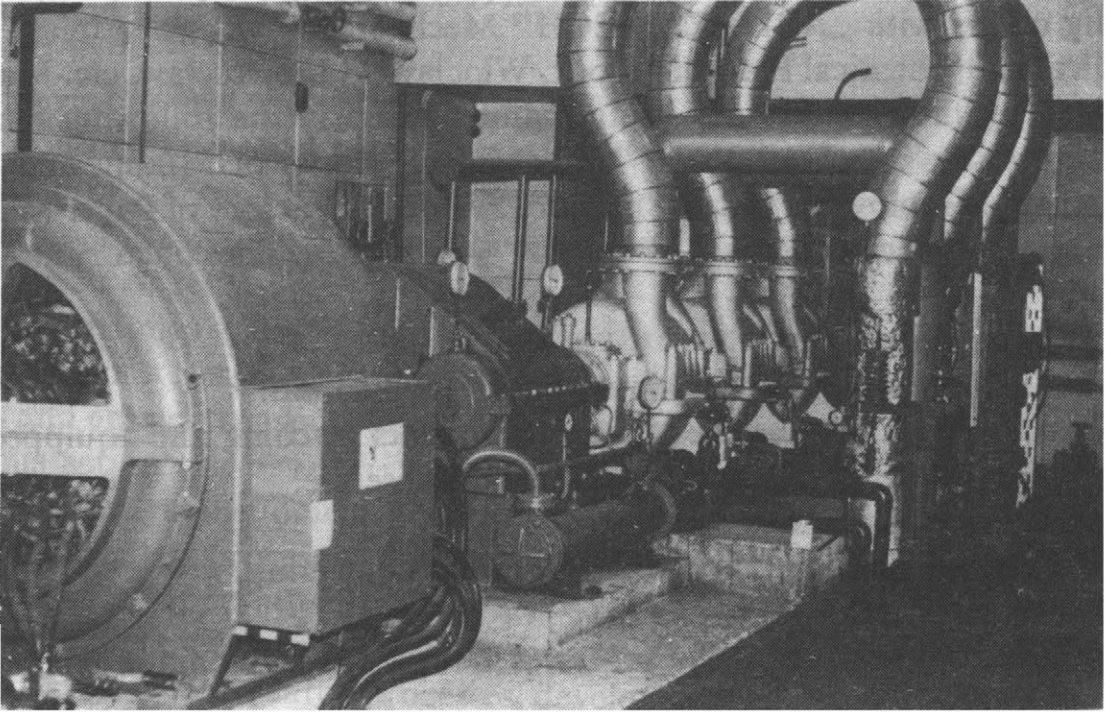
Laboratory equipment:

The Institute of Turbomachinery has at its disposal: Three educational laboratories used for students teaching and equipped with high standard testing rigs and instruments. These are:

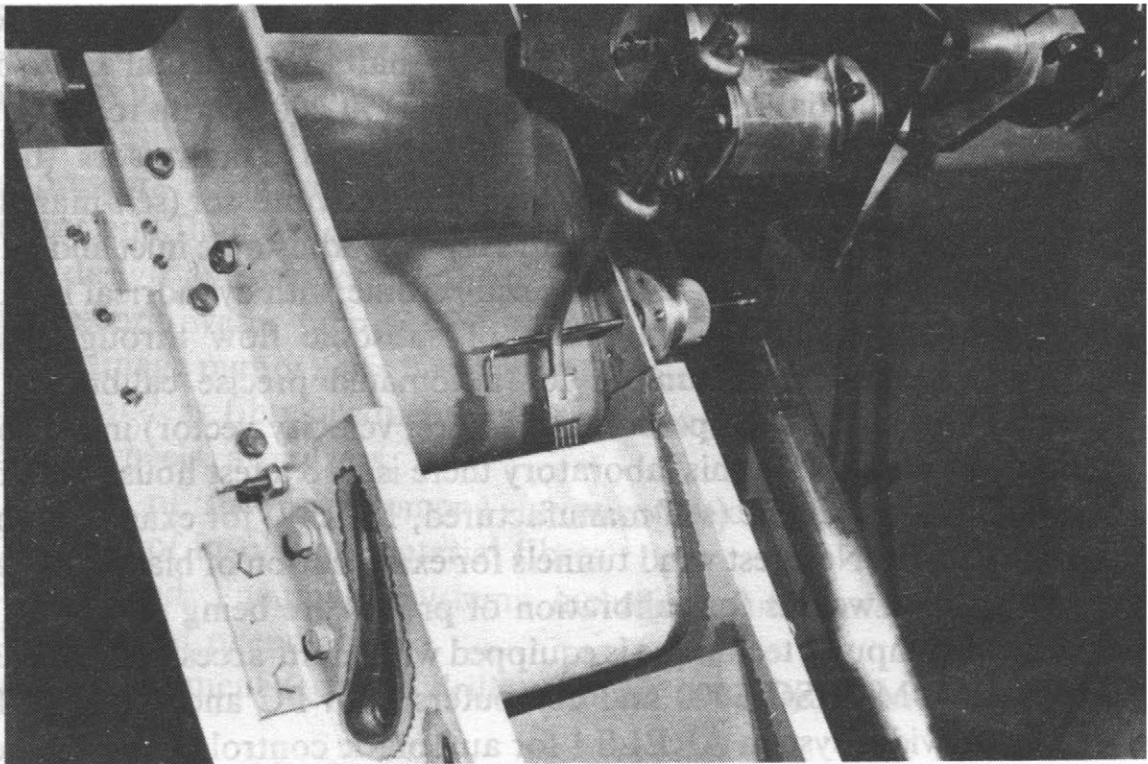
- laboratory of fluid mechanics,
- laboratory of automatic control in power engineering,
- laboratory of metrology.

Seven well equipped research laboratories in few cases with unique experimental rigs and testing instrumentation:

- laboratory of thermal turbomachinery, occupies five rooms with testing rigs and auxiliary equipment. It comprises three-casing Clark centrifugal compressor (163 Hz, 2 MW) and single-stage self-manufactured compressor (type 1.76, 163 Hz, 2 MW) supplying air mass flux of 24 kg/s at 0.29 MPa or 5.8 kg/s at 0.9 MPa. This laboratory includes also two-shaft experimental air turbine for examination of axial and radial-axial stages (50-200 Hz, up to 800 kW), testing rig for examination of stages of industrial compressors (up to 125 Hz, 400 kW), experimental single-stage radial compressor (self-manufactured, mass flux 15 kg/s, at 0.16 MPa, 101 Hz) with adjustable inlet and outlet blade rings, testing rig of single-stage axial turbine with cylindrical impulse blading, wind tunnel for examination of subsonic flow through blade cascade, two special wind tunnels for automated precise calibration of different testing probes (temperature, pressure, velocity vector) in subsonic flow (up to $M = 0.85$). In this laboratory there is also a test house for small turbine combustion engine (self-manufactured, 100 kW) for examination of special equipment. New test wind tunnels for examination of blade rings and blade cascades as well as for calibration of probes are being mounted.
- laboratory of computer technique is equipped with multi-access system based on computer IBM-RISC 6000 and computers IBM-PC and ATARI. The laboratory provides system ARELS 1 for automatic control of tests. A new



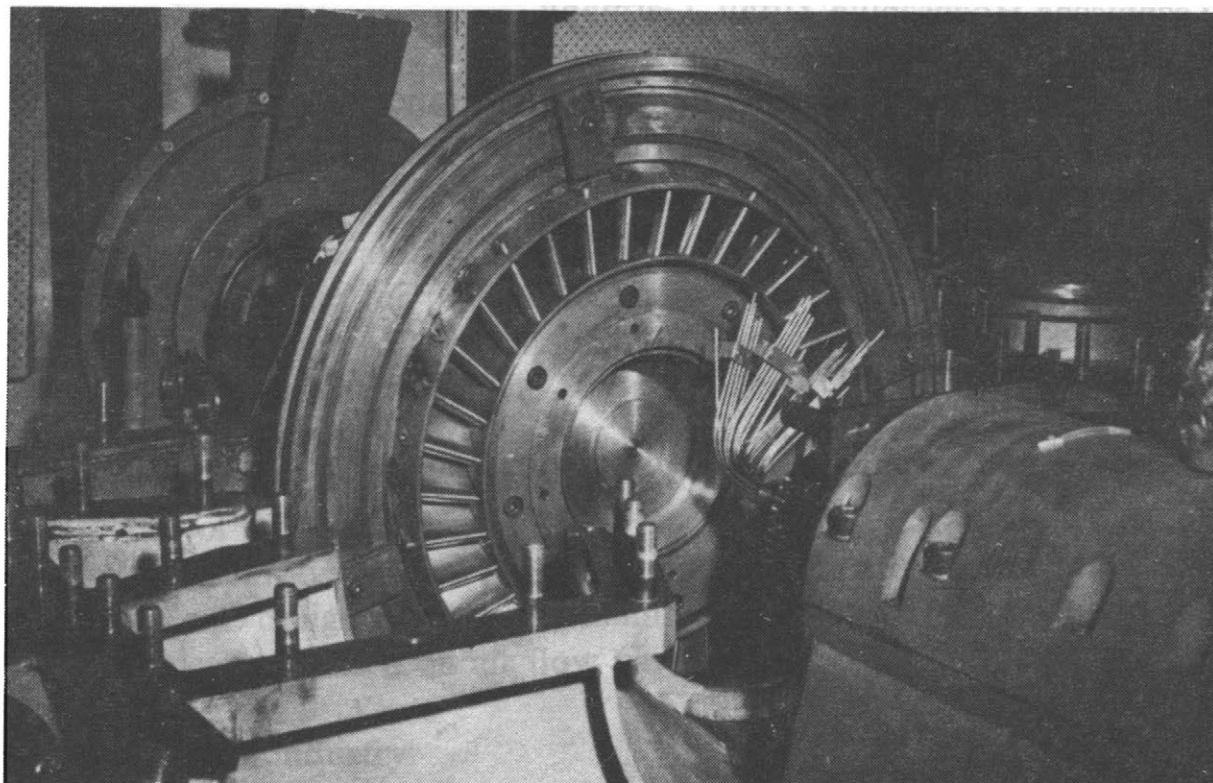
CLARK centrifugal compressor supplying the turbomachinery laboratory with the air



Blade cascade for automatic examination of subsonic flows

automatic system of ARELS 2 based on IBM-PC and KEITHLEY apparatus is being built.

- laboratory of micro-drives and gas bearing is equipped with a test rig for examination of microcompressors used in expansion turbines and machine tools, a test rig of charging micro-units of piston engines, a test rig for examination of absolute gas seals used in compressors forcing through gases in chemical processes, a test rig for examination of active super-stiff pneumatic bearings, a test rig for examination of self-balancing assemblies of rotors.
- laboratory of photo-optical metrology includes holography testing set, impulse super-sonic wind tunnel, „Schlieren” appliances for visualization of flows (80 mm and 150 mm of measurement diameter), high – speed cameras for fast photography, among others self-manufactured drum-type camera (up to 10000 shots per second).
- laboratory of hydraulic machinery (pumps) comprises six rigs for examination of different types of special purpose pumps and their elements.



Two-shaft experimental air turbine for examination of flows through blade rings

- laboratory of pneumatics and hydraulics is equipped among others with a generator of fast changeable pressures (adjustable up to 10 kHz, 0.5 MPa), stand for static calibration of pressure transducers (up to 0.3 MPa, class 0.01%).
- laboratory of two-phase flows includes, among others, a test rig for examination of the hydrodynamics of fluid beds and test stands for examination of atomization processes of fluids.

Publications, papers, books:

- books - 30
- published papers - 619
- conference papers - 693

International cooperation:

The Institute has cooperative links with the following universities abroad:

- University of Strathclyde, Glasgow, Great Britain,
- Rheinisch-Westfälische Technische Hochschule, Aachen, Germany,
- Technische Universität Dresden, Germany,
- Technische Hochschule Zittau, Germany,
- Université Paris VI, Paris, France,
- Ecole Supérieure d'Ingénieurs de Marseille, France,
- Moscow Power Engineering Institute, USSR,
- Technical University of Leningrad, USSR,
- Technical University of Zurich, Switzerland.

Offered M.Sc. courses:

- thermal turbomachinery,
- hydraulic machines,
- metrology and pneumatic and hydraulic equipment.

INSTITUTE OF VEHICLE RESEARCH, I-11**90-543 Łódź, Żeromskiego 116****Telephone: (42) 36-22-65, 36-55-22 ext. 250****Director: Professor Cezary Szczepaniak Ph.D., D.Sc.****Academic staff:**

Professor emeritus Jerzy Jędrzejewski M.Sc.

Professor Jerzy Lanzendoerfer Ph.D., D.Sc.

Professor Henryk Dajniak Ph.D., D.Sc.

Docent Jerzy Grabowski Ph.D.

Docent Kazimierz Janczak Ph.D.

Docent Jerzy Sygniewicz Ph.D.

Ryszard Andrzejewski Ph.D., D.Sc.

Senior lecturers: 12

Assistants: 9

Technical and secretarial staff: 24

List of Groups:

- Group of Theory and Design of Vehicles,
- Group of Internal Combustion Engines,
- Group of Vehicle Maintenance.

Main subjects of research:

- dynamics of the braking process with particular attention paid to the anti-locking devices for pneumatic braking systems,
- theory and design of hydrokinetic torque converters used in power transmission systems of vehicle and machinery,
- theory and design of hybrid power transmission systems,
- theoretical and experimental investigations for the increasing mechanical efficiency of diesel engines,
- injection apparatus of diesel engines - theoretical and experimental studies,
- analysis and design of the inlet manifold for 4-stroke diesel engine with direct injection, based on air flow parameters.

Cooperation with industry:

The Institute cooperates with a number of factories under the terms of direct orders. Among them the most important clients are: Power Hydraulic Centre in Łódź, Motorization Equipment Factory in Praszka, Motor-Car Factory in Jelcz, Vehicle Transport Institute in Warsaw.

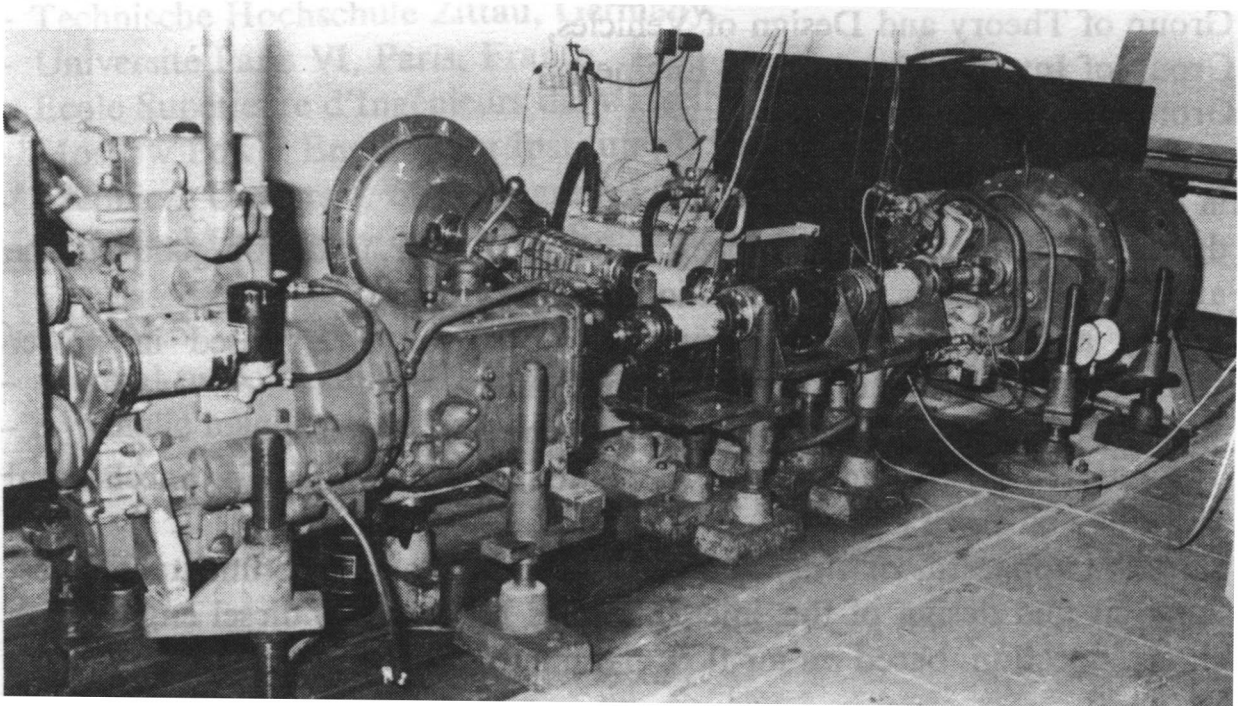
The most important achievements of the Institute in the last years are, among others:

- elaboration and development of anti-locking device of the 2nd generation,
- development of the diagnostic tester for anti-locking device (actually being produced),
- modelling of the damping performance of a power transmission system with hydraulic torque converter,
- elaboration of models of hybrid power transmission systems,
- investigations for the increase of mechanical efficiency of diesel engines.

Laboratory equipment:

In order to perform the teaching and research purposes the Institute's laboratories are used (majority of them being modernized at the moment) as well as the laboratories of industrial research centres. There is a heavy laboratory for investigations of vehicle units, the Institute also has a computing laboratory with SM4 microcomputer (6 terminals, operating store 124 kB) and a few personal computers IBM PC type which are permanently used by students.

Apart from that the Institute has mechanical and electric workshops and its own auditorium for 50 persons and fully equipped drafting room for 30 persons.



Test bed of hybrid driving systems

Publications, papers, books:

- books - 20
- published papers - 155
- conference papers - 95

International conferences:

There were 2 international conferences on the subject of vehicle brakes (1985, 1988).

Actually the III Conference „Brakes' 91" is prepared.

In 1984 the International Conference on the Teaching in the Areas of Motor-Cars in Technical Universities took place with participants from Yugoslavia, Czechoslovakia, Hungary, Germany, Bulgaria and USSR.

International cooperation:

This cooperation is based on bilateral agreements and personal contacts between scientists. The Institute cooperates with the following foreign research centres and institutions:

- Institute of Vehicle Engineering - Technical University of Budapest, Hungary,
- Ingenieurhochschule Zwickau, Germany,
- L'Institut National de Génie Mécanique de Boumerdes, Algérie,
- Institute of Vehicle Engineering - Technical University of Belgrade, Yugoslavia,
- Instituto Politecnico Superior Jose Antonia Echeverria, Havana, Cuba,
- Universidad Nacional Autonomia de Mexico, Mexico,
- University of Strathclyde, Glasgow, Great Britain,
- Forschungsstelle für Zahnantriebe- FZG Technische Universität, München, Germany,
- Rheinisch-Westfälische Technische Hochschule, Aachen, Germany.

Offered M.Sc. courses:

- motor-car and tractor design,
- internal combustion engines,
- structure and technology of car body,
- maintenance of vehicles.

The Institute provides Ph.D. courses for foreign students.

FACULTY OF ELECTRICAL ENGINEERING, W-2

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

Telephone: (42) 36-47-02

Telefax: (48 42) 36-85-22

Telex: 886-136 polit pl

FOUNDATION AND GROWTH

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

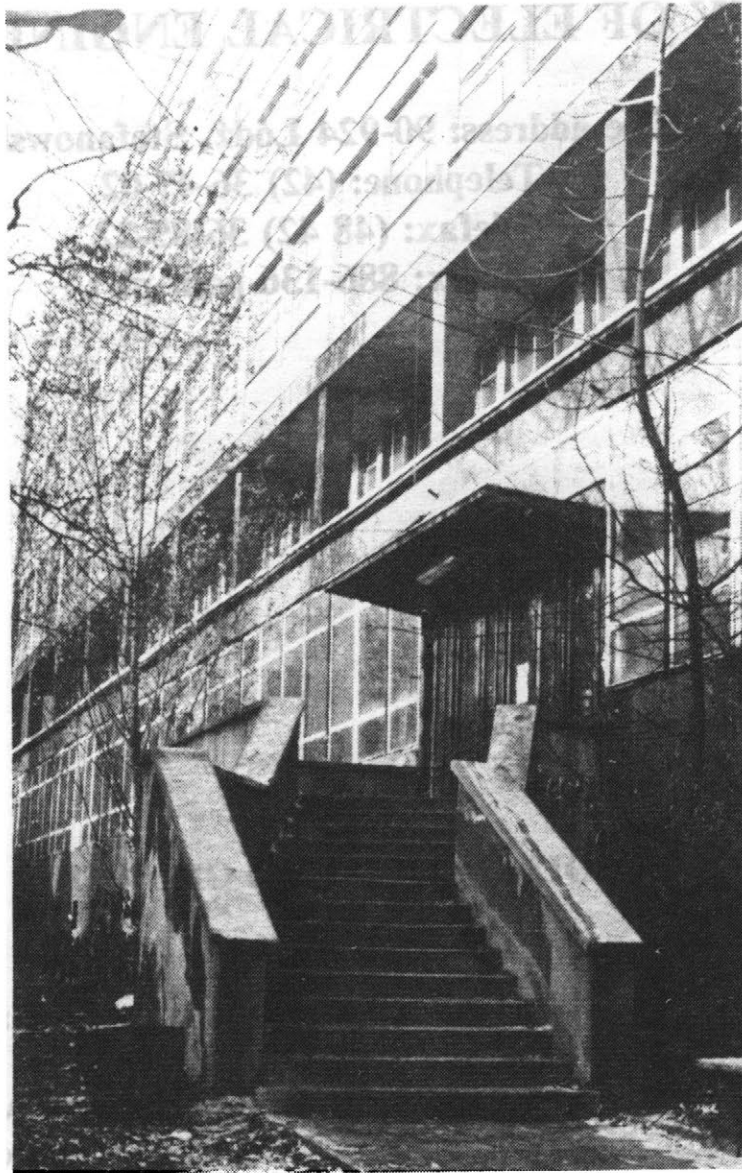
The need to create the Faculty of Electrical Engineering was enhanced by the poor condition of the national economy during the postwar period of reconstruction and also by the large scale electrification required by the country.

Important dates in the life of the Faculty of Electrical Engineering are:

1945 - 26th October - first meeting of the Faculty Council, presided over by Professor J. Groszkowski, with Professors: W. Iwaszkiewicz, J.L. Jakubowski, S. Konczykowski and R. Podoski in attendance. Here the Faculty structure was established.

1945 - October - Inauguration of the first academic year. The following departments (chairs) were established : Technical Physics, Principles of Electrotechnics, Electrical Machines, General Electronics, Electrical Power Engineering and Radiotechnics.

1956 - additional departments established: Electric Traction, Electrical Drives, Electroheat, Electrical Apparatus and Machinery, Electrical Power Plants and Industrial Electrotechnics.



**The building of the Faculty of Electrical Engineering-
entrance from Stefanowski St.**

- 1969 - opening of new buildings A and B for the Faculty of Electrical Engineering at 18/22 Stefanowski Street.**
- 1970 - restructuring of the Faculty, creation of the Institutes: of Principles of Electrotechnics, of Automatic Control, of Transformers and Electrical Machines and Apparatus, of Electrical Power Engineering and of Electronics.**
- 1982 - opening of the new building C**
- 1985 - Institute of Transformers, Electrical Machines and Apparatus divided to form two new Institutes called - Electrical Machines and Transformers**

and Electrical Apparatus and also the Department of High Voltage Engineering.

1986 - opening of the new building D

1989 - Department of Electroheat established.



The building of the Faculty of Electrical Engineering - view from Wólczańska St.

STRUCTURE

At present the Faculty has six Institutes and two Departments:

Institute of Principles of Electrotechnics, I-12,

Institute of Automatic Control, I-13,

Institute of Electrical Machines and Transformers, I-14,

Institute of Electrical Power Engineering, I-15,

Institute of Electronics, I-16,

Institute of Electrical Apparatus, I-36,

Department of High Voltage Engineering, K-21,

Department of Electroheat, K-22.

The Faculty Library founded in 1981, has over 40 000 books and about 300 subscriptions to monthly journals and reviews. The Library is used by more than 10 000 readers, each year.

DEANS OF FACULTY

1945	Professor Janusz Groszkowski
1945 - 1948	Professor Stanisław Konczykowski
1948 - 1952	Professor Witold Iwaszkiewicz
1952 - 1953	Professor Eugeniusz Jeziński
1953 - 1956	Docent Czesław Dąbrowski
1956 - 1959	Professor Bronisław Sochor
1959 - 1960	Professor Władysław Pelczewski
1960 - 1962	Professor Karol Przanowski
1962 - 1966	Professor Stanisław Dzierzbicki
1966 - 1969	Professor Tadeusz Koter
1969 - 1973	Professor Zdzisław Pomykański
1973 - 1981	Professor Zdzisław Szczepański
1981 - 1987	Professor Bolesław Bolanowski
1987 - 1990	Professor Maciej Pawlik
1990 -	Professor Krzysztof Kuźmiński

STAFF OF FACULTY

The Faculty of Electrical Engineering has 225 members of teaching staff, including 20 professors, 11 assoc. professors and 13 docents as well as 224 technicians and secretarial staff.

The Faculty has awarded 350 Ph.D. degrees and 50 D.Sc. (dr habil.) degrees since its creation.

EDUCATION

The actual teaching programmes were elaborated in 1973 and modified in 1982.

By the end of 1990 the total number of 4438 M.Sc. degrees and 845 B.Sc. degrees have been awarded to the students of the Faculty of Electrical Engineering.

The Faculty has at present about 900 students enrolled on the following courses leading to the degree of M.Sc.:

- I. Electrical power engineering with:
 - Electrical power plants,
 - Electrical power systems,
 - Industrial power engineering.

- II. Electrical machines and apparatus, with:
 - Transformers,
 - Electrical machines,
 - Electromechanical elements in automation,
 - Electrical apparatus,
 - Control and protecting equipment,
 - High voltage engineering.
- III. Conversion and utilization of electrical energy, with:
 - Industrial electroheat,
 - Automation in electroheat,
 - Electrical lighting.
- IV. Electric traction.
- V. Automatic control and electrical metrology, with:
 - Analog and digital control systems,
 - Control of electrical drives,
 - Robotics,
 - Optimal control,
 - Electrical metrology.
- VI. Electronic instrumentation, with:
 - Telecommunication,
 - Medical electronics,
 - Power electronics.

Full-time students choose the main areas of study in the 2nd year and specialize in the 4th and 5th year.

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

Graduates of the Faculty of Electrical Engineering are well trained for careers in all branches of industry, including power engineering, electric traction, research, design and development.

Post-diploma courses are organized for engineers from industry.

RESEARCH

Pure and applied research projects are conducted in the Institutes and Departments and will be discussed in the description of particular units of the faculty. As a rule the themes of the MSc. theses are closely connected with the running research.

INSTITUTE OF PRINCIPLES OF ELECTROTECHNICS I-12

90-924 Łódź, Stefanowskiego 18/22

Telephone: (42) 36-22-81

Director: Docent Stefan Wojciechowski Ph.D.**Academic staff:**

Professor Michał Tadeusiewicz Ph.D., D.Sc.
 Professor emeritus Zbigniew Piotrowski Ph.D., D.Sc.
 Professor emeritus Zdzisław Pomykalski Ph.D., D.Sc.
 Professor emeritus Walenty Starczakow M.Sc.
 Assoc. Professor Franciszek Kostrubiec Ph.D., D.Sc.
 Assoc. Professor Andrzej Koszmider Ph. D., D.Sc.
 Assoc. Professor Ryszard Nowicz Ph.D., D.Sc.
 Docent Franciszek Lachowicz Ph.D.
 Docent Jan Leszczyński Ph. D.

Senior lecturers: 35

Assistants: 7

Technical and secretarial staff: 36

The Institute is divided into four Divisions:

1. Electrical Circuits and Fields
2. Electrical Metrology and Automobile Electrotechnics
3. Instrument Transformers
4. Materials Science and Electrotechnology

The main subjects of research of the Institute are as follows:

- 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 media,
- construction of prototype equipment and computer systems for measurement of various physical quantities.

DIVISION OF ELECTRICAL CIRCUITS AND FIELDS

The head of the Division is Professor Michał Tadeusiewicz. The staff consists of 17 persons including 13 academic teachers and among them 2 docents. The main subjects of research are as follows:

- theory and analysis of nonlinear circuits focusing on computer-aided analysis of electronic circuits,

– analysis of electromagnetic fields in conducting media.

The staff of the Division published 7 books and 250 papers. Number of degrees awarded: D.Sc.-1, Ph.D.-22, M.Sc.-35, B.Sc.-2.

International cooperation:

M. Tadeusiewicz - reviewer of Mathematical Reviews, published by American Mathematical Society.



Impulse laser for spot- welding

DIVISION OF ELECTRICAL METROLOGY AND AUTOMOBILE ELECTROTECHNICS

The head of the Division is Assoc. Professor Zygmunt Kuśmierek. The staff consists of 24 persons including 16 academic teachers.

The main subjects of research are:

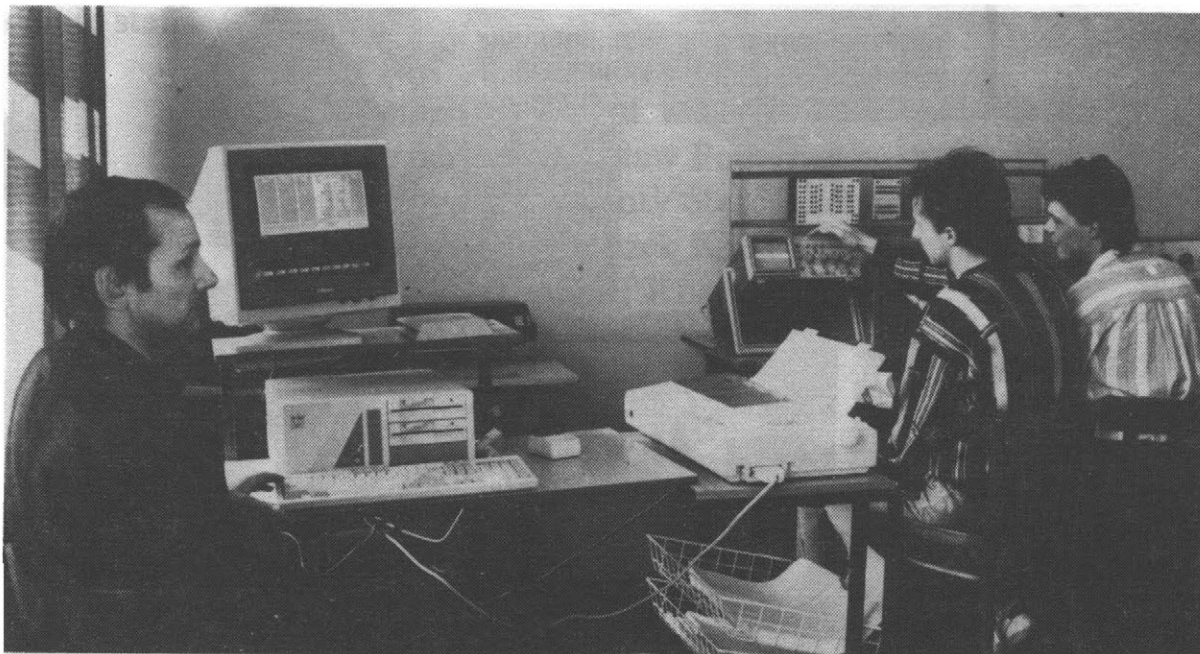
- identification and nonlinear correction of multidimensional measurement systems via nonlinear operators,
- automation of measurements and measurement networks,
- measurements of electric quantities such as voltage, current, active and reactive power,

- electrical measurements of nonelectric quantities,
- magnetic measurements.

Teaching duties of the Division are focused on education of graduate students preparing their M.Sc. theses in metrology.

Total number of papers published by staff of the Division is 145.

Total number of degrees awarded: D.Sc.-3, Ph.D.-24, M.Sc.-75, B.Sc.-31.



Tutorials in measuring systems

DIVISION OF INSTRUMENT TRANSFORMERS

The head of Division is Assoc. Professor A. Koszmider. The staff consists of 17 persons including 11 academic teachers and among them two assoc. professors. The research activity concentrates on:

- mathematical and physical models of instrument transformers,
- design and construction of standard instrument transformers and instrument transformers of special use,
- development of classical and computer-aided measurement methods.

This activity, covers construction of components of laboratory equipment quality test stands and special measurement devices for testing instrument transformers under varied operational conditions. The research concerning measurements in dynamic states and SHV computer measurement systems with fibre-optic data transmission has been recently a subject of special interest. The

activity connected with the modelling of field phenomena and making utility software for computer-aided design also has been developed.

The staff of the Division published 2 books and 127 papers.

International conferences organized:

1. Current State of Construction and Operating of Instrument Transformers, Łódź, 1971.
2. Instrument Transformers - Current State and Trends of Development, Łódź, 1990.

DIVISION OF MATERIALS SCIENCE AND ELECTROTECHNOLOGY

The head of the Division is Docent Jan Leszczyński. The staff consists of 12 persons including 7 academic teachers. The main subjects of research are:

- application of lasers 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.

Total number of papers published by staff of the Division is 75.

Number of degrees awarded: D.Sc.-1, Ph.D.-8, M.Sc.-19.

International cooperation: Physico-Technical Institute of Academy of Sciences of Ukraine, USSR.

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

INSTITUTE OF AUTOMATIC CONTROL, I-13
90-924 Łódź, Stefanowskiego 18/22
Telephone: (42) 36-76-44

Director: Professor Mirosław Krynke Ph.D.

Academic staff:

Professor Krzysztof Kuźmiński Ph.D., D.Sc.
Professor emeritus Władysław Pełczewski Ph.D.
Assoc. Professor Zbigniew Nowacki Ph.D., D.Sc.
Docent Andrzej Czajkowski Ph.D.
Docent Edward Jezierski Ph.D., D.Sc.

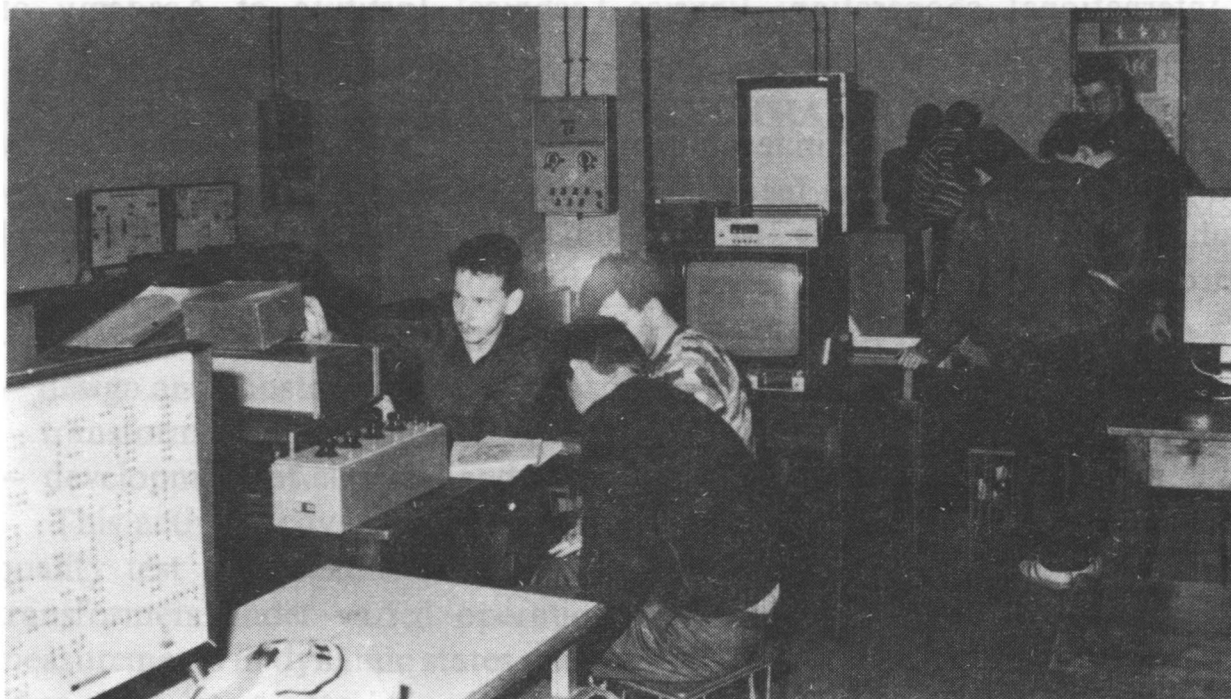
Senior lecturers: 17

Assistants: 8

Technical and secretarial staff: 25

The Institute is divided into two Divisions and two Groups:

- Division of Control Theory,**
- Division of Electrical Drive and Industrial Automatics,**
- Control Engineering Group,**
- Robotics Group.**



Laboratory of automatics

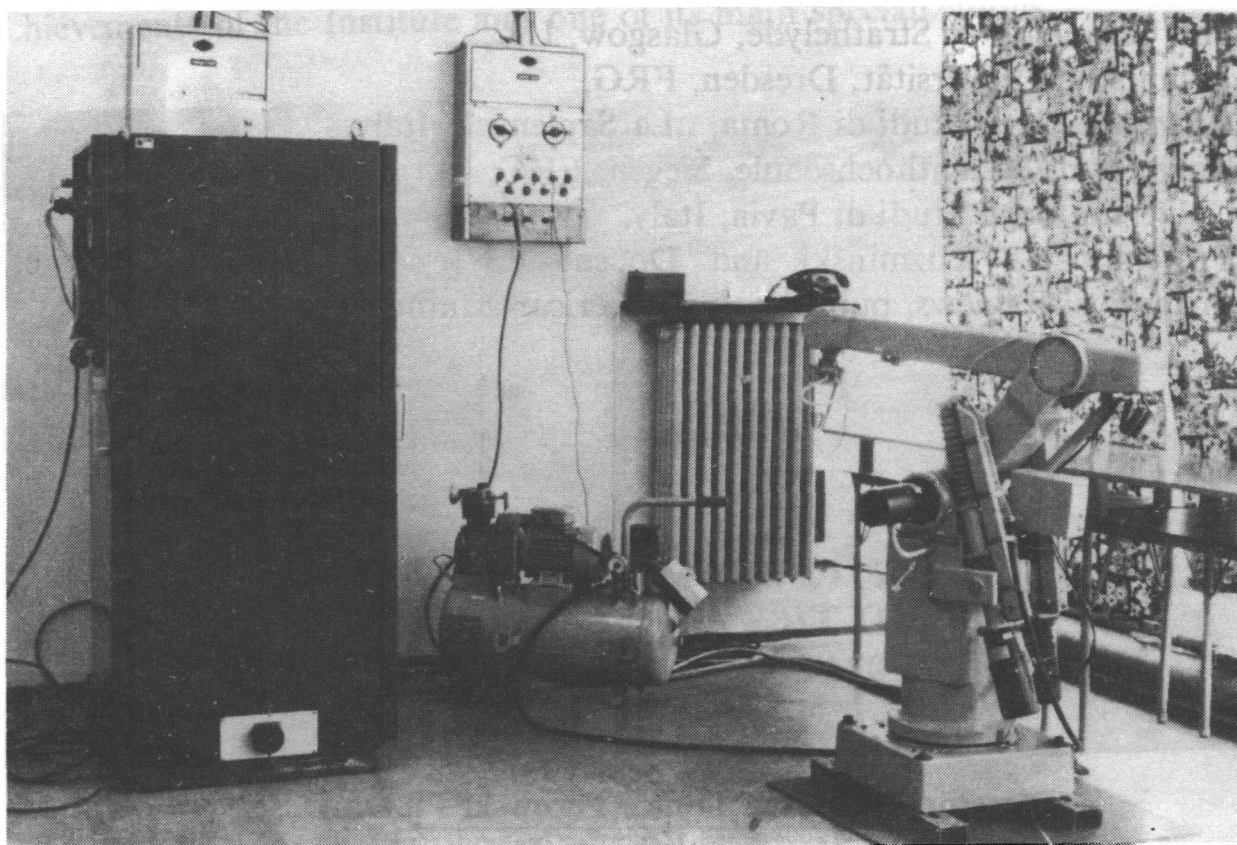
The research activities of the Institute are focused mainly on the following topics:

- control theory,
- control of electrical drives,
- digital and analog devices and systems,
- control of robots.

This research covers the following problems:

Effective optimal control algorithms for various cost criteria. Study of new ideas concerning adaptive control systems. Development of model control of nonlinear systems via use of extended and global linearization. Elaboration of robust control algorithms insensitive to the influence of disturbances and parameter changes.

Idea of preparing, construction and testing of transistor PWM converters of rated power of tens of kVA. Microcomputer control of electrical drives with DC and AC motors.



Testing of robots

Design and realization of analogue and digital signal processing, microcomputer systems and microcomputer control systems. Design and research of control elements and systems.

Dynamics analysis of robot electrical drives. Problems concerning the use of adaptive control in electrical drive units with DC motors. Realization of a research stand for testing of robot electrical drives.

Since the establishment of the Institute of Automatic Control 3 D.Sc., 49 Ph.D. and about 500 M.Sc. degrees were awarded.

The staff of the Institute published about 300 papers and 9 books.

The Institute of Automatic Control offers the following courses, leading to M.Sc. degree in:

- analog and digital control systems,
- control of electrical drives,
- robotics,
- optimal control and complex automatics.

The Institute has established scientific links with:

- The University of Strathclyde, Glasgow, UK,
- Technische Universität, Dresden, FRG,
- Università degli Studi di Roma, „La Sapienza”, Italy,
- Universität Gesamthochschule, Siegen, FRG,
- Università degli Studi di Pavia, Italy.

Professor K. Kuźmiński and Docent E. Jeziński are reviewers of Mathematical Reviews, published by American Mathematical Society.

INSTITUTE OF ELECTRICAL MACHINES AND TRANSFORMERS, I-14

90-924 Łódź, Stefanowskiego 18/22

Telephone: (42) 36-23-09

Director: Professor Janusz Turowski Ph.D., D.Sc.

Professor Eugeniusz Jeziński

Academic staff:

Professor Michał Jabłoński Ph.D., D.Sc.

Professor emeritus Tadeusz Koter M.Sc.

Professor Maciej Kozłowski Ph.D., D.Sc.

Professor Janusz Turowski Ph.D., D.Sc.

Professor Kazimierz Zakrzewski Ph.D., D.Sc.

Docent Alicja Kozłowska Ph.D.

Sławomir Wiak Ph.D., D.Sc.

Senior lecturers: 9

Assistants: 8

Technical and secretarial staff: 21

Research is carried out in three Research Groups:

1. Rotating electrical machines
2. Transformers and static converters
3. Electrodynamics and small machines
(including Computer Laboratory).

The Institute of Electrical Machines and Transformers specializes in electrodynamic of electrical machines and transformers with special emphasis on computerization, electronization and transient phenomena. Education and training of engineers for national transformer industry is one of the main achievements of the Institute and one of its main specializations.



Laboratory of electrical machines

The research activity of the Institute is focused on the following problems:

- modelling and analysis of electromagnetic and thermal fields in electrical devices,

- magnetic circuits and vibroacoustics of electrical machines and transformers,
- special transformers, induction motors, convertor-motor systems, electromechanical components of servomechanisms and special machines such as linear, impulse controlled, switched reluctance motors etc.

The majority of results are directly applicable in design and production in Polish electrical industry. The concept and development of the testing station in the Transformer and Traction Equipment Works ELTA in Łódź, and the prototypes of some special transformers, reactors and heavy-current DC sources, may be given as examples.

Problems of noise suppression and improvement of magnetic circuits in induction motors for electromachinery works KOMEL and EMIT, as well as transformers for ELTA factory, have been dealt with. Computer-aided design and computation methods in factories EMIT, ELTA etc. have been implemented. Research programmes concerning implementation of linear motors in textile industry, switched reluctance motors for mining and new small electrical motors for SILMA factory of fractional-power electrical motors, are currently being undertaken.

The research is sponsored by the government or industry.

During the years 1945 to 1990, 9 D.Sc., 54 Ph.D. and about 650 M.Sc. degrees have been awarded. The staff of the Institute published 496 papers and 8 more important books.

The Institute organized many national and international conferences, including the following:

1. Transformer conferences:

- National Transformer Conference, Łódź 1955,
- International Transformer Conference, Łódź 1970,

2. International Symposium on Electromagnetic Fields in Electrical Engineering ISEF. Periodical, biennial conference. Initially national (Uniejów 1974, Jadwisin 1982, Rydzyna 1983) and then international (Łódź 1979, Warsaw 1985, Pavia 1987, Łódź 1989, Southampton 1991).

Papers of ISEF Symposia, apart from regular Proceedings, have been published in the form of books:

a) A. Savini, J. Turowski (editors): *Electromagnetic Fields in Electrical Engineering*. PLENUM PRESS. New York, London 1988.

b) J. Turowski, K. Zakrzewski (editors): *Electromagnetic Fields in Electrical Engineering*. COMPEL. James and James. London 1990.

3. National Symposia on Electrical Machines in cooperation with Electrotechnical Committee of the Polish Academy of Sciences: Sulejów 1983, Kazimierz Dolny 1985, Łódź-Arturówek 1990.

4. International expert's „5x5” Seminars Łódź/Strathclyde. Łódź 1988, Glasgow 1989.

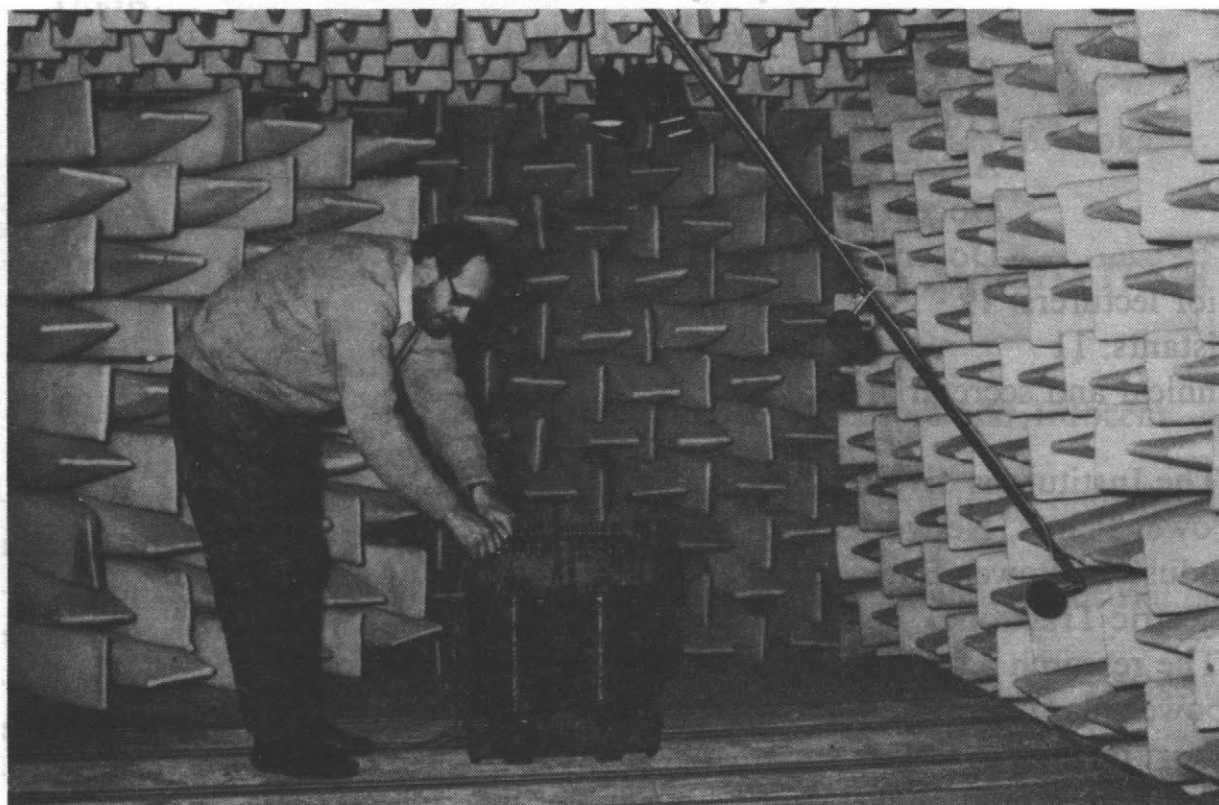
5. International expert's „3x3x3” Seminar Łódź/Pavia/Strathclyde. Łódź 1990.

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

The Institute has established scientific links with:

- University of Pavia, Italy - exchange of staff and students, joint International Symposia „ISEF”,
- University of Strathclyde, Glasgow - joint Seminars „5x5”. Joint „3x3x3” Seminars Łódź/Pavia/Strathclyde: exchange of staff,
- Technical University of Kiev, USSR,
- Latvian Academy of Sciences, Riga.

The Institute is well equipped in standard laboratory equipment and also has the laboratory of vibration and noise of electrical machines and transformers



Interior of anechoic room

with an anechoic chamber of a 200m³ volume and the laboratory of fractional power motors and electromechanical control components.

Teaching process is connected with the scientific specializations of the Institute. In the final year of the M.Sc. course the following seminars are conducted:

- rotating electrical machines;
- power and special transformers, static convertor sets;
- electromechanical components of automatic control systems and robotics.

INSTITUTE OF ELECTRICAL POWER ENGINEERING, I-15
90-924 Łódź, Stefanowskiego 18/22
Telephone: (42) 36-11-93

Director: Professor Zbigniew Kowalski Ph.D., D.Sc.

Academic staff:

Professor Jerzy Bąk Ph.D., D.Sc.
Professor Henryk Karbowski Ph.D., D.Sc.
Professor Maciej Pawlik Ph.D., D.Sc.
Professor emeritus Karol Przanowski M.Sc.
Assoc. Professor Franciszek Strzelczyk Ph.D., D.Sc.
Docent Władysław Mielczarski Ph.D., D.Sc.
Docent Janusz Skierski Ph.D., D.Sc.

Senior lecturers: 19

Assistants: 11

Technical and secretarial staff: 36

The Institute is divided into three Divisions:

1. Power Plants, Networks and Systems
2. Industrial Power Engineering and Electrical Lighting
3. Electric Traction.

The research activities of the Institute embrace the following:

- power plant operation and generation of electrical energy,
- short-circuits in power systems,
- electrical energy quality and its rational utilization,
- modelling and optimization of industrial networks,

- electrical lighting and their supply networks,
- application of expert system to power system control,
- automatic train control and supply networks for electric traction.

Since the creation of the Institute 10 D.Sc., 26 Ph.D. and over 1800 M.Sc. degrees have been awarded.

The Institute of Electrical Power Engineering has been involved in organizing the following international conferences:

1984, 1986 and 1988 - International Conference on Short-Circuit Currents in Power Systems,

1990 - a similar conference but organized jointly with the University of Liège, Belgium.

1987 and 1989 - Five-by-five Seminar on Power Systems and Machines, organized jointly with the Strathclyde University, UK.

The Institute has established scientific links with:

- The University of Strathclyde, Glasgow, UK,
- The University of Liège, Liège, Belgium,
- The University of Pavia, Pavia, Italy,
- Mariupol Metallurgical Institute, Mariupol, USSR,
- Institute of Electrodynamics, Academy of Sciences of Ukrainian SSR, Kiev, USSR,
- The Technical University of Budapest, Hungary,
- Hochschule für Verkehrswesen, Dresden, FRG.

The staff of the Institute published about 500 papers and 8 books.

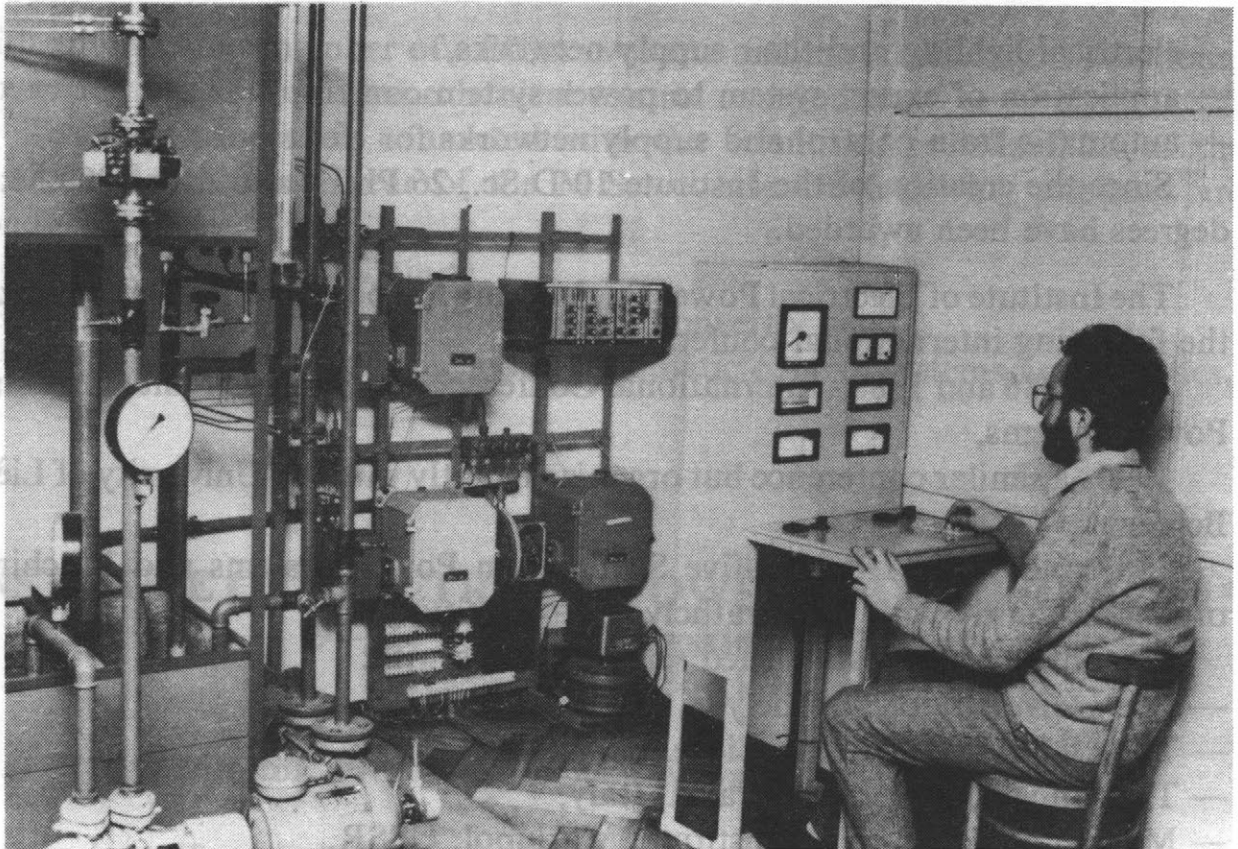
DIVISION OF POWER PLANTS, NETWORKS AND SYSTEMS

The Division is headed by Professor Maciej Pawlik.

There are 15 members of staff, including 2 professors and 1 docent.

The main areas of research are:

- power plant operation, with special regard to auxiliary networks and installations,
- optimization of thermal and electrical energy, production in industrial power stations.
- networks and power systems with special regard to the problem of short-circuit phenomena,
- load forecasting in communal distribution networks.



Laboratory stand for testing of power station automata

The Division has a well equipped Laboratory which includes:

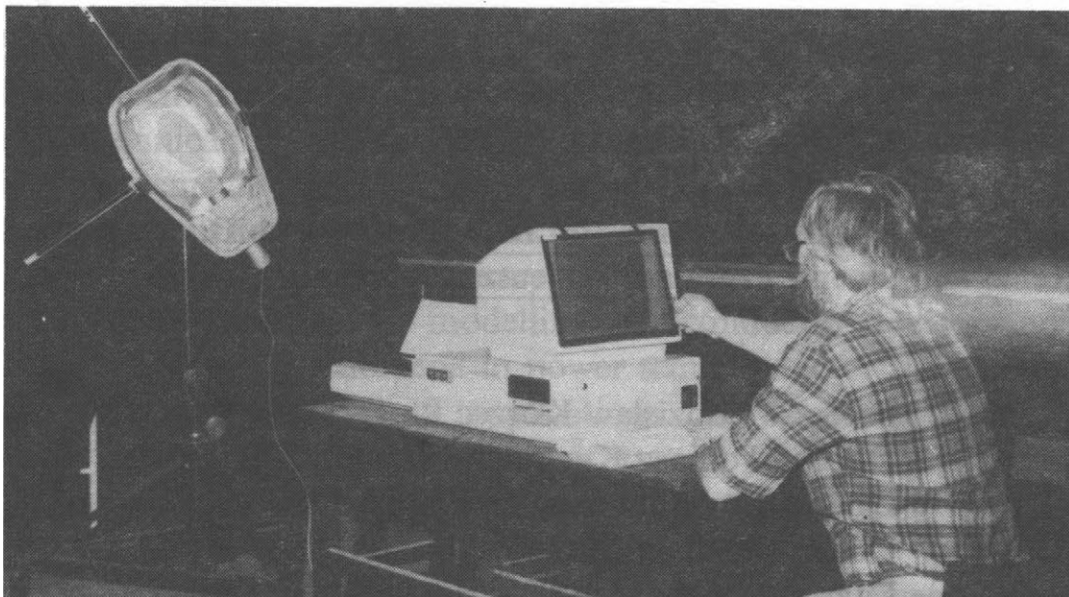
- model of a thermal power plant consisting of the model of a boiler and thermal processes,
- model of a power system which consists of a model of two generators, transformers, models of electric networks and loads.

DIVISION OF INDUSTRIAL POWER ENGINEERING AND ELECTRICAL LIGHTING

The Division is headed by Professor Zbigniew Kowalski. There are 15 members of staff, including 2 professors and 1 docent.

The main fields of research are:

- modelling and optimization of industrial power networks,
- quality and reliability of power supply in industrial power networks,
- application of expert systems in power system control,
- electrical lighting and lighting supply networks,
- testing of lighting equipment.



Testing of lighting equipment

The Division has a highly specialized laboratory for standard testing of lighting equipment used also for teaching purposes.

DIVISION OF ELECTRIC TRACTION

The head of the Division is Professor Henryk Karbowski. The staff consists of 7 persons.

The main subjects of research are:

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

The system of automatic limitation of train speed conceived in the Division is to be applied in Warsaw underground.

The Institute of Electrical Power Engineering offers the following courses, leading to M.Sc. degree in:

- electrical power stations,
- electrical power systems,
- industrial power engineering,
- electrical lighting,
- electric traction.

INSTITUTE OF ELECTRONICS, I-16
90-924 Łódź, Stefanowskiego 18/22
Telephone: (42) 36-00-65

Director: Professor Jerzy Luciński Ph.D.
Professor Tadeusz Konopiński

Academic staff:

Professor Zdzisław Korzec Ph.D., D.Sc.
Docent Tomasz Kacprzak Ph.D., D.Sc.
Docent Zygmunt Leszczyński Ph.D., D.Sc.
Docent Andrzej Materka Ph.D., D.Sc.
Docent Andrzej Napieralski Ph.D., D.Sc.

Senior lecturers: 18

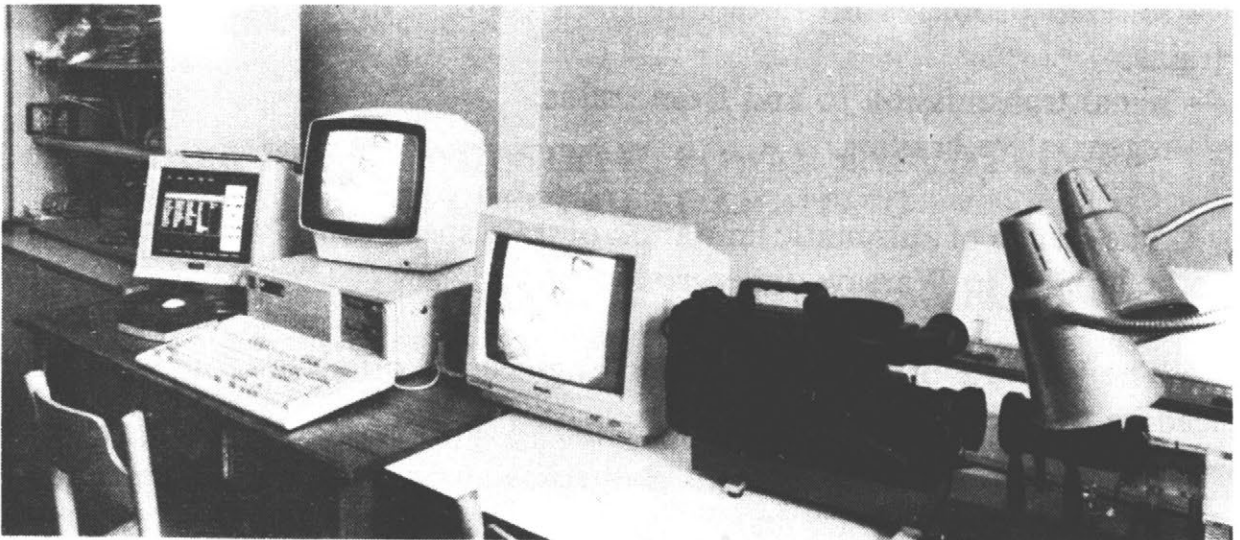
Assistants: 16

Technical and secretarial staff: 33

The Institute is composed of four research and teaching groups:

1. Electronic Circuits Group,
2. Power Electronic Circuits Group,
3. Medical Electronics Group,
4. Electronic Measurements Group.

The Institute includes also Student Laboratory Development Group which integrates activity of all the Institute workshops.

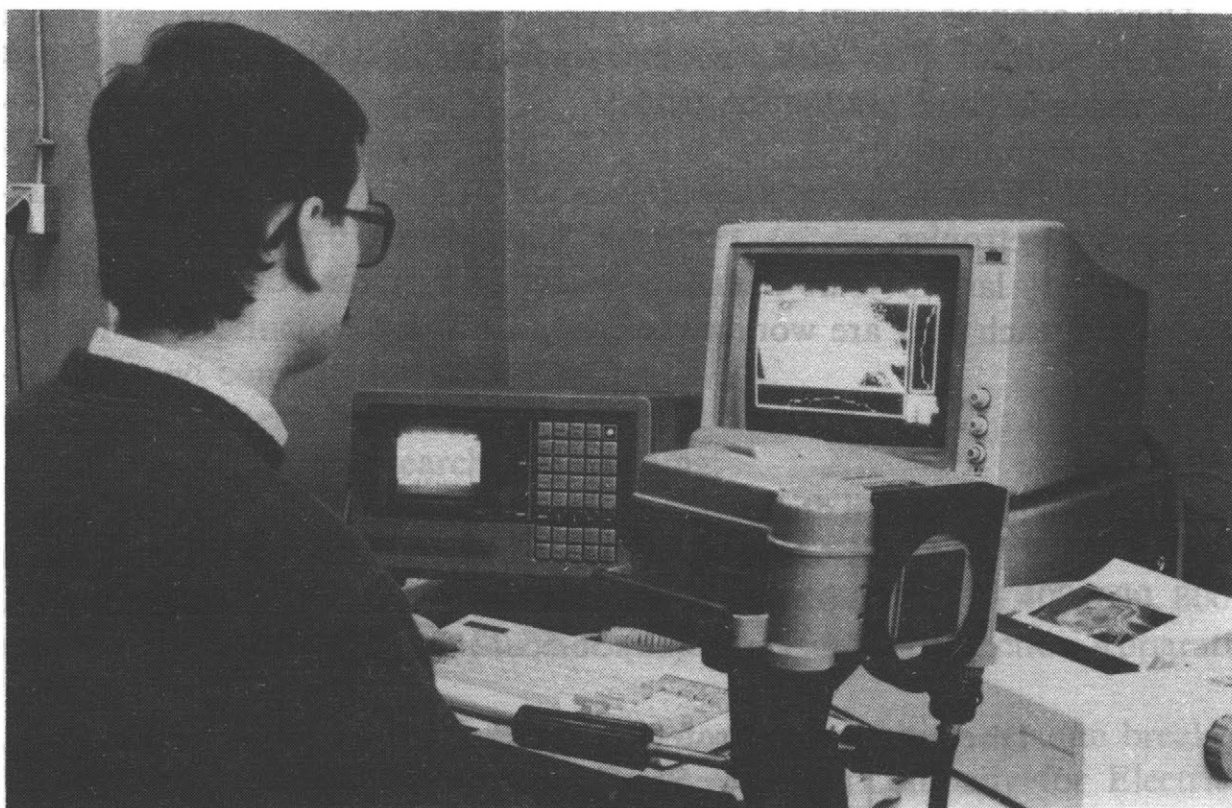


Computer-based thermography

The research activities of the Institute are divided into four main areas:

- electronic circuits,
- telecommunication,
- digital systems and medical electronics.

A large proportion of the research projects has been sponsored by National Research Fund, industry and Ministry of Education. The fundamental research projects include problems of modelling semiconductor devices and circuits, computer analysis of phenomena in power semiconductor structures, CAD of electronic circuits, theory and applications of switched capacitor circuits, computer analysis of biomedical images as well as modelling and computer simulation of artificial neural networks.



Microcomputer-image processing system

The applied research projects are concentrated on developing and designing the prototype electronic apparatus in areas of: microprocessor systems for controlling the power stations, microcomputer image analysis for image processing in Biological and Medical Sciences, control systems for technological processes and computer assisted thermographic systems for analysis and design of power semiconductor devices. The instruments, sometimes of nation-wide

unique value, are made under industry and/or Government organization contracts and are designated for research and student laboratories.

Since the establishment of the Institute of Electronics 4 D.Sc., 18 Ph.D., 531 M.Sc. degrees have been awarded. The staff of the Institute published 405 papers and 8 books.

The Institute maintains the scientific cooperation with other Polish and foreign universities including: University of Strathclyde, Glasgow, UK and Institut National des Sciences Appliquées de Toulouse, France.

The research laboratory facilities also include:

- Computer assisted thermographic work-station with Hughes TVS camera,
- Microcomputer image analyser,
- Digital analysis system GSK-48.

The Institute offers M.Sc. courses under the specialization of Electronic Engineering in three graduation fields:

- Telecommunication,
- Medical Electronics,
- Power Electronics.

The study lasts 5 years including M.Sc. dissertation. Currently, about 50 students of each year are working toward M.Sc. degree.

INSTITUTE OF ELECTRICAL APPARATUS, I-36

90-924 Łódź, Stefanowskiego 18/22

Telephone: (42) 36-55-22 ext. 274

Director: Assoc. Professor Marek Bartosik Ph.D., D.Sc.

Professor Stanisław Dzierzbicki

Academic staff:

Professor Bolesław Bolanowski Ph.D., D.Sc.
 Assoc. Professor Zbigniew Kołaciński Ph.D., D.Sc.
 Assoc. Professor Zdzisław Tarociński Ph.D., D.Sc.
 Assoc. Professor Eugeniusz Walczuk Ph.D., D.Sc.
 Docent Sławomir Lesiński Ph.D.

Senior lecturers: 7

Assistants: 4

Technical and secretarial staff: 30

Fundamental research tasks included in both Government and Ministerial Research Programmes relate to the general themes „Switching phenomena in electric circuits” and „New methods of the design and testing of electrical apparatus”.

There are the following research groups:

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

The main fields of the research activity are:

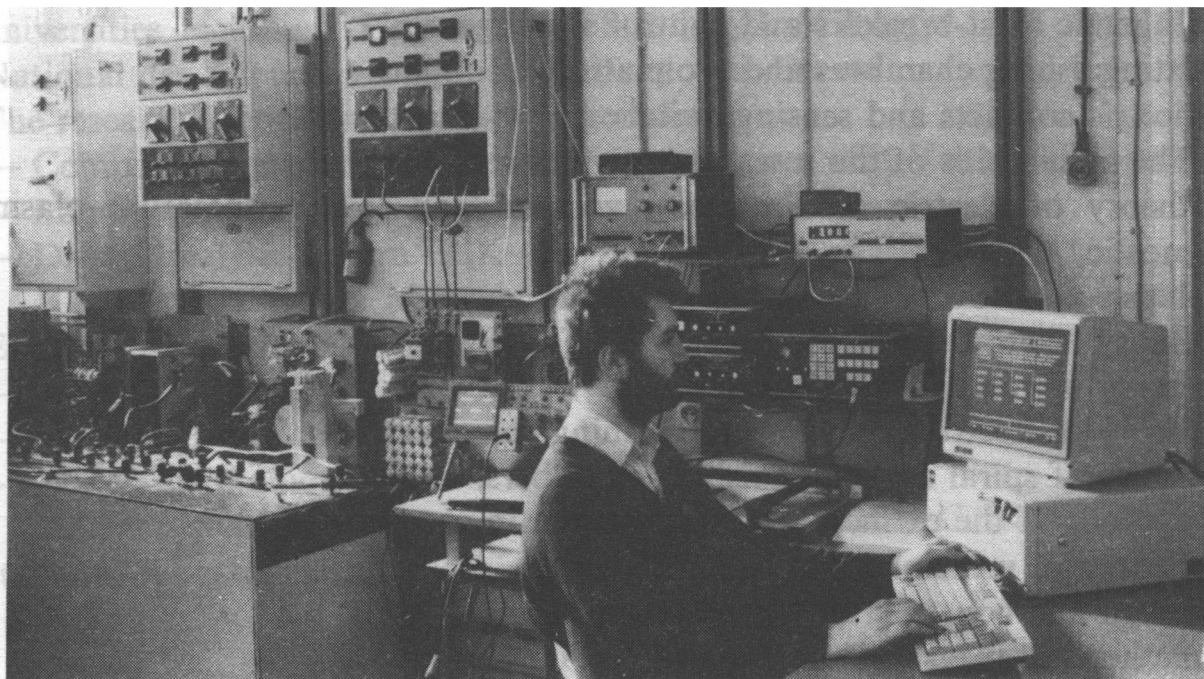
- theory of electric arc in gases, vacuum and low temperature plasma diagnostic,
- theory of recovery strength in gases and vacuum,
- theory of arc movement,
- theory of contact phenomena,
- theory of electromagnetic extinguishing chambers,
- theory of spiral arc extinguishing chambers,
- methods of the extinction of d.c. current in vacuum,
- theoretical principles of switchgear design,
- design and construction of the testing stands,
- methods of measurements in switchgear technique,
- computerization of research and teaching.

Institute of Electrical Apparatus collaborates with industry solving in the last years, the following problems:

1. Construction of the traction electromagnetic contactors SPG 400, 630, 800A and prototypes of ST-150, 300, 400A for Transformers and Traction Apparatus Factory, Łódź.
2. Construction of the prototypes of the d.c. current-limiting vacuum breakers PWT-250 and PWT-400 for Polish Foreign Trade Company for Electrical Equipment Ltd. ZWAR Z-1, Warszawa.
3. Construction of the current collectors for cranes for S.A.E. „Pokój”, Łódź.
4. Construction of the control stands for testing:
 - a) current collectors for cranes,
 - b) contact materials - stand is fully automated and computerized - for the Institute of Non-Iron Metals.
5. Modernization of the semiconductor voltage regulator ARP24/30B for the traction car and construction of the low loss impulse voltage regulator 24V, 100A for ZWAR Z-1, Warszawa.

6. Construction of:

- a) digital instrument for measurement of the Joule's integral
- b) digital transient recorder
- c) fibre instrument for measurement of the displacement and bounces of the contacts.



Research stand of the extinction of D. C. arc in vacuum

In the Institute there are two groups of laboratories:

1. Laboratories for routine testing of switchgear are composed of several stations equipped as follows:

- Short circuit generator, $U = 480-1200\text{V}$, $I = 40$ to 18 kA ,
- Short circuit transformer,
- DC short circuit for L.V. testing $U = 110$ to 720V , $I = 8\text{ kA}$ at 720V ,
- DC short circuit for H.V. testing $U = 1500$ to 3600V , $I = 10\text{kA}$,
- Capacitor short circuit unit, $U = 10\text{kV}$, $I = 100\text{kA}$, $E = 120\text{ kJ}$
- Varistor testing unit, $U = 10\text{kV}$, $E = 70\text{kJ}$
- Endurance testing stations:
 - AC station, $U = 1200\text{V}$, $I = 1200\text{A}$,
 - DC station, $U = 660\text{V}$, $I = 1000\text{A}$.

2. Laboratories for fundamental research:

- low temperature plasma laboratory,
- spectroscopy laboratory for temperature and arc parameters estimation,

- control laboratory for testing of contacts erosion, resistance and welding,
- vacuum laboratory,
- computer laboratory.



Investigations of the phenomena in electric contacts

In the above mentioned fields the following degrees have been awarded: 6 D.Sc., 20 Ph.D., 406 M.Sc. and 187 B.Sc.

The staff of the Institute published 414 papers and 13 books.

The results of the research works are presented among others in the proceedings of Conferences on „Switching Arc Phenomena”, organized by the Institute. This international conference takes place periodically in Łódź and was held in the years 1970, 1973, 1977, 1981, 1985, 1989.

The Institute cooperates with the following foreign Universities and Institutes:

Technische Universität Chemnitz, FRG

Technische Universität Braunschweig, FRG

The University of Strathclyde, Glasgow, UK

X'ian Jiaotong University, China

Shanghai Electrical Apparatus Research Institute, China

Vysoka Skola Technicka, Bratislava, Czechoslovakia

Vysoke Ucení Technické, Brno, Czechoslovakia

The Institute of Electrical Apparatus offers the following M.Sc. graduate courses: electrical apparatus, control and protecting equipment.

DEPARTMENT OF HIGH VOLTAGE ENGINEERING, K-21
90-924 Łódź, Stefanowskiego 18/22
Telephone: (42) 36-55-22- ext. 273

Director: Assoc. Professor Jerzy Wodziński Ph. D., D.Sc.

Professor Zygmunt Hasterman

Professor Zdzisław Szczepański

Academic staff:

Assoc. Professor Franciszek Mosiński Ph.D., D.Sc.

Senior lecturers: 7

Assistant: 1

Technical and secretarial staff: 7

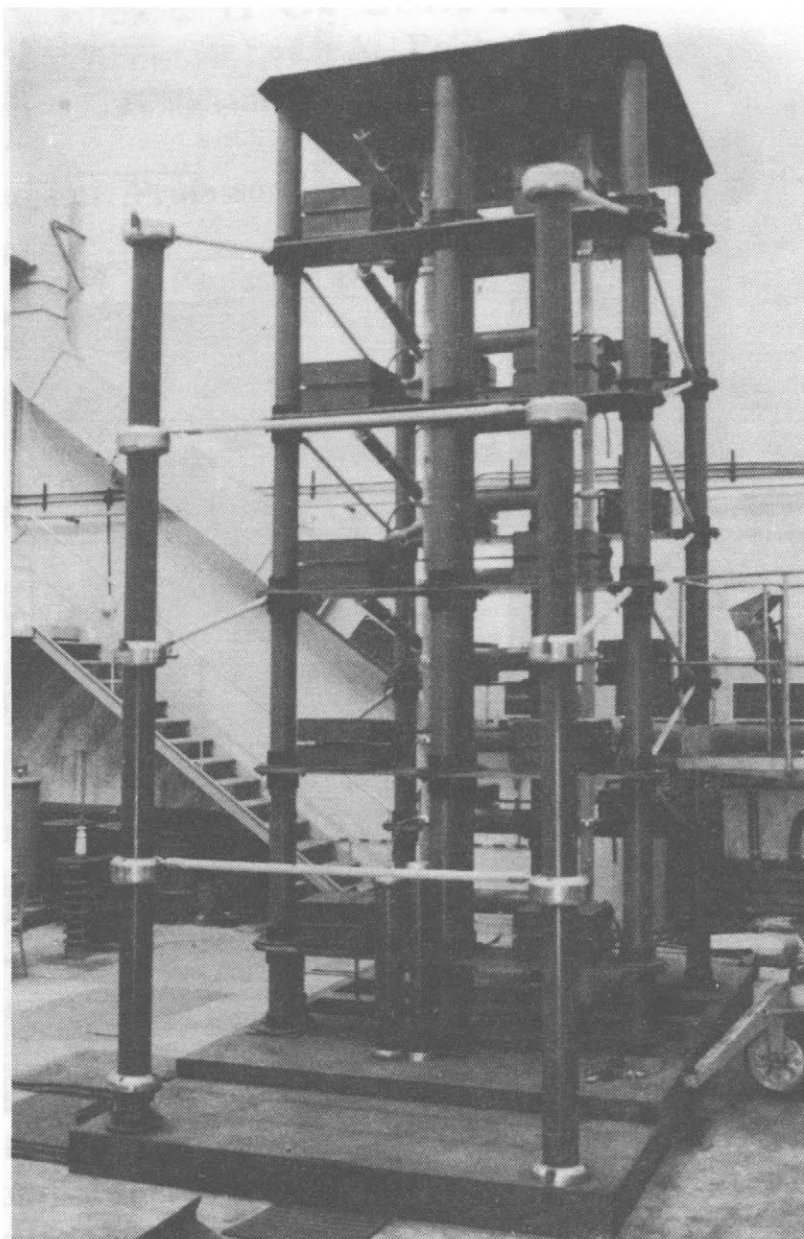
Main research subjects are:

- 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,
- investigations on electrical breakdown strength and methods of its estimation using mathematical statistics and numerical analysis of electric fields applied mainly to high voltage insulation of power transformers,
- experimental study of electrification characteristics of transformer oil,
- computer-aided design of insulation structures,
- H.V. measuring and test technique including design and manufacturing of H.V. impulse voltage sources and complete test stands.

The most important achievements of the Department in the last years are:

- design and manufacturing of a series of H.V. lightning and switching impulse generators of a rated voltage from 20kV up to 2400kV; those are used at dielectric tests but have also unconventional applications, e.g. in microbiology in studies on electrofusion of living cells,
- elaboration of assessment methods of paper-oil insulation withstandability and computer-aided design methods of this insulation, which find their application in transformer industry,
- manufacturing of a complete automatic 3-20-40-110kV test unit with a microcomputer output.

Since the establishment of the Department 6 D.Sc., 16 Ph.D., about 200 M.Sc. and 20 B.Sc. degrees have been awarded. The staff of the Department published 300 papers and 6 books.

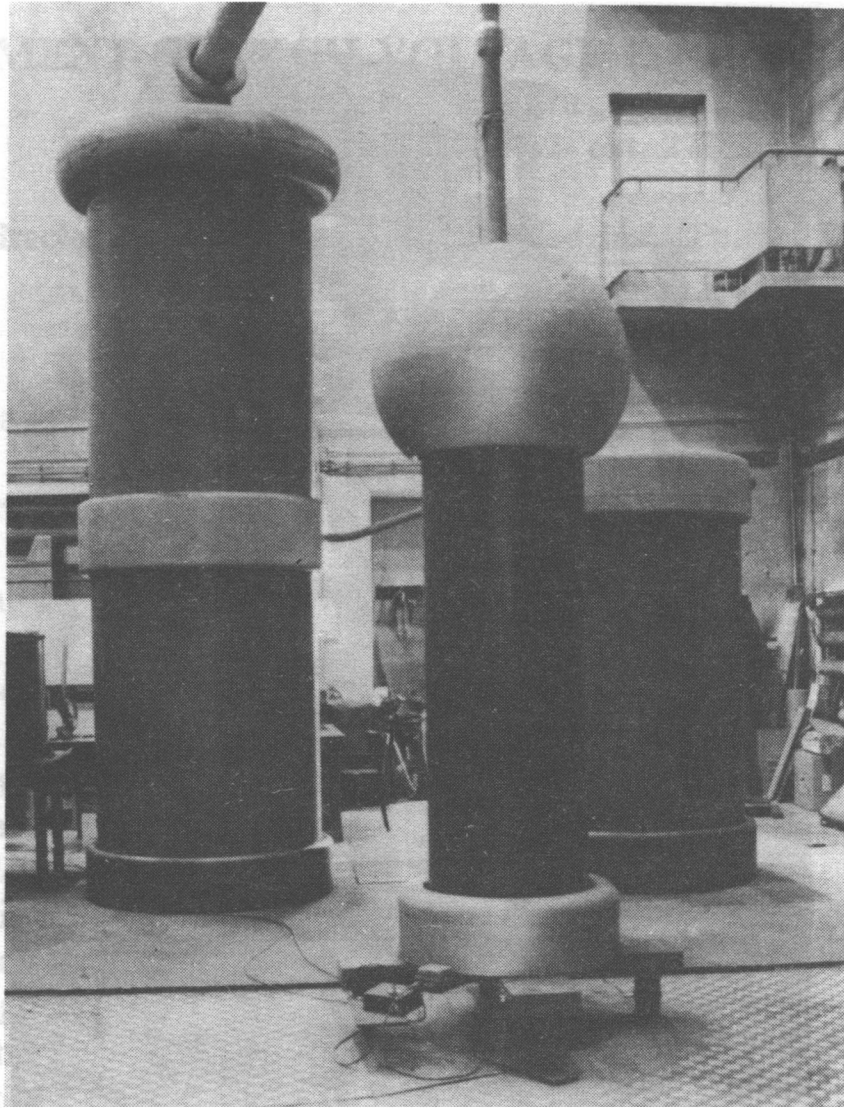


3 MV impulse generator for insulation testing

Since 1984, every third year, the Department has organized together with the Transformer and Traction Apparatus Works „Elta” International Conference on Insulation Problems in Power Transformers.

The High Voltage Laboratory possesses the following special equipment:

- Lightning and switching impulse generators of the following rated voltages and energies: 1500kV (17kJ), 700kV (15kJ), 400kV (2,2kJ), 300kV (1,5kJ)
lightning impulse shape 1,2/50 μ s,
switching impulse shape 1-1200/1700-8000 μ s.
- Tests transformer cascade 2x310kV, 310kVA.



625 kV cascade testing transformer

- Equipment for transformer oil treatment and drying and for impregnation of paper-oil insulation models.
- Multi-channel partial discharge analyser.
- On-line microcomputer setup for partial discharge intensity measurements.
- Laser electrooptical equipment for investigations of pre-breakdown phenomena in transformer oil.
- Device for investigations of transformer oil electrification phenomena.

All this equipment is situated in two high voltage halls, 12x15x13m each.

The Department of High Voltage Engineering offers the M.Sc. course on High Voltage Engineering.

The graduates of this course gain professional knowledge both in design and in maintenance of insulating systems of H.V. equipment.

DEPARTMENT OF ELECTROHEAT, K-22**93-590 Łódź, Al. Politechniki 11****Telephone: (42) 36-55-22 ext. 519****Director: Professor Ludwik Michalski Ph.D., D.Sc.****Professor Bronisław Sochor**

Academic staff:

Assoc. Professor Krzysztof Januszkiewicz Ph.D., D.Sc.

Docent Dominik Sankowski Ph.D., D.Sc.

Senior lecturers: 5

Assistants: 2

Technical and secretarial staff: 10

The main fields of research of the Department are as follows:

- induction heating,
- resistance heating and heat transfer,
- numerical, analogue and hybrid simulation in electroheat,
- automation of electroheat processes,
- temperature measurement and control.

In the last years the following theoretical research problems and industrial projects have been elaborated:

Induction heating of multi-layer charges, optimum generator to charge matching, induction heating of big steel plates, current concentrators for induction heating, induction hardening of high-speed steel tools.

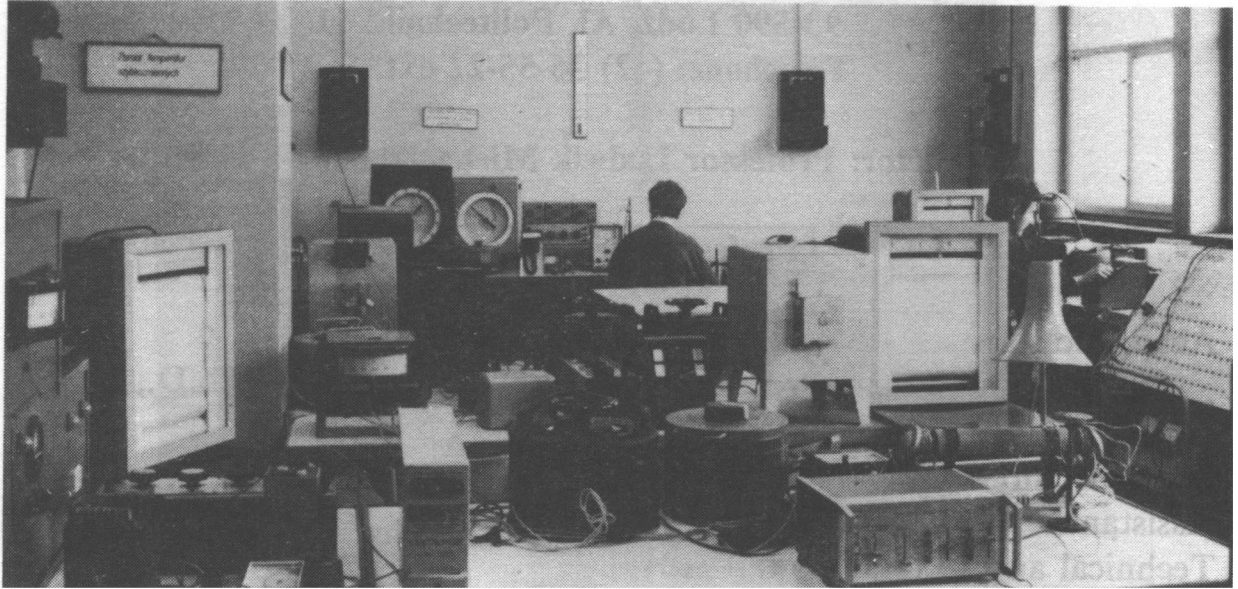
Digital non-linear simulation of electric resistance furnaces, optimum operation of resistance furnaces.

Identification of dynamics of electric furnaces by multifrequency binary sequences, adaptive temperature control.

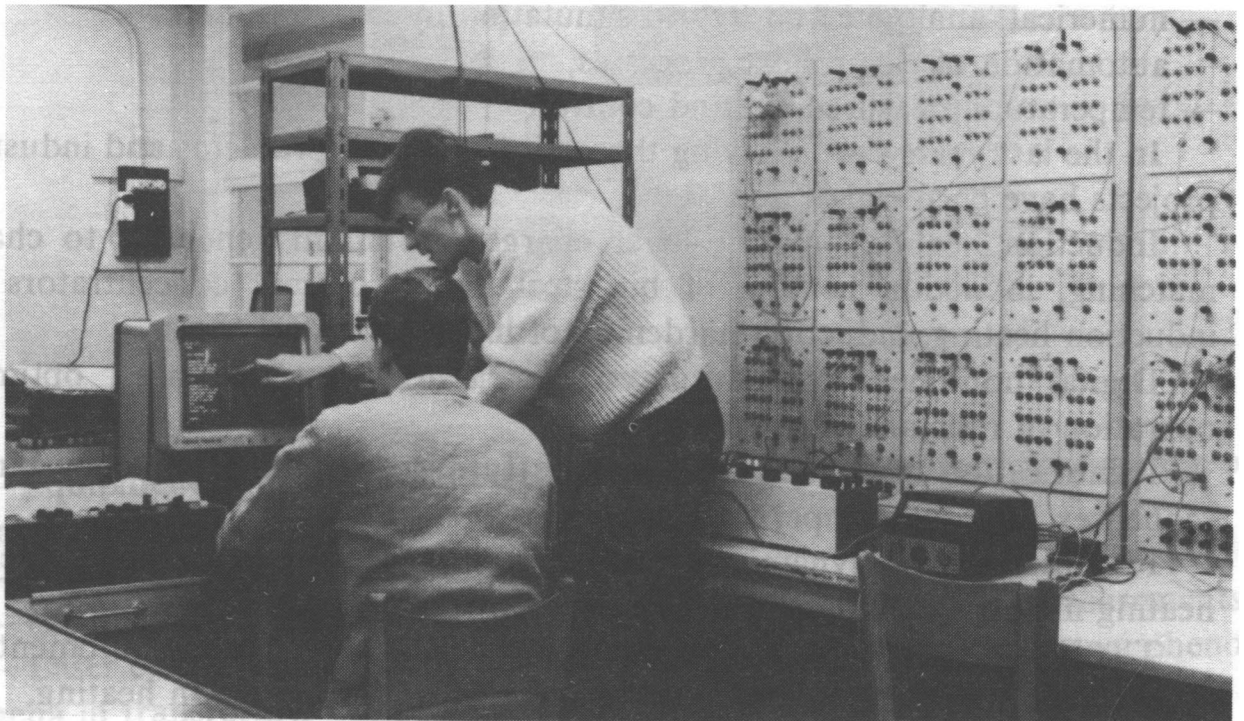
Identification of dynamics of temperature sensors by the direct internal heating method.

The Electroheat Laboratory possesses the following special equipment:

- Medium and high frequency power generators for induction heating,
- Medium and high temperature resistance furnaces,
- Computerized equipment for identification of electric furnaces,
- Equipment for temperature measurement and control,
- Hybrid analogue-digital system for simulation of closed loop temperature control.



Laboratory of temperature control



A/D hybrid system for modelling of electroheat appliances

Since the establishment of the Department of Electroheat 6 D.Sc., 20 Ph.D., 478 M.Sc. and 102 B.Sc. have been awarded. Members of staff published 288 papers and 9 books.

Department of Electroheat organized the following international conferences:

1960 - Symposium der Thermoelektrischen Thermometrie,

1974 - Polish-British Seminar on Microcomputers,

1981 - First International Conference on Electroheat Education, organized on behalf of the International Union of Electroheat.

1989 - International Symposium on Microprocessors in Temperature Measurement, organized on behalf of IMEKO, TC-12 Committee.

The Department of Electroheat runs joint research and staff exchange programmes with the following institutions:

— Universität Hannover, Germany,

— Katholieke Universiteit Leuven, Belgium,

— Technische Hochschule Ilmenau, Germany,

— University of Strathclyde, Glasgow, UK,

— PLEM, Electroheat Laboratory, Maastricht, the Netherlands.

The Department of Electroheat offers the following M.Sc. graduate courses:

— industrial electroheat,

— automation in electroheat.

FACULTY OF CHEMISTRY, W-3

Dean's office address: 90-924 Łódź, Żwirki 36

Telephone: (42) 36-47-03

Telefax: (48 42) 36-85-22

Telex: 886 136 polit pl

FOUNDATION AND GROWTH

The Faculty of Chemistry was established together with the Faculties of Mechanical and Electrical Engineering on May 24, 1945 by a decree of Council of Ministers. From the beginning the scientific and teaching programmes of the Faculty were closely related to the local industry. Professor Tadeusz Wojno, the last pre-war dean of the Faculty of Chemistry at Warsaw Polytechnic, was nominated the first dean of the Faculty of Chemistry.

STRUCTURE

The Faculty of Chemistry consists of five Institutes:
Institute of General and Ecological Chemistry, I-17,
Institute of Organic Chemistry, I-18,
Institute of Applied Radiation Chemistry, I-19,
Institute of Polymers, I-20,
Institute of Dyes, I-21.

DEANS OF FACULTY

1945	Professor Tadeusz Wojno
1945 - 1951	Professor Alicja Dorabialska
1951 - 1953	Professor Edward Józefowicz
1953 - 1954	Professor Witold Janowski
1945 - 1956	Professor Edmund Trepka
1956 - 1958	Professor Bolesław Bochwic
1958 - 1960	Professor Edward Józefowicz
1960 - 1968	Professor Stanisław Chrzczonowicz
1968 - 1970	Professor Jan Michalski
1970 - 1972	Professor Jerzy Ruciński
1972 - 1975	Professor Kazimierz Studniarski
1975 - 1981	Professor Tadeusz Paryjczak
1981 - 1984	Professor Włodzimierz Sarewicz
1984 - 1990	Professor Tadeusz Paryjczak
1990 -	Professor Józef Mayer



The main building of the Faculty of Chemistry

STAFF OF FACULTY

The Faculty of Chemistry has 178 members of teaching staff, including 23 professors, 6 assoc. professors, 12 docents and 6 senior lecturers with D.Sc. degree as well as 229 technicians and secretarial staff.

EDUCATION

There are specializations with the following diploma courses

1. Inorganic chemistry and technology:

- trace analysis,
- technology of sorbents and catalysts,
- environmental protection.

2. 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.

3. Polymer chemistry and technology:

- technology of leather manufacture,
- rubber technology,
- plastics technology.

4. Pulp and paper technology:

- pulp technology,
- paper technology,
- paper converting technology.

5. Nuclear and radiation technology.

Up to 1990, 4177 students were graduated receiving diplomas either of M.Sc. or engineer. At present 440 students are taking the 5-year course at the Faculty of Chemistry including 70 students taking the extramural courses.

RESEARCH

The scientific activity of the Faculty of Chemistry is very extensive and represents 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 award Ph.D. and the D. Sc. degrees. Every year a few

persons receive D.Sc. degrees and dozen or so Ph.D. degrees. At the Faculty of Chemistry a graduate programme leading to Ph. D. degree is offered to the research workers either from industry or other institutions. Up to now 81 scientists have received the D.Sc. degree, and 392 the Ph.D. degree.

The Faculty Library, the subunit of Main Library of the Technical University, offers a rich collection of books and journals to the staff members and students. The scientific journal „Scientific Bulletin of Łódź Technical University, Chemistry” is periodically edited. The Polish Chemical Association, the Association of Engineers and Technicians of Chemical Industry, and Polish Society for Radiation Research are active at the Faculty of Chemistry. In addition, the students may develop their interests acting as members of the Young Chemists Association.



The library of the Faculty of Chemistry

**INSTITUTE OF GENERAL
AND ECOLOGICAL CHEMISTRY, I-17**

90-924 Łódź, Żwirki 36

Telephone: (42) 36-23-29; 36-55-22 ext. 541

Director: Professor Tadeusz Paryczak Ph.D., D.Sc.

Academic staff:

Professor Maria Bukowska-Strzyżewska Ph.D., D.Sc.
 Professor Andrzej Cygański Ph.D., D.Sc.
 Professor Danuta Czakis-Sulikowska Ph.D., D.Sc.
 Professor Zdzisław Gałdecki Ph.D.
 Professor Andrzej Korczyński, Ph.D., D.Sc.
 Professor Rajmund Sołoniewicz Ph.D., D.Sc.
 Assoc. Professor Tadeusz Bartczak Ph.D., D.Sc.
 Assoc. Professor Marek Główka Ph.D., D.Sc.
 Assoc. Professor Janina Karolak-Wojciechowska Ph.D., D.Sc.
 Docent Zbigniew Gorzka Ph.D.
 Docent Konrad Janio Ph.D.
 Jacek Rynkowski Ph.D., D.Sc.
 Bogdan Ptaszyński Ph.D., D.Sc.

Senior lecturers: 42

Assistants: 7

Technical and secretarial staff: 56

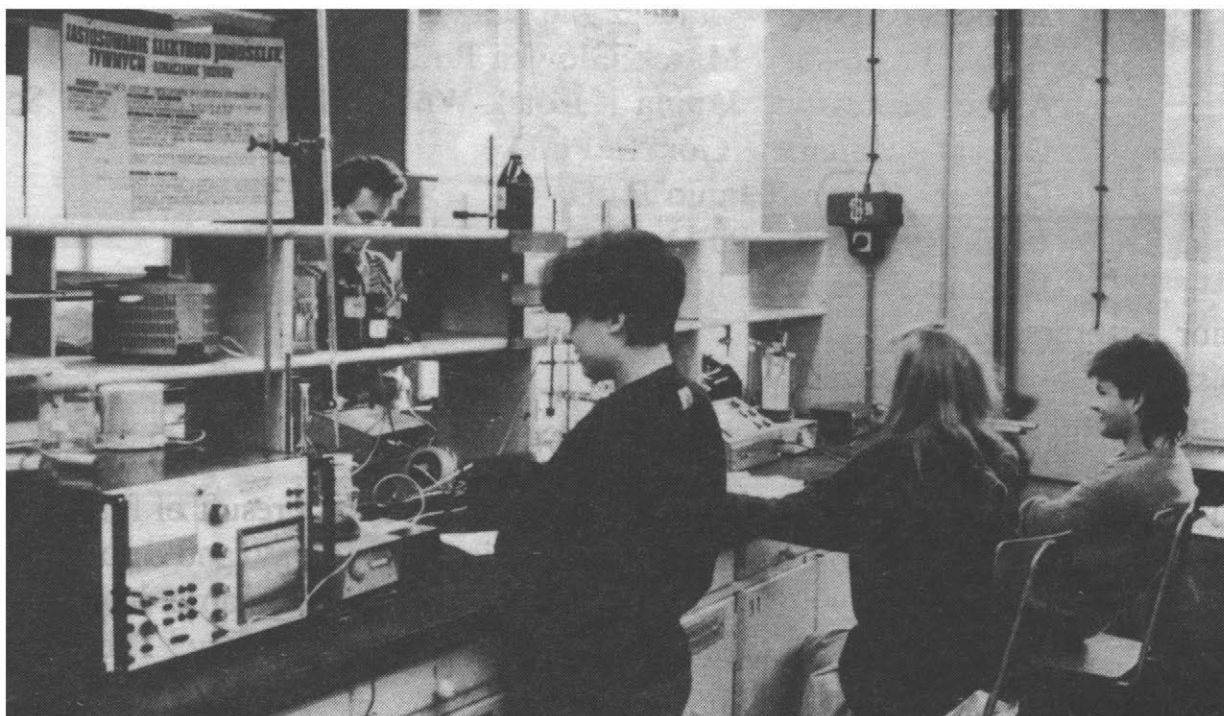
Institute of General Chemistry was founded in 1970, as a result of fusion of former Chairs of General Chemistry, Inorganic Technology and Inorganic Chemistry. In October 1990 by a decision of Senate the name has been transformed into Institute of General and Ecological Chemistry. There are 4 research groups in the Institute:

- Catalysis and Adsorption,
- X-Ray Crystallography and Crystal Chemistry,
- Inorganic and Analytical Chemistry,
- Chemical Technology and Environmental Protection.

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

The subject matter of research carried out by the Catalysis and Adsorption Group includes investigations of physico-chemical properties of catalysts and adsorbents with a special application of techniques, being derived from gas

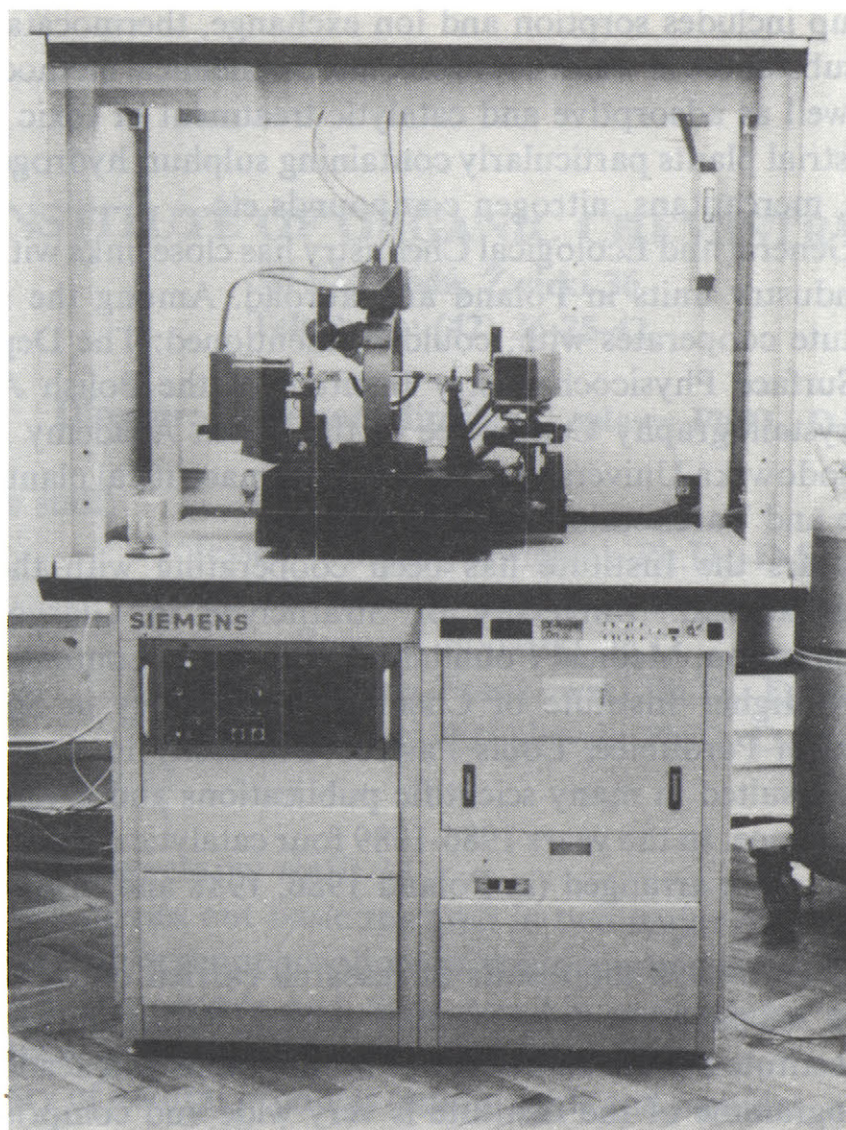
chromatography. The Group has at its disposal a modern apparatus for investigation of solids, especially adsorbents and catalysts, which is used to determine the catalytic activity, texture and other properties of the objects under study. The Group has remarkable achievements in the field of examination of mono- and bimetallic supported catalysts, consisting in determination of such parameters as liability to reduction and reoxidation, metal dispersion, the form of gases adsorbed on the surface, activity and selectivity in catalytic reactions, reaction of different gases with the surface of the catalyst and metal-support interaction. These investigations are of both cognitive and practical importance. Another subject of interest is an application of electrochemical methods to the investigations of the catalytic reduction of the aromatic nitrosulphonic acids to amines, which are very important intermediate products in the dye and pharmaceutical industry.



Laboratory of instrumental analysis

The main achievements of the X-Ray Crystallography and Crystal Chemistry Group 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 studies are oriented toward better understanding of molecular properties, conditioned by the structure.

The Group is also engaged in designing new drugs in cooperation with pharmaceutical industry. The Group's ambition is to adapt all crystallographic and related (molecular mechanics, quantum chemistry) computer programmes 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 programmes (including Cambridge Structure Database) enable the Group to play the leading role in this field.



Single crystal diffractometer

The Inorganic and Analytical Chemistry Group for many years has been working out methods of determination of odorous and toxic air contaminations arising from chemical manufacture operations using thermal analysis, trace

analysis and instrumental methods, particularly molecular absorption spectrophotometry and polarography.

The studies have both cognitive and applied character.

The laboratory is equipped with derivatograph, VIS and UV spectrophotometers, square-wave and pulse polarographs, coulometers and gas-chromatograph. The subject matter of the research carried out by the Inorganic and Analytical Chemistry Group comprises also chemistry of complex and coordination compounds, first of all synergetic extraction, synthesis and properties of the new complexes of rare-earth elements with N-donors.

The research conducted by the Chemical Technology and Environmental Protection Group includes sorption and ion exchange, thermocatalytic oxidation of organic substances in water solutions, electrochemical methods of sewage purification as well as adsorptive and catalytic treatment of toxic waste gases emitted by industrial plants particularly containing sulphur, hydrogen sulphide, sulphur dioxide, mercaptans, nitrogen compounds etc.

Institute of General and Ecological Chemistry has close links with numerous scientific and industry units in Poland and abroad. Among the institutions, which the Institute cooperates with, could be mentioned: The Department of Catalysis and Surface Physicochemistry Institute of the Polish Academy of Sciences, the Crystallography Committee of the Polish Academy of Sciences, Maria Curie-Skłodowska University in Lublin, pharmaceutical plants „Polfa” in Łódź, Pabianice and Tarchomin, and many others.

For many years the Institute has been cooperating with the following scientific centres abroad: University of Strathclyde in Glasgow, Alberta University in Edmonton, Medical Foundation in Buffalo, Lomonosov University in Moscow, Higher Institute of Chemical Technology in Sofia, Higher Chemical School in Pardubice, Louis Pasteur University in Strasbourg. The cooperation has resulted in many scientific publications and a very profitable exchange of experience. In the years 1986-1989 four catalytical Polish-Bulgarian microsymbioses were arranged (in Poland 1986, 1988 and in Bulgaria 1987, 1989).

In the period 1970-1990 the results of research carried out in the Institute were published in 768 papers both in international and Polish journals. Scientific workers of the Institute are the authors of 11 monographs and academic books.

Teaching programme of the Institute is very wide and comprises lectures, laboratory works and design in the range of general as well as special courses.

The Institute instructs graduates in the following diploma courses:

- trace analysis,
- technology of sorbents and catalysis,
- environmental protection.

Armed with comprehensive knowledge from general and special courses and laboratory skills, postgraduate students and assistants are in a position to continue their scientific research on a Ph.D. level.

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

INSTITUTE OF ORGANIC CHEMISTRY, I-18

90-924 Łódź, Żwirki 36

Telephone: (42) 36-25-42

Director: Professor Mirosław Leplawy Ph.D., D.Sc.

Academic staff:

Professor Andrzej Zwierzak Ph.D., D.Sc.

Assoc. Professor Anna Markowska Ph.D., D.Sc.

Docent Ryszard Bodalski Ph.D.

Docent Andrzej Frankowski Ph.D., D.Sc.

Docent Andrzej Wróblewski Ph.D., D.Sc.

Senior lecturers: 22

Assistant: 1

Technical and secretarial staff: 32

The Institute carries out basic research in two major directions:

1. Chemistry of organophosphorous compounds: new synthetic methods leading to such compounds and their possible applications as reagents for organic synthesis,

2. Chemistry of natural products (amino acids and peptides, nucleosides and nucleotides, terpenes, modified phospholipides, analogues of prostaglandins and alkaloids) with particular stress on research concerning the synthesis and conformational studies of oligopeptides containing fragments of α,α -disubstituted amino acids in their molecules. New syntheses of certain natural products

analogues as potential antiviral and anticancer agents as well as enzyme inhibitors are developed. The Institute is also engaged in applied research concerning the development of new synthetic methods for pharmaceutical industry and synthesis of new organophosphorous pesticides. The following final products 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 Bromfeninfos at the Institute of Organic Industry in Warsaw.

The Institute cooperates with many research centres in Poland and abroad. The research group supervised by Professor Leplawy (chemistry of amino acids and peptides) cooperates with the University of Padua (Italy), University of Tübingen (Germany), and University of St. Louis, Missouri (USA). Docent Frankowski in the domain of glycoside inhibitors cooperates with the University of Mulhouse (France).



High Performance Liquid Chromatography (HPLC)

Institute of Organic Chemistry has well equipped research laboratories prepared for realizing organic syntheses on a bench scale. Besides typical laboratories there are also available several special ones like: laboratory of

elemental analysis (unique of that type at the University), nuclear magnetic resonance laboratory, laboratory of spectroscopy (infrared and ultraviolet) and laboratory of high performance chromatography.

Over the last decade scientific activity of the Institute is represented by more than 200 publications in various periodicals and journals.

The Institute of Organic Chemistry conducts basic lectures and classes in the subject of „organic chemistry” for the full-time students of the Faculty of Chemistry, the Institute of Chemical and Process Engineering as well as for the students of the Institute of Chemical Processing of Fibres of the Textile Engineering Faculty. It conducts also classes and lectures in subjects: „stereochemistry, electron structure and dynamics of organic systems”, „spectroscopic methods in organic chemistry” and „chemical bibliography” for the students specializing in organic chemical technology. It also conducts lectures and classes in the following subjects: „bioorganic chemistry”, „chemistry of natural products”, „principles of photochemistry” and „planning of organic syntheses” for students specializing in the synthesis of drugs and pesticides.

The Institute has organized one-year post-graduate course. The course, including lectures, seminars and laboratory classes, deals with new achievements in technology, new methods of spectral analyses, and current trends and discoveries in organic chemistry.

In the last 20 years over 200 students graduated from the Faculty in the specializations of „chemistry and technology of drugs” and „chemistry and technology of pesticides”. They are employed in factories producing pesticides, pharmaceuticals and other organic products. Many of them successfully work in research centres in the Polish Academy of Sciences, universities and industry.

INSTITUTE OF APPLIED RADIATION CHEMISTRY, I-19

93-590 Łódź, Wróblewskiego 15

Telephone: (42) 84-00-44; 36-55-22 ext. 600

Director: Professor Jerzy Kroh Ph.D., D.Sc.

Academic staff:

Professor Witold Bartczak Ph.D., D.Sc.

Professor Józef Mayer Ph.D., D.Sc.

Professor Władysław Pękala Ph.D.

Professor Andrzej Płonka Ph.D., D.Sc.

Professor Władysław Reimschüssel Ph.D.
Professor emeritus Stefania Bachman Ph.D., D.Sc.
Assoc. Professor Jerzy Gębicki Ph.D., D.Sc.
Docent Henryk Bem Ph.D., D.Sc.
Docent Zbigniew Czerwik, Ph.D.
Docent Ewa Hawlicka Ph.D., D.Sc.
Docent Witold Świątkowski Ph.D., D.Sc.
Halina Abramczyk Ph.D., D.Sc.
Piotr Paneth Ph.D., D.Sc.

Senior lecturers: 29

Assistants: 6

Technical and secretarial staff: 51 (2 Ph.D.'s and 21 M.Sc.'s)



Building of the Institute of Applied Radiation Chemistry

The Institute of Applied Radiation Chemistry (IARC), including former Chairs of Physical Chemistry and of Radiation Chemistry, was established in 1970. The Institute is sponsored by the Ministry of National Education as well as by the National Atomic Agency. Research activity of the IARC encompasses radiation chemistry, photochemistry, radiochemistry and some areas of chemical physics, biochemistry and physical chemistry of polymers. The efforts are

directed both to the fundamental problems and applications. They reflect the needs to contribute to the science of radiation chemistry and to apply the results in the national economy.

There are three groups engaged in the research:

- Research Group for Fundamental Problems of Radiation Chemistry, headed by Professor J. Kroh,
- Research Group for Physical Organic Chemistry and Radiochemistry, headed by Professor W. Reimschüssel,
- Research Group for Applied Radiation Chemistry, headed by Professor W. Pękala.

The research efforts of the Group for Fundamental Problems of Radiation Chemistry are concentrated on elucidation of the mechanisms of primary radiation-chemical processes involving short-lived intermediates like electrons, ions, excited states and radicals. The species are investigated in condensed phases over the temperature range from ambient temperatures to 4.2 K (liquid helium temperature) using analytical methods such as spectrophotometry, electron spin resonance (ESR), radiothermoluminescence (RTL) or isothermal luminescence. By means of pulse radiolysis technique very fast processes are followed with the time resolution down to few nanoseconds. Picosecond laser photolysis experiments are to be undertaken this year. The main interest concerns the processes of electron solvation and trapping, electron transfer, and energy transfer, the reactivity and structure of molecular ions and radicals as well as relaxation phenomena in the stabilizing matrices. Kinetic studies are particularly extensive. Both simple systems of diverse polarity and more complex biochemical systems, polymers, or microheterogeneous micellar solutions (membrane mimetic systems) are under investigation. Along with the experimental works theoretical studies are performed. Noteworthy is the development of computer experiment and computer simulations on dynamics and structure of transient species and of matrices used for their stabilization.

The activity of the Research Group for Physical Organic Chemistry and Radiochemistry encompasses few subjects of research.

Much effort is focused on investigation of the structure and reactivity of chemical intermediates such as radicals, biradicals, radical-ions, ions, unstable conformers, tautomers, molecular complexes etc. The species are generated by photochemical, radiolytical or electrochemical methods and various techniques, both steady-state and time-resolved, are used to follow their behaviour. Noteworthy are the studies by means of matrix isolation spectroscopy, isotopic labelling and isotope effects.

Kinetic methods of isotope tracers and isotope effects are also used to study the mechanisms of chemical reactions, especially those involving organic compounds of phosphorus.

Another research is directed to elucidation of the structure and dynamics of liquid solutions. Molecular dynamic studies and experimental studies of transport processes (self-diffusion and conductivity) are carried out for two- and three-component systems containing water, organic solvent and electrolyte.

Furthermore, this Group performs low-level measurements of natural and artificial radionuclides in environmental samples.

Of particular importance is the project on assessment of the radiological consequences of the emission of natural radionuclides from coal-fired power stations in the Łódź region. The work is supported by the Environmental Research and Control Centre in Łódź.

Finally, it is worth to mention the studies on allotropic transformations of selenium and sulphur by the method of differential thermal analysis (DTA). This is a continuation of the research originated in the former Chair of Physical Chemistry.

The main directions of research of the Group for Applied Radiation Chemistry are as follows:

- radiation initiation of polymerization processes of mono- and multicomponent systems in liquid and solid phases
- radiation modification of physical and chemical properties of natural and synthetic polymers by crosslinking and grafting of macromolecules
- radiation modification and preservation of food and feeds, e.g. degradation of patulin in apple juices, prolongation of storage life of strawberries and mushrooms, immobilization of enzymes
- application of ionizing radiation to protection of natural environment, e.g. purification of waste water from industry
- development of technologies of radiation sterilization of various materials like pharmaceutical products, medical equipment, animal tissues, packagings used for product preservation during prolonged storage, etc.

Several radiation technologies have been worked out as a result of the above studies. The relevant examples are: (i) radiation initiated polymerization of resins of high electrical conductivity, (ii) production of hydrogel dressings (based on synthetic and natural biocompatible polymers) for treatment of burns, oozing lesions and other medical applications, (iii) production of collagen substitute for dura mater and „collagen” vascular prostheses, (iv) radiation immobilization of glucoisomerase and rennin.

Numerous fundamental studies, complementary to strictly applied works are also carried out by this Group with the objective of elucidation of the

mechanisms of radiation effects in model systems of biological importance or in polymers. Worth mentioning are the investigations on proteins, enzymes and sugars, on collagen and its composites with drugs, as well as those on aromatic polyamides. The results are used for evaluation of the properties of radiation sterilized materials and to follow the behaviour of polymers in the radiation field.

The activity of the Research Group for Applied Radiation Chemistry brings about cooperation with national industry, e.g. with the Pharmaceutical Works „Polfa”, the Factory of Cosmetics „Pollena”, the Factory of TV Tubes „Polcolor”, the Factory of Fruit and Vegetable Processing „Hortex” and some meat and dairy manufacturers. Various industrial units for research and development as well as medical institutions (hospitals and transplantation centres) are also involved in cooperation with the Institute.

There are five main laboratories in the Institute:

- ESR laboratory, headed by Professor A. Płonka
- Radiation Chamber Laboratory, headed by Dr. W. Bogus
- Pulse Radiolysis Laboratory, headed by Dr. S. Karolczak
- Computer Centre, headed Professor W. Bartczak
- Laser Photolysis Laboratory, being currently organized under the head of Dr. M. Wolszczak.

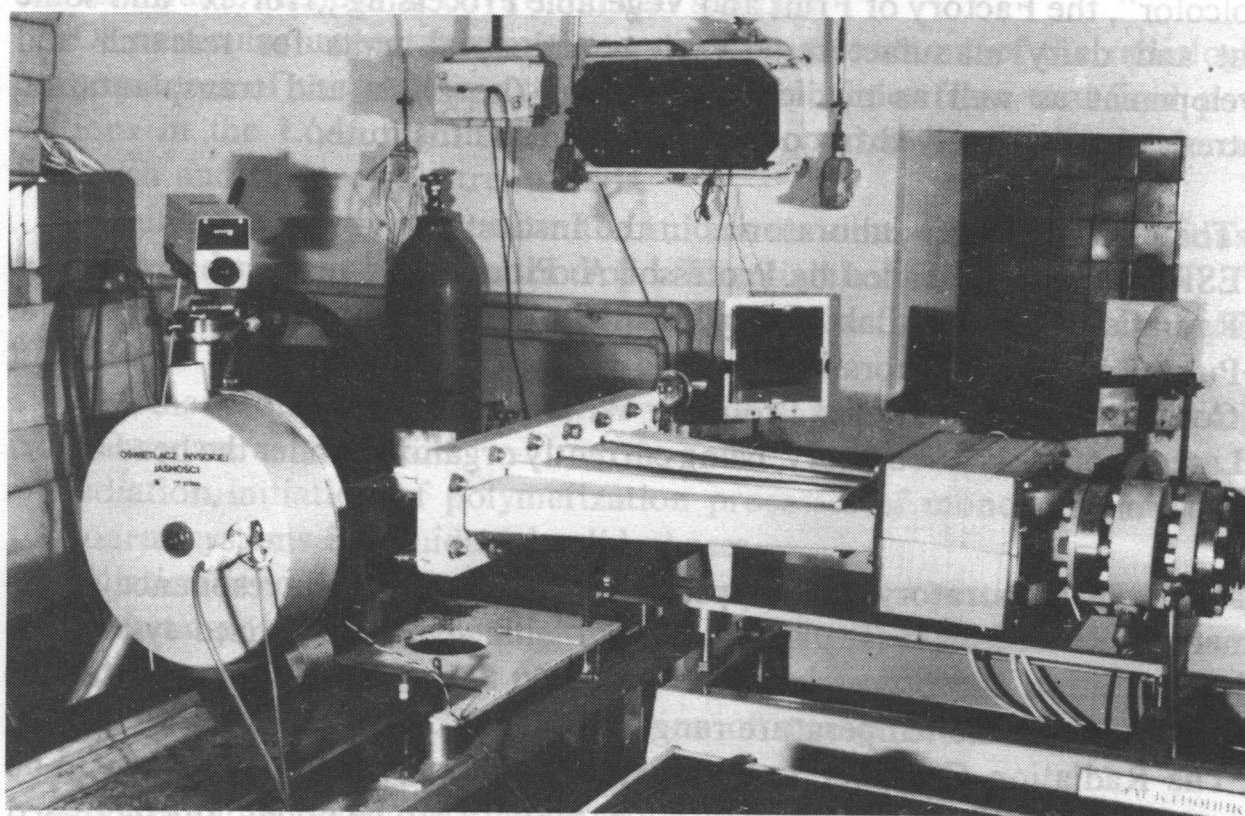
The ESR Laboratory is equipped with the electron spin resonance spectrometer, ER 2000-SRC (Bruker), provided with the computerized system for data acquisition and processing, ESP 3220-200 SH, and with the cryostat for measurements in the temperature range 4.2-300 K.

The Radiation Chamber Laboratory enables γ – irradiation from Co-60 sources of the nominal activity 20 kCi. The activity can be potentially increased up to 80 kCi. In progress are the works on installation of the special conveyer for radiation processing.

The Pulse Radiolysis Laboratory, created in 1984, is equipped with a unique nanosecond pulse radiolysis system based on Soviet made LINAC ELU-6E. The accelerator can generate single or repetitive pulses of high energy electrons (5-8 MeV) of duration from 5 ns to 5 μ s. Chemical processes induced by electron pulse can be followed by fast absorption spectrophotometry, luminescence measurements or transient conductometry. In addition pulse light scattering set-up (LSI) is provided for observations in polymer solutions. Spectrophotometric measurements can be carried out in a broad spectral range from UV to IR (200-2500 nm) with time resolution of few nanoseconds (UV and visible), submicroseconds (1100 nm) and microseconds for LSI experiments. Transient signals from photodetectors are digitized and sent to IBM PC computer for storing and

further mathematical processing. In repetitive mode (10-200 Hz) the accelerator can be used for applied purposes.

The Computer Centre is equipped with a modern computer system of parallel architecture, which can develop very high computational power up to 140 MIPS. The system is based on the network of 14 transputers – very fast microprocessors able to perform parallel data processing. The network is hosted by IBM AT micro's and includes also 80386, 80486 processors and 32-bit. Motorola



Part of the accelerating tube of the LINAC (ELU-6E, Soviet made)

processors. The system is provided with high quality peripheral devices like laser printers, colour jet printers, etc. At user's disposal there is a selection of professional software including compilers, graphical integrated systems etc.

In the Laser Photolysis Laboratory a system is being installed for time-resolved experiments by picosecond absorption technique. The system includes the passively mode-locked (Nd/YAG) laser (PL-1124 4H from EKSMa, Vilnius) as an excitation source, the spectrometer and the fast detection set-up on line with a computer for data storage and processing. The expected parameters of the system are: laser pulse width - 25 ps, energy of the fundamental laser pulse (1064 nm) - 35 mJ, spectral range from 380 to 1700 nm, temporal resolution - 20 ps.

The research activity of the Institute has resulted hitherto in 804 scientific papers, published in both Polish and international journals, 9 books and monographs, 46 patents (plus 4 submitted), 57 doctoral dissertations as well as hundreds of unpublished contributions to scientific conferences.

The IARC is the organizer of international meetings and conferences, like „Electrons at Low Temperatures”, Nieborów 1980; 1st Polish-Soviet Seminar on Radiation Chemistry, Łódź, 1981; „PULS – International Meeting on Pulse Investigations in Physics, Chemistry and Biology”, organized every third year since 1985. Organization of the conferences is part of extensive international activity of the IARC. According to formal agreements the Institute cooperates with the following scientific institutions: International Atomic Energy Agency (IAEA), Vienna (Austria); Central Institute of Isotopes and Radiation Research, Leipzig (Germany); Research Institute of Electrotechnical Industry, Bucharest (Romania); Institute of Nuclear Research, Rez (Czechoslovakia); Institute for Research, Production and Application of Radioisotopes, Prague (Czechoslovakia); Academy of Sciences of the USSR – several institutes in Moscow, Novosibirsk and Vilnius (USSR); Cookridge Radiation Research Centre, University of Leeds (Great Britain); University of Strathclyde, Glasgow (Great Britain); Pavia University (Italy); University of Fribourg (Switzerland). The Institute has also developed less formal contacts with many other laboratories in Europe, Japan, USA and Canada.

The relevant forms of international cooperation are (i) mutual visits of scientists involving lectures, joint experiments and exchange of information, (ii) post-doctoral fellowships, both for the Institute staff abroad and for foreign scientists in the IARC, (iii) joint publications, (iv) active participation of the Institute staff in international conferences, including chairmanship of the sessions, plenary lectures and communications.

In the frames of cooperation with the IAEA the Institute contributes to the international research project concerning bioactive hydrogels and has obtained a considerable support under the programme of technical assistance (laboratory equipment, grants for fellowships etc.).

The role played by the IARC in radiation research has been recognized throughout the world. Professor J. Kroh has been nominated a regional editor of the international journal *Radiation Physics and Chemistry*. He is also a member of editorial boards of such journals as *Journal of Radioanalytical and Nuclear Chemistry (Letters and Articles)* or *Isotopenpraxis*, as well as a member of the Council of Miller Trust for Radiation Chemistry. Furthermore, Professors J. Kroh and A. Płonka were elected as councillors of the International Association for Radiation Research.

Beside research the Institute is engaged in teaching programme of the Faculty of Chemistry. The general courses are offered on two subjects: physical chemistry and introduction to informatics, the former one also for the Faculty of Chemical and Process Engineering and the Faculty of Engineering. The courses include lectures, seminars and laboratory.

M.Sc. course is offered on nuclear and radiation techniques. Within this speciality there are two lines of granting a diploma: radiation technology or isotope techniques. The main subjects of the course are: radiation chemistry, photochemistry and spectroscopy, radiochemistry and isotopic techniques, chemical kinetics. Graduates are prepared for creative work in science and technology. In 1970-1990 there were 85 graduates.

A graduate programme leading to Ph.D. degree is also offered by the Institute to the staff of the University, to the students of special doctoral courses and research workers from industry.

INSTITUTE OF POLYMERS, I-20
90-924 Łódź, Żwirki 36
Telephone: (42) 36-25-43; 36-55-22 ext. 619

Director: Professor Ludomir Ślusarski Ph.D., D.Sc.

Academic staff:

Professor Marian Kryszewski Ph.D.
Professor Zygmunt Lasocki Ph.D., D.Sc.
Professor emeritus Jerzy Ruciński Ph.D., D.Sc.
Professor Kazimierz Studniarski Ph.D.
Professor Mirosław Włodarczyk Ph.D., D.Sc.
Docent Czesław Krawiecki Ph.D.
Docent Zofia Michalska Ph.D., D.Sc.
Maria Mucha Ph.D., D.Sc.
Władysław Rzymiski Ph.D., D.Sc.
Jacek Ulański Ph.D., D.Sc.

Senior lecturers: 12

Assistants: 5

Technical and secretarial staff: 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, Chair of Leather Technology and the Group of Polymer Physics. There are four divisions in the Institute:

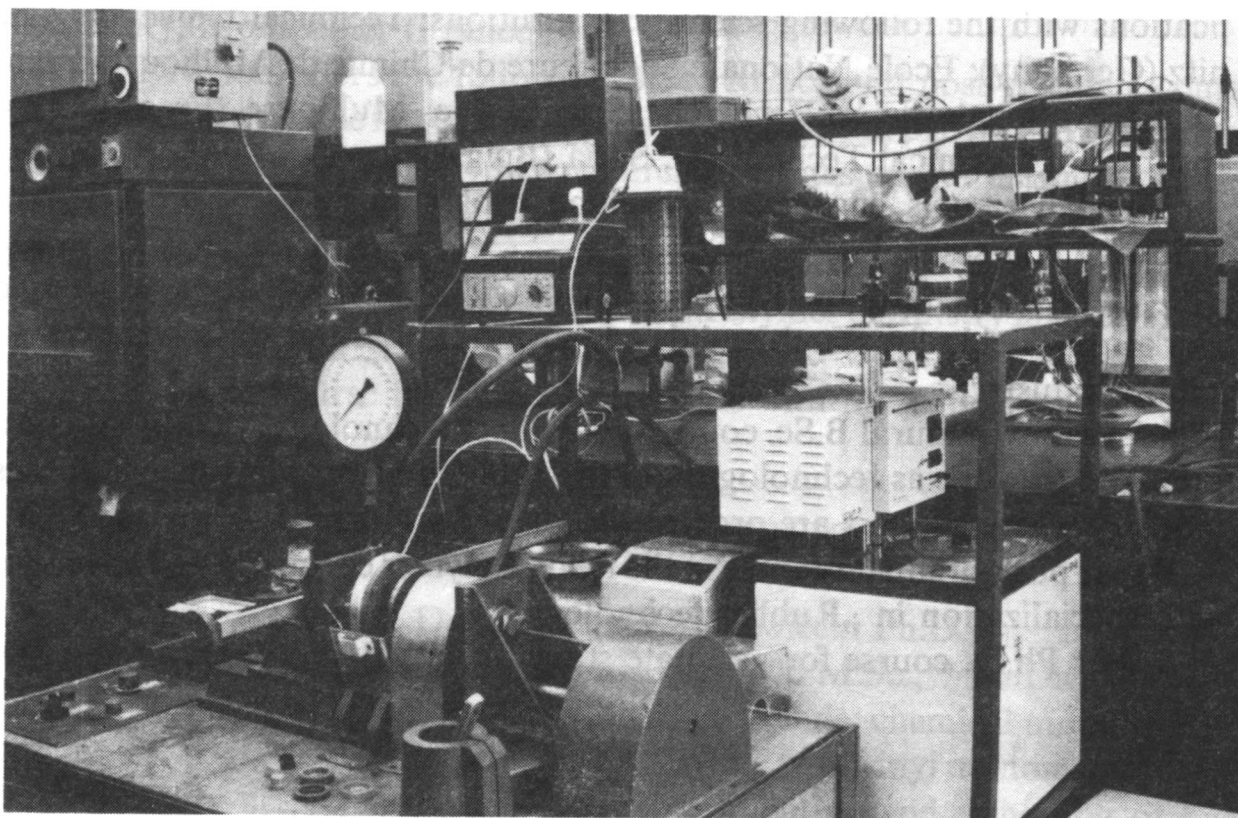
- Division of Rubber Technology,
- Division of Plastics Technology,
- Division of Leather Technology,
- Division of Polymer Physics.

DIVISION OF RUBBER TECHNOLOGY

Head: Professor Ludomir Ślusarski, Ph.D., D.Sc.

Staff: 20 persons; degrees awarded: ~60 B.Sc., ~500 M.Sc., 13 Ph.D., 3 D.Sc.

The main subjects of research are: characterization of rubbers and composites, crosslinking of rubbers by conventional and unconventional substances, relations between structure and properties of elastomers, polymer-filler interaction, mechanism of adhesion.



Division of Rubber Technology. Tribological apparatus for elastomers and plastics

The Division has close connections with the Polish rubber industry and other branches of industry, in which rubber goods are produced or used. The technological projects are developed, most often concerning the special rubber goods, e.g. porous, non-burning, those with enhanced thermal or chemical stability, with low coefficient of friction, etc.

The Laboratory equipment includes:

- machines for rubber processing: laboratory two-roll mill, strainers, injection moulding machine, paddle mixer, vulcanization presses;
- equipment for testing rubbers, rubber compounds and vulcanizates: Mooney viscometer, Monsanto type rheometer, Brabender Plasti-Corder, Knauer osmometer, UV-spectrometer, machines for testing mechanical properties, a special stand for tribological investigations, apparatus for testing thermal properties by DTA, DSC, TG and TMA methods, apparatus for oxygen index measurement.

The Division has published 120 original papers, 210 publications of general character, lectures and short communications as well as 2 books (encyclopedia „Material Science” and Polish translation of „Rubber Technology” with its own Supplement).

The members of staff took part in organization of conferences with participation of guests from abroad: „Elastomery 85”, „Elastomery 90” and „Bretsznajder’s Seminars on Thermal Analysis” in 1983, 1986, 1989.

The Division has close connections, joint research programmes and publications with the following scientific institutions: Technical University Chemnitz (Germany); Ecole Nationale Supérieure de Chimie de Mulhouse (France); Centre Nationale de la Recherche Scientifique, Mulhouse (France); Higher Institute of Chemical Technology, Sofia (Bulgaria).

The Division is engaged in teaching programme. There are offered the following courses:

- 5-year M.Sc. course in „Rubber technology”. The graduates are prepared to work in the field of research and development or as senior staff members in the rubber industry;
- 4.5-year extramural B.Sc. course in „Rubber technology”. The graduates are prepared to work as technologists in the rubber industry or other branches of industry where rubbers are processed;
- 1-year post-graduate course in the field „Polymer chemistry and technology” with specialization in „Rubber technology”;
- 4-year Ph.D. course for graduate students with M.Sc. degree.

DIVISION OF PLASTICS TECHNOLOGY

Head: Professor Zygmunt Lasocki Ph.D., D.Sc.

Staff: 18 persons; degrees awarded: over 710 M.Sc. and B.Sc., 18 Ph.D., 4 D.Sc.

Main subjects of research of the Division are: synthesis of new organosilicon monomers and polymers, kinetics and reaction mechanisms, catalysis with use of polymer-supported metal complexes and chemistry of microgels. Technological projects include the development of casting of polyurethanes and polyamides on industrial scale.

The Division cooperates in the field of polymer synthesis with Nitrogen Works in Tarnów and Research and Development Centre for Plastics in Łódź. The laboratory equipment includes UV and IR spectrophotometers, GL chromatographs, pH-meters, equipment for molecular weight determination, apparatus for polymer synthesis. So far the Division has published 152 original papers and 320 publications of general character, lectures and short communications. Moreover 3 books have been translated and two book chapters have been written.

The 7th International Symposium on Polycondensation Processes was organized by the Division in Łódź in 1977. The Division of Plastics Technology cooperates with the following foreign universities: University of Strathlyde, Glasgow (Great Britain); Technical University, Dresden (Germany); Languedoc University, Montpellier (France).

The Division offers the following B.Sc., M.Sc., and post-graduate courses:

- 5-year M.Sc. course in „Chemistry and technology of plastics”. The graduates are prepared to work in polymer research institutes and in plastics industry;
- 4.5-year extramural B.Sc. course in „Plastics technology”. The graduates are prepared to work as technologists in plastics industry;
- 1-year post-graduate course in the field „Polymer chemistry and technology” with specialization in „Plastics technology”;
- 4-year Ph.D. course for graduate students with M.Sc. degree.

DIVISION OF LEATHER TECHNOLOGY

Head: Docent Czesław Krawiecki Ph.D.

Staff: 20 persons, degrees awarded: 10 B.Sc., 400 M.Sc., 7 Ph.D.

Main subjects of research of the Division include: chemical modification of commonly available natural proteins by grafting with vinyl monomers, preparation of highly active enzymatic products for bating and unhairing of hides, preparation of chemicals for simultaneous tanning and fatting of leather.

Technological projects cover pretannage and posttannage processes in leather technology. The Division cooperates with industry in development of chemicals for leather processing. The Division possesses the equipment for routine leather analysis and full technological plant for leather manufacture.

There have been published 250 papers. The 2nd Interantional Conference on New Technologies of Leather Processing was organized by the Division in Łódź in 1987. The Division has developed international cooperation with Technical University, Chemnitz (Germany).

The following M.Sc., B.Sc., and post-graduate courses are offered:

- 5-year M.Sc. course in „Chemistry and technology of leather”. The graduates are prepared to work in research polymer and leather institutes or in leather industry;
- 4.5-year extramural B.Sc. course in „Leather technology”. The graduates are prepared to work as technologists in leather industry;
- 1-year post-graduate course in the field „Polymer chemistry and technology” with specialization in „Leather technology”;
- 4-year Ph.D. course for graduate students with M.Sc. degree.

DIVISION OF POLYMER PHYSICS

Head: Professor Marian Kryszewski, Ph.D.

Staff: 8 persons; degrees awarded 20 M.Sc., 37 Ph.D., 9 D.Sc.

Main subjects of research of the Division are: preparation of conducting and photoconducting heterogeneous organic polymeric systems and charge carrier transport in these systems, conductivity polarization and depolarization phenomena in polymers, influence of structure and morphology on photo- and thermodegradation and on photophysical properties, phase transition and electro-optical properties in polymer blends with liquid crystals, photocrosslinking of polymers in view of lithography.

The Division focusses on basic research but it has close contacts with printing industry and some relations with electronic and display producing companies. Laboratory equipment includes: light scattering equipment for morphology studies of polymers, UV-Vis spectrometer, specialized equipment for simultaneous studies of thermally stimulated currents and luminescence, unconventional equipment for studies of photoconductivity, conductivity polarization and for electro-optical properties of dispersions of liquid crystals in polymers, prototype semi-technical system for continuous preparation of lithographic systems for printing industry, equipment for studies of phase transitions in polymers and their blends.

The Division has published 310 original papers, 350 publications of general character, lectures and short communications and 3 books. The members of staff organized the conferences on „Structure and Morphology of Polymers” for East European Countries (1968, 1976). The Division of Polymer Physics organized 21 Europhysics Conference on Macromolecular Physics „Electrical and Optical Polymers” in 1989. The head of the Division was a member of the organizing committees of several international conferences on polymer physics and electrical properties of polymers.

There are close relations and joint publications with the following scientific institutions: Max-Planck Institut für Polymer Forschung (Germany); Université Claude Bernard, Lyon (France); Université Libre de Bruxelles (Belgium); University of Stathclyde, Glasgow (Great Britain).

The Division of Polymer Physics participates in the education of students at M.Sc. courses in „Rubber technology”, „Polymer technology” and „Leather technology” as well as in post-graduate course in the field „Polymer chemistry and technology” and in Ph.D. course for graduate students.

INSTITUTE OF DYES, I-21

90-924 Łódź, Żwirki 36

Telephone: (42) 36-25-96

Director: Professor Jan Kraska Ph.D., D.Sc.

Academic staff:

Professors Jan Kraska Ph.D., D.Sc.

Assoc. Professor Jerzy Szadowski Ph.D., D.Sc.

Docent Wojciech Czajkowski Ph.D., D.Sc.

Senior lecturers: 7

Technical and secretarial staff: 13

The Institute of Dyes continues the activity of the former Department of Dyes Technology. 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 new area of present investigations is synthesis of dyes for special application (liquid crystal dyes, fluorescent dyes etc.).

The Institute has close contacts with Polish dyestuff industry, especially with Organika-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 for industrial application.

The Institute of Dyes cooperates with Research and Development Centre of the Dyestuff Industry in Zgierz. Close contacts are also maintained with other universities concerned with organic chemistry and organic technology such as: University of Łódź, Nicolaus Copernicus University of Toruń, Technical University of Warsaw and Military Technical Academy in Warsaw.



Xenotest - apparatus for testing of light-fastness of dyeing

Laboratories of the Institute are well equipped both for research and teaching programme with visible, ultraviolet and infrared spectrometers, gas chromatograph and equipment for structural studies (optical and electron microscopes). Facilities for colour application technology such as laboratory dyeing machines, Xenotest and other equipment for estimation of fastness properties of dyeings are also available.

Up to now the scientific activity of the Institute resulted in more than 200 publications (papers, patents and books). The Institute of Dyes has scientific contacts with Department of Colour Chemistry at the University of Leeds (Great Britain) and Chemical and Technological School in Pardubice (Czechoslovakia). The result of these contacts are exchange of publications, cooperation in research programmes and joint post-doctoral research fellowships.

The Institute of Dyes is the only Polish university institute providing education to students in the range of technology of dyes and chemical auxiliaries. Post-graduate courses in the same range are also offered. So far the Institute graduated more than 500 students on B.Sc. and M.Sc. courses 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. Up to now 20 degrees of Ph.D. and 3 D.Sc. were awarded.

FACULTY OF TEXTILE ENGINEERING, W-4

Dean's office address: 90-543 Łódź, Żeromskiego 116

Telephone: (42) 36-48-23

Telefax: (48 42) 36-85-22

Telex: 886 136 polit pl

FOUNDATION AND GROWTH

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

Between the World Wars One and Two the academic education in textile engineering was continued at the Department of Textile Engineering of the Warsaw Technical University with Professor Bratkowski as its Head, and after the World War Two at the Faculty of Mechanical Engineering at the Technical University in Łódź established in 1945. On September 15, 1947, following the decree of the Ministry of Education, an independent Faculty of Textile Engineering was set up at the Technical University of Łódź and separated from the Faculty of Mechanical Engineering.

At that time the Faculty of Textile Engineering consisted of 5 departments:

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



The main building of the Faculty of Textile Engineering

During the years 1949-51 the following new departments were organized:

- Department of Technology of Man-Made Fibres - headed by Professor Atanazy Boryniec,
- Department of Textile Finishing - Professor Józef Majzner,
- Department of Textile Engineering - Professor Julian Hunka,
- Department of Weaving - Professor Józef Grosman,
- Department of Knitting - Dr. Leon Pfeifer.

In the academic year 1957/58 the Department of Physical Chemistry of Polymers was created and directed by Docent Eligia Turska as well as the Department of Industrial Economics started its activity with Docent Jerzy Rachwalski as its Head.

In 1968 the Department of Clothing Technology was organized and headed by Docent Włodzimierz Więźlak.

In 1970/71 the Faculty of Textile Engineering was reshaped and at present - in place of the 13 former departments 6 new institutes and a branch, the Institute of Textile Engineering in Bielsko - Biała, make the actual structure of the Faculty.

The Faculty of Textile Engineering is headed by the Dean and the Faculty Council of 29 professors and docents.

During the past years the following Deans performed their duties:

1948 - 1952	Professor Tadeusz Żyliński
1952 - 1953	Professor Józef Majzner
1953 - 1954	Professor Jan Szmelter
1954 - 1962	Professor Atanazy Boryniec
1964 - 1966	Docent Marian Malinowski
1966 - 1969	Docent Juliusz Zakrzewski
1969 - 1975	Professor Janusz Szosland
1975 - 1979	Professor Grzegorz Urbańczyk
1979 - 1981	Docent Włodzimierz Więżlak
1981 - 1983	Docent Tadeusz Kołaciński
1983 - 1990	Docent Janusz Lipiński
1990 -	Professor Kazimierz Kopias

STRUCTURE

The present organization of the institutes is as follows:

1) Institute of Metrology, Clothing Technology 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,
- Polymer Physical Chemistry.

4) Institute of Fibre Physics and Textile Finishing, I-25, consists of 3 sections:

- Textile Physics and Fibre Science,
- Textile Finishing,
- Maintenance of Textiles.

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

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

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, with teaching groups:
- Sociology,
- Ergonomy.

7) The Institute of Textiles in Bielsko-Biała, FI 3, has 3 sections:

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

STAFF OF FACULTY

Academic staff of the Faculty is represented by 29 professors and docents, 140 senior lectures and assistants and 136 technical and secretarial staff.

EDUCATION

During more than 40 years 8815 students graduated from the Faculty of Textile Engineering and obtained their M.Sc. and B.Sc. diplomas. At present the Faculty provides a wide range of specializations and graduation directions, as follows:

- 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: Textile Finishing, Fibre Physics and Fibre Chemistry, Maintenance of Textiles.

The Faculty has several large laboratories, design studios and lecture theatres with modern research equipment and industrial machinery as well as computers used to control technological processes and to design fabrics.

Well equipped laboratories are those of textile metrology, clothing technology, weaving and fibre physics and of man-made fibres.

The Faculty offers M.Sc. and Ph.D. courses.

Graduates of the Faculty of Textile Engineering form the engineering and managing staff for textile industry, research centres and academic institutions.

The Faculty has its foreign students and specialists. Two post-graduate courses for textile specialists from the developing countries were organized at the

Faculty and sponsored by the United Nations Industrial Development Organization. Besides, a number of students from Greece, Ecuador, Nigeria, Cyprus, Syria, Vietnam, Angola, Tunisia, Mongolia, Korea, Albania, USSR, Germany, Hungary, Iraq, China, Yugoslavia and Egypt attend full-time courses to obtain their M.Sc. or B.Sc. diplomas. Some of them continue to get Ph.D. degree.

RESEARCH

Until now the Faculty Council has awarded 39 D.Sc. and 257 Ph.D. degrees. Students take part in research projects by performing M.Sc. work. Research in Textile Engineering has an interdisciplinary character and involves various background sciences as: mathematics, physics and chemistry, mechanical and chemical engineering, economics and management.

PUBLICATIONS

The research works performed in the Institutes of the Faculty have been published in many scientific journals. For example in 1990 120 articles were published in Polish periodicals and 30 papers in foreign scientific journals. 130 reports and communications were presented at congresses, conferences and symposia in Poland and abroad.

In the years 1983-90 the average number of patents obtained was 30 per year.

During last six years 1984-90, 20 textbooks and monographs, as well as 21 mimeographic brochures were published.

INSTITUTE OF METROLOGY, CLOTHING TECHNOLOGY AND NONWOVENS, I-22

90-543 Łódź, Żeromskiego 116

Telephone: (42) 36-15-38

Director: Professor Włodzimierz Więżlak, Ph.D.

Academic staff:

Professor Witold Żurek, Ph.D.,

Professor Wojciech Szmelter, Ph.D., D.Sc.

Docent Witold Gądor, Ph.D., D.Sc.

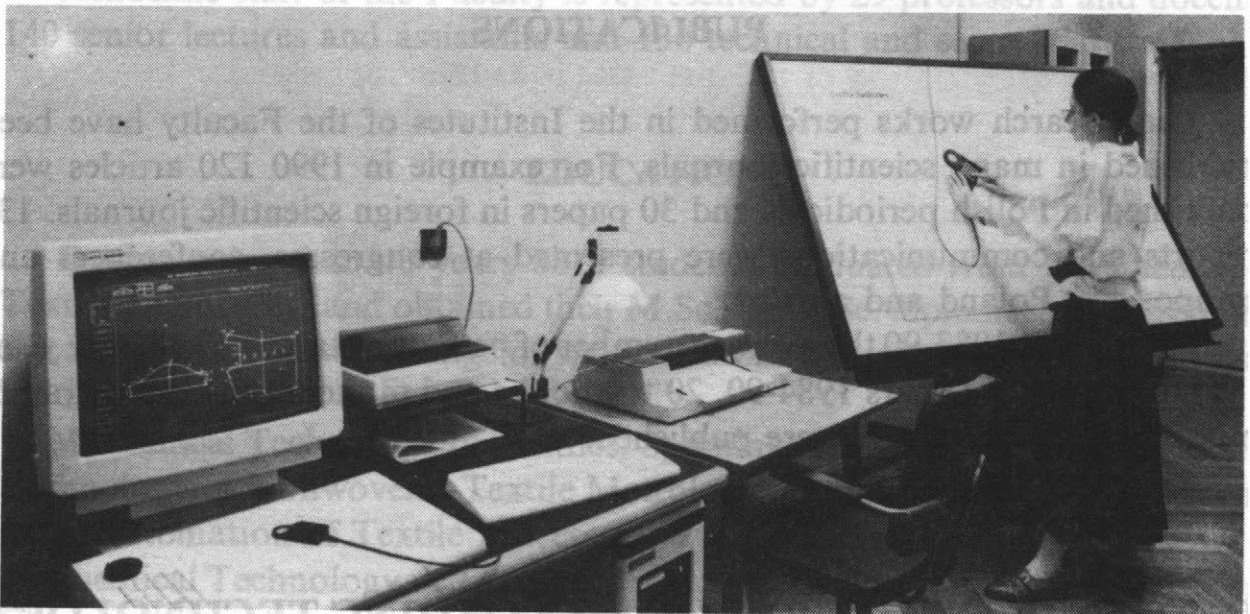
Senior lecturers: 10

Assistants: 4

Technical and secretarial staff: 15

Divisions: Textile Metrology
Clothing Technology
Technology of Nonwovens

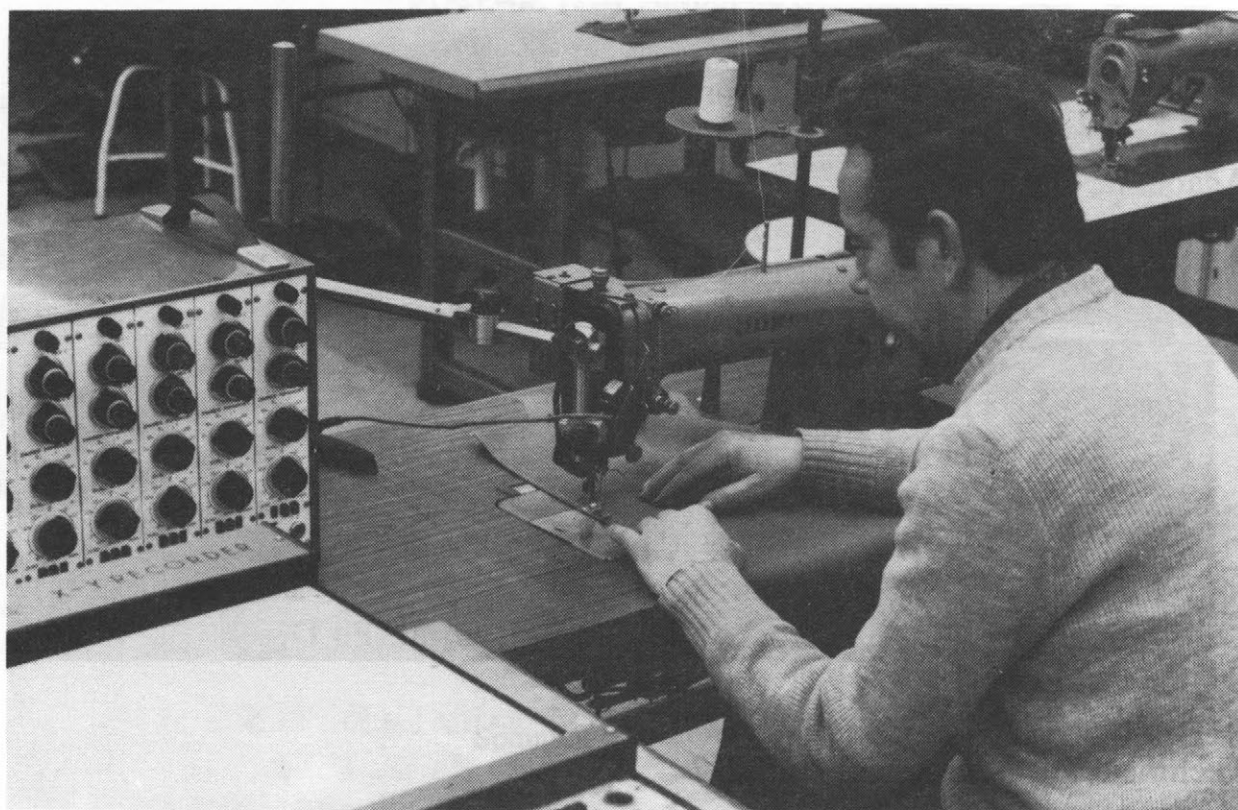
Research carried out in the Institute covers the following areas: examination of fibres and fibre properties, new analytical methods, computing programmes for fabric design, development of new equipment for textile metrology, design and properties of nonwovens, including new bonding agents, clothing design, maintenance of sewing machinery and physical phenomena in garment-making processes.



Graphic computer station

The Institute of Metrology, Clothing Technology and Nonwovens is involved in studies aimed at meeting the needs of industry. Practical application of the results concerns the design of textiles and improvement of their quality, construction of quality-control equipment for industry. In the field of nonwoven technology new fabrics are designed for sanitary purposes, for household, filtration, clothing etc. Patents for numerous filtration products obtained by the Institute are commercially used in the industry.

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



Laboratory of clothing machinery

The Institute has run long-lasting cooperation with the Technical University of Dresden, Germany relating to clothing design, factors affecting elastic properties of nonwovens and construction of measuring equipment. Direct contacts with other German universities involve cooperation in the field of optimization of nonwoven fabric properties. Close links have also been maintained with the Higher School of Textile Engineering and Technology in Liberec, Czechoslovakia, and with the Higher Technical School in Budapest, Hungary. The research staff of the Institute takes part in international conferences, cotton classification tests (calibration, examinations).

The Institute offers M.Sc. courses in textile metrology, clothing technology and in technology of nonwovens. Ph.D. studies are also organized.

**INSTITUTE OF MECHANICAL TECHNOLOGY OF
TEXTILES, I-23****90-924 Łódź, Żwirki 36****Telephone: (42) 36-32-74****Director: Professor Janusz Szosland Ph.D., D.Sc.****Academic staff:**

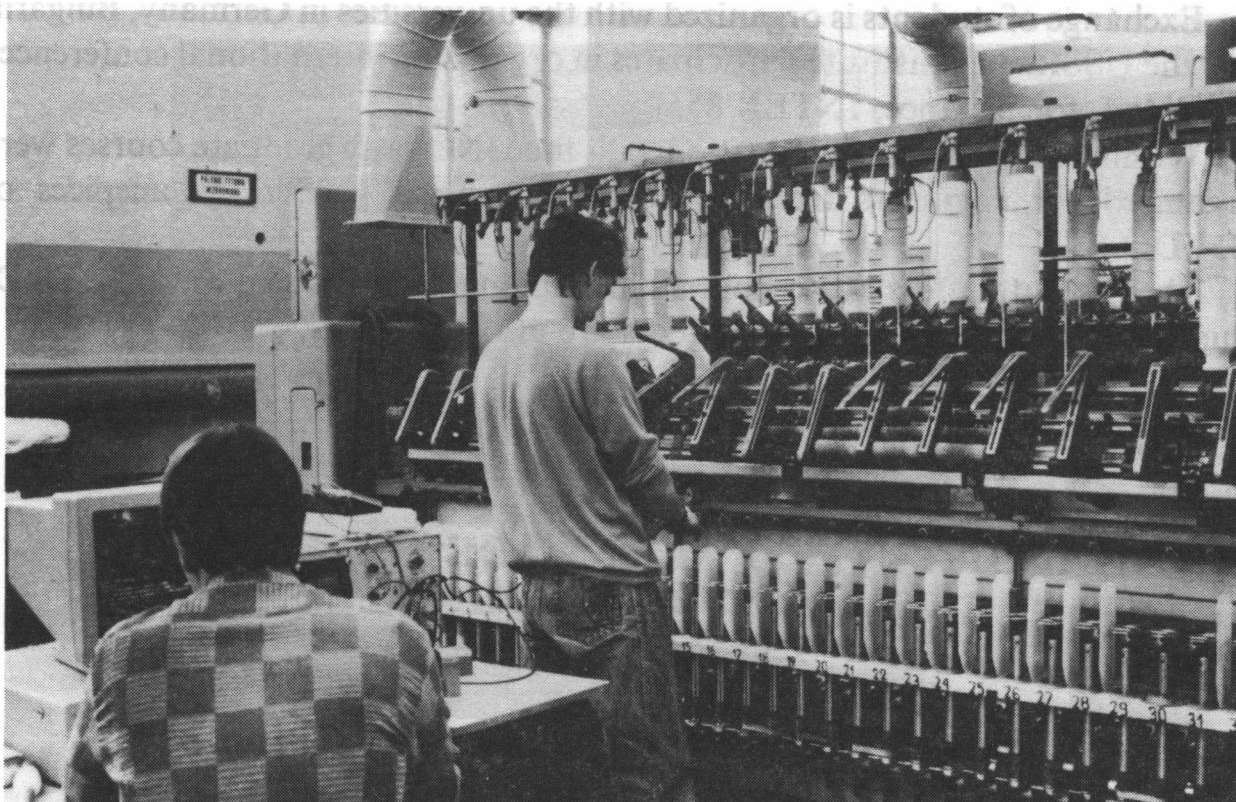
Professor Janusz Szosland Ph.D., D.Sc.
Professor Marian Malinowski Ph.D., D.Sc.
Professor Tadeusz Jackowski Ph.D., D.Sc.
Professor Władysław Korliński Ph.D., D.Sc.
Docent Marian Stasiak Ph.D., D.Sc.
Docent Kazimierz Kopias Ph.D., D.Sc.
Docent Józef Masajtis Ph.D., D.Sc.
Docent Karol Natkański Ph.D.
Docent Barbara Chylewska Ph.D.
Docent Izabela Frontaczak-Wasiak Ph.D.

Senior lecturers: 18**Assistants: 3****Technical and secretarial staff: 42**

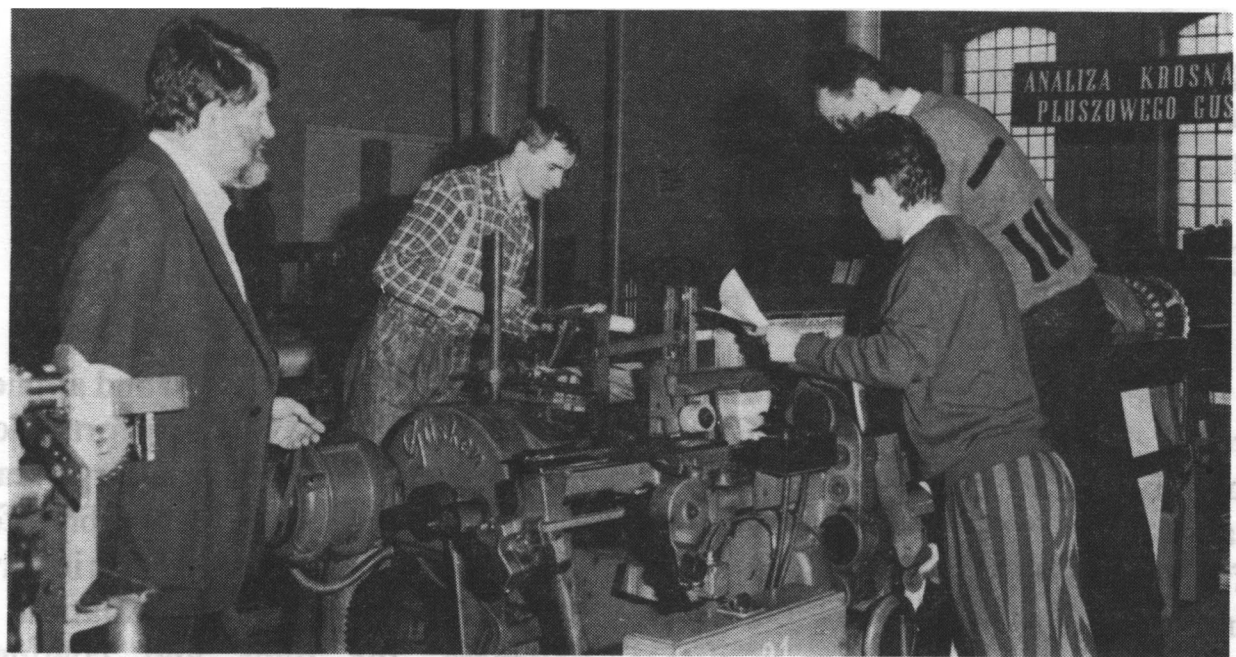
Divisions: Spinning
Weaving
Knitting

Main research topics are 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 and knitted fabrics, application of wovens and weaving techniques for industrial fabrics, design of new spinning, weaving and knitting plants. An example of achievements of the Institute is the analysis and modelling of phenomena occurring in spinning, weaving and knitting processes, multifactorial optimization of computer design of yarns and fabrics and intensification of carding. Other results concern air-jet spinning, weft beating-up by means of vibration and application of sinkers, as well as pneumatic weft insertion in converted shuttle looms and industrial fabrics-woven resistors and textile-reinforced concrete. The research projects are carried out mainly for industrial institutions.

The Institute cooperates with many academic institutions in the United Kingdom, France, Germany, Czechoslovakia and the USSR.



Spinning laboratory



Weaving laboratory

Exchange of students is organized with the universities in Germany, Bulgaria and the USSR. The Institute participates in organizing international conferences in Poland, for instance, INTEX'85.

Within the frames of cooperation with the UNO post-graduate courses were organized for engineers from developing countries, under the auspices of UNIDO.

The Institute offers M.Sc. courses in spinning, weaving and knitting. Ph.D. studies for Polish and foreign students are also organized.

INSTITUTE OF MAN-MADE FIBRES, I-24
90-924 Łódź, Żwirki 36
Telephone: (42) 36-26-30

Director: Professor Tadeusz Skwarski Ph.D., D.Sc.

Academic staff:

Professor Bogumił Łaszkiewicz Ph.D., D.Sc.

Professor Stefan Połowiński Ph.D., D.Sc.

Docent Jacek Dutkiewicz Ph.D., D.Sc.

Tadeusz Wódka Ph.D., D.Sc.

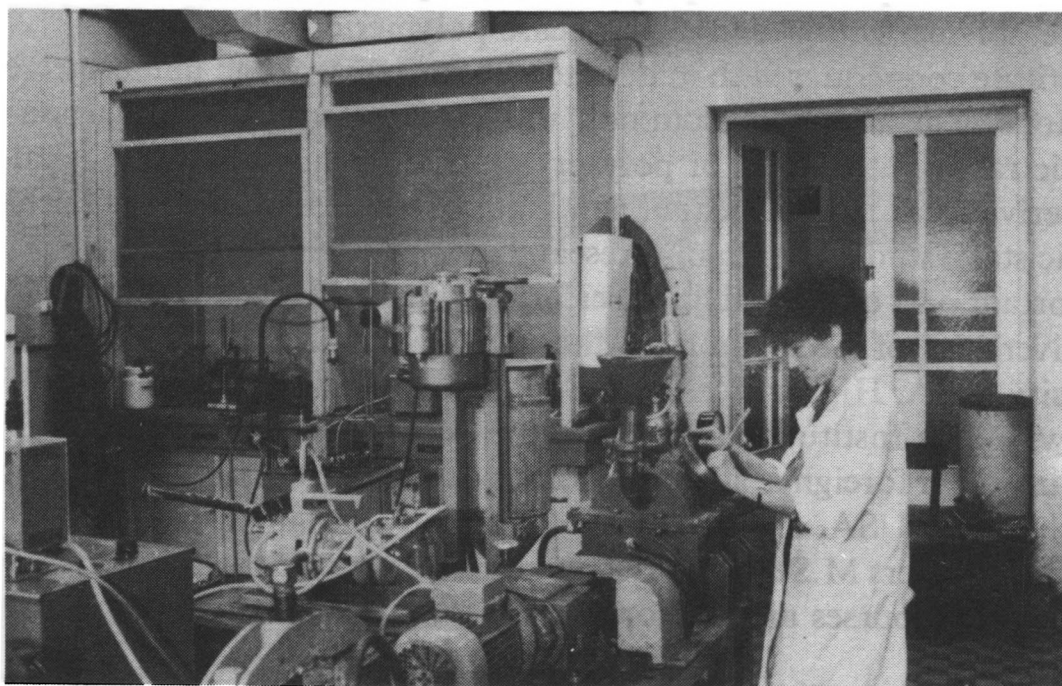
Senior lecturers: 13

Assistant: 1

Technical and secretarial staff: 16

Divisions: Man-Made Fibre Technology
Physical Chemistry of Polymers

The Institute of Man-Made Fibres carries out both fundamental and applied research. The main topics are modification of fibre-forming polymers, formation of fibres with special properties and biomaterials. For example a large-scale laboratory method of spinning of high-modulus precursor PAN fibres for further processing into carbon fibres has been worked out. Other projects involve immobilizing of enzymes in cellulosic fibres, new methods of formation of cellulosic filament, thermoresistant polymers, for films and coatings, fibre-forming block copolymers, natural polymers as carriers of bioactive substances. There is also research going on concerning chitin polymers and biomaterials for medical uses. In the Division of Polymer Physical Chemistry the



Laboratory of man-made fibre technologies



Laboratory wet-spinning equipment

main research topics are copolymerization processes, copolymer structure, template polymerization and slow-release polymeric systems.

The Institute cooperates with man-made fibres industry and numerous research institutions. The topics of common interest are for example carbon fibres, cellulosic rayon, utilization of polyacrylonitrile fibrous waste, practical use of chitin derivatives, development of new kinds of textile biomaterials. Exchange of scientific staff, students and joint research projects with universities abroad are an important part of the activities performed by the Institute. It cooperates with the Universities of Leeds and Strathclyde, United Kingdom, North Carolina University, USA, Higher Technical School in Bratislava, Czechoslovakia, and Moscow Textile Institute, USSR. Informal, close contacts are also maintained with many other foreign academic institutions as for example with the University of Washington, USA, and Hokkaido University in Japan.

The Institute offers M.Sc. courses in man-made fibre technology and in polymer science. Ph.D. courses are also organized.

**INSTITUTE OF FIBRE PHYSICS AND TEXTILE
FINISHING, I-25**

90-543 Łódź, Żeromskiego 116

Telephone: (42) 36-27-62

Director: Professor Grzegorz Urbańczyk Ph.D., D.Sc.

Academic staff:

Docent Barbara Lipp-Symonowicz Ph.D., D.Sc.

Docent Jerzy Kalinowski Ph.D.

Docent Józef Mielicki Ph.D.

Senior lecturers: 9

Assistant: 1

Technical and secretarial staff: 19

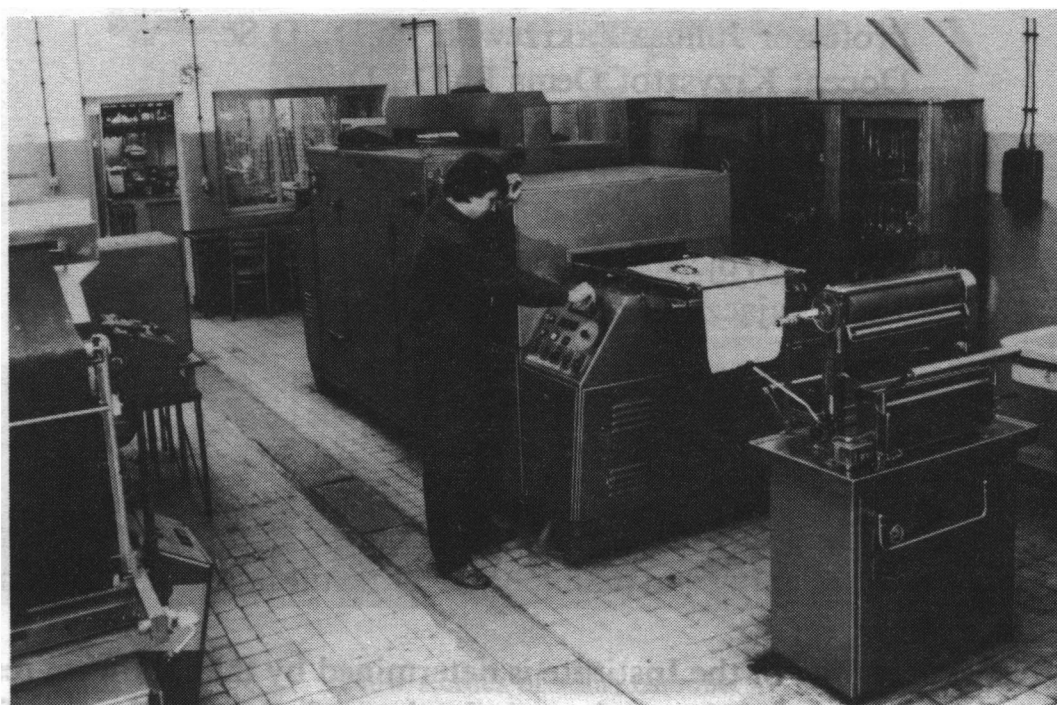
Divisions: Fibre Physics

Textile Finishing

Main research topics are studies of physical microstructure and properties of fibres, physical and physico-chemical methods of examining fibre microstructure



Spectrophotometric laboratory



Laboratory of textile-finishing technologies

and properties, basic processes in finishing processes and their optimization, washing and cleaning of textiles.

The Institute is engaged in collaboration with various research and industrial institutions. The results of many research projects have found their application and are utilized on a commercial scale.

The Institute has a wide cooperation programme with foreign academic institutions, in particular with the Higher Institute of Chemistry and Technology in Sofia, Bulgaria.

The M.Sc. courses are offered in fibre physics, textile finishing and textile maintenance.

INSTITUTE OF TEXTILE MACHINERY, I-26

90-543 Łódź, Żeromskiego 116

Telephone: (42) 36-14-29

Director: Docent Janusz Ziółkowski Ph.D.

Academic staff:

Professor Juliusz Zakrzewski Ph.D., D.Sc.

Docent Krzysztof Dems Ph.D., D.Sc.

Docent Waldemar Kobza Ph.D., D.Sc.

Docent Leszek Korycki Ph.D.

Docent Janusz Lipiński Ph.D.

Docent Wojciech Winiarski Ph.D.

Jerzy Zajączkowski Ph.D., D.Sc.

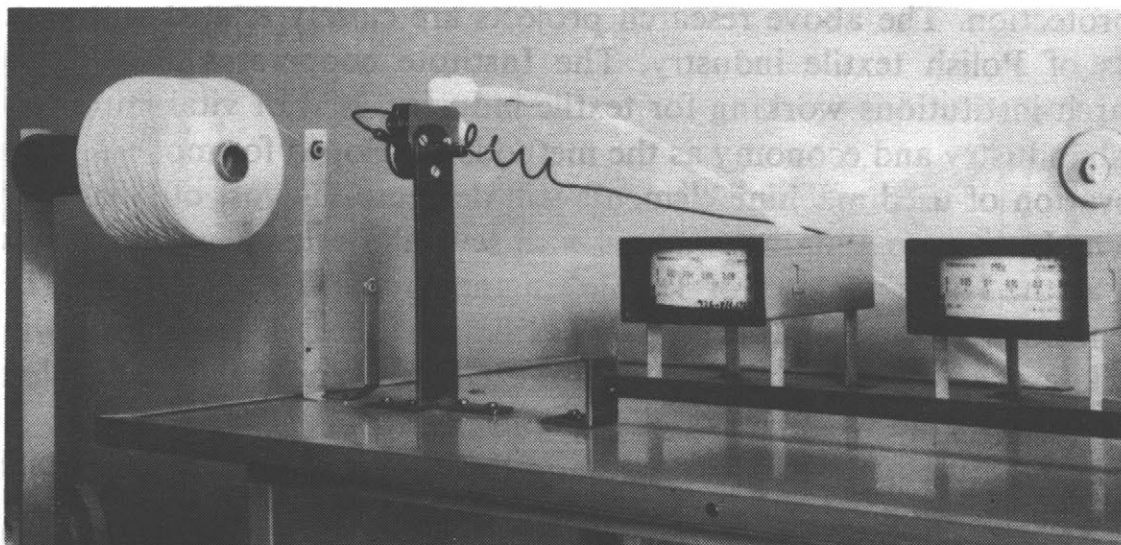
Senior lecturers: 20

Assistants: 6

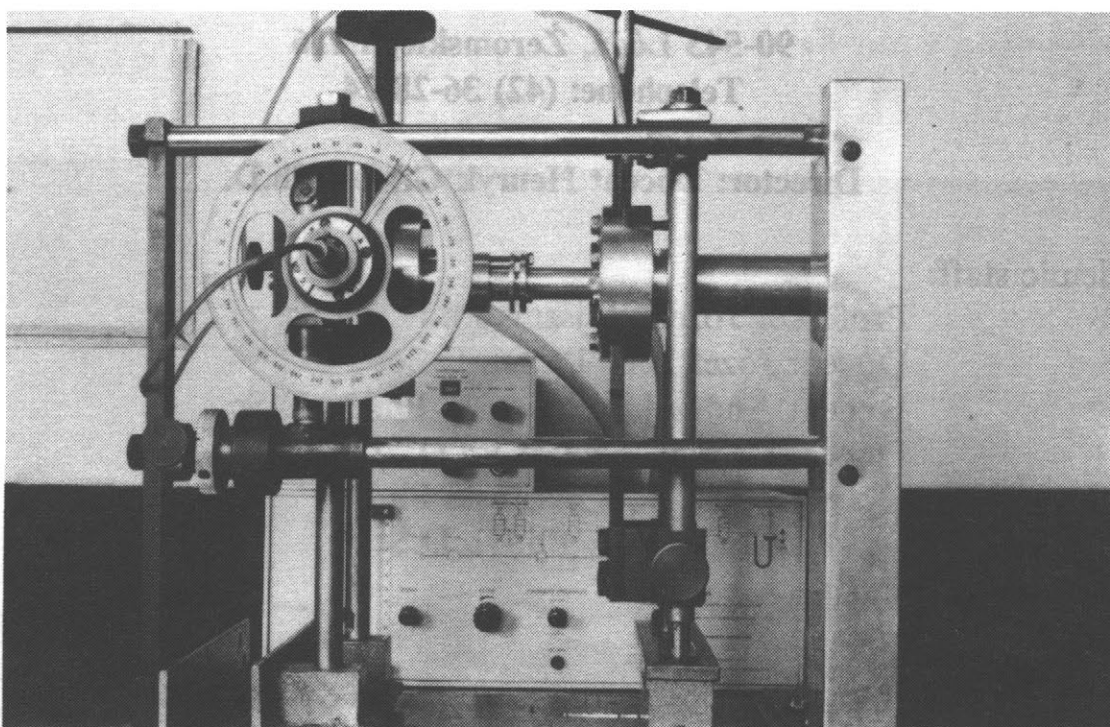
Technical and secretarial staff: 12

The research carried out at the Institute includes general mechanical and electrical problems, designing and maintenance of textile machinery, automation of textile processes.

The scientific profile of the Institute is determined by the following research directions: strength properties and optimization of constructions, effect of temperature and other external factors on resilient and brittle materials, textile machinery design parameters, maintenance and reliability of textile machinery, modernization of textile equipment, optimization of raw material flow in textile



Stand for the analysis of pneumatic transport of yarn



Flow studies of whirl chambers

industry, thermal phenomena in textile machinery, ergonomics and environmental protection. The above research projects are closely related with industrial needs of Polish textile industry. The Institute cooperates also with textile research institutions working for textile industry. It is of vital importance for Polish industry and economy as the methods developed for modernization and renovation of used machine elements will decrease the cost of spare parts.

The Institute maintains contacts with several foreign academic institutions such as the Higher School of Textile Engineering and Technology in Liberec, Czechoslovakia and the Moscow Textile Institute, USSR. Following the multilateral agreements, research staff is exchanged and scientific problems and results of research work are discussed and reviewed.

The Institute offers M.Sc. courses in the maintenance of textile machinery and in automation of textile processes.

INSTITUTE OF ECONOMICS AND MANAGEMENT, I-27

90-543 Łódź, Żeromskiego 116

Telephone: (42) 36-28-24

Director: Docent Henryk Gralak Ph.D.

Academic staff:

Professor Józef Wojsznis Ph.D., D.Sc.

Docent Józef Penc Ph.D., D.Sc.

Docent Andrzej Pomykański Ph.D., D.Sc.

Docent Czesław Szmidt Ph.D., D.Sc.

Docent Lechosław Berliński Ph.D.

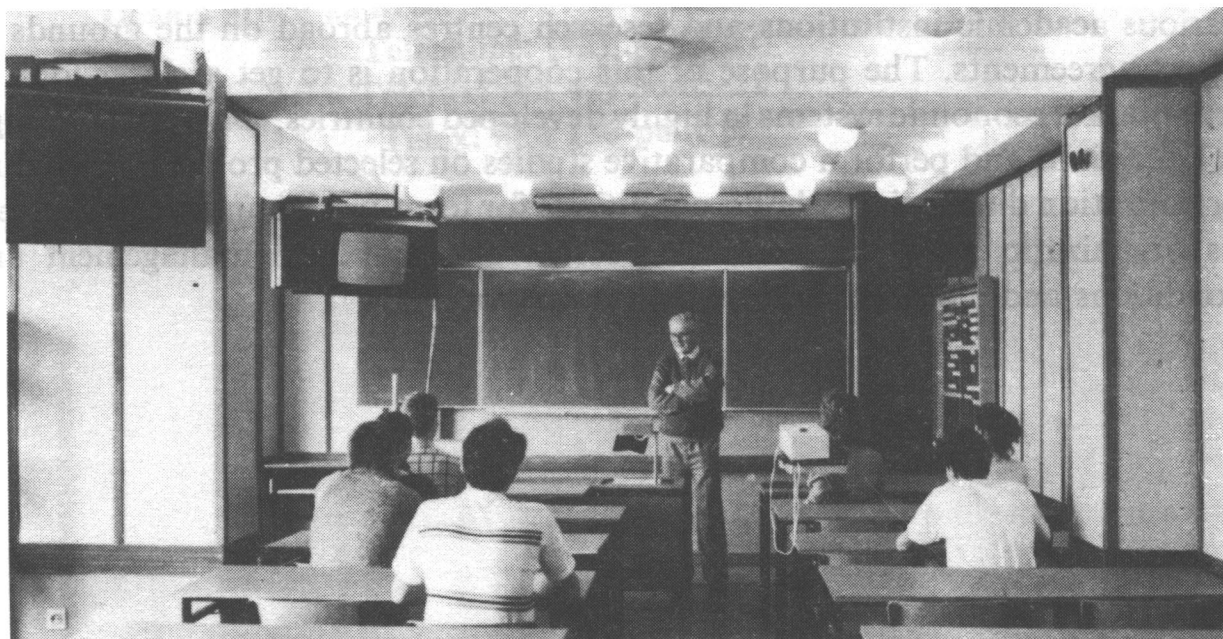
Jerzy Lewandowski Ph.D., D.Sc.

Senior lecturers: 21

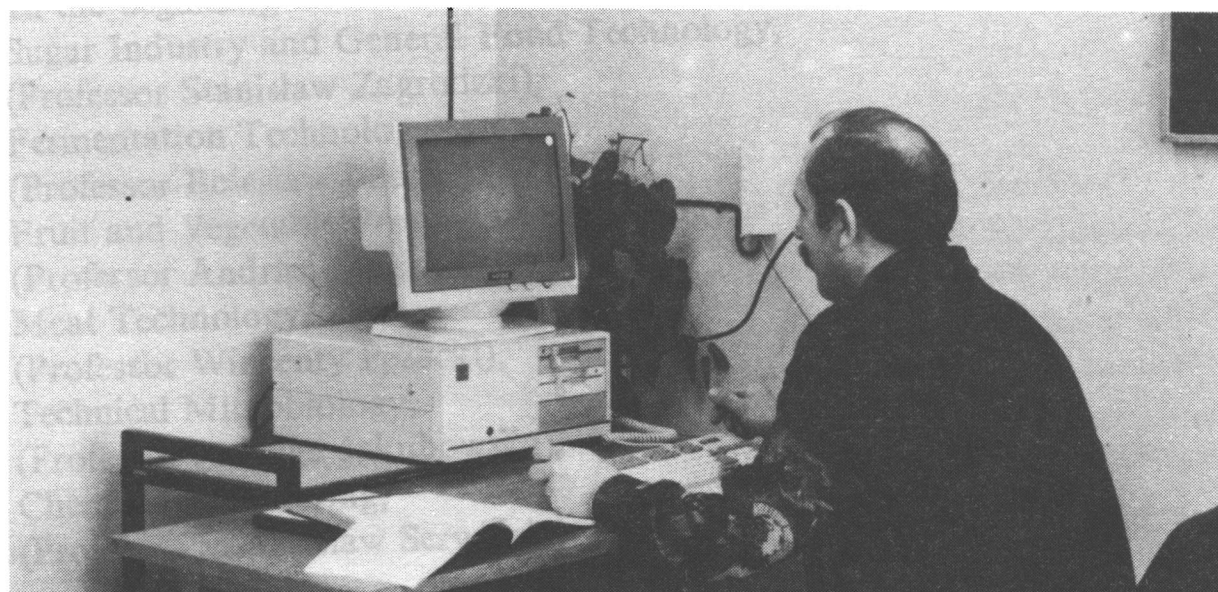
Assistants: 10

Technical and secretarial staff: 2

The research activity is focused on the problems of conditions and effects of managerial and technological progress in relation to the new economic situation in Poland. So the studies carried out at the Institute are now aimed at finding efficient methods of management, restructurization of industry, marketing, evaluation of work conditions and labour relations, methods of selecting and qualifying professional, engineering staff.



Students in the classroom



At work

The Institute cooperates and develops new cooperation programmes with various academic institutions and research centres abroad on the grounds of direct agreements. The purpose of this cooperation is to get a closer look at free-market economic systems in highly developed countries, solve methodological questions and perform comparative studies on selected problems, including organization diagnosis methods, conditions for team-work implementation and its organizational forms, controlled forms of production management and conditions and effects of automated production.

FACULTY OF FOOD CHEMISTRY, W-5

Dean's office address: 90-924 Łódź, Stefanowskiego 4/10

Telephone: (42) 36-48-37

Telefax: (48 42) 36-85-22

Telex: 886 136 polit pl

FOUNDATION AND GROWTH

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

In the beginning there were the following departments:

- Sugar Industry and General Food Technology,
(Professor Stanisław Zagrodzki),
- Fermentation Technology,
(Professor Bolesław Bachman),
- Fruit and Vegetable Processing Technology,
(Professor Andrzej Mering),
- Meat Technology,
(Professor Wincenty Pezacki),
- Technical Microbiology,
(Professor Jadwiga Jakubowska),
- Chemical Engineering,
(Professor Mieczysław Serwiński).

The 70's were the turning point in the growth of the Faculty. The number of students and staff doubled. The rate of the Faculty growth was promoted by the construction of a new building in 1976.

The present structure was set up in 1976.



New building of the Faculty of Food Chemistry

STRUCTURE

The faculty is composed of four Institutes:
 Institute of General Food Chemistry, I-28,
 Institute of Technical Biochemistry, I-29,
 Institute of Chemical Technology of Food, I-30,
 Institute of Fermentation Technology and Microbiology, I-31.

DEANS OF FACULTY

1950 - 1952	Professor Stanisław Zagrodzki,
1952 - 1956	Professor Mieczysław Serwiński,
1956 - 1958	Professor Bolesław Bachman,
1958 - 1960	Professor Stanisław Zagrodzki,
1960 - 1962	Professor Mieczysław Serwiński,

1962 - 1966	Professor Jerzy Kroh,
1966 - 1968	Professor Stanisław Masior,
1968 - 1970	Professor Bolesław Bachman,
1970 - 1972	Professor Edward Galas,
1972 - 1975	Professor Józef Góra,
1975 - 1981	Docent Piotr Moszczyński,
1981 - 1984	Professor Zdzisław Włodarczyk,
1984 - 1987	Docent Piotr Moszczyński,
1987 -	Professor Józef Góra.

STAFF OF FACULTY

The Faculty of Food Chemistry has members of teaching staff including 9 – professors, 4 – assoc. professors, 7 – docents, 73 – senior lecturers, 31 – assistants and 142 – technicians and secretarial staff.

EDUCATION

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

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

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

Since the foundation the Faculty awarded the following number of degrees: D.Sc. – 20, Ph.D. – 183, M.Sc. – 2792 and B.Sc. – 655.

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

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

Buildings of the Faculty are located at 171/173 Wólczańska Street and 4/10 Stefanowski Street, comprising the area of 21,210 m².

INSTITUTE OF GENERAL FOOD CHEMISTRY, I-28

**90-924 Łódź, Stefanowskiego 4/10
Telephone: (42) 36-28-60**

Director: Professor Józef Góra Ph.D.

Academic staff:

**Professor Joanna Masłowska Ph.D., D.Sc.
Professor Henryk Sugier Ph.D., D.Sc.
Assoc. Professor Stanisław Wysocki Ph.D., D.Sc.
Docent Jerzy Podlejski**

Senior lecturers: 20

Assistants: 12

Technical and secretarial staff: 33

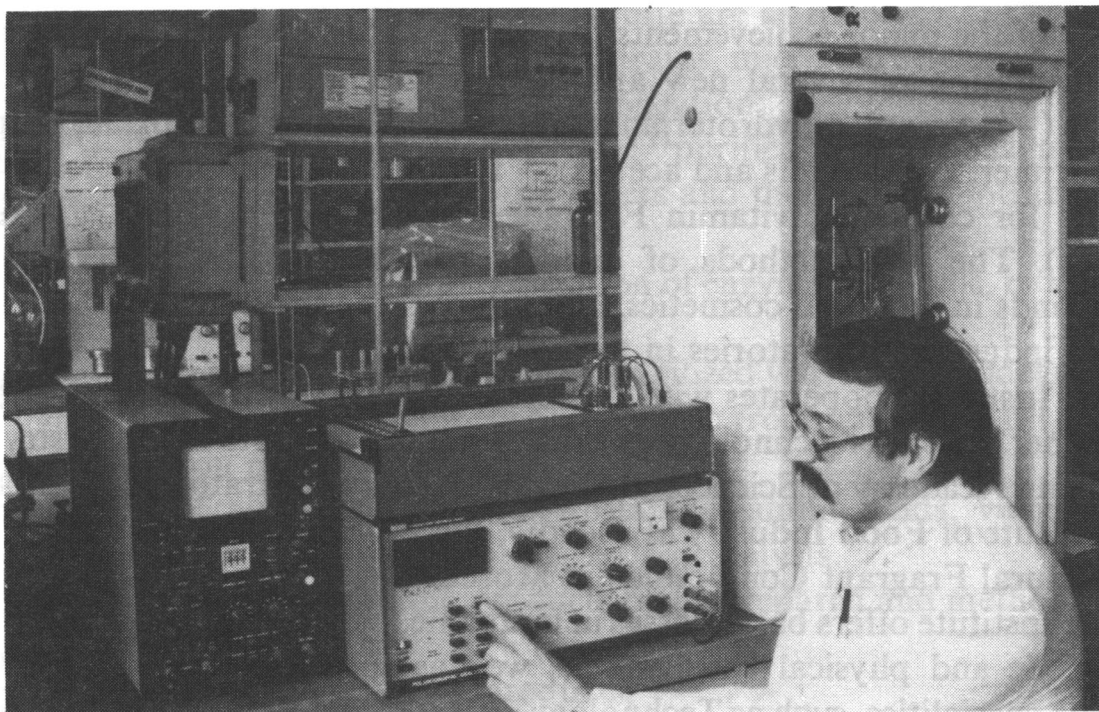
The Institute consists of four educational-research groups:

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

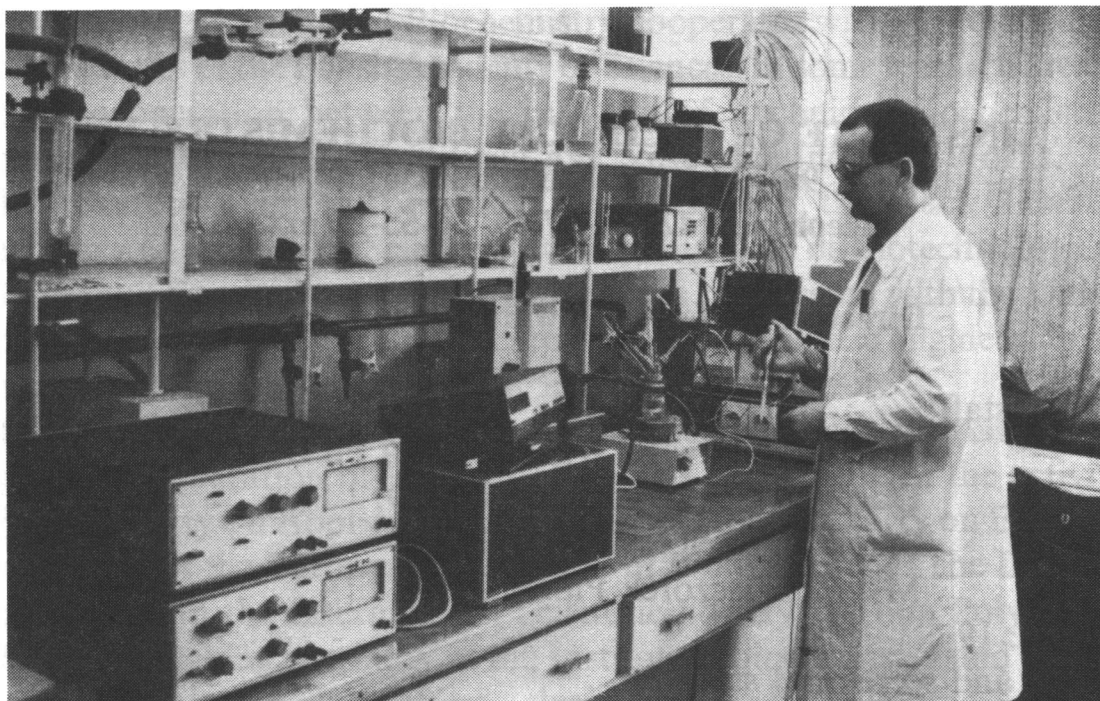
The Institute carries out basic and applied research in the following fields: synthesis of fragrant substances and biologically active agents for cosmetics, biotechnological processes for preparation of fragrant intermediates and products, organic electrosynthesis, enriching tobacco with enzymes, enzyme 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 examination of equilibrium processes in complex-forming systems, instrumental food analysis.

In research the Institute cooperates with the Institute of Technical Biochemistry, the University of Łódź, Maria Curie-Skłodowska University in Lublin, University of Wrocław, the Technical Universities of Gdańsk and Wrocław. This cooperation encompasses 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 240 scientific papers and 110 patents including 16 patents granted abroad.



A fragment of the electrochemical laboratory in the Bioengineering and Analytical Chemistry Group



Apparatus used for the measurement of organic electrosynthesis

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 the country.

The Institute cooperates with numerous foreign research centres including the Higher School of Technology at Bratislava, the Institute of Chemistry at the Ukrainian Academy of Sciences in Kiev, University of Strathclyde in Glasgow, the Institute of Food Industry at Plovdiv, the All-Union Institute of Synthetic and Natural Fragrant Compounds in Moscow.

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

INSTITUTE OF TECHNICAL BIOCHEMISTRY, I-29

90-924 Łódź, Stefanowskiego 4/10

Telephone: (42) 36-77-04, 36-55-22 ext. 812

Director: Professor Edward Galas Ph.D., D.Sc.

Academic staff:

Professor Jadwiga Wilska-Jeszka Ph.D., D.Sc.

Docent Piotr Moszczyński Ph.D.

Stanisław Bielecki Ph.D., D.Sc.

Michał Wieczorek Ph.D., D.Sc.

Assistants: 19

Technical and secretarial staff: 36

The Institute of Technical Biochemistry consists of three research-educational groups: Technical Biochemistry; Nutrients, Vitamins and Food Concentrates Technology; Fruit and Vegetable Processing Technology.

The main research activities at the Institute are as follows:

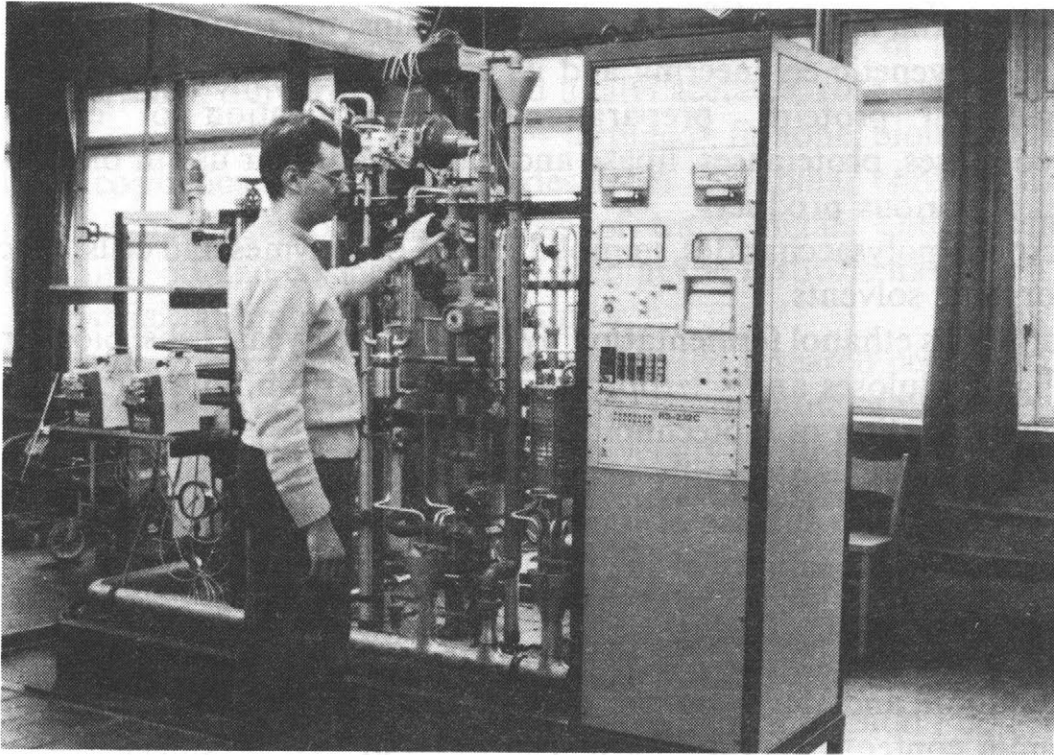
- selection and improvement of microbe strains, microbial screening mutagenization, genetic engineering and its application,
- single cell proteins, preparation and purification of enzymes like glycosidases, proteinases, lipase and others and their use in biotransformation of various products,
- microbial polysaccharides, immobilization of enzymes and cells, biocatalysis in organic solvents,
- continuous ethanol fermentation by immobilized yeast cells, biodegradation of lignocelluloses and scleroproteins, enzymes from antarctic krill,
- computerization of biotechnological processes,
- preparation of biologically active substances (amino acids, vitamins and coenzymes) with the use of immobilized biocatalysts,
- examination of stability of the products being prepared and methods for its improvement,
- crystallographic analysis of bioproducts,
- adaptation and development of new methods for the determination of vitamin content in food, pharmaceutical and feed products,
- preparation, properties and stabilization of natural vegetable dyestuffs,
- characteristics and examination of conversions of polyphenol compounds in fruit.

The Institute of Technical Biochemistry cooperates with 12 Polish universities and institutes of the Polish Academy of Sciences. In some research areas there is a close cooperation between the Institute of Technical Biochemistry and Pharmaceutical Companies and Fruit and Vegetable Industry Works.

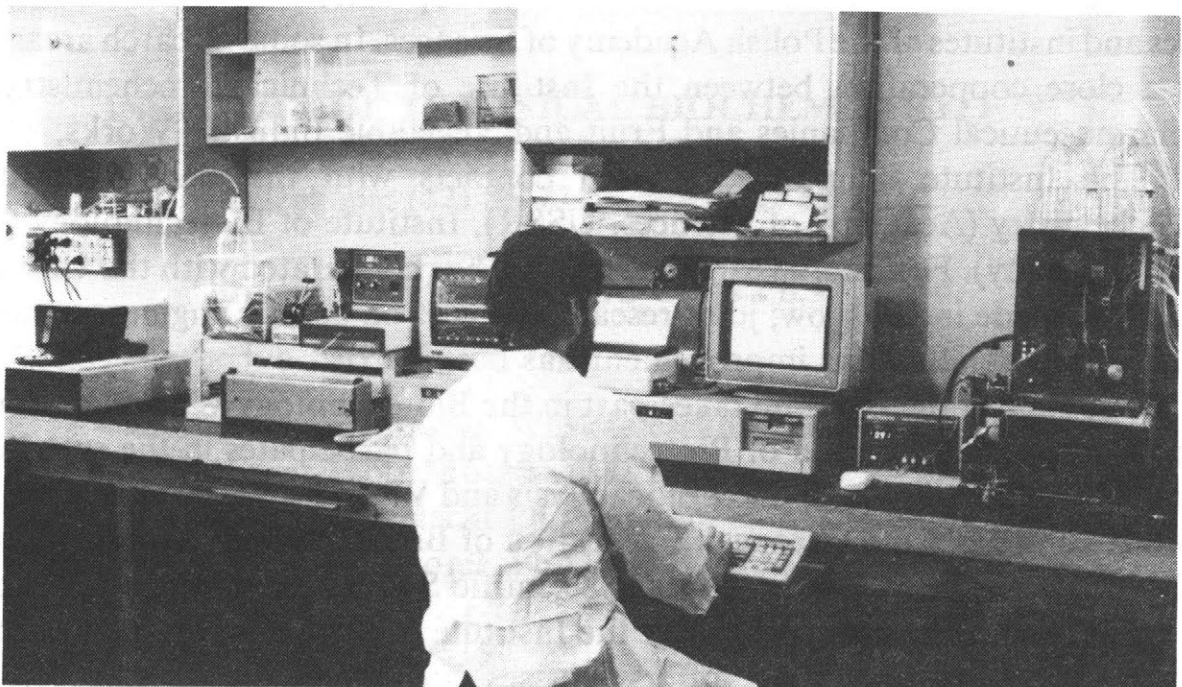
The Institute maintains research contacts with the Bach Institute of Biochemistry (Academy of Sciences, USSR), Institute of Biotechnology (Leipzig, Germany). For many years the Institute has cooperated with the University of Strathclyde in Glasgow; joint research project on genetic engineering and its use in microbial strains improvement has been carried out.

The staff of the Institute takes part in the Biotechnology Working Group of the European Federation of Biotechnology and participates in the activities of the Working Party on Applied Biocatalysis and Working Party on Education in Biotechnology of the European Federation of Biotechnology. The Institute has also contacts with the International Scientific Society „Group Polyphenols”.

The main teaching speciality at the Institute is biochemistry and biotechnology. The Institute also offers classes in three diploma specialities:



A „Chemap” fermenter with a volume of 150 l



A liquid chromatograph for fast protein separation

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 on semi-pilot scale as well as laboratories fitted for biochemical classes and experiments.

In 1958-1990, 470 graduates received their M.Sc. degrees.

INSTITUTE OF CHEMICAL TECHNOLOGY OF FOOD, I-30

90-924 Łódź, Stefanowskiego 4/10

Telephone: (42) 36-74-88

Director: Docent Mieczysław Boruch Ph.D.

Academic staff:

Professor Helena Zaorska Ph.D. , D.Sc.

Professor Zygmunt Niedzielski Ph.D. , D.Sc.

Assoc. Professor Jan Iciek Ph.D. , D.Sc.

Senior lecturers: 23

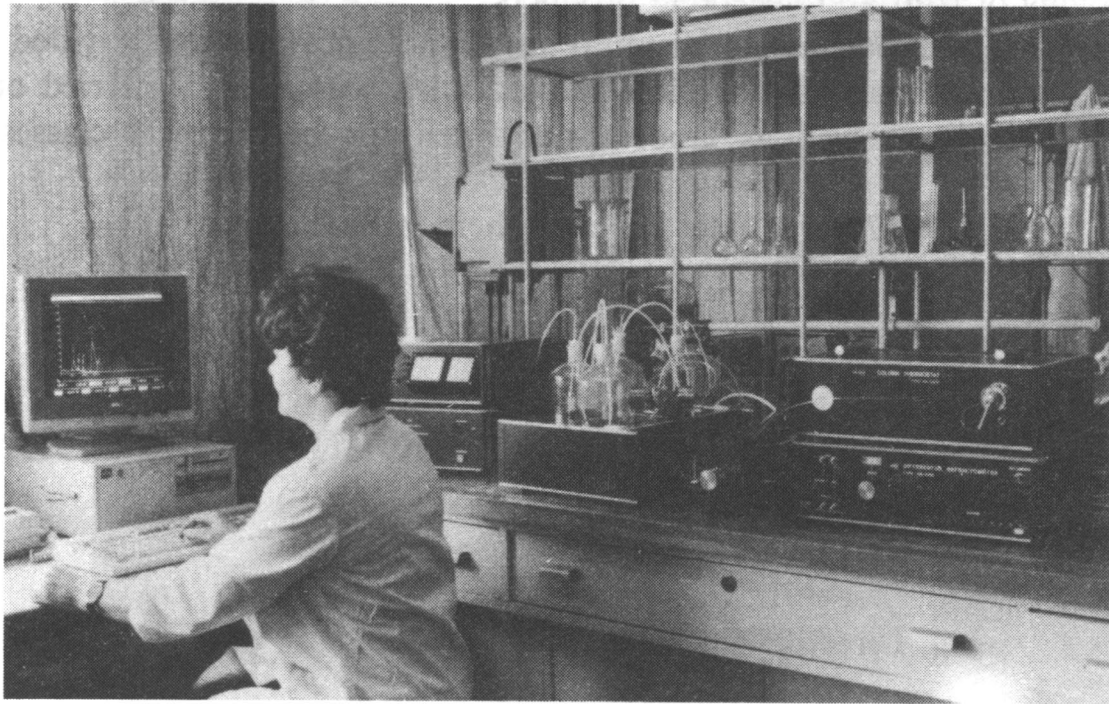
Assistants: 4

Technical and secretarial staff: 31

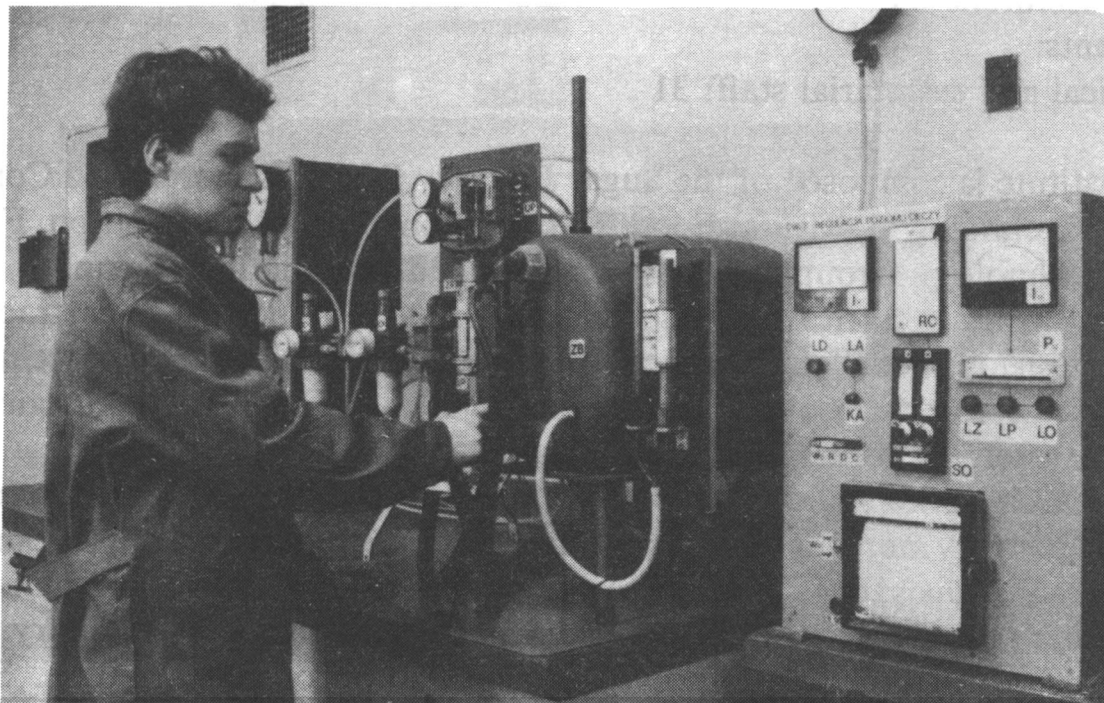
The Institute is composed of the Sugar Industry Division, Starch and Confectionery Technology Division, Food Refrigeration Technology Division, Foodstuffs Technology Group and Measurement and Automation Group.

The Institute carries out research 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.

Research workers of the Institute 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 were implemented in the sugar industry. The saccharose extraction was improved by inoculation of crystal nuclei. Serial production of a sugar conductometer was started. An ultrafiltration process was developed and implemented into the potato industry to recover and to reduce the harmfulness of wastes. Products of oxidation of starch hydrolyzates were



Determination of carbohydrates by the method of liquid chromatography



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

introduced into 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. The Institute carries out applied research on:

- the influence of liquid nitrogen and solid CO₂ freezing of vegetables on the difference quality during storage,
- application of protective gases for prolongation of stability of air-water cooling dead fowl,
- investigation of the transmutation kinetics of the components of freeze-dried strawberry juice.

The Institute cooperates with domestic and foreign research centres. Some research workers are permanent members of international scientific societies.

Curricula comprise the following subjects: sugar industry, starch technology (starch and bakery), technology of confectionery and technology of food refrigeration. Specialization lectures include sugar chemistry, technology, machinery and energy problems. 160 graduates completed post-graduate studies in the speciality of sugar technology, since 1972. In 1988 a post-graduate course in sugar machinery was started.

Analytical, technological and measuring and automation laboratories are equipped with modern specialistic apparatus.

Up to 1991 the Institute educated 1310 M.Sc. , including 660 sugar experts, 450 technologists in starch and confectionery and 200 food refrigeration technologists. The number of postgraduate degrees awarded at the Institute: 56 Ph.D. and 3 D.Sc.

INSTITUTE OF FERMENTATION TECHNOLOGY AND MICROBIOLOGY, I-31

90-924 Łódź, Stefanowskiego 4/10

Telephone: (42) 36-55-22, ext.342

Director: Professor Helena Oberman Ph.D. , D.Sc.

Academic staff:

Professor Zdzisław Włodarczyk Ph.D.

Assoc. Professor Józef Szopa Ph.D. , D.Sc.

Assoc. Professor Magdalena Włodarczyk Ph.D. , D.Sc.

Senior lecturers: 16

Assistants: 5

Technical and secretarial staff: 33

The Institute was set up in 1970 by the fusion of the Department of Fermentation Technology, Division of Spirit and Yeast Technology and the Department of Technical Microbiology.

The Institute comprises three teaching-research groups: Fermentation Technology Group, Spirit and Yeast Technology Group and Technical Microbiology Group. There are two auxiliary units: the Collection of Industrial Microorganisms and the Laboratory of Environmental Protection.

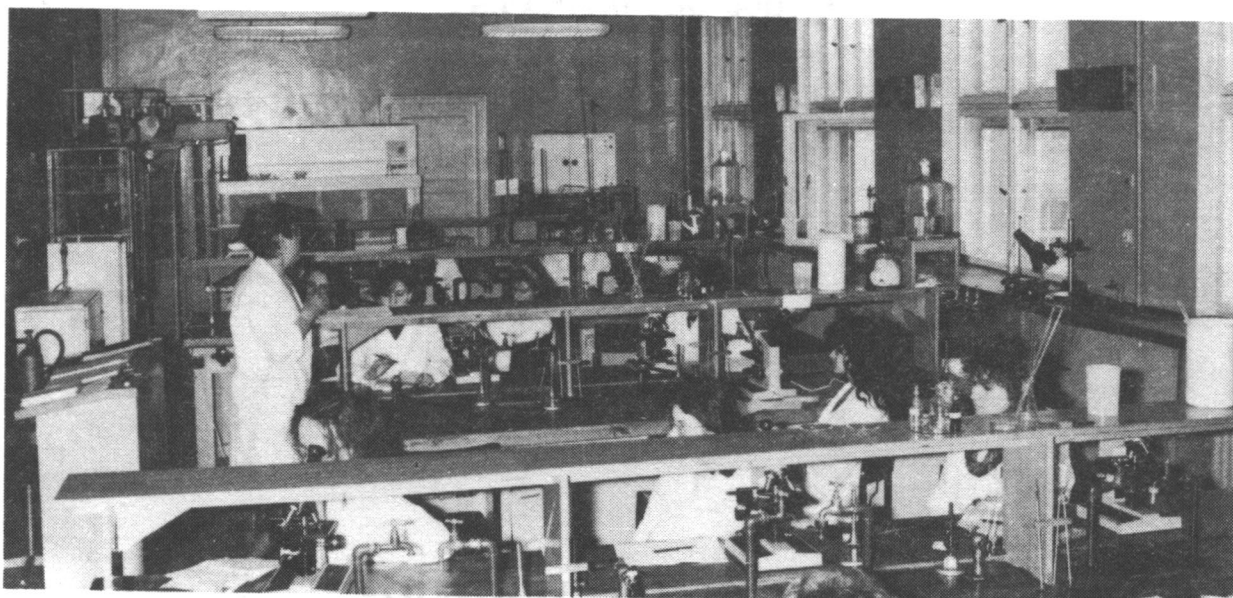


Laboratory of Biotechnology Process Optimization

The Institute carries out basic and applied research on improvement of industrial strains using genetic methods, 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 include 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 of vinasse, technology of bread acid concentrate, effective utilization of hop in the production of beer, production of red wines from colour fruits, technology of promoted production of stable apple

wines, manufacturing technology of Madeira wines and of plum and apple ports, development of new forms of dairy starters as concentrated and frozen biomass, modifications of bakery yeasts, obtaining of 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 waste water economy in meat industry.



Classes at the Laboratory of Technical Microbiology

The Institute cooperates with spirit and yeast industry works, pharmaceutical works, pulp and paper works, and with numerous dairies where technological developments and patents have been implemented.

The Institute cooperates also with foreign research centres, such as the Higher School of Chemical Technology in Prague, the Humboldt University in Berlin, the University of Strathclyde in Glasgow and Queen's University in Belfast.

Subjects of study offered by the Institute include: biotechnology of food-stuffs, technical microbiology, natural environment protection, waste water economy in food and plastics industries, microbiological pollution of food. Besides, subjects connected with the following graduating specialities: Fermentation Technology, Spirit and Yeast Technology, Technical Microbiology and post-graduate studies in Spirit and Yeast Technology, are offered. The total number of post-graduate specialists who completed their studies at the Institute amounts to 1300.

FACULTY OF CIVIL ENGINEERING AND ARCHITECTURE, W-6

Dean's office address: 93-590 Łódź, Al. Politechniki 6

Telephone: (42) 36-86-64

Telefax: (48 42) 36 85 22

Telex: 886 136 polit pl

FOUNDATION AND GROWTH

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

In the first years the Faculty included

- Department of Reinforced Concrete Constructions,
Head: Professor Władysław Kuczyński,
- Department of Fundamental Civil Engineering,
Head: Docent Jan Niewęglowski,
- Department of Theory of Structures,
Head: Professor Jerzy Mossakowski,
- Department of Soil Mechanics and Foundation Engineering,
Head: Professor Bolesław Rosiński,
- Department of Steel Structures,
Head: Docent Jerzy Czechowicz.

- At the end of the sixties new departments were established:
- Department of Industrial Buildings and Prefabrication,
Head: Docent Roman Dowgird,
 - Department of Geodesy,
Head: Docent Jan Wereszczyński,
 - Department of Theoretical Mechanics,
Head: Professor Marian Suchar.



Building of the Faculty of Civil Engineering and Architecture

In 1970 the structure of the Faculty was reorganized. The departments were changed into two institutes: 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 the Institute of Municipal Engineering was changed into the Institute of Environmental Engineering and in 1987 once again into the Institute of Civil and Sanitary Engineering. The name of the Faculty itself was changed into the Faculty of Civil Engineering and Architecture.

The Faculty was reorganized again in 1990. The Institute of Construction Engineering was transformed into five departments.

STRUCTURE

The present structure of the Faculty of Civil Engineering and Architecture was established in 1990. The Faculty consists of five departments and two institutes:

- Department of Mechanics of Materials, K-61
- Department of Building Physics and Building Materials, K-62
- Department of Structural Mechanics, K-63
- Department of Steel Structures, K-64
- Department of Concrete Structures, K-65
- Institute of Civil and Sanitary Engineering, I-33
- Institute of Architecture and Town-Planning I-35.

DEANS OF FACULTY

1956 - 1958	Professor Władysław Kuczyński
1958 - 1960	Professor Bolesław Rosiński
1960 - 1961	Docent Jan Niewęglowski
1961 - 1963	Professor Władysław Kuczyński
1963 - 1965	Professor Bolesław Rosiński
1965 - 1968	Professor Władysław Kuczyński
1968 - 1973	Professor Marian Suchar
1973 - 1975	Professor Tadeusz Godycki-Ćwirko
1975 - 1979	Docent Tadeusz Przedeczki
1979 - 1984	Professor Jerzy Sułocki
1984 - 1987	Docent Piotr Klemm
1987 -	Professor Marian Suchar

STAFF OF FACULTY

Academic staff: 16 professors, 5 assoc. professors, 12 docents, 92 senior lecturers, 31 assistants.

Technical and secretarial staff: 58 technicians, 25 administrative workers.

EDUCATION

Since the origin of the Faculty 1565 B.Sc. and 3141 M.Sc. degrees have been awarded. In all, there are now some 1,100 students at the Faculty.

Students are offered five-year programmes leading to B.Sc. and M.Sc. degrees in the fields of Architecture, Civil and Sanitary Engineering.

The curriculum in Architecture is designed to give a student the broad knowledge, skills and sensitivity needed to solve the problems of the urban and landscape environment. Essential principles are emphasised, for the architect must be capable of self-motivation and creative adaptation throughout his professional life. Particular concern is focused on preservation and revalorization of both monuments of architecture and urban environment. Diploma works are of high standard. Many of them have been awarded in regional and national competitions.

The Civil Engineering course aims at giving a student thorough grounding in fundamental engineering principles and their application to the various branches of civil engineering. The programme of the course includes basic technical and theoretical subjects which constitute the base in one of the four possible diploma courses. Theoretical work in the classroom is supplemented by experimental work in the strength of materials, physics of construction, material testing and structural laboratories.

The Civil Engineering and Sanitary course aims at providing broad and well-balanced foundation to develop design skills in 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.

Graduates of the Faculty are prepared for careers in technical and managerial positions in research, development, design, production and planning.

RESEARCH

Since the origin 73 Ph.D and 4 D.Sc. degrees have been awarded.

Most of the research conducted at the Faculty makes use of many laboratories. Structural engineering research is concerned with developing an improved understanding of the response of structures to various loading and environmental conditions. Structures of concrete and steel as well as wood are currently under study. Research on the monolithic slab-column technology reflects the search for new technological and constructional solutions. Complex studies on the properties of building partitions are undertaken. 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.

Fundamental research is also continued in the area of optimization of geodetic measurements for prophylactic and diagnostic needs in the process of the utilization of objects and on soil mechanics with regard to nonlinear and variable-in-time characteristics. Research topics include investigation on road surface life.

As concern for the protection of our environment becomes more and more crucial, several research projects include water and waste water technology, water economics in ecosystem, waste and sludge disposal, town cleaning, air protection and ensuring the optimum indoor microclimate, blow-in - blow-away blocked systems, effect of relative air dampness on the dust extraction effectiveness and air curtains testing.

Methods of solution range from experimental to theoretical, numerical, deterministic as well as probabilistic. Numerical investigators have a wide range of computational facilities at their disposal. The computer-aided design (CAD and CAE) is the subject of interest in civil engineering.

In the field of architecture research studies focus on revalorization and modification of 19th century towns, problems of new tissue of the urban environment, planning of little towns, villages and landscape with particular regard to central macroregion. In industrial architecture the research concerning the arrangement and network of industrial enterprises in the area of Łódź is carried out. The typology of small town spacial forms of Łódź region is also an essential element of the research work. Preservation and revalorization of the monuments of architecture and town-planning are based on the cultural values and the most proper direction of practical action. 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.

DEPARTMENT OF MECHANICS OF MATERIALS, K-61

93-590 Łódź, Al. Politechniki 6

Telephone: (42) 36-55-22 ext. 738

Director: Professor Marian Suchar Ph.D., D.Sc.

Academic staff:

Docent Wojciech Barański Ph.D., D.Sc.

Docent Bogdan Rogowski Ph.D., D.Sc.

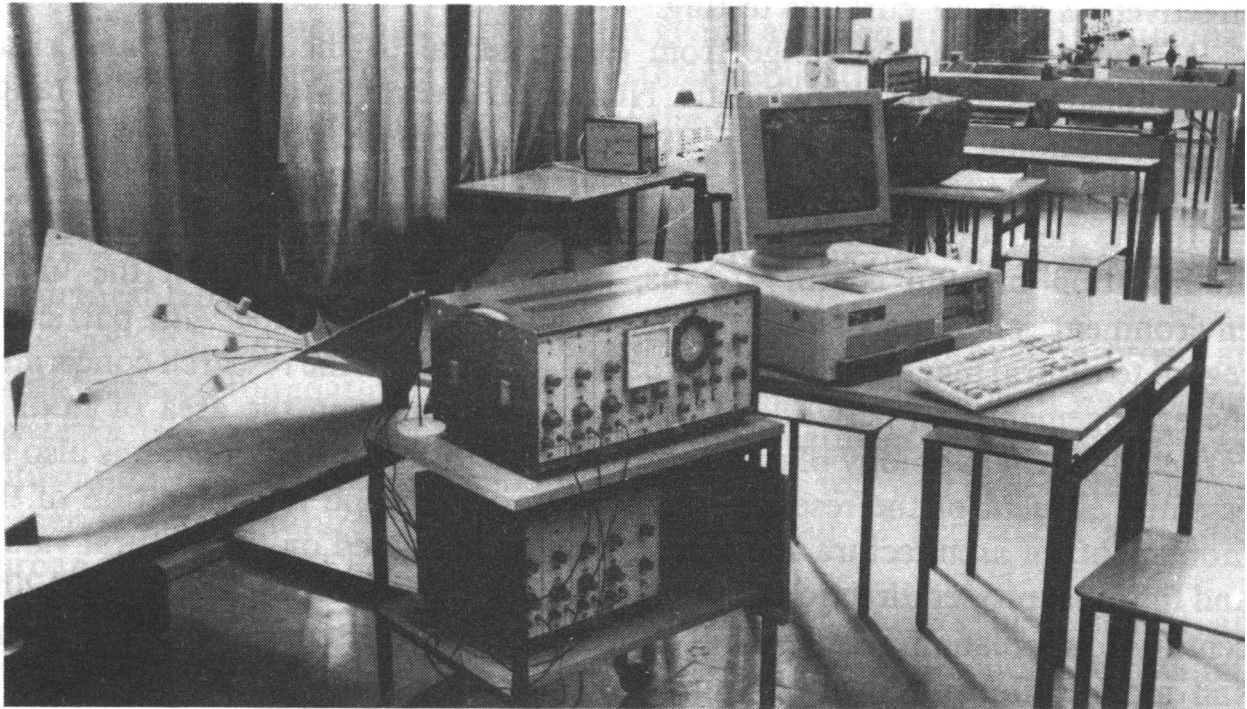
Senior lecturers: 2

Technical and secretarial staff: 2

Seminars and lectures on the following elementary subjects are organized: Theoretical Mechanics, Strength of Materials, Theory of Elasticity, Computer Methods in Building Engineering. Also, every year a variety of facultative seminars may be selected by students, such as Theory of Plasticity, Mechanics of Composite Materials, Model Tests. Moreover, facultative classes on programming for beginners are offered.

There are two laboratories in the Department:

- Students' Computer Laboratory,
- Laboratory of Strength of Materials.



Dynamic testing of shells

The Department carries out studies concerning mechanics of media of heterogeneous structures. Such media are modelled by homogeneous bodies whose effective properties account for their heterogeneity. The structure of an object is analyzed in order to find repetitive areas of the object which make it possible to quantitatively and qualitatively determine the effective properties of an equivalent model. The analyses are possible using advanced numerical techniques and high speed computers. Lower and upper estimates of solutions for selected problems for linear and nonlinear models are performed. Along with theoretical and numerical studies experiments on composite construction models are carried on which are useful for the testing of models of the objects. Another area of research performed in the Department is development of teaching

computer programmes on mechanics of solid body. These programmes consisting of the elements of artificial intelligence provide natural communication with a computer.

In the Łódź region the Department prepares the expertises concerning technical condition of buildings, performs dynamic tests on building vibrations evaluating their disadvantages for people and the effects on construction and machines installed in these buildings. The Department collaborates with the Institute of Fundamental Technological Research of the Polish Academy of Sciences, Institute of Roads and Bridges at the Technical University in Warsaw, Central Institute of Labour Protection.

Students' Computer Laboratory has 7 PC computers, plotter, digitiser and scanner. Other computers in the Department are provided with Arcnet cards. Computers with the AD/DA card are used for dynamic experiments. Computers in Students' Computer Laboratory and other divisions of our Department work in Novell net and are operated by a single server.

Laboratory of Strength of Materials has 8 stationary teaching research stands, 2 research stands, used by students while writing their master's theses and by our workers while preparing their projects. The following machines and measuring instruments are used at the stands: 8 Wheatstone bridges for static and dynamic measurements, 5 vibration meters and 3 vibration recorders, 1 polariscope, 1 testing machine. Besides, the Department is equipped with audio-visual and photographic equipment as well as fine measuring instruments such as dial indicators, measuring rules, strain gauges and stands.

About 120 papers have been written and 50 lectures have been given by the Department research workers at various conferences organized in Poland and abroad.

Our Department collaborates with the following technical universities:

- Escuela T.S. Ingenieros de Camions in Barcelona, Spain,
- Institute of Aerodynamics and Mechanics in Marseilles, France,
- Institute of Mechanics in Grenoble, France,
- Institute of Applied Problems of Mechanics and Mathematics at the Academy of Sciences, USSR.

**DEPARTMENT OF BUILDING PHYSICS
AND BUILDING MATERIALS, K-62**

**93-590 Łódź, Al. Politechniki 6
Telephone: (42) 36-55-22 ext. 744**

Director: Professor Piotr Klemm Ph.D., D.Sc.

Academic staff:

Docent Ryszard Peła Ph.D.

Senior lectures: 12

Assistants: 8

Technical and secretarial staff: 8

The main points of interest are the thermic-humidity problems of the partitions and building materials which are considered both theoretically and experimentally.

The connected problems of thermal and mass flow in building materials and partitions as well as phase transitions on a partition surface are investigated.

Moreover, the phenomena occurring in the surface layer and on the very surface of the partition, i.e. drying, absorption of low and high – temperature radiation, the influence of climatic factors on strength of external plasters are studied.

The results of experimental and theoretical works are the basis for design of energy-saving laminar partitions.

Research work on development and modernization of timber constructions in civil engineering is carried out continuously. Recently, the researches have been done on joints of elements.

The original mechanical joint in the shape of the doublesided spiked insert has been worked out.

The problem of exploitation of traditional structures is also examined. Complex studies on masonry, wooden and mixed constructions, determination of the conditions of further exploitation are carried out. Casual expertises concerning the problems of exploitation of building materials are also taken up.

In collaboration with industry the modification of building material characteristics and utilization of waste products as the heat insulating materials are investigated. One of the main positions in this cooperation is working out of a new technology for the needs of civil engineering.

Research of architectural acoustics for the needs of industry is carried out permanently.

The Department is a consulting body for diagnostic of technical states of housing and civil engineering masonry as well as wooden and masonry constructions.

The following laboratories are at the Department's disposal:

- Building Physics Laboratory
- Acoustics Laboratory
- Concrete Technology Laboratory
- Building Materials Laboratory
- Building Materials Engineering Laboratory



Differential scanning calorimeter DSC-605M

In the Department the measuring apparatus for thermic and mass flow phase transitions, absorption of low and high-temperature radiation, vapour condensation on the surface as well as inner structure of building materials has been developed. Moreover, a complete standard equipment is owned by the Department

The staff of the Department published about 50 papers and 7 books.

In 1987 a scientific and technical conference „Building Physics in Theory and Practice” was organized.

The Department cooperates with the Polish Academy of Sciences and many other institutions in the country and abroad (Hungary, Czechoslovakia, Germany, Belgium, Canada).

The academic staff conducts three different M.Sc. courses: civil engineering, architecture and sanitary engineering. Ph.D. studies in the field of Building Materials and Physics of Constructions are also offered.

DEPARTMENT OF STRUCTURAL MECHANICS, K-63

93-590 Łódź Al. Politechniki 6

Telephone: (42) 36-55-22

Director: Assoc. Professor Sylwester Konieczny Ph.D., D.Sc.

Academic staff:

Assoc. Professor Stanisław Zieliński Ph.D., D.Sc.

Senior lecturers: 3

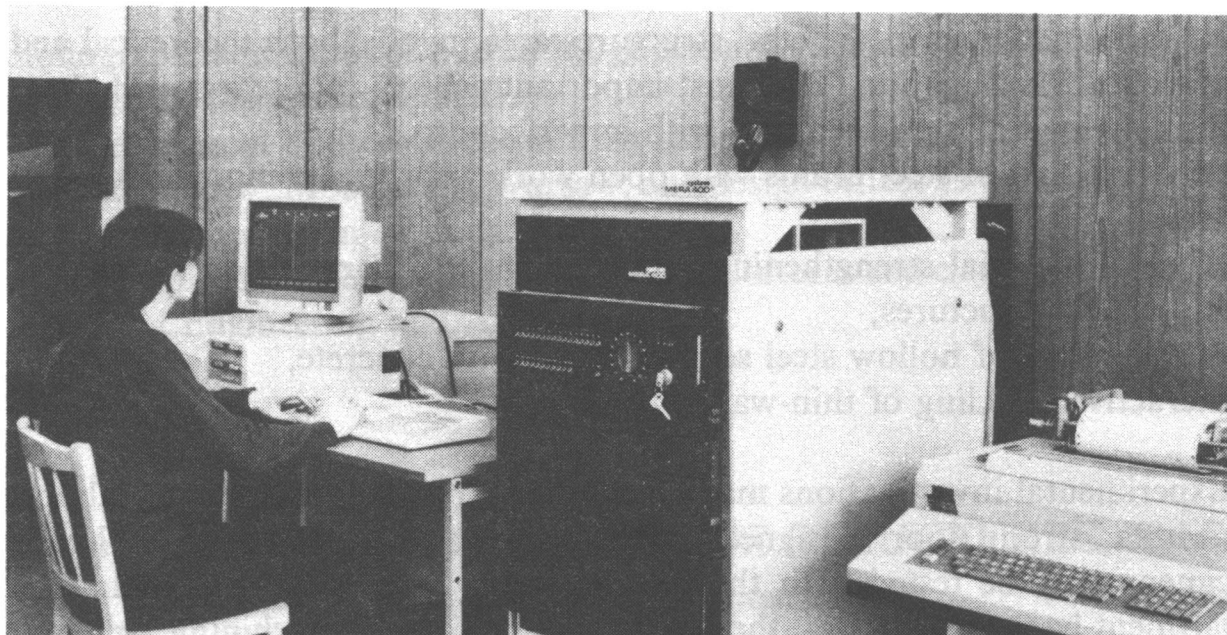
Assistants: 2

Technical and secretarial staff: 2

The scientific activity of the Department is concentrated on the problems concerning mechanics of heterogeneous structures. Within this subject a series of algorithms concerning a homogenization method based on the non-standard analysis was developed. Some of the algorithms were finished by handling the programme for digital computers. The programmes may be used for non-typical constructional analyses.

The Department performs a number of scientific research and service works for national economy, specializing mainly in the expertises of the technological state of industrial objects. Non-typical works needing a considerable, both practical and theoretical knowledge, concerning vibrations of constructional elements and constructions, estimation of the effect of these vibrations on technical instruments and people are undertaken. These works result in practical studies of reconstruction and changes enabling the exploitation of foundations of turbine sets, fans and other constructions.

The Department possesses programmes for solving non-typical problems of dynamics and stability of building constructions.



Computer system for structural engineering research

The staff of the Department published about 50 papers.

The curriculum in structural mechanics is designed to teach fundamental methods of predicting the behaviour of building structures. Students are expected to apply their theoretical knowledge to find practical solutions to a wide range of design problems using a computer technique.

DEPARTMENT OF STEEL STRUCTURES, K-64

93-590 Łódź, Al. Politechniki 6

Telephone: (42) 36-55-22 ext. 11-44

Director: Professor Jan Bródka Ph.D.

Academic staff:

Docent Marian Łukowski Ph.D.

Senior lecturers: 5

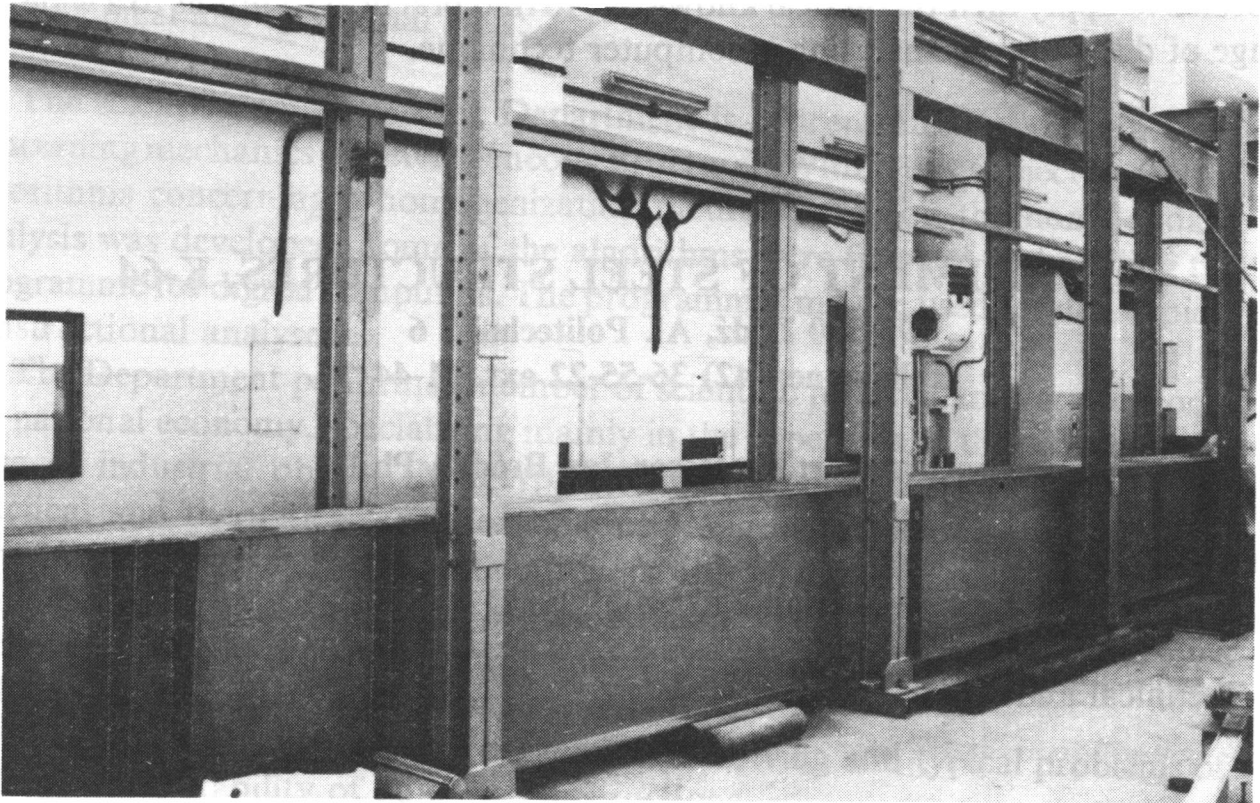
Technical and secretarial staff: 4

Research activities in the steel structures area involve both theoretical and experimental investigation. The most important aspects of research include:

- ultimate load of steel members with imperfections,
- local buckling of steel beams with open work webs in a compound state of stress,
- effect of material strengthening produced by cold forming on stability of thin-walled structures,
- ultimate load of hollow steel sections filled with concrete,
- interactive buckling of thin-walled columns.

Experimental investigations make use of the structural engineering laboratory with a „strong floor” designed to resist large vertical and horizontal loads. Specimens may be tested with the testing frame 13 m long, 4 m high. The Department has at its disposal the mechanical workshop (machining, welding) and the teaching laboratory with ultrasonic defectoscopes, the metallographic microscope and the X-ray apparatus.

The staff of the Department is actively involved in a worldwide exchange of research information, including the publication of papers, proceedings,



Frame for full-scale tests

monographs and textbooks. In all 260 papers and 12 books were published by the members of the academic staff.

The Department of Steel Structures has close links with the Research Centre of Steel Structures „Mostostal”, Warsaw, and design offices as well as the building industry in the region of Łódź.

Members of staff of the Department conduct lectures and classes at two courses: Structural Engineering and Architecture.

DEPARTMENT OF CONCRETE STRUCTURES, K-65

93-590 Łódź, Al. Politechniki 6

Telephone: (42) 36-19-84

Director: Professor Jerzy Sułocki Ph.D., D.Sc.

Academic staff:

Docent Artemiusz Czkwianianc Ph.D.

Docent Wiczesław Bortniczuk Ph.D.

Senior lecturers: 16

Assistant: 1

Technical and secretarial staff: 15

Department of Concrete Structures is divided into two divisions:

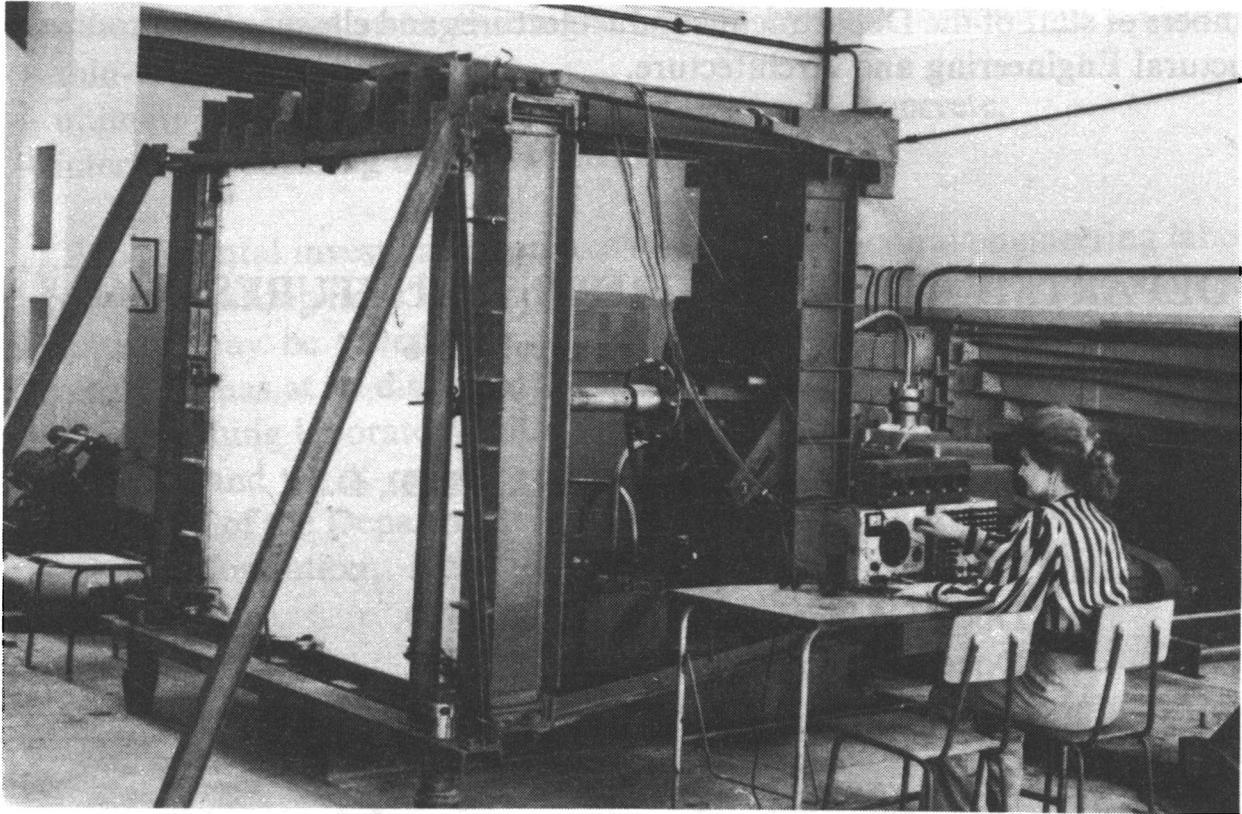
1. Division of Concrete Structures

2. Division of Technology and Management of Civil Engineering

Main subject of research of the Department is Reinforced and Prestressed Concrete Structures, Technology and Management of Civil Engineering.

The primary function of the Department of Concrete Structures is the delivery of a quality education programme for its students. Students following the Structural Engineering curriculum have the opportunity to specialize in their senior years (and also with elective courses) in the area of fundamentals of structural design and application to reinforced concrete, properties of concrete, concepts of concrete design, inelastic behaviour of reinforced concrete structures, revalorization of concrete constructions and also technology of prefabrication montage systems and management of Civil Engineering. The programme has been designed to provide students with experience in design problems of

concrete including modern computer-aided analysis, trends in advanced construction practice and also the laboratory practice. Department of Concrete Structures awards B.Sc. and M.Sc. degrees.



Loading system for the punching tests of concrete slab-column connection in the research laboratory

The Department has a second function - it is a resource for conducting applied research on local, regional and national technical problems.

The Department has at its disposal the laboratory equipped with strength testing apparatus (6 presses from 20 N to 6 MN), the plate of strength (82 m²) with hydraulic sets for static and dynamic load as well as the air-conditioned room, together with the equipment for rheological testing.

In previous years, the Department of Concrete Structures cooperated closely with the Polish Academy of Sciences and with several industrial institutes as well as with design offices and enterprises. As a result of this cooperation, the slab-column constructions, technology of sand concrete and technology of polyacrylamide foam have found practical application.

DIVISION OF CONCRETE STRUCTURES

Head: Professor Jerzy Sułocki Ph.D., D.Sc.

Staff: Docent Artemiusz Czkwianianc Ph.D., 9 senior lecturers, 14 technical and secretarial staff.

The scientific activity of the Division concerns mainly:

- non-linear analysis of monodimensional concrete members,
- reinforced concrete shear walls,
- punching of concrete slabs in flat-plate systems,
- theory of cracking in concrete members,
- shear strength of partially prestressed and reinforced concrete beams,
- reinforced concrete columns under various types of loading,
- technology and properties of sand concrete,
- revalorization of industrial objects.

DIVISION OF TECHNOLOGY AND MANAGEMENT OF CIVIL ENGINEERING

Head: Docent Waczesław Bortniczuk Ph.D.

Staff: 8 senior lecturers, 1 assistant, 1 technical and secretarial staff.

Main subjects of research:

- technology of prefabrication of concrete elements,
- montage systems of prefabricated concrete buildings,
- building systems of monolithic concrete constructions,
- analysis of the realizations of buildings in view of the chosen technological and economic criteria.

The number of the publications of the staff of the Department of Concrete Structures, from its beginning is about 300 papers and 5 books.

**INSTITUTE OF CIVIL AND
SANITARY ENGINEERING, I-33**

93-590 Łódź, Al. Politechniki 6

Telephone: (42) 36-81-73

Director: Docent Tadeusz Przedeczki Ph.D.

Academic staff:

Professor Edmund Góral Ph.D.

Professor Stefan Przewłocki Ph.D., D.Sc.

Professor Jan Siuta Ph.D., D.Sc.

Professor Tadeusz Trojanowski Ph.D.

Assoc. Professor Michał Żukowski Ph.D., D.Sc.

Docent Marek Lebedowski Ph.D., D.Sc.

Docent Maciej Urbaniak Ph.D., D.Sc.

Docent Grzegorz Kowalski Ph.D.

Docent Stefan Sztromajer Ph.D.

Senior lecturers: 20

Assistants: 7

Technical and secretarial staff: 30

The Institute is divided into the following divisions:

- Geodesy and Descriptive Geometry
- Geotechnical Engineering
- Roads and Bridges
- Environmental Engineering
- Heating and Ventilation Engineering

Main subjects of research and teaching of the Institute include civil engineering and sanitary engineering. Within the teaching activity the Institute participates in educational programmes of Civil Engineering, Environmental Engineering and Architecture.

DIVISION OF GEODESY AND DESCRIPTIVE GEOMETRY

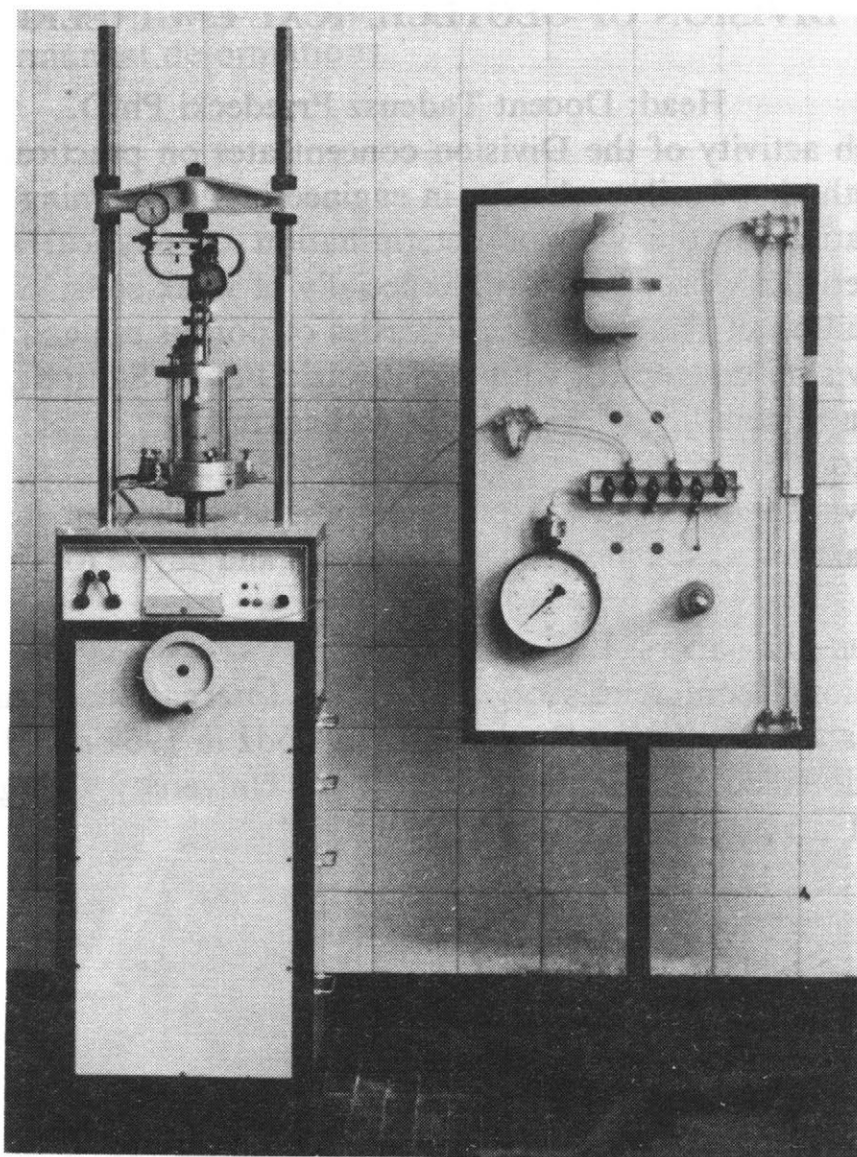
Head: Professor Stefan Przewłocki Ph.D., D.Sc.

The members of staff of the Division of Geodesy and Descriptive Geometry carry out research in three main lines:

- engineering geodesy to the improvement of methods of geodetic measurement in the process of geometric forming of construction,

- cartographic studies of thematic maps in a large scale for the needs of rational economy of urban-industrial centres,
- application of the methods of descriptive geometry in engineering works.

The Division cooperates with the Department of Geodesy and Cartography of Warsaw Technical University, the Department of Geodesy and Land Management of the Civil Service in Łódź.



Apparatus of triaxial compressing

- In the Laboratory owned by the Division the following work was carried out:
- design, construction and application of the set of three prototype laser instruments to building engineering,

- design of new instruments and methods for measurement and control of the features of geometric forms of production, prefabricates and whole sets of engineering constructions.

Publications: 225 papers, 32 books.

International cooperation with Technical University in Bratislava, Czechoslovakia.

DIVISION OF GEOTECHNICAL ENGINEERING

Head: Docent Tadeusz Przedeczki Ph.D.

Research activity of the Division concentrates on practical application of modern methods of soil mechanics in engineering, concerning mainly:

- examination of the way of determination of physical and mechanical characteristics of soil „in situ”, especially of weak soils,
- modification of the capillary properties of porous mineral media.

The Division cooperates with the Electric Power Station „Bełchatów” in examination of stability of earth tanks embankments.

Laboratory equipment:

The Division has at its disposal a mineral collection in the geological laboratory as well as soil mechanics laboratory and device for field examination of subsoil.

Publications: 112 papers, 12 books

International conferences organized: two International Seminars on Soil Mechanics and Foundation Engineering in Łódź in 1964 and 1970.

International cooperation with Strathclyde University, Glasgow (U.K.) and McMaster University in Hamilton (Canada).

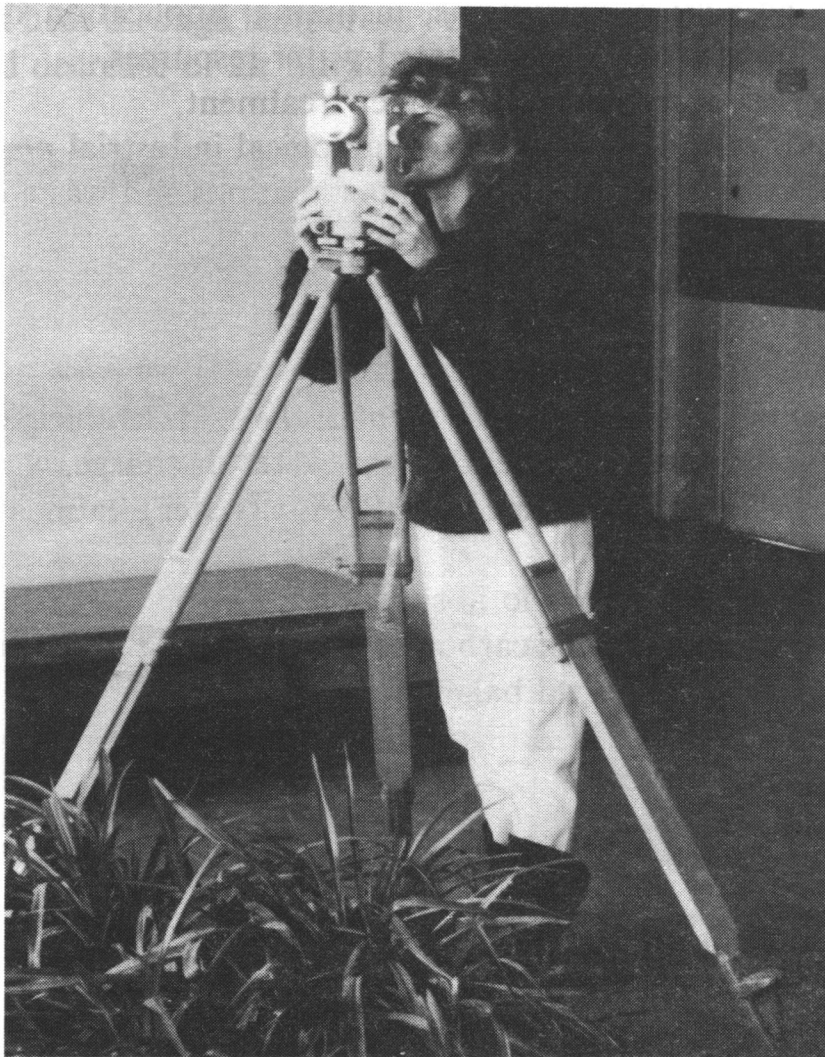
DIVISION OF ROADS AND BRIDGES

Head: Assoc. Professor Michał Żukowski Ph.D., D.Sc.

The Division concentrates on research of strength of road constructions.

These include:

- non-linear shrinkage in design of concrete bridge constructions,
- temperature and moisture distribution in the layered system of the construction of road surface,
- influence of mechanical non-linearity of soil behaviour on the work of multilayer road constructions with a special regard to the phenomenon of increasing permanent deformations.



Classes in geodesy by theodolite

The Division of Roads and Bridges maintains the scientific and educational collaboration with the Institute of Roads and Bridges of Warsaw Technical University as well as with the District Head Office of Public Roads.

The laboratory of the division is equipped with modern apparatus for testing of strength of road surface.

Publications: 32 papers, 3 books.

DIVISION OF ENVIRONMENTAL ENGINEERING

Head: Docent Maciej Urbaniak Ph.D., D.Sc.

The Division carries out complex research of

- new engineering methods of environmental protection,
- water economics in ecosystems, including: application of bioengineering methods for recovery of devastated water resources,
- technology of water and waste water treatment,
- rational utilization of water in technological industrial processes,
- new solutions of water distribution installations and waste water disposal in urban and industrial centres,
- solid waste and sludge disposal,
- town cleaning.

Cooperation with industry.

1. Environmental Protection Department of the Łódź Municipality (waste water disposal, waste water treatment, storm water discharge, water recovery).

2. Water Supply Enterprise of the Łódź Region (water treatment technology, tap water quality).

Laboratory equipment: atomic absorption spectrophotometer, UV-Vis spectrophotometers, total organic carbon analyzer, flame photometer, conductivity meters, pH-meters, analytical balances.

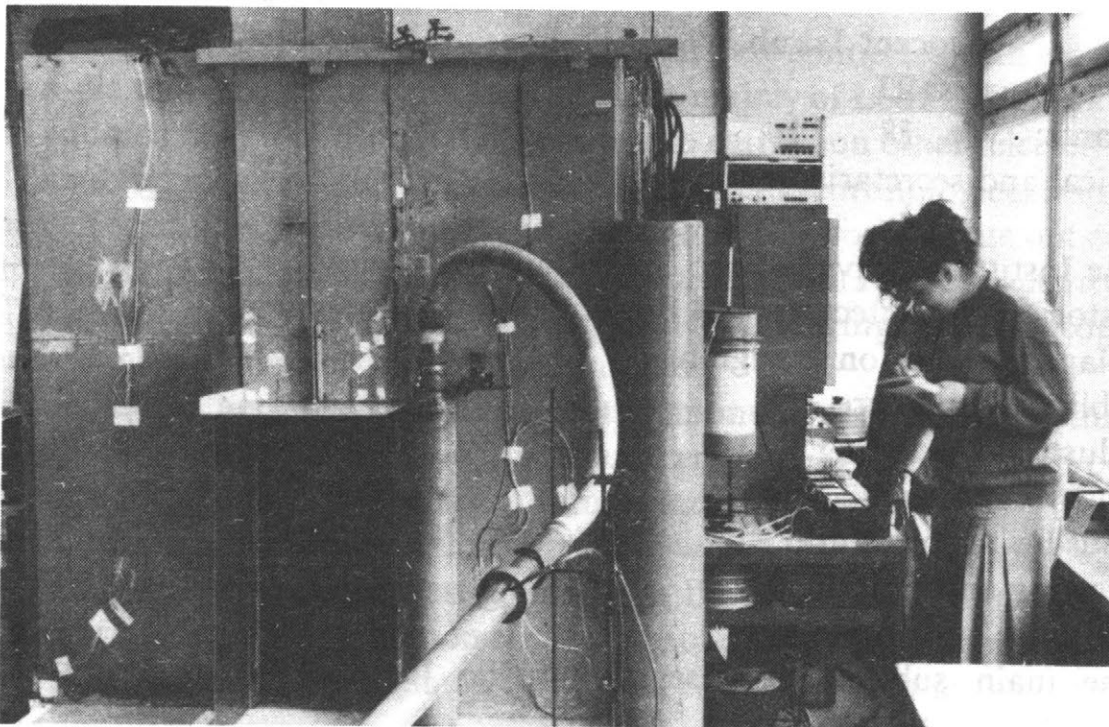
Publications: 280 papers.

DIVISION OF HEATING AND VENTILATION ENGINEERING

Head: Professor Tadeusz Trojanowski Ph.D.

The Division is concerned with research on air protection and ensuring the optimum indoor microclimate referring to:

- new central heating systems with the decrease in heat consumption and individual regulation of radiators by thermostatic valves.
- heating systems with decreasing losses of heat transmitted to buildings, with heat recovery, heat pump,
- new ventilation methods utilizing the central systems with heat recovery,
- purification of air which ventilates rooms and is removed to the atmosphere, reduction of concentration of impurities in work-stands, testing of air filters, optimization examinations of dust extraction devices,
- reduction of heat through temporarily opened doors by means of vertical air curtains and decrease of air filtration caused by leaky building partitions.



The air curtain investigation stand

The division produced over a thousand heating and ventilation installations. Laboratory equipment includes over 50 test stands of heating and ventilation.

Publications: 68 papers, 7 books.

The Division cooperates with the International Institute of Refrigeration in Paris.

**INSTITUTE OF ARCHITECTURE
AND TOWN-PLANNING, I-35**

93-590 Łódź, Al. Politechniki 6

Telephone: (42) 36-78-73

Director: Docent Henryk Jaworowski Ph.D.

Academic staff:

Professor Zygmunt Świechowski Ph.D., D.Sc.
Professor Stefan Krygier M.A.
Professor Bolesław Kardaszewski Ph.D.
Assoc. Professor Irena Popławska Ph.D., D.Sc.
Assoc. Professor Bolesław Januszaniec Ph.D., D.Sc.
Docent Marian Gabryś Ph.D.
Docent Henryk Jaworowski Ph.D.
Docent Radosław Radwan-Dębski Ph.D., D.Sc.
Docent Jakub Wujek Ph.D.

Seniors lecturers: 23

Assistants: 18

Technical and secretarial staff: 17

The Institute is divided into the following divisions:

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

The main subjects of research of the Institute of Architecture and Town-Planning are as follows:

- revalorization and modification for further development of the XIX century industrial towns,
- problems of new town structures,
- country towns design, also villages scenery with particular regard to central macroregion.

As far as the educational activity is concerned the Institute participates in the educational programmes of Civil Engineering and Architecture.

DIVISION OF HISTORY OF ARCHITECTURE AND PRESERVATION OF MONUMENTS

Head of the Division is Professor Zygmunt Świechowski Ph.D., D.Sc.

The research and teaching work of the Division is focused upon the problems of the history of architecture and the preservation of monuments as well as on the revalorization of monumental complexes as complementary branches.

History of architecture is represented by the works devoted primarily to European Early Middle Ages period with particular attention paid to Central Europe, France and Italy and to architecture and town-planning of the XIXth and XXth centuries, mainly in Łódź and industrial towns of Łódź district.

The problems of Middle Ages concern Romanesque architecture and architectural sculpture, first of all in sacred buildings. The measuring and photographic records are the starting point and if it is necessary they are complemented by systematic archeological exploration and auxiliary investigations of buildings in situ (analysis of the stages of constructing, theoretical reconstruction of the original state).

The problems of the XIXth and XXth century are connected with the analysis of town-planning, both industrial and housing, mainly of Łódź and the industrial towns situated near it although the work is also carried on other selected towns.

The subject matter of the work is determined by the chronological framework of the periodization, the building types, functions, the works of the outstanding architects, the patronage of families or individual sponsors and the activity of the local authorities. An important role, beside measuring and photographic records, is played here by the archival queries.

Preservation and revalorization of the monuments of architecture and town-planning are based on the above characterized research making it possible to determine precisely the cultural values and the most proper direction of practical action. On the theoretical plane the works lead to working out of the methodology of structural investigations. On the other hand, in practice, they result in a significant participation at the stage of design and the control over the preservation tasks of particular objects and complexes in the town-planning scale.

DIVISION OF VILLAGE AND REGION DESIGNING

Head of the Division is Docent Radosław Radwan-Dębski Ph.D., D.Sc.

The most important task of the Division is to create natural environment conditions for regional town planning. The Division has also in view the

problems of natural environment as the basis of landscape architecture as well as the aspects of planning and designing of greenery.

The work of the Division deals particularly with the following areas:

- the methods of regional planning,
- local planning in the aspect of the landscape architecture,
- planning of recreation areas of different types.

Ph.D. theses, already written and those in progress, concern the methods of spatial planning of the week-end recreation and the history of the development of green areas in Łódź as well as the mutual relations between both housing and industrial areas and green ones, aspects of folk architecture and the problems connected with revalorization of the country landscape as well as the settlement - making role of commune villages.

The following subjects are other research themes in the Division:

- the methods of planning of villages and farming areas,
- the master and detailed plans of villages,
- the problems connected with the influence of the commune villages on the settling down in the area,
- the use of the traditional folk architecture elements in the contemporary village building and the revalorization of the degraded country landscape.

A handbook written by some members of staff deals with planning of the villages and farming areas.

One of the Ph.D. theses concerns the methods of planning of green areas in the urbanized regions.

DIVISION OF PUBLIC ARCHITECTURE

Head of the Division is Professor Bolesław Kardaszewski Ph.D.

The educational activity comprises teaching to design public objects during the last two terms of the studies.

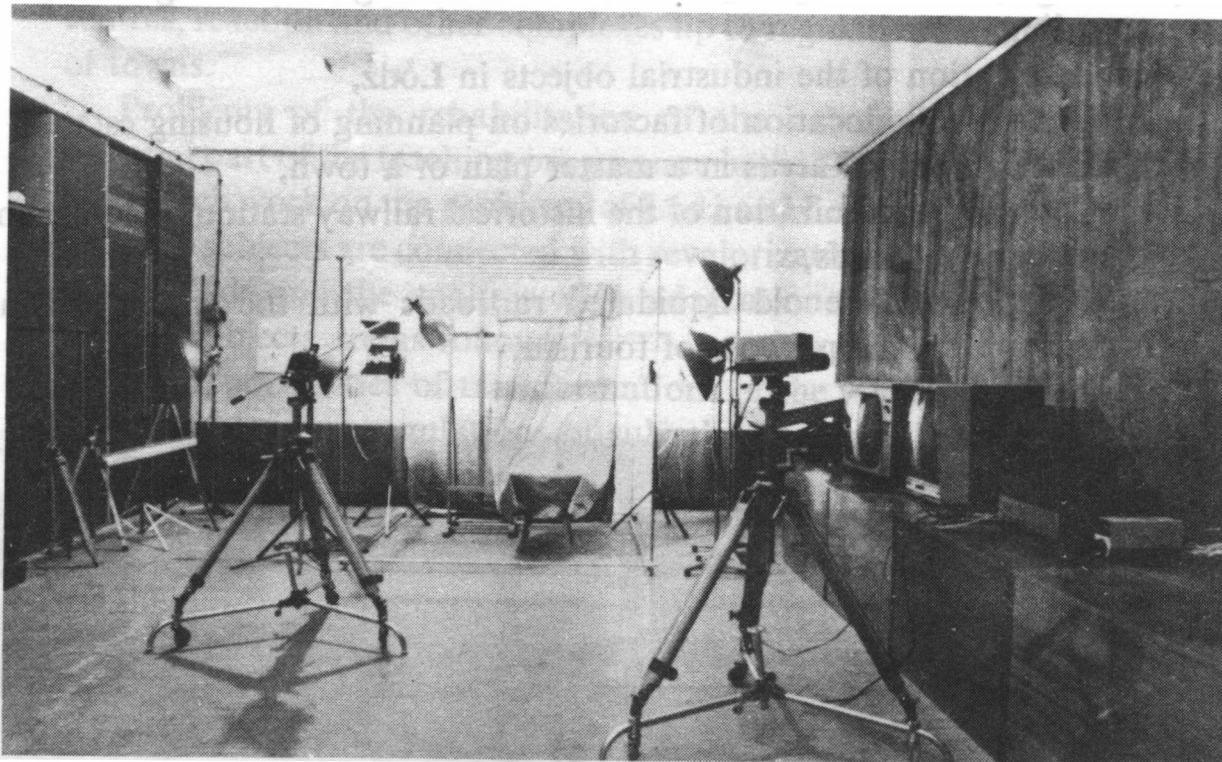
The programme of studies comprises lectures and project classes combining the theoretical knowledge and its practical use.

The content of lectures is to convey the information about the rules, criteria, suppressions and functional consequence in designing buildings of public services.

Classes include the design of buildings of public services in definite conditions of environment and space. They last for two terms, during the first one students design such buildings as libraries, culture clubs or office buildings, and during the second one, they design sport halls, museums or theatres.

The problems of cooperation of two categories of functional zones: the attended and attending ones and part of the latter in the formation of the system of motion are the area of specialization of the Division.

The staff cooperates with the Designing Department „Miastoprojekt Łódź” in designing and construction of new buildings.



Photographic studio in the Institute of Architecture and Town-Planning

DIVISION OF INDUSTRIAL DESIGNING

Head of the Division is Docent Marian Gabryś Ph.D.

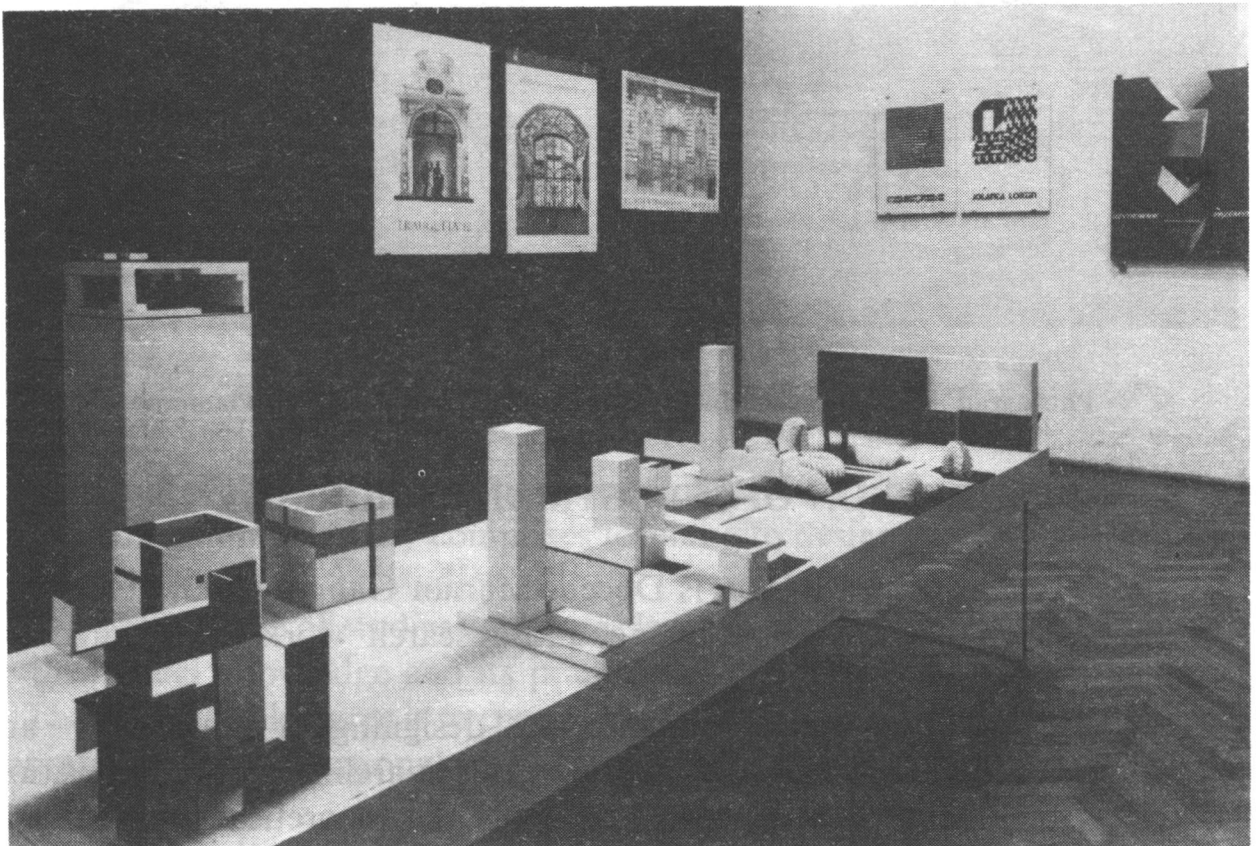
The Division carries out teaching and research work in architectural designing for industry.

Teaching: the subject matter is architectural designing for industry. The aim is, apart from general education, to develop skills in architectural composition, the ability to think in general terms, to apply the theoretical knowledge in practical work, to learn the methods of work in designing complex and complicated projects, and how to cooperate with specialists of other disciplines and coordinate their actions.

Research work: the main research problem is how to humanize the working place; its title is: „Industrial architecture as the way of shaping man's environment considering his functional, biological and physical needs”.

The study of, among others, Łódź Region is particularly interesting here:

- the functioning and the network of factories in the area of Łódź and the possibility to improve it,
- spatial analysis of the factories in the Łódź Region - changes in their surrounding,
- the modernization of the industrial objects in Łódź,
- the influence of the location of factories on planning of housing estates,
- problems of industrial areas in a master plan of a town,
- adaptation and modernization of the historical railway station buildings for the contemporary needs,
- the adaptation of the old liquidated railroads with the whole existing infrastructure for the purpose of tourism.



Interior architecture and modelling studio

DIVISION OF TOWN-PLANNING

Head of the Division is Docent Jakub Wujek Ph.D.

Teaching is the essential task of the Division. It runs classes for students of all years, making them acquainted with the problems of town-planning in different scales; starting with the basic elements of composition in town-planning through the architectural and town-planning designing of the housing estates, shopping centres, reaction and other complexes up to regulative detailed and master plans of towns.

Problems of the rehabilitation of the urbanized environment form an essential part of the teaching programme in the Division. Its staff is also engaged in research work on the problems of Łódź and Łódź Region. The majority of the research subjects are connected with revalorization of the historical tissue of the city of Łódź and the analysis of its adaptation to the contemporary needs.

The subjects are as follows:

- The opportunities of transformations in the XIXth century city centre,
- Town-planning regulations of suburban areas.

Other subjects concern the region of Łódź:

- The study and typology of little towns in the region of Łódź.

DIVISION OF HOUSING ARCHITECTURE

Head of the Division is Senior Lecturer Leszek Łukaś M.A.

The general activity of the Division is the education, organized by guiding the student through the problems of architectural design in housing, public utility and industry.

The guiding role in the activity of the Division is to develop student's abilities, to make choice between different values, which by nature of things cannot be reduced to simple factors such as technology, utility, art, economy or cultural values.

The balance between these values is an architect's ability and the work of the section is devoted to its release. However, since every choice must necessarily contain subjective elements, one ought to state that this process of design lies beyond the limits of science.

The Division runs also research work in design, in the key problems of contemporary architecture and town-planning, in the search for modern structure of the city and housing. The problem „Future housing unit and a low-rise building base” which has such a character, has been run since 1979.

DIVISION OF DRAWING AND PAINTING

Head of the Division is Senior Lecturer Leszek Arabski M.A.

Drawing and painting are one of the most important elements in educating future architects.

Studies of architecture require the development of student's space imagination, his ability of composition, colour sensitivity, the sense of proportion. To achieve these aims student is taught drawing, painting, lettering, perspective. Classes consist first of all of study from nature of differentiated forms starting from simple forms, furniture, architectonic elements, anatomical studies of the skeleton, figure and head – to the perspective drawing, composition and study of the landscape, architectonic and town-planning objects and interiors.

The ability of drawing makes it possible to present graphically the design concepts both in architecture and in town-planning.

So the education in drawing is not the aim itself but one of the most important elements in preparation of students to the creative and professional practising of their future job. Teaching consists of both indoors and out-of-doors activities.

Holiday plein-air - two weeks after the second term plays a very important role in the whole educational process.

Recently, with the help of IAESTE an international plein-air of drawing was organized in Poland. About 50 participants from 9 European countries took part in it.

DIVISION OF SCULPTURE AND MODELLING

Head of the Division is Professor Stefan Krygier M.A.

The projects of this group give students an opportunity to experiment with space in a real third dimension. This is a conversion from an illusion on a paper to the substantial masses and the space divisions.

The curriculum in this unit consists of:

- plastic composition (first year),
- sculpture (third year),
- facultative lectures (fifth year).

The main teaching tasks include

- developing of spacial imagination,
- skills and observation of nature procurement and transforming it into the forms of sculpture,

- introduction into the problems of architectonic forms: formation in the shape of masses arrangement and space division,
- development of manual abilities by working with various materials (clay, gypsum, metal, artificial resins),
- practical utilization of knowledge of plastic composition.

The basic courses to achieve the above mentioned aims are:

- nature study (a portrait in a semisculpture and in a sculpture),
- observation and enlargement of a chosen object with its surrealistic transformation,
- illustration of discrete notion by a masses disposition.

Individual corrections are enriched by the elements of lecture and show. The theoretical base developed and verified during the facultative lectures for the fifth year students, constitutes:

- necessity of forming proper links between theory and practice in artistic designing processes,
- principle of correlating various branches in the process of creation.

FACULTY OF TECHNICAL PHYSICS AND APPLIED MATHEMATICS, W-7

Dean's office address: 90-361 Łódź, Piotrkowska 266

Telephone: (42) 84-80-01

Telefax: (4842) 36-85-22

Telex: 886 136 polit pl

FOUNDATION AND GROWTH

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 Division of Computer Networks was undertaken.

STRUCTURE

The present organization of the Faculty is as follows:

- Institute of Computer Science, I-1,
- Institute of Mathematics, I-2,
- Institute of Physics, I-3,
- Division of Computer Networks, Z-1.

DEANS OF FACULTY

During the past years the following Deans performed their duties:

1976 – 1981	Professor Jan Karniewicz
1981 – 1984	Docent Andrzej Lipiński
1984 – 1987	Professor Edward Kački
1987 – 1990	Docent Antoni Drobnik
1990 –	Professor Izydor Dziubiński

STAFF OF FACULTY

The academic staff of the Faculty consists of 10 professors, 5 docents, 114 senior lecturers and 48 assistants. 65 non-academic workers are also employed at the Faculty.

EDUCATION

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. 220 students study in the Faculty in the academic year 1990/91.

The Faculty also offers two different (two-semester) post-graduate courses:

- Application of Informatics in Engineering,
- Informatics for Teachers.

Till the end of 1990, 352 students graduated from the Faculty; 182 graduated in Technical Physics and 170 in Applied Mathematics. It is worth mentioning that 42 of them graduated with honour degree.

Graduates of the Faculty are employed at universities and research institutes of the Polish Academy of Sciences, industrial laboratories, design offices and institutions of Health Service. A large number of graduates of the Faculty work abroad or study as post-graduate students at foreign universities.

RESEARCH

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 as well as medical application of computers.

The Institute of Mathematics research work includes real and complex analysis, theory of optimal control and probability, differential equations, general topology.

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 Division of Computer Networks specializes in theory, design and chosen applications of the local area networks with special regard to specific needs of university education and industry of the Łódź region.

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

INSTITUTE OF COMPUTER SCIENCE, I-1

90-217 Łódź, Sterlinga 16/18

Telephone: (42) 32-97-57

Director: Professor Edward Kącki Ph.D. , D.Sc.

Academic staff:

Professor Maciej Krakowski Ph.D.

Piotr Szczepaniak Ph.D. , D.Sc.

Senior Lecturers: 13

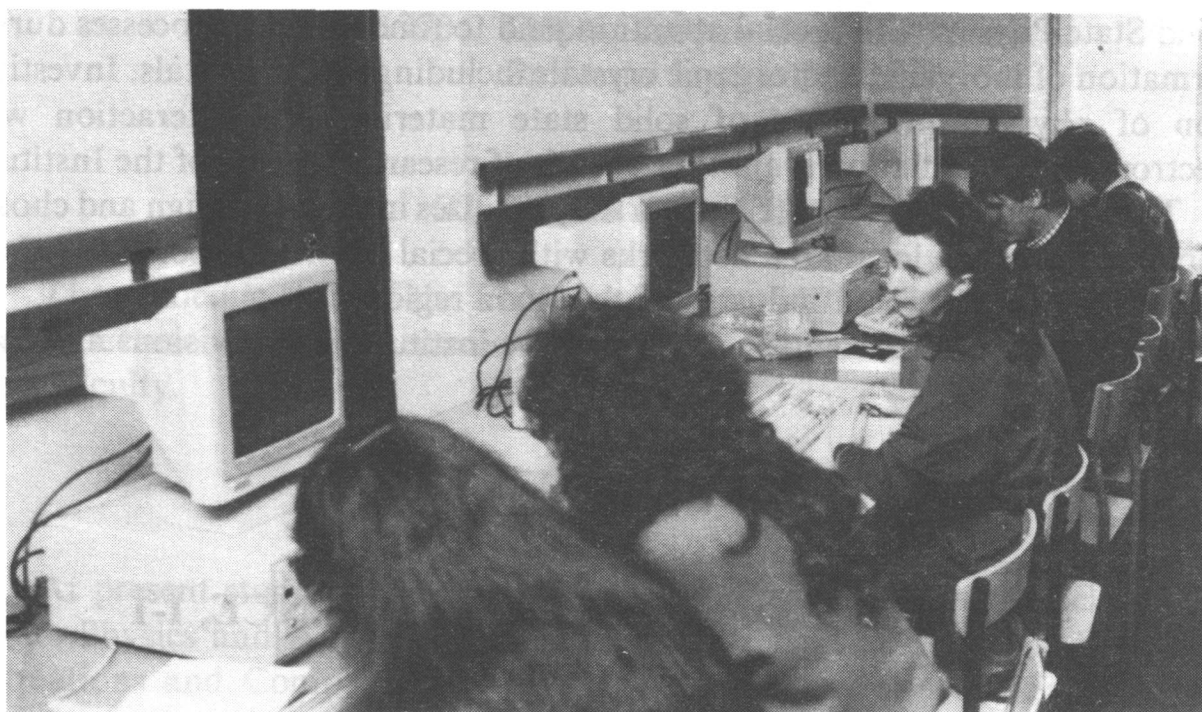
Assistants: 15

Technical and secretarial staff: 25

The main subjects of research carried out at the Institute are:

- Artificial Intelligence and Expert Systems,
- Simulation and Modelling,
- Software Engineering,
- Robotics,
- Parallel and Distributed Processing,
- Medical Applications of Computers,
- Computer Control of Technological Processes.

The Institute cooperates with several scientific and industrial centres both at home and abroad. The cooperation with industry is centred around the following problems: Management Systems for Textile Industry, Field Simulation for Transformers and Electrical Apparatus, Seismological Data Processing Systems for Coal-Mines.



Students' laboratory in the Institute of Computer Science

Institute of Computer Science has modern laboratories equipped with: LAN Novell 2.15 with microcomputers.

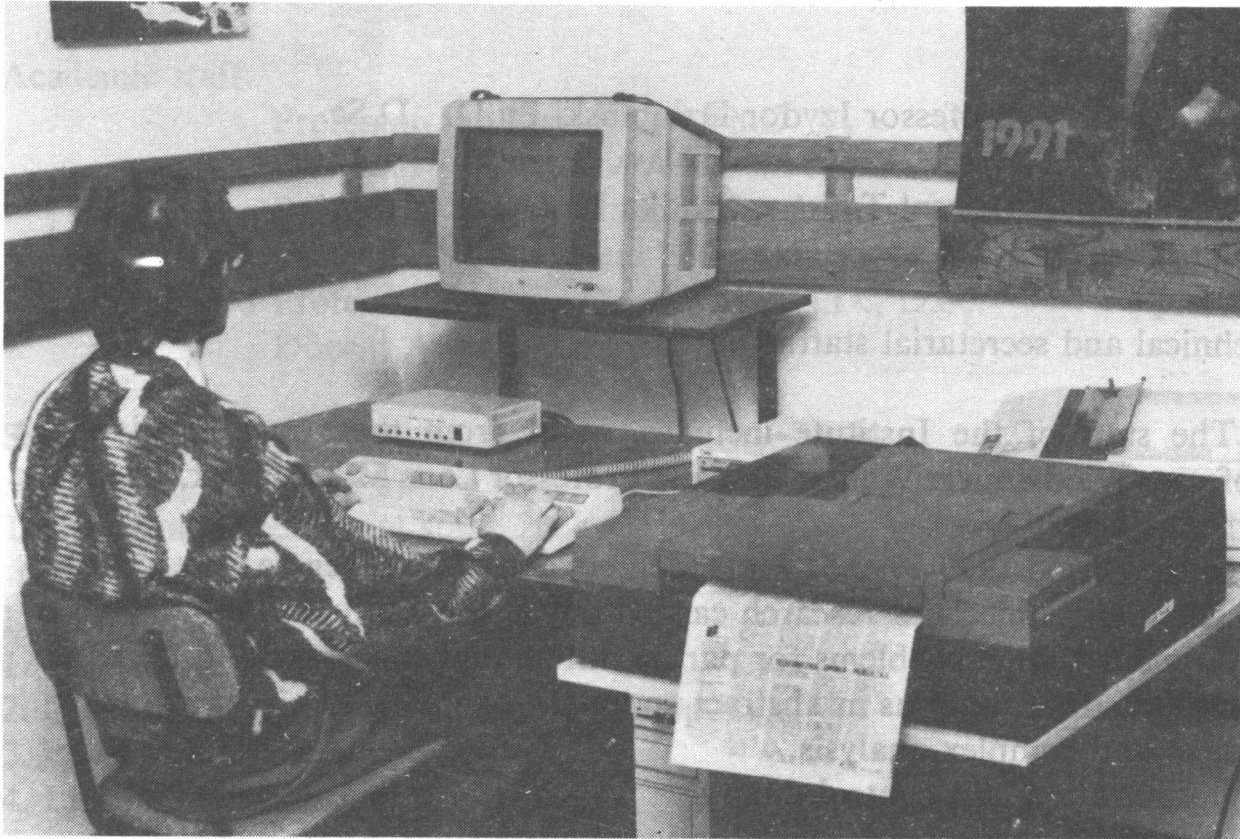
Up till now, the workers of the Institute have published 365 papers and 24 books.

The Institute has organized and coorganized many, both national and international meetings and conferences, like the series of Polish-Bulgarian Seminars – 9, Polish-English Seminar on Microcomputers – 1, International Conference „System-Modelling-Control” – 6.

For many years now the Institute has been cooperating with the following centres abroad:

- The Institute of Control, WCHTI – Sofia, Bulgaria,
- Department of Computer Science, University of Strathclyde U.K. ,
- Department of Electrical Engineering, Polytechnical Institute of Mexico City, Mexico,
- Ryerson Polytechnical Institute – Toronto, Canada.

Since 1983 the Institute has been educating students who specialize in applied mathematics and, mainly, in computer science; in 1988 first students received their M.Sc. degrees in informatics. Till the end of 1990, 31 students graduated in informatics.



Laboratory of computer graphics

The Institute also offers two different two-semester post-graduate courses: Applications of Informatics in Engineering and Informatics for Teachers, the latter designed for those teaching fundamentals of computer science in grammar schools.

INSTITUTE OF MATHEMATICS, I-2**93-590 Łódź, Al. Politechniki 11****Telephone: (42) 36-31-14****Director: Professor Tadeusz Świątkowski Ph.D. , D.Sc.****Academic staff:****Professor Izydor Dziubiński Ph.D. , D.Sc.****Assoc. Professor Lesław Gajek Ph.D. , D.Sc.****Docent Tadeusz Śródka Ph.D.****Senior lecturers: 55****Assistants: 9****Technical and secretarial staff: 7**

The staff of the Institute includes, apart from these mentioned above Professor Włodzimierz Waliszewski and Professor Leon Mikołajczyk, who work part-time here.

In the period 1970-1990 51 Ph.D. degrees and 1 D.Sc. degree were awarded.

The main subjects of research carried out at the Institute are:

- Boundary value problems for partial differential equations,
- Differential equations in abstract spaces,
- Real and complex analysis,
- Optimization and control theory,
- Probability theory with mathematical statistics,
- Differential geometry,
- General topology.

The Institute has well equipped Computer Laboratory with software which fully enables numerical treatment of theoretical results.

Members of the Institute have published, so far, about 300 papers and 20 books. The Institute issues its own internationally recognized journal „Scientific Bulletin of the Technical University of Łódź”, series Mathematics.

The Institute has well developed cooperation in Boundary Value Problems with the University of Strathclyde in Glasgow and in Statistics with Dortmund Universität.

The Institute offers M.Sc. courses in differential equations, differential geometry, optimization and probability theory with statistics. It is also possible to take courses with programmes devised according to individual interest of students.

INSTITUTE OF PHYSICS, I-3**93-005 Łódź, Wólczańska 219****Telephone: (42) 36-31-39****Director: Docent Antoni Drobnik Ph.D.****Academic staff:**

Professor Jan Karniewicz Ph.D.

Professor Przemysław Adamski Ph.D.

Professor Cecylia Malinowska-Adamska Ph.D. , D.Sc.

Professor Włodzimierz Nakwaski Ph.D., D.Sc.

Professor Andrzej Opanowicz Ph.D., D.Sc.

Docent Andrzej Lipiński Ph.D.

Senior lecturers: 42

Assistants: 20

Technical and secretarial staff: 20

List of divisions:

1. Physics of Crystals,
2. Quantum Electronics and Nonlinear Optics,
3. Physics of Dielectrics,
4. Liquids and Solutions,
5. Physics of Semiconductors and Insulators.

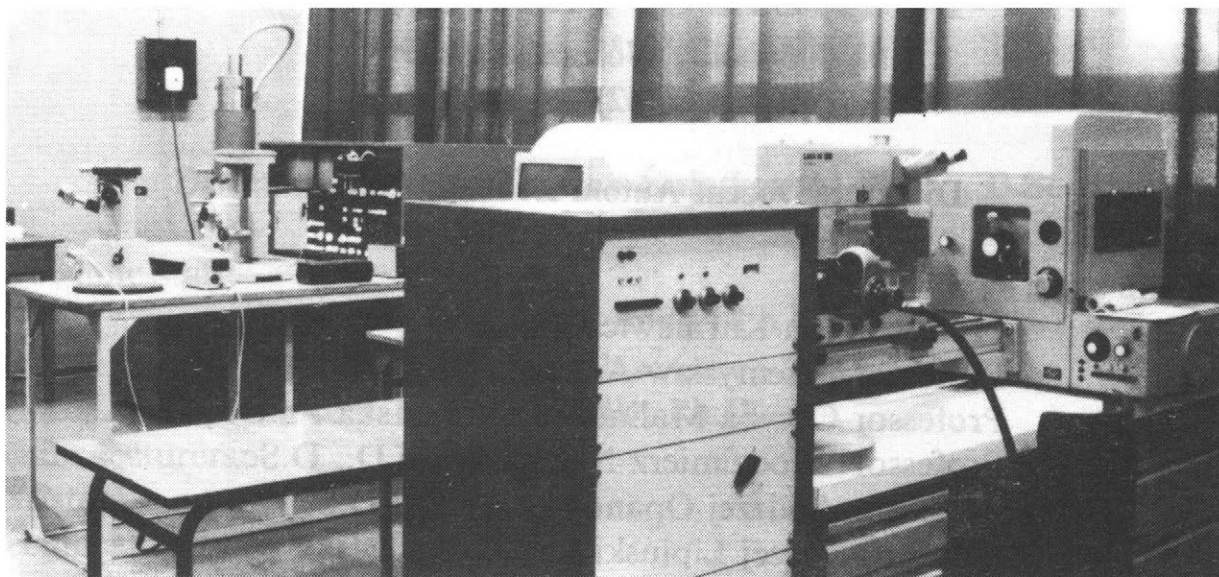
Main subjects of research of the Institute:

The main fields of current research are:

- crystal growth mechanism and physical properties of monocrystals,
- interaction between laser light and matter,
- electrical properties of organic solids and liquid crystals,
- physics of semiconducting and insulating compounds.

45 Ph.D. degrees and 6 D.Sc. degrees have been awarded since the creation of the Institute.

The Institute of Physics offers the courses leading to M.Sc. degree in Physics and Medical Physics.



Students' laboratory in the Institute of Physics

DIVISION OF PHYSICS OF CRYSTALS

Head: Professor Jan Karniewicz Ph.D.

The staff of the Division includes 3 professors, 21 senior lecturers, 10 assistants.

Theoretical and experimental work on crystal growth mechanism (with emphasis on elementary process), investigation of physical properties of crystal and computer modelling of physical phenomena taking place in optoelectronic devices are the main interests of the Division.

The scientists cooperate with industry, especially in the construction of unique instruments or conduction of specialized measurements.

The research and students training is carried on in four laboratories:

- laboratory of crystal growth,
- laboratory of physical properties of crystals,
- laboratory of solid state physics,
- laboratory of low temperature.

The work of the Division has resulted in publishing 2 monographs, 2 books, 9 handbooks for students, and 574 papers in well known international scientific journals.

The Division of Physics of Crystals organized the following international conferences:

- Electrooptical Crystals and Liquid Crystals in Science and Industry, Uniejów-Łódź, (27-29 Sept. 1973),
- Crystal Growth and Liquid Crystals, Łódź (11-13 Sept. 1986).

For many years the Division has developed a wide cooperation with other scientific centres such as:

- Central Research Institute for Physics, Hungarian Academy of Sciences, Budapest, Hungary
- University of London, Royal Holloway College, U.K.,
- University of Strathclyde, Glasgow, U.K.,

which has given the scientists the opportunity of close contact with world science. The results of this cooperation have been also revealed in publications and a few Ph.D. degrees received abroad.

DIVISION OF QUANTUM ELECTRONICS AND NONLINEAR OPTICS

Head: Docent Antoni Drobnik Ph.D.

Staff: 3 senior lecturers, 4 assistants and 2 persons of non-academic staff.

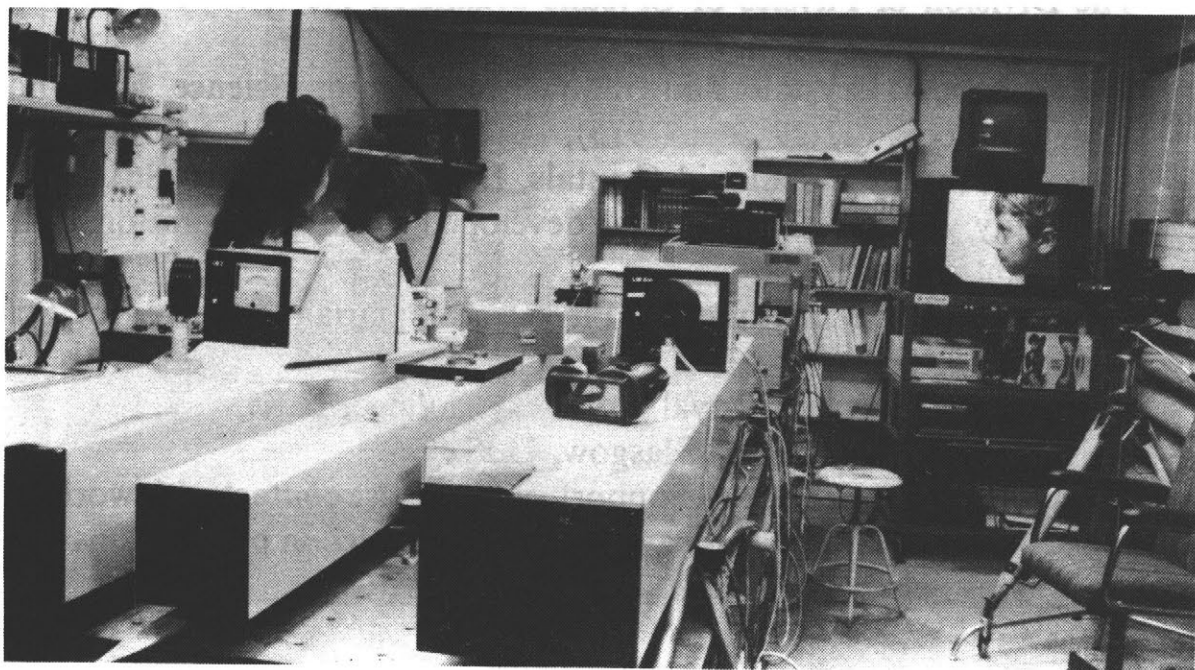
The Division research work includes the investigation of interaction between laser light and matter (also with living matter). For many years the Division has collaborated with several scientific and industrial centres such as: the Brian Reece Scientific Ltd., Industrial Estate Newbury, Berkshire, U.K. Among numerous scientific institutions with which the Division cooperates in our country is: the Research and Development Centre of Textile Industry in Łódź.

Scientific research and students training is carried on in 3 laboratories. The laboratories are equipped with various lasers, spectrometers, microscopes, scientific video-equipment, laser automatic analyzer of aerosols, computers and other equipment.

The results of the Division research activity are 50 published papers and 2 books.

The Division of Quantum Electronics and Nonlinear Optics organized and coorganized the following international conferences:

1. Electrooptical Crystals and Liquid Crystals in Science and Industry, Uniejów-Łódź, (27-29 Sept. 1973), Poland;
2. School of Lasers and Their Applications, Port Harcourt (Dec. 1984), Nigeria (co-organized with Dept. of Physics of Rivers State University);



Quantum electronics laboratory

3. Conference on Crystal Growth and Liquid Crystals, Łódź (11-13 Sept.1986), Poland;
 4. III Symposium on Laser Technology, Szczecin-Świnoujście (24-27 Sept. 1990), Poland (co-organizer with SPIE, The International Society of Optical Engineering).
 5. International School on Laser Technology, Vilnius (10-14 Sept. 1990), Lithuania (co-organizer with the Lithuanian Academy of Sciences).
The Division continues the collaboration with:
 1. University of Strathclyde – Glasgow, U.K.: (Dept. of Pure and Applied Physics, Dept. of Pure and Applied Chemistry, Dept. of Metallurgy),
 2. Lithuanian Academy of Sciences – Vilnius: (Dept. of Laser Technique and Technology),
 3. Rivers State University of Science and Technology, Port Harcourt, Nigeria: (Dept. of Physics),
 4. University of Moscow, Moscow, USSR: (Dept. of Wave Processes).
- This cooperation resulted in joint publications and possibility of close contact with world science.

DIVISION OF PHYSICS OF DIELECTRICS

Head: Docent Andrzej Lipiński Ph.D.

Staff: 13 senior lecturers, 3 assistants, 8 technical staff.

The research activity of the group covers the following topics:

- Electrical properties of organic solids and other high-resistivity materials,
- Electrical, electrooptical and rheological properties of liquid crystals and their applications.

The Division cooperates with many branches of industry (electronic, metallurgical, food) especially in construction of unique apparatus or conducting specialized measurements. The laboratories of the group are equipped with:

- apparatus for dielectric spectroscopy,
- apparatus for drift mobility measurements,
- apparatus for thermally stimulated currents measurements,
- apparatus for phase transitions investigations,
- apparatus for liquid crystals viscosity measurements.

The Division has also high vacuum equipment for technological processes.

The results of the research activity are published in 300 papers.

The Division of Physics of Dielectrics was a co-organizer of the following international conferences:

- Electrooptical Crystals and Liquid Crystals in Science and Industry, Uniejów 1973,
- Crystal Growth and Liquid Crystals, Łódź 1986,
- 1-st Symposium on Low Frequency Dielectric Spectroscopy and Related Problems, Krynica 1990.

Among numerous scientific institutions with which the Division cooperates are:

- Higher School of Chemical Technology, Sofia, Bulgaria (Dept. of Physics, Dept. of Semiconductors),
- Technical University of Chemnitz, Germany (Dept. of Physics),
- University of London, Royal Holloway College (Dielectric Group).

DIVISION OF LIQUIDS AND SOLUTIONS

Head: Professor Przemysław Adamski, Ph.D.

Staff: 2 senior lecturers, 2 assistants.

The Division is engaged in experimental investigation of physical properties of liquid crystals. The results of the Division research activity are published in 2 monographs, 52 papers, and 2 handbooks for students.

The Division organized the following international conferences:

- Electrooptical Crystals and Liquid Crystals in Science and Industry, Uniejów-Łódź, (27-29 Sept.1973),
- Crystal Growth and Liquid Crystals, Łódź, (11-13 Sept. 1986).

DIVISION OF PHYSICS OF SEMICONDUCTORS AND INSULATORS

Head: Professor Andrzej Opanowicz Ph.D., D.Sc.

Staff: 2 senior lecturers, 3 assistants.

The research activity of the Division covers the following topics:

- Physics of semiconducting and insulating compounds,
- Electronic properties of metal-semiconductors junction.

The Division has modern laboratories equipped with:

- apparatus for crystal growth (Bridgman method) and for thin film evaporation,
- apparatus for Hall-effect study,
- apparatus for study of photoconductivity,
- apparatus for study of electronic properties of m-s junctions,
- apparatus for study of photo-magneto-electric effect.

Up till now the workers of the Division published 44 papers.

For many years the Division has been cooperating with the Higher School of Chemical Technology, Sofia, Bulgaria.

DIVISION OF COMPUTER NETWORKS, Z-1

90-924 Łódź, Stefanowskiego 18/22

Telephone: (42) 36-03-00

Director: Assoc. Professor Roman Małecki Ph.D., D.Sc.

Academic staff:

Senior lecturers: 4

Assistants: 4

Technical and secretarial staff: 13

Division of Computer Networks is the scientific and teaching establishment of the Technical University of Łódź, founded in July 1988. The characteristic feature of this unit is, that besides carrying out the teaching and research work, it was commissioned by the university authorities to fulfil an extremely important function of the coordinator of the University Computerization Programme. The Division will carry out this assignment until the University Computer Centre – service unit – is organized.

In the nearest future the computerization programme of the Technical University of Łódź consists in realization of the most important tasks mentioned below:

- formation of local area networks in the institutes,
- organization of the university computer network together with the University Computer Centre,
- organization of the Łódź Academic Computer Network (LASK), connecting 7 universities of the city,
- connecting LASK to the National Academic Computer Network (KASK) which will be connected to West European computer network EARN.

The Division of Computer Networks specializes in the following problems: theory, design and chosen applications of the local area networks with special regard to specific needs of university education and industry of the Łódź region.

According to the main subject of interest the research work is carried on in the following areas:

- Computer Networks and University Computerization Programme,
- Computer-Aided Management of the University,
- Computer-Aided Management of Textile Industry Works.

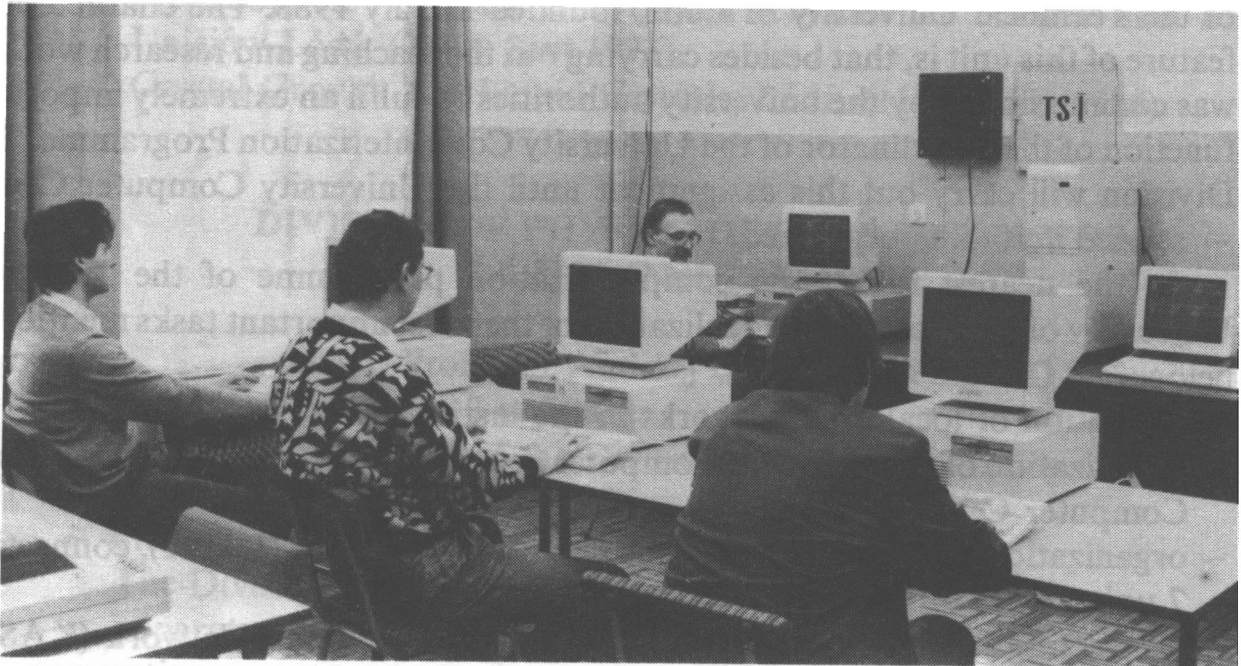
The Division is involved in projects, commissioned by textile works, regarding the computer-aided management systems based on local area network. Two projects are carried on:

1. Data base for materials management of a textile industry establishment
2. Data base of ready-made goods for a textile industry establishment.

The Division of Computer Networks has modern laboratories equipped with powerful computer hardware and software:

1. The students' laboratory:

Novell Local Area Network connecting 14 IMB PC/XT and 4 IMB PC/386 SX personal computers running Advanced Netware 286 with 2 file-servers, 3 HDD 200 MB and 8 dot matrix printers.



Local Area Network. Novell Netware 286 with two file servers

2. The research laboratory – I

The Unix-based multiaccess system running SCO Open Desktop connected with Novell LAN via Ethernet:

- IBM PC 386/33MHz, Cache Memory, 8MB RAM, HDD 150 MB – host computer.
- 6 IBM PC/AT stations,
- 1 Graphic Workstation – PC 386/25MHz, 4MB RAM, 80387 coprocessor, HDD 105MB, Super VGA Graphic Card, Multisync Monitor, mouse,
- plotter,
- laser printer, dot matrix printer.

3. The research laboratory – II

Micro VAX multiaccess system running VMS 5.3 and Ultrix:

- DEC processor 32b, 13MB RAM,
- HDD 600 MB & HDD 330 MB,
- cartridge TK50, megatape TU80,
- 16 VT320 terminals,
- VR260 graphic terminal,
- DELQA – Ethernet controller,
- dot matrix printer.

During the 2 years of its existence the Division of Computer Networks accomplished and published over 130 works in the following main areas:

- Computer Networks and University Computerization Programme – over 50 items,
- Computer-Aided Systems Supporting the Management of Research–
–Teaching Group – over 30 items,
- Textile Industry Computerization Programme – over 20 items,
- Teaching Computer Science – 7 handbooks.

The Division of Computer Networks participates in organizing the following conferences:

- International Students' and Young Research Workers' Conference „Personal Computers in Science and Technique”,
- Conference „Internet Working”.

The Division of Computer Networks maintains the scientific contacts with the following establishments abroad:

- University of Strathclyde, Glasgow, Great Britain – research and design of Wide and Local Area Networks in connection with the computerization programme of the Technical University of Łódź,
- Rijksuniversiteit Ghent, Ghent, Belgium – design of networks protocols,
- EARN Office – the authorities of the European Academic Research Network – subject to establishing the network backbone of the Polish Academic Research Network (PL-EARN) connected to EARN.

The Division of Computer Networks supervises the M.Sc. theses in the following areas: -

- Local Area Computer Networks and Internet Working,
- Computer-Aided Systems Supporting the Management of Research-
-Teaching Group,
- Textile Industry Computerization Programme.

**INSTITUTE OF CHEMICAL AND PROCESS
ENGINEERING, I-34
(with the status of a Faculty)**

**Dean's office address: 90-924 Łódź, Wólczańska 175
Telephone: (42) 36-49-23
Telex: 886 136 polit pl
Telefax: (48 42) 36-85-22**

**Dean and Director of the Institute:
Professor Zdzisław Kemblowski Ph.D., D.Sc.**

FOUNDATION AND GROWTH

The Institute of Chemical Engineering* was created at the Technical University of Łódź in 1970 as a result of a merger of the Department of Chemical Engineering and Equipment, Faculty of Food Technology and the Department of Chemical Equipment, Faculty of Chemistry.

The newly founded Institute of Chemical Engineering was chaired by Professor M. Serwiński until 1987. First students enrolled in 1969 and first graduates left the Institute in 1974.

In 1974 the Institute moved into new facilities composed of an auditorium and office building and high-ceiling laboratory building.

* Now the Institute of Chemical and Process Engineering

The Institute is a nation-wide coordinator of state-sponsored basic researches in fermentation and drying. It cooperates with the University of Strathclyde, Swansea and Salford, the Electricity Research and Development Centre in Capenhurst (UK), Technical University in Aachen (Germany), Pardubice (Czechoslovakia), Moscow Textile Institute, Lykov Institute of Heat and Mass Transfer in Minsk, Institute of Food Technology in Kiev (USSR), McGill University in Montreal (Canada), Texas A & M University (USA).

Professor Czesław Strumiłło is a member of the Polish Academy of Sciences and together with Professor Zdzisław Kemblowski of the European Federation of Chemical Engineering.



Main building and high-ceiling laboratory of the Institute of Chemical and Process Engineering

STRUCTURE

Research and education are carried out in the Institute by the following divisions and groups:

1. Chemical Equipment Division,

2. Bioprocess Engineering and Thermal Process Division,
Bioprocess Engineering Group,
Thermal Processes Group,
3. Process Engineering Division,
Distillation and Extraction Group,
Mass Transfer and Chemical Reaction Engineering Group,
Fluid Dynamics Group.

The Institute has two main buildings: one contains offices, auditoria and undergraduate labs, second is a high-ceiling laboratory building where most of the graduate research work takes place.

The Institute owns professionally staffed machine and electronic shops. There are facilities to build even large scale laboratory set-ups as the main lab building offers more than 10 m head space.

A collection of specialized laboratory equipment is available including gas and liquid chromatographs and others. All necessary analytical instruments can also be reached in the neighbouring Faculty of Food Chemistry and Faculty of Chemistry .

The Chemical Equipment Division has facilities for particle size analysis including Coulter Counter and several set-ups for testing various types of mixers, wet grinding in pearl mills, vibrating screens and granulators.

The Bioprocess Engineering Group owns several fully instrumented tank fermenters of volumes ranging from 1 to 200 l, as well as disk and column fermenters of size from 1 to 20 l.

Several large laboratory scale dryers are operational among them a 5000 l spray dryer, batch fluid bed 0.3×0.3 m, batch vibrated fluid bed $\Phi 0.15$ m, continuous fluid bed 0.3×0.3 m, batch vibrated fluid bed $\Phi 0.15$ m, continuous fluid bed 0.1×1 m, jet spouted bed 20 l in volume, spin flash dryer $\Phi 0.3$ m, microwave band dryer 0.2×2 m, freeze dryer 0.5 l in volume, drying tunnel 0.2×0.2 m cross section and others. A dynamic water vapour sorption isotherm measuring set-up is also available in the Thermal Processes Group.

A high pressure (up to 100 atm) and high temperature (up to 500°C) set-up for investigation of reaction kinetics as well as bubble column slurry reactors working in the same range of parameters are available in the Mass Transfer and Chemical Reaction Engineering Group.

The Fluid Dynamics Group owns several rheometers, among them a Feranti-Shirley cone-and-plate rheometer, Instron extruding rheometer for polymer resins and set-ups for industrial rheometry including a 10 m tube tank for two-phase flows and $\Phi 0.15 \times 2$ m loop reactor for rheometry of fermentation broths.

The Institute owns several personal computers XT and AT used for reeseach. A separate computing lab equipped with six PC XT and one AT networked together caters for everyday computing needs of the students. Beside the University Computing Centre mainframe is available.

The number of volumes in the library maintained by the Institute amounts to 12,800.

STAFF OF FACULTY

Academic staff:

Professor emeritus Henryk Błasiński Ph.D., D.Sc.

Professor Andrzej Heim Ph.D.,D.Sc.

Professor Zdzisław Kembłowski Ph.D., D.Sc.

Professor Stanisław Michałowski Ph.D., D.Sc.

Professor emeritus Mieczysław Serwiński Ph.D.

Professor Czesław Strumiłło Ph.D., D.Sc.

Professor Roman Zarzycki Ph.D., D.Sc.

Assoc. Professor Stanisław Ledakowicz Ph.D., D.Sc.

Assoc. Professor Piotr Wodziński Ph.D., D.Sc.

Docent Henryk Michalski Ph.D.

Władysław Kamiński Ph.D., D.Sc.

Senior lecturers: 36

Assistants: 12

Technical and secretarial staff: 72

EDUCATION

Graduate Study Programmes

The Institute offers both M.Sc. and doctoral programmes. The M.Sc. degree in Chemical Engineering can be achieved either in a 2 year M.Sc. programme (B.Sc. or equivalent is prerequisite) or a 5 year programme including an undergraduate course. Preparation of a Master's thesis is required. The successful graduate receives both Engineer's and Master's degrees.

The doctoral programme has a compact course in advanced chemical engineering and general subjects (e.g. philosophy) and substantial portion of individual research work guided by thesis supervisor. Doctoral thesis must be

submitted and defended in an oral defense preceded by a doctoral examination of competence in chemical engineering and a selected subject.

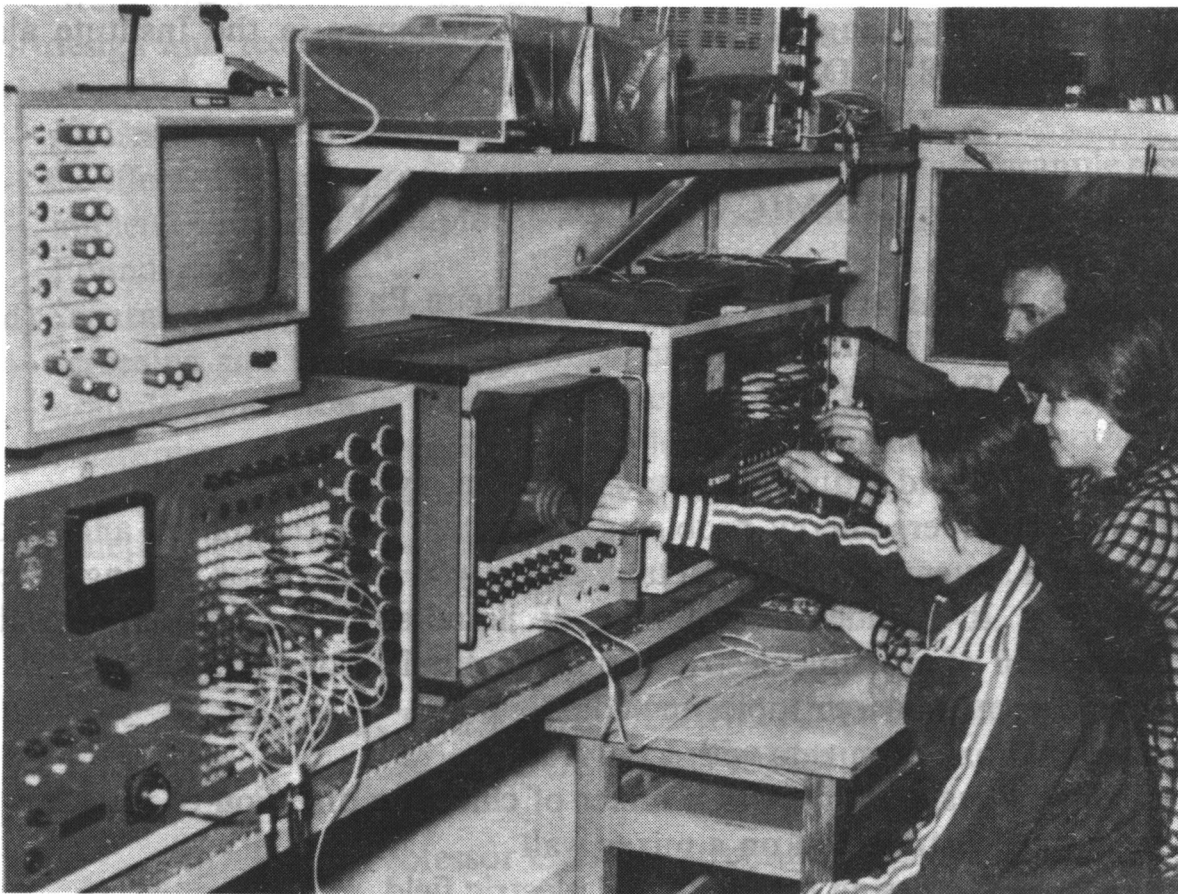
The programme takes at least 3 years to complete (M.Sc. is prerequisite). A successful graduate receives the Doctor's degree in technical sciences (dr n.t. equivalent to Ph.D.).

The knowledge of Polish is a prerequisite for the full 5 year Master's programme. One year language course preceding the programme is available in Łódź.

Doctor's programme and a 2 year M.Sc. programme do not require any knowledge of Polish, English and Russian are commonly spoken within the Institute.

There are four graduation fields:

- chemical and process engineering,
- process equipment,
- bioprocess engineering,
- environmental protection.



Students' laboratory of process dynamics and control

Graduate Subjects

The following courses are examples taken from the Master's curriculum.

- | | |
|--|---|
| – Inorganic chemistry | – Organic chemistry |
| – Technical drafting and mechanical technology | – Physical chemistry |
| – Analytical chemistry | – Thermodynamics I and II |
| – Fluid mechanics | – Mass transfer |
| – Process dynamics and control | – Heat transfer |
| – Unit operations I and II | – Transport phenomena |
| – System engineering | – Process equipment |
| – Optimization | – Reactor engineering and design I and II |
| – Introduction to equipment and machinery construction | – Phase change processes |
| – Chemical technology | – Rheology |
| – Food industry equipment | – Bioprocess engineering |
| | – Thermal treatment of food |

Students can prepare theses and specialize in the following subjects:

- | | |
|--|------------------------|
| – Bioprocess engineering | – Industrial equipment |
| – Environmental protection in industry | – Process engineering |

Since the beginning of the graduate programme in the Institute almost 500 M.Sc. and 68 Ph.D. degrees were awarded.

CHEMICAL EQUIPMENT DIVISION

Head: Professor Andrzej Heim Ph.D., D.Sc.

Academic staff: 17 persons

Technical staff: 5 persons

a) Mixing of liquid, liquid-solid and liquid-gas systems

This subject covers energy problems connected with circulation and velocity profiles in a system of cylindrical tank-mixer with constant or varying direction of rotation. It includes also mixing of liquid-solid systems as a result of superposition of crossing electric and magnetic field on the system.

The current research topics include:

- investigations of mixers with axial flow
- mixing of suspensions with a mixer of changing direction of rotations
- local drag distribution on a mixer wall
- mixing in a crossing magnetic and electric field
- mixing in single and multiphase systems
- residence time distribution in mixers with single and complex impellers

b) Investigations of fine grinding

In this area interest is focussed on wet grinding in pearl mills, modelling of these mills, design solutions and their applicability in disintegration of microorganisms. Moreover, dry grinding in tumbling mills and in rod grinders, and the relationships between mechanical properties of materials and process effects are investigated.

Current research projects include:

- mixing efficiency in pearl mills of various types
- thermal effects of mixing in pearl mills
- new designs of pearl mills
- mixing efficiency in horizontal pearl mills
- disintegration of microorganisms in pearl mills
- the influence of mechanical properties of materials on mixing efficiency in ball and rod mills
- investigations of prototypes of pearl mills with cylindrical mixers (laboratory, pilot-plant and industrial scale)
- construction and testing of packings for mixers, bioreactors and pearl mills.

c) Granulation of powders in tumbling granulators

Main topics under this title include description of process kinetics, the effect of design and technological parameters, such as material properties, on this kinetics and particle concentration in granules, and as a result their resilience.

- studies of powder granulation kinetics
- the effect of powder properties on particle condensation and granule resilience
- implementation of equipment for continuous drum pelletizing in the Iron Foundry „Koluszki”.

d) Separation of granular materials on screens and centrifugal separators

- screening and metering of granular materials
- granule separation in a centrifugal separator.

e) Adsorption from solutions, particularly determination of isotherms and description of process kinetics and dynamics

- kinetics of adsorption from solutions
- dynamic adsorption from solutions.

BIOPROCESS ENGINEERING AND THERMAL PROCESS DIVISION

Head: Professor Czesław Strumillo Ph.D., D.Sc.

Academic staff: 18 persons

Technical staff: 16 persons

BIOPROCESS ENGINEERING GROUP

- a) Investigations of kinetics, modelling and optimization of biotechnological processes occurring in the presence of bacteria, yeasts and moulds:
 - development of a highly efficient system for ethanol fermentation,
 - investigation of heat of biosynthesis
- b) Design of biotechnological processes and equipment:
 - development and implementation of a series of laboratory bioreactors of volume 2, 7(5) and 10 dm³ and large-scale laboratory bioreactors 42, 100, 150 and 200 dm³ in volume
 - development and implementation of mechanical defoaming devices in the above listed bioreactors
 - implementation of Polish-made polymer coatings in bioprocess equipment
 - design of a three-phase fluid bioreactor for ethanol production
- c) Investigation and optimization of biotechnological processes
- d) Scaling-up of processes from laboratory to industrial conditions:
 - methods for scaling-up of tower bioreactors for citric acid production and mathematical modelling of citric acid biosynthesis

THERMAL PROCESSES GROUP

The Group main research area is simultaneous heat and mass transfer in the process of drying. In addition a research on thermal sterilization of liquids is also carried out. Main research areas are as follows.

a) Theoretical principles of the drying process

Topics carried out in this area include sorptional equilibrium and drying kinetics taking into consideration the influence of material structural properties and wave propagation velocity in heat and mass transfer. Research on multicomponent moisture removal and internal heat and mass transfer in solids with presence of internal heat sources is also carried out. Finally, this topic includes works on nonconventional methods of drying and energy utilization in drying:

- heat transfer in solids of complex structure
- multicomponent moisture removal
- application of heat pumps in drying
- kinetics of drying and materials characterization
- drying in high-frequency energy fields
- energy savings in drying

b) Modelling and optimization of selected dryers

This area covers construction of mathematical models and their use for optimization of selected dryers: fluid bed and vibrated fluid bed of cross-flow type, spray dryers, spouted bed dryers, flash and spin-flash dryers, and band dryers with high-frequency energy field generator:

- algorithms for design calculation and modelling of selected dryers
- spray drying
- drying of paste-like materials in inert spouted beds

c) Technology of drying of selected products especially products of biotechnology

Main objectives of this area are investigations of the drying process, evaluation of suitable technology and putting to practice the results of investigations. The list of products investigated includes granular crystalline materials e.g. sugar, table salt, citric acid, fertilizers; fibrous materials e.g. tobacco cut, beet pulp; paste-like materials e.g. dyestuffs and pigments, L-lysine, Zn-bacitracin, fodder yeast; web-like materials, e.g. tobacco foil, prepasted paper:

- optimization of drying of biosynthesis products with reference to product quality
- drying of materials containing multicomponent moisture.

d) Evaporation and sterilization of solutions and suspensions

Main topics here include modelling of evaporator battery and a whole evaporation and boiling station of sugar factories, as well as continuous thermal sterilization of liquids by injection of liquid:

- continuous direct thermal sterilization of liquids and suspensions
- the effect of thermal processing during UHT sterilization on stability of labile food components and fermentation media
- modelling of growth/collapse of a steam bubble in subcooled liquid.

PROCESS ENGINEERING DIVISION

Head: Professor Zdzisław Kemblowski Ph.D., D.Sc.

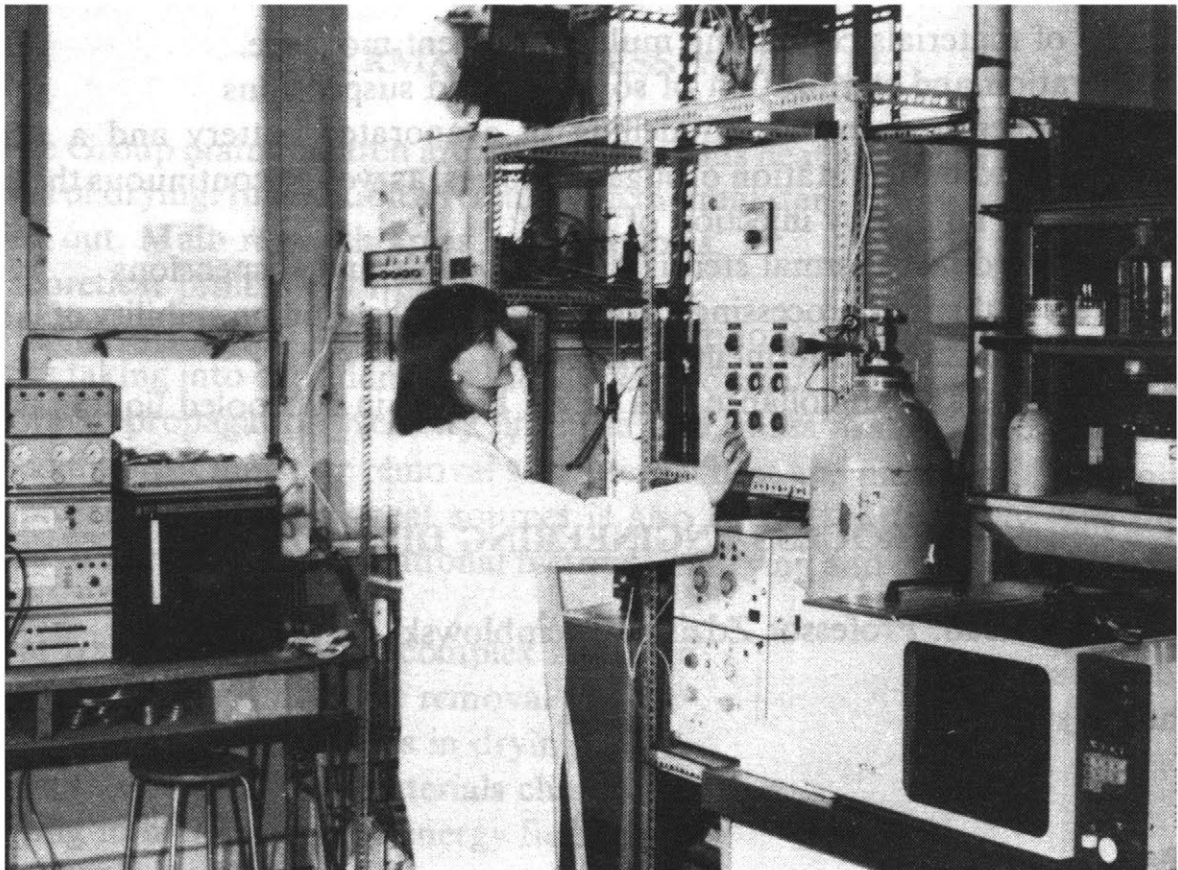
Academic staff: 17

Technical staff: 13

**MASS TRANSFER AND CHEMICAL REACTION
ENGINEERING GROUP and DISTILLATION
AND EXTRACTION GROUP**

- a) Diffusional mass transfer in the processes of distillation, absorption, extraction and adsorption

Within this topic investigations are carried out on the theoretical principles of mass transfer based on the boundary layer theory and transfer models, particularly for multicomponent mixtures. Multicomponent distillation is studied. Methods for calculation of columns and system of columns and their optimization are developed. Applicability of heat pumps in distillation is investigated. Studies of absorption refer to physical absorption and absorption with a chemical reaction, especially with respect to the environmental protection. In the field of extraction diffusional mass transfer in a porous solid body-liquid system is investigated and kinetic coefficients of leaching are determined.



Experimental three-phase slurry reactors in chemical reaction engineering laboratory

Additionally, studies on thin liquid film and rivulet flow down a solid surface are performed:

- studies of the phenomena occurring during the contact of steam bubble with liquid under different thermodynamic conditions
- recovery of solvents and production of high-purity substances
- multiobjective optimization of systems of thermally integrated distillation columns
- applicability of heat pumps in distillation
- simultaneous heat and mass transfer in the processes of multicomponent physical and chemical absorption
- numerical programmes for designing absorption columns of various types
- investigations of extraction of components from plant products in batch and continuous co- and countercurrent processes
- determination of cross section of a liquid rivulet flowing down a vertical solid surface
- studies of the phenomena of gas-solid and liquid-solid interfaces for flotation and biotechnology processes

b) chemical reaction engineering in homo- and heterogeneous systems

The investigations in this field refer to reaction kinetics in a liquid phase and conversion of synthesis gas in slurry-phase reactors, e.g. Fischer-Tropsch reaction, methanol synthesis. Analysis of steady-state multiplicity features in chemical reactors.

- kinetics of methanol synthesis in a liquid phase
- methanol synthesis in bubble-column slurry reactors
- mass transfer with a chemical reaction in the presence of solid inert and active particles.

FLUID DYNAMICS GROUP

The Fluid Dynamics Group is mainly concerned with engineering rheology. The research topics include:

a) Measurements of rheological properties of non-Newtonian fluids and construction of rheometers

The investigations include the determination of flow curves of polymer solutions and melts, food materials, coating mixtures, fermentation broths etc. Several rheometers have been also constructed: two capillary rheometers for solutions, pastes and molten polymers, and an on-line rheometer for biological suspensions.

b) Two-phase flow of gas and non-Newtonian liquids in horizontal and vertical pipes

The investigations in this field refer to the flow pattern maps, two-phase pressure drop and optimum conditions for drag reduction in horizontal pipes. Research on the flow in vertical pipes is concerned with the hydrodynamics of air-lift bioreactors.

c) Rheology and thermodynamics of rheologically unstable materials

Investigations are carried out concerning the determination of rheological properties of thixotropic suspensions and degrading polymer melts. The principles of thermodynamics are involved which enable the formulation of general constructive equations of rheologically unstable materials.

d) Flow of non-Newtonian fluids in various geometries

The investigations include the flow in the boundary layer along the entry length of flow conduits and the applications of the Finite Element Method to solving some flow problems in polymer processing.

- optimization of transport of products, raw materials and wastes in food industry which ensures optimum economic results,
- on-line measurement of rheological properties of fermentation liquids,
- boundary layer development along the entry length of the flow conduits,
- application of the Finite Element Method to optimization of screw extruders,
- construction of a rotational rheometer for very low shear stresses with the electromagnetic drive,
- construction of a rheometer for rapidly sedimenting suspensions.

Since the foundation of the Institute, its staff published about 1160 papers and 52 books and textbooks, in this number 3 monographs published abroad.

**INSTITUTE OF PAPERMAKING AND
PAPER MACHINES, I-4
(Independent Unit)**

**Director's office address: 93-005 Łódź, Wólczańska 219-223,
Telephone: (42) 36-88-22**

FOUNDATION AND GROWTH

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

In 1952 at the Chemical Faculty of the University the Department of Pulp and Paper Technology was organized and headed by its initiator Professor Edward Szwarcsztajn.

In 1970 as a result of fusion of the Departments of two Faculties engaged in the papermaking research the Institute of Papermaking and Paper Machines was called into being, its head was Professor Edward Szwarcsztajn. At present the Institute is the 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 fibre — 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.

DIRECTORS OF THE INSTITUTE

1970 – 1979	Professor Edward Szwarcsztajn M.Sc.
1979 – 1986	Professor Czesław Pustelnik M.Sc.
1986 – 1989	Docent Kazimierz Modrzejewski Ph.D.
1989 –	Docent Włodzimierz Kawka Ph.D., D.Sc.



Buildings of the Institute

STRUCTURE

The Institute is administered by the Director and the Institute Council elected from the most experienced staff.

The Institute is composed of five following Divisions:

- Division of Pulping – in charge of Professor J. Rutkowski Ph.D., D.Sc.
 - Division of Papermaking – in charge of Docent K. Przybysz Ph.D., D.Sc.
 - Division of Paper and Fibreboard Machines – in charge of Docent W. Kawka Ph.D., D.Sc.
 - Division of Thermal Equipment and Converting Machines of Paper and Fibreboard Industry – in charge of Docent W. Tarnawski Ph.D., D.Sc.
 - Division of Printing Machines – in charge of Docent K. Stępniewski Ph.D.
- They are helped by the library, technical section and institute administration.

STAFF OF INSTITUTE

Academic staff:

Professor Jan Rutkowski Ph.D., D.Sc.
 Professor emeritus Włodzimierz Surewicz Ph.D.
 Professor emeritus Edward Szwarcsztajn M.Sc.
 Assoc. Professor Kazimierz Przybysz Ph.D., D.Sc.
 Docent Włodzimierz Kawka Ph.D., D.Sc.
 Docent Wiktorian Tarnawski Ph.D., D.Sc.
 Docent Józef Dąbrowski Ph.D.
 Docent Henryk Godlewski Ph.D.
 Docent Kazimierz Modrzejewski Ph.D.
 Docent Kazimierz Stępniewski Ph.D.
 Docent Tomasz Tyralski Ph.D.

Senior lecturers: 10

Assistants: 7

Technical and secretarial staff: 31

EDUCATION

The Institute educates engineers with M.Sc. degree at two faculties of the Technical University:

a) Faculty of Chemistry – specialization in „Chemistry and Technology of Pulp and Paper” with three fields of graduation:

- pulp technology,
- papermaking technology,
- paper converting technology;

b) Faculty of Mechanical Engineering – specialization in „Machines and Equipment of Paper and Woodworking Industries” with four fields of graduation:

- paper machines,
- 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.

In the future two new fields of graduation will be provided: printing technology and machines of wood industry.



Apparatus for fibre length measurement developed in the Institute

Specialization studies are conducted in the Institute for full-time students, extra-mural students and evening-students. About a thousand full-time students graduated from the Institute in both specializations. This number includes also 39 foreigners, mostly Hungarians, but a few students from Korea and India are among them.

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

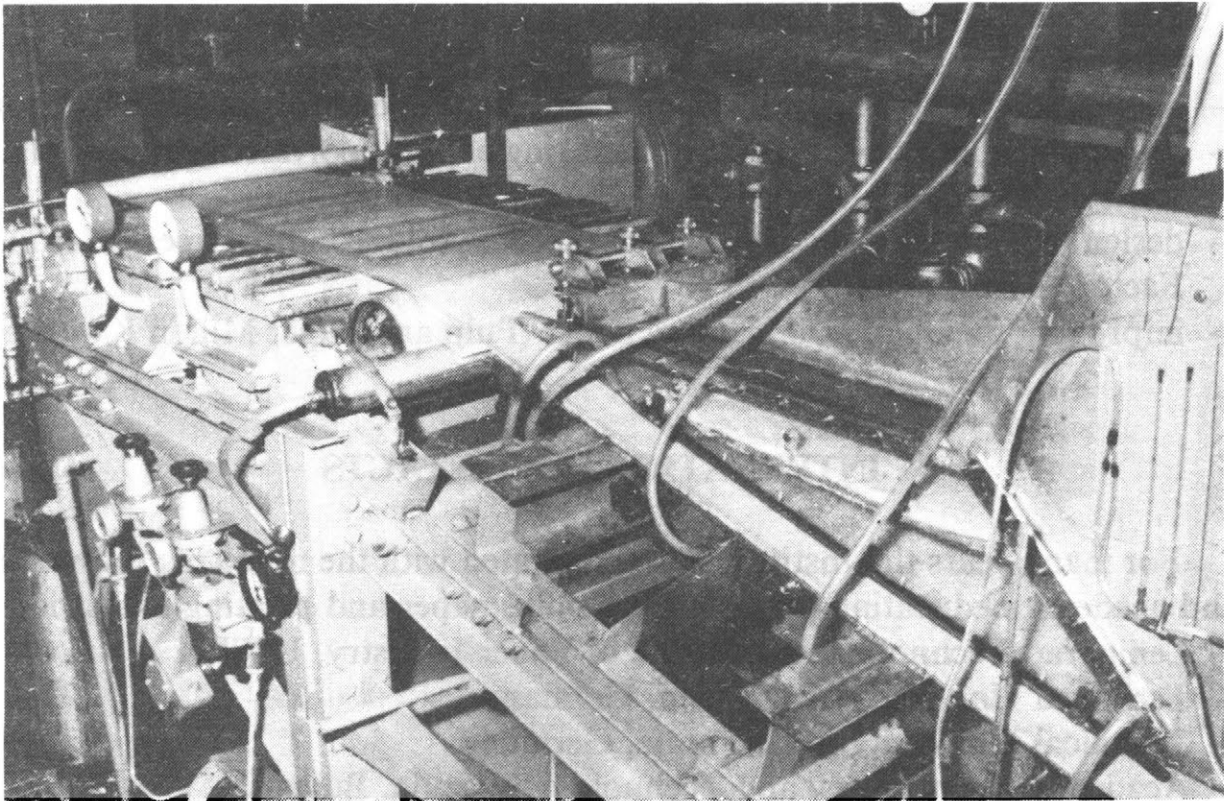
Post-graduate courses create a possibility for improvement of qualification of technical personnel. The completion of these courses is required for getting the professional specialization by an engineer. 131 engineers completed post-graduate courses (50 chemists and 81 mechanics).

RESEARCH

The Institute takes part in many research works sponsored by the Ministry of National Education. The Institute participated in Central Research and Development Programme – 15.4 – „Technology of Pulp and Paper” by carrying out 16 projects. Present research works called „grants” 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.

During the last 5 years 5 works qualifying for D.Sc. degree and 7 Ph.D. dissertations were completed in the Institute.



Laboratory paper machine made in the Institute

COOPERATION WITH INDUSTRY

The research works meeting the needs of national economy are being carried out within the central development plans 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 allowing to obtain chemical pulps of full value (Pulp and Paper Mill in Kwidzyn);
- 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 Jeziorna);
- application of home-made steam chambers (Paper Mills in Krapkowice);
- development of a device for manufacturing of photopolymeric printing plates (GRAFMASZ, Warsaw);
- design of the defiberizing screen (licence sold to the Paper Machines Factory – FAMPa);
- improving the quality of printing paper (Pulp and Paper Mill in Kwidzyn).

INTERNATIONAL CONTACTS

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, USSR
- Technical University in Dresden, Germany
- Technical University in Chemnitz, Germany
- Academy of Chemistry and Technology in Sofia, Bulgaria
- Academy of Chemistry and Technology in Pardubice, Czechoslovakia
- Technical University of Slovakia in Bratislava, Czechoslovakia
- Technical University in Graz, Austria
- Technical University in Darmstadt, Germany.

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 Eastern countries the exchange of graduates has been started up. Joint scientific sessions are organized, reports of joint research works are published and joint patents are developed.

LIBRARY

The Institute library contains 5300 books and 1500 bound journals (32 titles). The Library also contains research reports, student theses and dissertations, standards and trade literature.

PUBLICATIONS

During the last 5 years the employees of the Institute published 230 research reports (these include 25 reports in international journals), issued 3 sets of lectures run off on the duplicator and 1 monograph.

MAIN LIBRARY OF THE TECHNICAL UNIVERSITY OF ŁÓDŹ, BG

Address: 90-543 Łódź, Żeromskiego 116

Telephone: (42) 36-31-65

The Main Library was founded almost simultaneously with the Technical University. The decision about its creation was made 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 founders and to the hard work of the library staff.

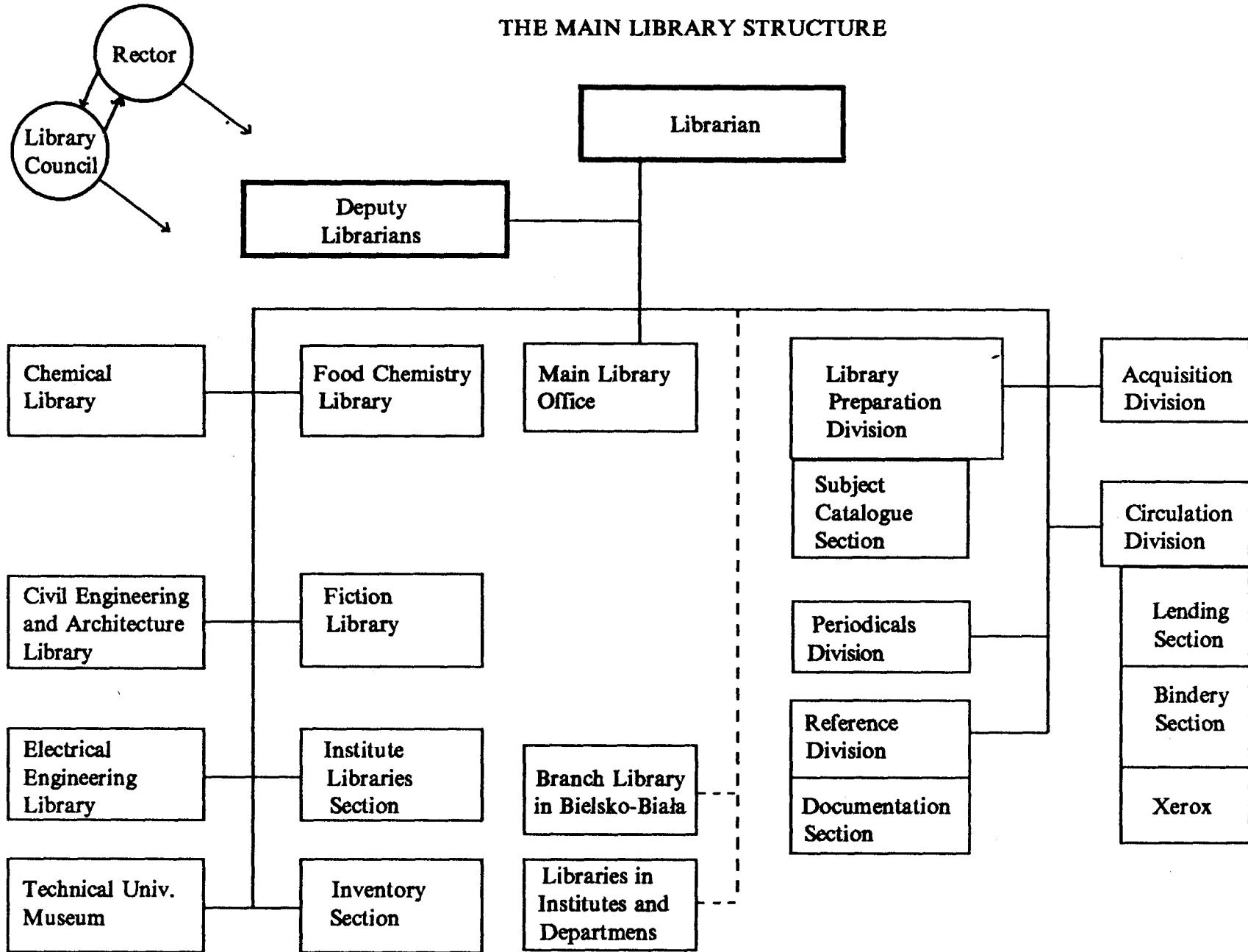
Initially the Library was supervised by the Library Committee and its Chairman Professor Bolesław Konorski. In 1950 Dr. S. Peliński was appointed the first Librarian (1950-1957). Next, this function was performed by Mrs I. Augustyniakowa (1959-1965), Mr J. Walewski M.Sc. (1963-1973), Dr.J. Przygocka (1974-1988), and C. Garnysz, M.Sc.

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 founded: the Chemical Library (1954), the Food Chemistry Library (1976), the Library of Civil Engineering and Architecture (1981), the Electrical Engineering Library (1982) and the Fiction Library.

The ever-increasing book collection and the growing needs of the Library allowed to change it gradually into a well-organized University unit with developed internal structure, capable of serving both scientific and educational purposes. The Main Library and its branches occupy 3,700 square meters, employ about 100 people in total. The structure and the tasks of the Main Library are described in the Library Regulations from 1986.

The Library collects the basic book stock in Polish and in foreign languages as well as the student text-books. The subject matter of the book collection corresponds to both the fields of the students training and research done at the

THE MAIN LIBRARY STRUCTURE



University. The needs of the engineering and technical staff in the Łódź Region are also taken into account.

On the 31st of December 1990 the total stock in the Main Library amounted to 257 thousand vols of books, 105 thousand bound vols of periodicals (more than 3,400 titles) and 165 thousand items of special collection (standards, patents, etc.).

The basic source of book acquisition is purchase. Scientific books and journals are also obtained by means of donations and exchange (about 370 book vols and over 380 periodical titles each year). At present the Library has exchange relations with 160 institutions in Poland and abroad. The basis for the exchange are the publications of our University.



Reading room of the Main Library

The book collection may be approached through alphabetical and subject catalogue. The Main Library catalogue is supplemented by the alphabetical catalogues of Institute libraries collections. Additionally, all reading rooms maintain the selective catalogues of their own collections. All library materials are available in 11 reading rooms in the Main Library and in the branch libraries. The Main Library also accommodates the Inter-Library Lending Division. The Reference and Information Division carries on documentation activities such as registration of research work at the University. It also compiles the bibliography

of the scientific workers publications of our Technical University. This Division also helps the readers find what they want.

The Main Library has been computerized for a few years now using the software received from the UNESCO. There are used the programmes of Integrated Scientific Information System (ISIS) in the PC version. At present two data bases: Symposia and Bibliography become available on-line. The former includes information about conference proceedings collected in the University. The latter gathers information about the literary output of the workers of the University. Moreover, other accessible batches facilitate carrying out standard office and library jobs. The Library is equipped with local computer network with 6 terminals. The Main Library also coordinates the use of BRIOLIS service in the local area of Łódź.

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

- 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.

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

Apart from the Main Library and the branch libraries there are also 28 minor libraries existing in the Institutes and Departments. All these units constitute a library-information system. The Library Council is the Rector's consultative and advisory body.

THE DEPARTMENT OF FOREIGN LANGUAGE TEACHING, S-2

93-590 Łódź, Al. Politechniki 11

Telephone: (42) 36-32-06

From 1945 till 1953 the Department of Foreign Language Teaching of the Technical University of Łódź, founded by Professor Wilkoszewski, acted on the basis of language section.

The starting year was 1953 and Mr Arno Will was the first head 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.

H heads of language sections:

English section - Mirosław Flis, M.A.

German section - Anna Malinowska, M.A.

Russian section - Teresa Skirtun, M.A.

Staff of the Department of Foreign Language Teaching is composed of 43 senior lecturers.

Department library has 5350 volumes.

THE DEPARTMENT OF PHYSICAL EDUCATION, FS-3

93-590 Łódź, Al. Politechniki 11

Telephone: (42) 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.



Gymnasium

The Department employs 25 teachers, a physician, and accompanist.

The Department organizes physical training for students of all the faculties during four years of their studies.

Sports section of the College Club of Academic Sports Association has been very successful. There are 16 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.

The section keeps in touch with other universities both in our country and abroad, for example in Yugoslavia and Italy.

THE UNIVERSITY HOUSING ESTATE, OA

93-590 Łódź, Al. Politechniki 3a

Telephone: (42) 36-41-77

The University accommodation service offers accommodation to 2500 students in 8 students' hostels. There are also two university canteens catering for over 2000 people a day and 10 snack-bars situated in the University Housing Estate.

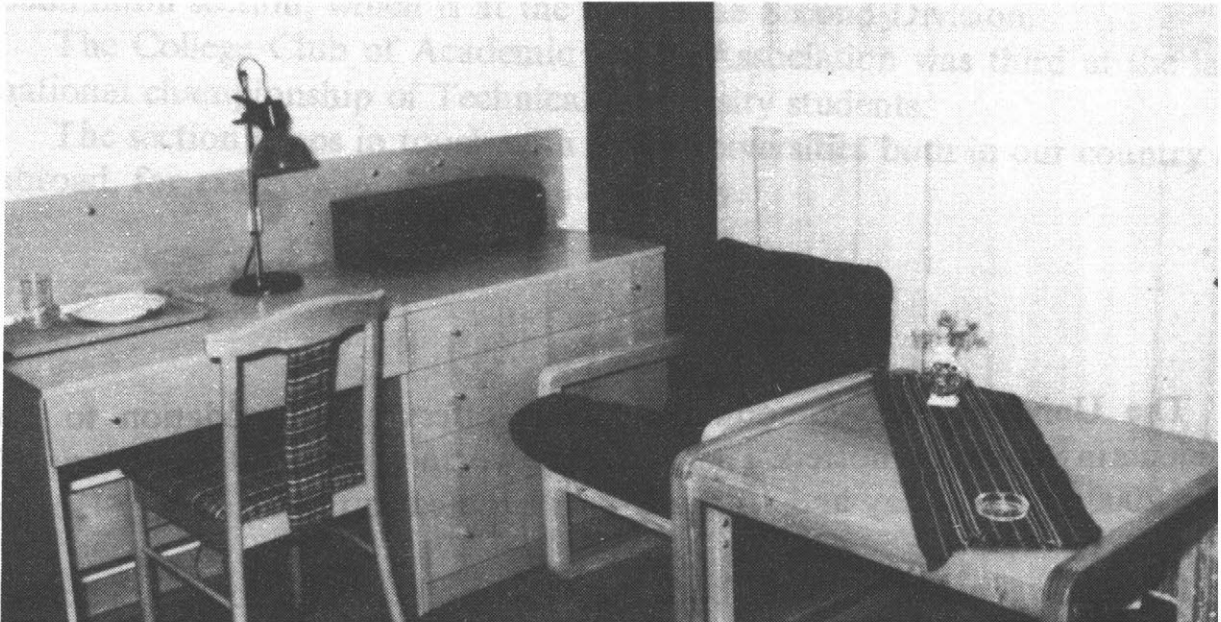
Each hostel accommodates both men and women. The accommodation is chiefly in the form of double study-bedroom, with communal kitchen-lounge



Academic housing estate

facilities on each floor. There are also common rooms, study rooms, guest rooms in each hostel.

Three students' hostels (III, IV, V) house big student clubs which offer 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.



Student's room

There are also two clubs for those interested in tourism - „Płazik” „Kajak” 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 programme and their broadcasting studio „Żak” deals mainly with information, social issues and entertainment.

As the estate is the centre of student life, all students' organizations and associations have their offices here.

Everyday life of the University housing estate is organized by the Council of the Estate, a branch of students' self-government.

Student 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. Some services run by students can also be mentioned.

SENIOR'S CLUB

Senior's Club associates 388 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 16 members elected by the General Assembly.

There are the following sections: Entertainment Section, Excursion Section, Social Section, Organization and Economic 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.

Following the initiative of a group of oldest employees of the Łódź Technical University (members of the Senior's Club) the Board of University founded a University Museum. Its official opening took place on the 24th of May 1985, i.e. on the 40th anniversary of the foundation of the University. Apart from a permanent exhibition showing the formation and beginning of the University the Museum also organises other exhibitions e.g. on various anniversaries. The Museum also has a Visitors Book as well as Commemorative Book for the employees of the Łódź Technical University.

The Club makes one big family: its members help each other, there are Club's meetings every second Thursday and our members enjoy the meetings very much. The Club's activity has been highly appreciated by the authorities and the employees of the University.

TECHNICAL UNIVERSITY OF ŁÓDŹ BRANCH IN BIELSKO – BIAŁA

Address: 43-309 Bielsko-Biała, Willowa 2

Telephone: (30) 270-61

Telefax: (30) 23502

Telex: 35246 pol bb

**Prorector of the Branch:
Professor Marek Trombski Ph.D., D.Sc.**

FOUNDATION AND GROWTH

- 1966 – 19 th February – The Consulting Centre for extramural studies of the Faculty of Textile Engineering was organized.
- 1969 – Branch in Bielsko-Biała of the Technical University of Łódź was established.
- 1971 – Branches of the Institutes of Applied Mechanics and of Machine Design were established.
- 1973 – New organization of the Branch; creation of the Institutes of: Mechanics and Machine Design, Technology and Automobile Construction, Textile Engineering, and of the Divisions, Social Science, Foreign Languages, Physical Education as well as of the branch of Main Library.
- 1981 – Establishment of the Faculty of Machine Design.
- 1987 – The Departments of Mathematics and of Thermodynamics were established.

- 1988 – The M.Sc. course in Electrotechnics is offered.
1989 – The M.Sc. course in Organization and Management in Industry is established.



Technical University of Łódź: Branch in Bielsko-Biała

STRUCTURE

At present the Branch in Bielsko-Biała is composed of the Faculty of Machine Design to which belong:

- Institute of Technology and Automobile Construction, FI–1,
- Institute of Mechanics and Machine Design FI–2,
- Department of Mathematics, K–81,
- Department of Thermodynamics, K–82,

and of the Faculty and Institute of Textile Engineering, FI-3, established as a branch of the Faculty of Textile Engineering in Łódź.

STAFF OF THE BRANCH

The Branch in Bielsko-Biała has 144 members of teaching staff, including 9 professors, 4 associate professors, 16 docents as well as 144 technical and secretarial staff.

EDUCATION

The Branch in Bielsko-Biała has at present about 800 students enrolled at M.Sc. courses.

By the end of 1990 the total number of 1,583 M.Sc. degrees and 682 B.Sc. degrees were awarded to the students of the Branch in Bielsko-Biała.

FACULTY OF MACHINE DESIGN, W-8

Dean's office address: 43-309 Bielsko-Biala, Willowa 2

Telephone: (30) 270-61

Telefax: (30) 23502

Telex: 35246 pol bb

DEANS OF FACULTY

1969 – 1973	Professor Jan Wajand
1973 – 1981	Docent Marek Trombski
1981 – 1987	Professor Marek Trombski
1987 –	Professor Jan Wajand

STAFF OF FACULTY

The Faculty of Machine Design has 116 members of teaching staff, including 7 professors, 4 associate professors, 13 docents, as well as 51 technicians and secretarial staff.

EDUCATION

The Faculty has at present 550 students enrolled on courses leading to M.Sc. degree. By the end of 1990 the total number of 843 M.Sc. degrees and 512 B.Sc. degrees were awarded to the students of the Faculty.

The Faculty offers the following courses:

I Mechanical Engineering.

- cars and tractors, with construction, exploitation and repairing technology,
- textile machines and appliances,
- power systems and appliances, with internal combustion engines, fluid-flow machines and hydraulics,
- machine technology with foundry, machining of materials.

II Electrical Engineering.

III Management and Administration in Industry.

**INSTITUTE OF TECHNOLOGY
AND AUTOMOBILE CONSTRUCTION, FI-1**

43-309 Bielsko-Biala, Kustronia 99

Telephone: (30) 43531, 42019, 42118

Director: Professor Jan Wajand Ph.D., D.Sc.

Academic staff:

Professor Jan Szadkowski Ph.D., D.Sc.

Assoc. Professor Maciej Sobieszczanski Ph.D., D.Sc.

Docent Stefan Gadziński Ph.D.

Docent Józef Matuszek Ph.D.

Docent Kazimierz Romaniszyn Ph.D.

Docent Przemysław Wasilewski Ph.D.

Senior lecturers: 17

Assistants: 9

Technical and secretarial staff: 31

List of divisions

Division of Technology, with

- Group of Machining of Materials,
- Group of Chipless Technology,

Division of Cars, Tractors and Engines.

Main subjects of research of the Institute cover the following areas: machining, founding, sheet metal working, internal combustion engines, motor-cars, engine feeding.

DIVISION OF TECHNOLOGY

GROUP OF MACHINING OF MATERIALS

Head: Professor Jan Szadkowski

The Group of Machining of Materials conducts teaching activity including: machine tools, industrial robots, machining, design and automation of technological processes and metrology. Research activity concentrates on process modelling of multi-tool, and group machining for CAD/CAM systems.

GROUP OF CHIPLESS TECHNOLOGY

Head: Assoc. Professor Przemysław Wasilewski

The Group of Chipless Technology concentrates on the problems of founding and plastic working. Research in founding deals with Al-Si alloys. Its purpose is to study versatile hypo- and eutectic silumin features after modification with sodium, sodium salt, strontium and antimony (stibium).

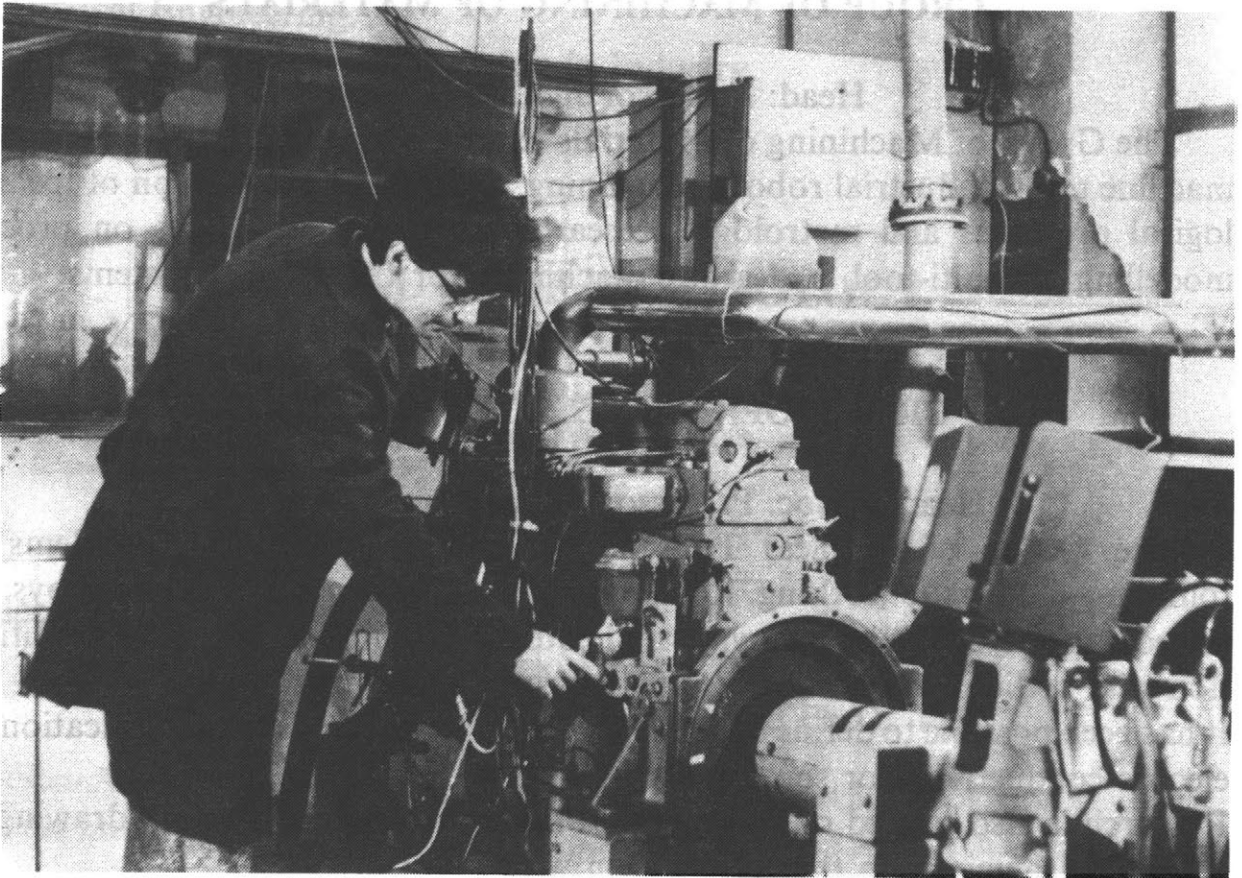
It has been possible to define dependences of alloy features after modification on electric conductivity for some silumins with regression equations.

Research is also carried out on material-saving technology of deep drawing of cylindric drawpieces in the cooperation with industry.

DIVISION OF CARS, TRACTORS AND ENGINES

Head: Professor Jan Wajand

Internal combustion engines, motor-cars and tractors are the specializations of the Division of Cars, Tractors and Engines. The activity of the Division is based both on the cooperation with industrial and other research centres. The research work includes the construction and testing of prototype engines of small swept capacity, some problems connected with energy saving in the development of automotive vehicle and internal combustion engines, decrease of engine exhaust gas toxicity, engine and car diagnostics, the development of differential gears.



Testing of microcomputer controlled car engine

The Division of Cars, Tractors and Engines deals with the following problems:

- Feeding and combustion as a complex problem in both spark and self-ignition engines:
 - a) design of combustion chambers and self-ignition engines with small swept capacity;
 - b) systematics and calculation of complex problems connected with injection run both in traditional injection system and injection units;
 - c) structural systematics of a combustion piston engine in a system formulation;
 - d) diagnostics of the whole vehicle.
- Power division in vehicle power transmission system 4 x2 and 4 x 4. The result of the system are two original differential self-blocking mechanisms of a new generation.

The research work of the Institute of Technology and Automobile Construction resulted in 16 books and 575 papers.

INSTITUTE OF MECHANICS AND MACHINE DESIGN, FI-2

43-309 Bielsko-Biała, Willowa 2

Telephone: (30) 270-61 ext. 298

Director: Professor Marek Trombski Ph.D. D.Sc.

Academic staff:

Professor Marek Trombski Ph.D., D.Sc.

Professor Józef Wojnarowski Ph.D., D.Sc.

Assoc. Professor Stanisław Wojciech Ph.D., D.Sc.

Assoc. Professor Franciszek Marecki Ph.D., D.Sc.

Assoc. Professor Maciej Hajduga Ph.D., D.Sc.

Docent Tadeusz Berowski Ph.D.

Docent Stanisław Suwaj Ph.D.

Docent Janusz Pacałowski Ph.D.

Docent Józef Łyszczek Ph.D.

Senior lecturers: 18

Assistants: 6

Technical and secretarial staff: 20

Main subjects of research

- Resistance, stability and dynamics of machine construction.
- Construction, production and utilization of textile machines.
- Optimization of manufacturing processes (founding, machining, plastic working).
- Analytical and numerical problems of thermal conduction.
- Rationalization of energy utilization.

Laboratories

Resistance of materials; textile machine construction; fluid mechanics; metallographic research.

Publications

The total number of publications from 1969 to 1990 is 424 papers and 7 books.

Cooperation with industry

The Institute cooperates with industry in the field of:

- designing, stability, strength and dynamics of cranes,
- textile machines designing,
- hydraulic machines,
- material engineering.

International cooperation

The Institute cooperates with Machine Building and Textile College in Liberec, Technical College in Brno, Technical University in Chemnitz, Technical University in Magdeburg, Technical University in Offenburg, Radiotechnical Institute in Riazan and Polytechnic in Kragujewac.

International conferences

The Institute organized three international scientific conferences on textile and crane machines dynamics, one conference on machines and mechanisms theories, the other one on the occasion of the 300th anniversary of the publication of Izaak Newton's Principles.

DEPARTMENT OF MATHEMATICS, K – 81

43-309 Bielsko-Biala, Willowa 2

Telephone: (30) 270-61

Director: Professor Janusz Matkowski

Academic staff:

Docent Kazimierz Nikodem Ph.D.

Senior lecturers: 6

Assistants: 2

Technical and secretarial staff: 2

Main subjects of research

- Functional equations and inequalities;
- Nemytskii operators;
- Set-valued functions.



Laboratory of Computer Science

International cooperation

- organization of the 27th International Symposium on Functional Equations, Bielsko-Biala, August 14-24, 1989.

Publications

The total number of publications: 80

DEPARTMENT OF THERMODYNAMICS, K-82

43-309 Bielsko-Biala, Willowa 2

Telephone: (30) 270-61

Director: Professor Stanisław Jerzy Gdula Ph.D., D.Sc.

Academic staff:

Docent Michał Ferenc Ph.D.

Docent Jan Sochański Ph.D.

Senior lecturer: 1

Assistants: 2

Technical and secretarial staff: 4

Main subjects of research:

- analytical and numerical problems dealing with heat conduction,**
- waste heat energy utilization in industry.**

Laboratory equipment: calorimetric chamber for transients examination in electric storage heaters.

Publications

Books: 2

Papers: 2

FACULTY OF TEXTILE ENGINEERING

**Dean's office address: 43-309 Bielsko-Biala, Plac Fabryczny 5
Telephone: (30) 274-00**

DEANS OF FACULTY

1969 - 1973	Docent Eligiusz Sobiczewski
1973 - 1977	Docent Andrzej Włochowicz
1977 - 1981	Docent Jan Heczko
1981 - 1987	Professor Andrzej Włochowicz
1987 - 1990	Docent Janusz Bogusławski
1990 -	Professor Andrzej Włochowicz

STAFF OF FACULTY

The Faculty of Textile Engineering has 28 members of teaching staff including 2 professors, 3 docents as well as 22 technical and secretarial staff.

EDUCATION

The Faculty of Textile Engineering has at present 228 students attending the courses leading to M.Sc. degree. By the end of 1990 the total number of 740 M.Sc. degrees and 170 B.Sc. degrees were awarded to the students of the Faculty.

The Faculty offers the following courses:

1. Mechanical Technology of Fibre, with
 - spinning,
 - weaving,
 - knitting,
 - textile machine exploitation.
2. Chemical Technology of Fibre with:
 - chemical treatment of finished product.

INSTITUTE OF TEXTILE ENGINEERING, FI-3

43-309 Bielsko-Biała, Plac Fabryczny 5

Telephone: (30) 274-00

Director: Professor Andrzej Włochowicz Ph.D., D.Sc.

Academic staff:

Professor Stefan Brzeziński Ph.D., D.Sc.

Docent Janusz Bogusławski Ph.D.

Docent Eugeniusz Dobrzański Ph.D., D.Sc.

Docent J. Suschka Ph.D.

Senior lecturers: 17

Assistants: 7

Technical and secretarial staff: 18

Main areas of research

- structural research of natural and chemical fibres and fibre-form polymers (molecular and hypermolecular),
- new techniques and technologies of fibre processing into textile goods,
- assessment of changes in fibre quality and textile goods caused by different external factors.

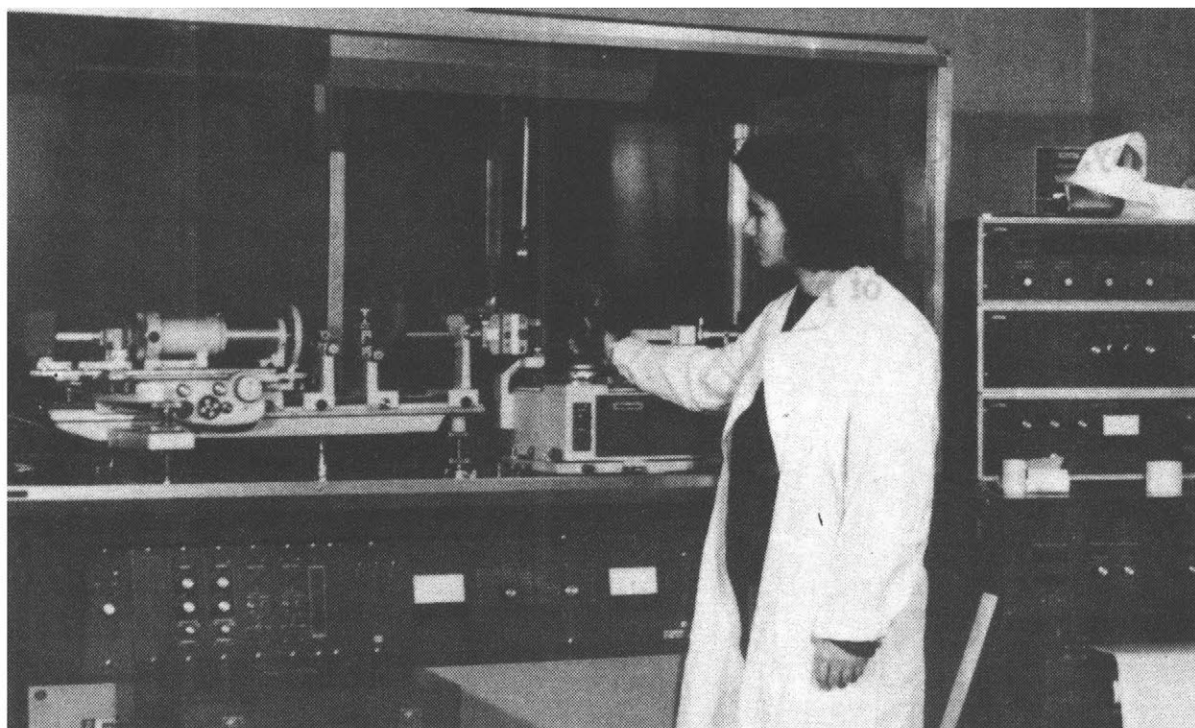
Equipment and laboratories

Mechanical Technology of Fibre:

- laboratory of technology: spinning, weaving, knitting (equipped with spinning, weaving and knitting machines),
- laboratory of textile metrology equipped with: electro-capacity sets: „Al-meter” – fibre length measurement set; „Uster” – irregularity of inter-



Electronic microscope in the Institute of Textile Engineering



Laboratory in the Institute of Textile Engineering

mediate product and yarn tests; testing machines: „Instron” Models 1026 and 1122 (measurements at high and low temperatures);

- laboratory of physics,
- laboratory of organic and inorganic chemistry,
- laboratory of fibre physics,
- laboratory of fibre science,
- laboratory of synthetic fibre and foil,
- microscope laboratory (equipped with optical and electron microscopes: scanning electron and transmission),
- X-ray radiography room.

Chemical Technology of Fibre:

- laboratory of physical-chemical processes of purification (equipped with: spectrophotometers for colour measurements: PREMA-COLOR-COMPUTER, MOMCOLOR, SPECOL, OPTON RFA-A and leucometer),
- laboratory of fibre treated chemically.

Cooperation with industry

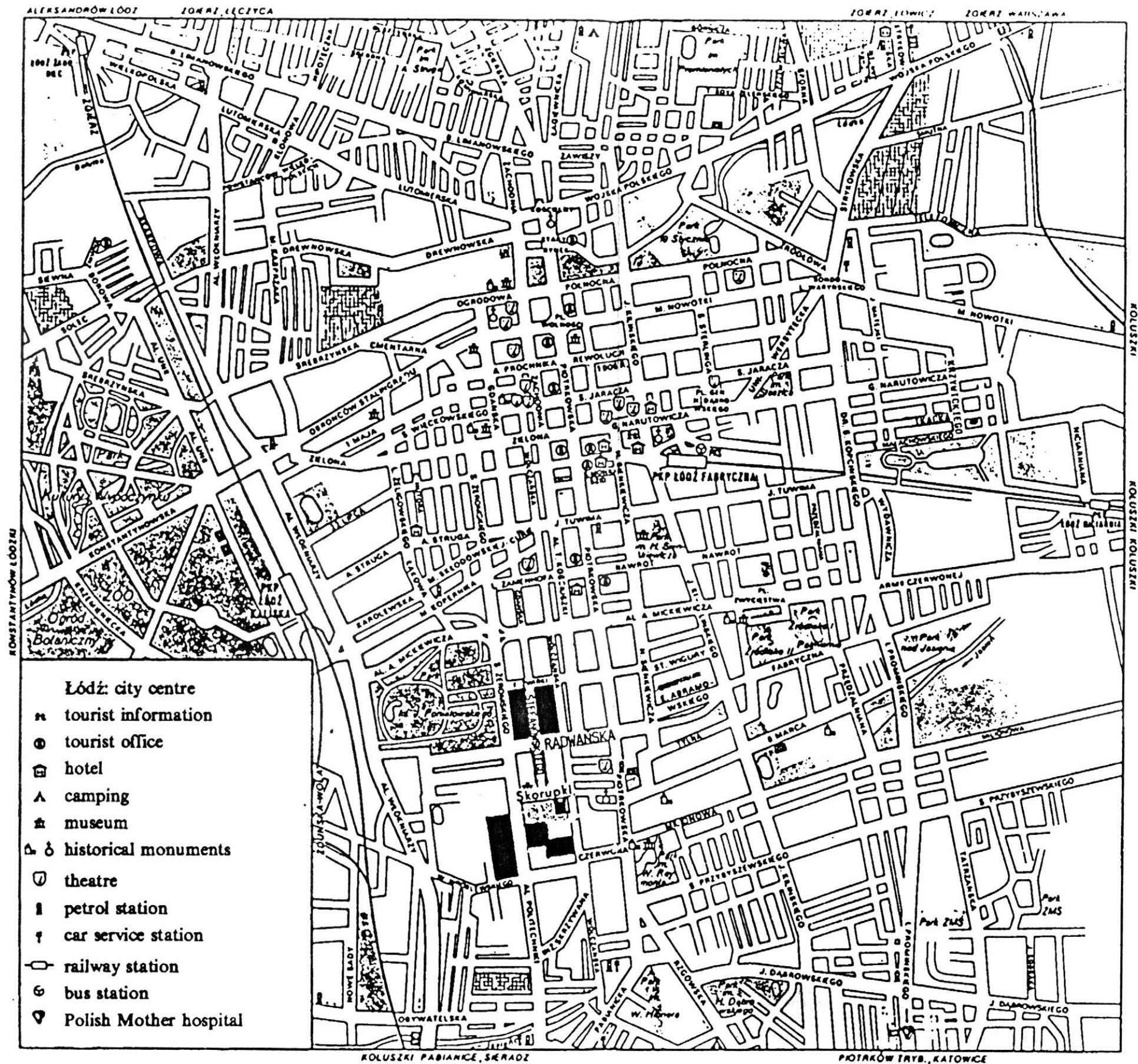
The Institute cooperates with industry in the field of:

- polymer synthesis and its conversion to fibre,
- fibre conversion to yarn and flat product (with the total morphological analysis).

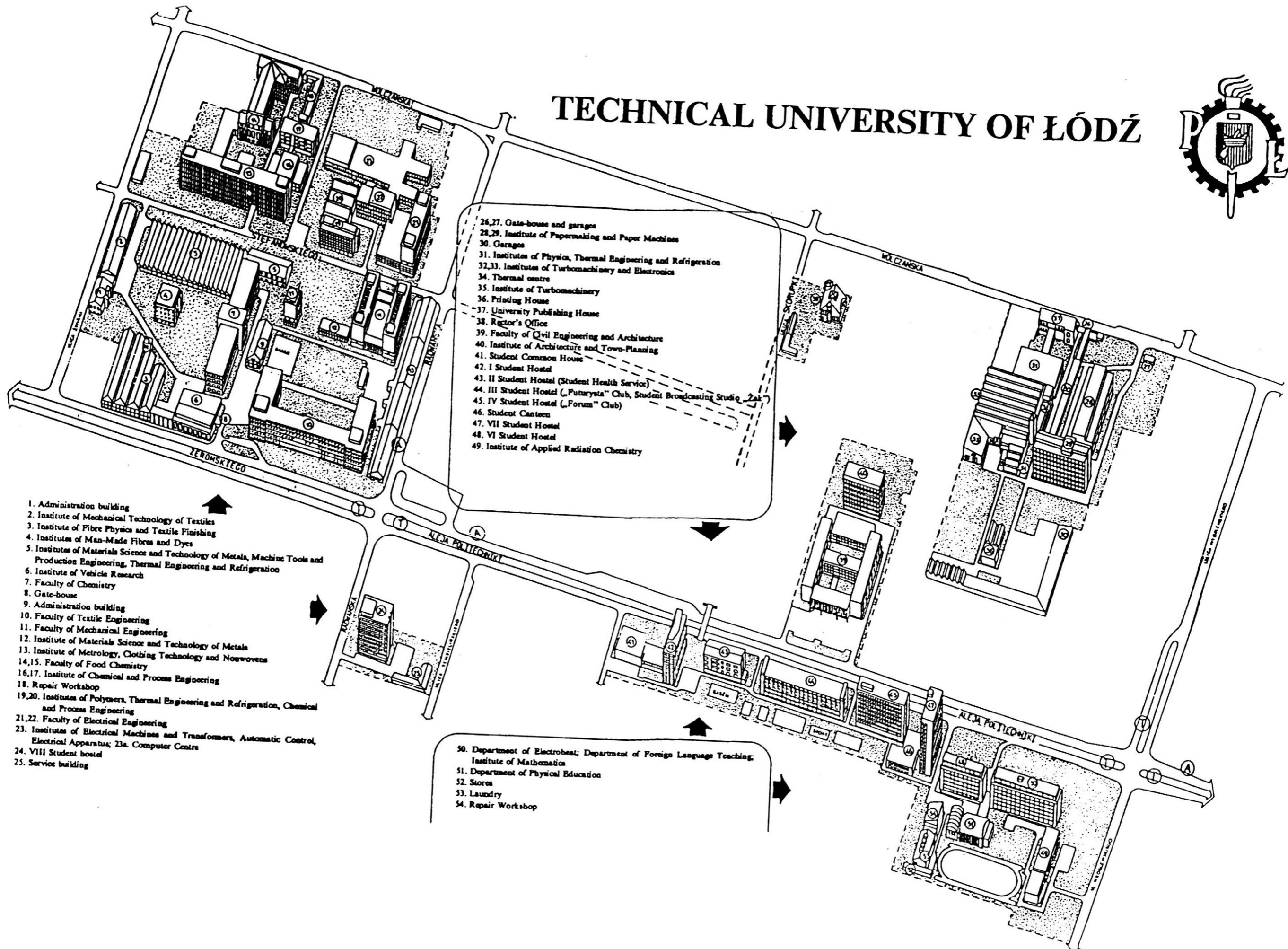
Cooperation with foreign partners: USSR, Czechoslovakia, Bulgaria, Romania, Germany, Japan, Great Britain.

Publications

The total number of publications is over 500 papers.



TECHNICAL UNIVERSITY OF ŁÓDŹ



1. Administration building
2. Institute of Mechanical Technology of Textiles
3. Institute of Fibre Physics and Textile Finishing
4. Institutes of Man-Made Fibres and Dyes
5. Institutes of Materials Science and Technology of Metals, Machine Tools and Production Engineering, Thermal Engineering and Refrigeration
6. Institute of Vehicle Research
7. Faculty of Chemistry
8. Gate-house
9. Administration building
10. Faculty of Textile Engineering
11. Faculty of Mechanical Engineering
12. Institute of Materials Science and Technology of Metals
13. Institute of Metrology, Clothing Technology and Nonwovens
- 14,15. Faculty of Food Chemistry
- 16,17. Institute of Chemical and Process Engineering
18. Repair Workshop
- 19,20. Institutes of Polymers, Thermal Engineering and Refrigeration, Chemical and Process Engineering
- 21,22. Faculty of Electrical Engineering
23. Institutes of Electrical Machines and Transformers, Automatic Control, Electrical Apparatus; 23a. Computer Centre
24. VIII Student hostel
25. Service building

- 26,27. Gate-house and garages
- 28,29. Institute of Papermaking and Paper Machines
30. Garages
31. Institutes of Physics, Thermal Engineering and Refrigeration
- 32,33. Institutes of Turbomachinery and Electronics
34. Thermal centre
35. Institute of Turbomachinery
36. Printing House
37. University Publishing House
38. Rector's Office
39. Faculty of Civil Engineering and Architecture
40. Institute of Architecture and Town-Planning
41. Student Common House
42. I Student Hostel
43. II Student Hostel (Student Health Service)
44. III Student Hostel („Putarysta” Club, Student Broadcasting Studio „Zak”)
45. IV Student Hostel („Forum” Club)
46. Student Canteen
47. VII Student Hostel
48. VI Student Hostel
49. Institute of Applied Radiation Chemistry

50. Department of Electroheat; Department of Foreign Language Teaching; Institute of Mathematics
51. Department of Physical Education
52. Stores
53. Laundry
54. Repair Workshop

