

JÓZEF ŚWINIARSKI

THE FACULTY OF MARINE FISHERIES
AND FOOD TECHNOLOGY
in Szczecin – Poland

WYDZIAŁ RYBACTWA MORSKIEGO I TECHNOLOGII ŻYWNOŚCI
W SZCZECINIE

OUTLINE OF THE ORGANIZATION

A BRIEF HISTORY

Faculty of Marine Fisheries and Food Technology was first established within the structure of Agricultural College at Olsztyn in 1951 under the name of the FACULTY of FISHERIES. This faculty enjoyed full academic rights and existed in Olsztyn until 1968 when it was reorganized according to directions of current scientific development and needs of the country, and transferred to the University of Agriculture in Szczecin where it was given the name of the Faculty of Marine Fisheries. It grew up within the structure of this institution, dealing mainly with problems of marine fisheries as well as processing and preservation of marine foods, and acquired its present name in 1976.

The Faculty enjoys full academic rights in providing fishery oriented education up to M.Sc. level and in conferring doctoral degrees in relevant fields.

The Faculty includes 14 professors, 45 Ph.D. – and D.Sc.-holders, 38 M.Sc.-holders, technical personnel, and foreign language teachers.

To date, more than 2200 students have graduated from the Faculty, among them 62 students from foreign countries, from Asia, Central and South America, and South-Eastern Europe.

During its 34-year-long history the institution has contributed considerably to the exploitation of the sea and inland waters, mainly by:

- educating highly qualified specialists,
- conducting research works,
- cooperation in fisheries with international organizations,
- organizing international symposia and conferences.

The Faculty issues two scientific periodicals dealing with fisheries problems in which articles and scientific publications of the Faculty members as well as other reports and information are published. These are:

- "Acta Ichthyologica et Piscatoria", in conference languages,
- „Zeszyty Naukowe Akademii Rolniczej w Szczecinie” – seria Rybactwo (Scientific Notes of the University of Agriculture in Szczecin – Fishery Series) in Polish with summaries in conference languages.

Extensive scientific contacts with other universities and scientific centres in Poland abroad, scholarships, participation in scientific expeditions (e.g. to the Antarctica where a Polish experimental station named after H. Arctowski is operating), participation in the international symposia and conferences, consulting, commissions and exchange of student groups have greatly expanded the activities and contacts of the Faculty which has become the recognized academic and scientific centre working for the needs of fishery.

FACULTY DEPARTMENTS

Secretary Office and Bureau of Education

Administration Section

Student Affairs Section

Department of Fish Anatomy and Embryology

Professor A. WINNICKI, Ph.D., Director

Department of Fish Physiology

Professor R. WĘGRZYNOWICZ, Ph.D., Director

Department of Fish Systematics

Dr. S. KRZYKAWSKI, Director

Department of Ichthyopathology and Toxicology

Professor A. CHODYNIECKI, Ph.D., Director

Department of Fish Biology

Dr. W. ZAŁACHOWSKI, Ass. Prof., Director

Department of Oceanography

Professor I. DRZYCIMSKI, Ph.D., Director

Department of Aquatic Zoology

Professor L. SZLAUER, Ph.D., Director

Department of Meteorology and Sea Climatology

Professor K. PRAWDZIC, Ph.D., Director

Department of Hydrochemistry and Water Protection

Dr. A. TADAJEWSKI, Ass. Prof., Director

Department of Living Resources

Dr. A. KOMPOWSKI, Ass. Prof., Director

Department of Fishing Techniques

Professor J. ŚWINIARSKI, Ph.D., Director

Department of Fishing Vessels and Exploitation of Ports

Dr.S. DUDKO, Director

Department of Fishery

Professor R. TRZEBIATOWSKI, Ph. D., Director

Department of Marine Fish Technology

Professor E. KOŁAKOWSKI, Ph.D., Director

Department of Fish Preservation

Dr. L. STODOLNIK, Ass. Prof., Director

Department of Material Science and Fish Products Quality Assessment

Dr. A. KOŁAKOWSKA, Ass. Prof., Director

Department of Food Microbiology

Dr. E. CERONIK, Director

Department of Engineering and Processing Equipment

Dr. K. MILER, Ass. Prof., Director

Department of Fishery Economics and Management

Dr. S. WRONSKI, Director

Department of Resources and Environmental Protection Economics

Dr. M. DOMAGAŁA, Ass. Prof., Director

Division of General Education

Subdivisions of Philosophy, Economics and Politics, Natural Sciences, Foreign Languages, Health and Physical Education have inter-faculty character, i.e., are common for all the faculties at Szczecin University of Agriculture.

AFFILIATED FACILITIES

- Fishing Gear Model Research Station at Ińsko
- Fishery Experimental Station at Darłowo
- Salmonid Fish Research Station at Jąźwiny
- Warmwater Fish Research Station at Nowe Czarnowo
- Pilot Plant Laboratory of Fish Processing Technology at "ODRA" Company, Świnoujście
- Electron Microscope Laboratory
- Experimental Aquarium
- Library

RESEARCH ACTIVITIES**SCOPE OF RESEARCH IN THE FACULTY****ICHTHYOLOGY AND MARINE ENVIRONMENTAL SCIENCE**

- Embryophysiology of salmonid fishes; pathology of embryonal and larval development as a result of unfavorable physical and chemical environmental factors; embryonal and

- larval development in the magnetic field; ultrastructure of eggs and spermatozoa (Dept. of Fish Anatomy and Pathology).
- Influence of stress-inducing environmental factors (temperature, overcrowding, manipulations etc.) on the homeostatic mechanisms of fish in an intensive culture. Applications of pharmacological antistressors in carp and trout culture (Dept. of Fish Physiology).
 - Morphometric and biochemical methods of species differentiation; morphology of commercial fish species; specimen-collections representing ichthyofauna of intensively fished regions (Dept. of Fish Systematics).
 - Systematic and physiological survey of marine and freshwater fish parasites. Morphology and ecology of fish parasites. Pathological changes in fish caused by parasites. Marine microbiology, fish pathology, applied entomology. Pesticides and PCB's in aquatic organisms and fish products. Analytical methodology of organic contaminants in aquatic environment and food. Polycyclic aromatic hydrocarbons. Inorganic contaminants in the environment and food. Heavy metals and other toxic elements and substances in the aquatic organisms (Dept. of Ichthyopathology and Toxicology).
 - Ecology of fish populations inhabiting natural marine and inland water bodies; age, growth rate, feeding, maturation, fertility, predator-prey relationships. Mathematic models of growth, estimation of daily food intake. Influence of environmental conditions (natural and anthropogenous on internal relations in ichthyocoenoses (Dept. of Fish Biology).
 - Mesoplankton of the Baltic Sea and Antarctic waters (species composition, biomass, weight standards, pelagic ecosystems). The Baltic meiofauna studies (systematics, ecology, with special reference to Copepoda Harpacticoida) (Dept. of Oceanography).
 - Biological purification and fishery utilization of sewage. Methods of invertebrate collection for cultured fish feeding. Application of artificial media for water purification (Dept. of Aquatic Zoology).
 - General hydrochemical characterization of estuaries, inshore waters of the Baltic Sea and lakes (water eutrophication, nitrogen and phosphorus dynamics, contamination by petroleum hydrocarbons, assessment of water suitability for fish farming, influence of fish culture upon water quality). General characterization of the bottom sediments in the Baltic Sea inshore waters and estuaries (contamination by petroleum hydrocarbons and heavy metals) (Dept. of Hydrochemistry and Water Protection).
 - Climatic conditions in the Polish part of the Szczecin Lagoon and Szczecin-Świnoujście navigation route (frequency and temporalspatial distribution of meteorologic factors unfavorable for fishermen, seamen and longshoremen). Ice phenomena within the Polish sector of the Baltic Sea and their effect upon navigation and fishing. Identification of bioclimatic conditions in the ocean fishing grounds and navigation routes (Dept. of Meteorology and Sea Climatology).
 - Characterization of fishing grounds exploited by the Polish fishing fleet (assessment of resources situation and potential possibilities of their exploitation). Biology of

antarctic fish and their population dynamics. Resources and population dynamics of carangids (Dept. of Living Resources).

- Economy and policy of resource management. Economy of resource exploitation and processing. International cooperation in marine fisheries. Economic aspects of marine environment protection (Dept. of Resources and Environmental Protection Economics).

FISHING SCIENCE, TECHNOLOGY AND ENGINEERING

- Physical properties of materials used for fishing gear construction. Characterization of fishing gear and its operational efficiency with special reference to trawls and gill nets. Methods of model fishing gear testing. Application of hydroacoustic instruments for fishing operation and the estimation of fish biomass (Dept. of Fishing and Fishing Techniques).
- Mechanics of trawling fishing gear. Engineering of fishing processes. Technology of fish transportation and unloading at sea and at fishing ports (Dept. of Fishing Ships and Exploitation of Ports).

AQUACULTURE

- Breeding and feeding technology applied to different fish species in technical appliances, and also in cooling waters. Composition, quality of feeding stuffs and methods of their manufacture. Reproduction, selection and genetics of fish. Assessment of populations of salmonid species and methods for enhancing their increase. Utilization of inland waters use in fishery (Dept. of Fishery).

FOOD SCIENCE AND TECHNOLOGY

- Effect of heat treatment on nutritive value of fish protein. Biological and technological factors affecting fish and fish products quality. Sensory and objective methods of quality assessment (with special reference to rancidity of fish). Lipid-protein interaction in fish storage and processing. Rheological methods in quality assessment of fish and fish products. Fish utilization technology. Minced fish. New product developments. Thermal extrusion. New resources of protein (krill). Processing of fish roe. Pigments of fish flesh and natural food colourants. Fish protein concentrates, meal, and silage (Dept. of Marine Food Technology).
- Fish protein deterioration at frozen storage. Substances protecting fish protein at frozen storage. Fish lipids and their changes at frozen storage. Influence of lipids on the texture of fish flesh in low temperature preservation. Freezing and frozen storage

of fish and fish mince. Analysis of freezing process thermodynamics. Changes of flavour substances in salted fish products (Dept. of Fish Preservation).

- Assessment of microbiological quality of marine food (spoilage index and pathogenic microorganisms). Factors influencing inhibition of microorganisms during refrigerated storage of raw materials. Thermal inactivation of microorganisms. Resistance, germination and outgrowth of bacterial endospores as influenced by processing factors. Influence of fish culture on the microbiological quality of waters (Dept. of Food Microbiology).

FOOD ENGINEERING

- Construction of the fish processing machinery. Construction of fish thawing machinery. Theory of biological material cutting. Mechanical evisceration of squids (Dept. of Processing Equipment and Engineering).

FISHERIES ECONOMY AND MANAGEMENT

- Organization and management in commercial fisheries. Organization of production processes. Ergonomy. Sociology of labour (Dept. of Fishery Economics and Management).

EDUCATIONAL PROGRAM

Students of the Faculty are offered a choice between the following two areas of emphasis:

1. Ichthyology and Aquaculture, Resource Exploitation and Protection
2. Marine Food Technology.

The curricula are so constructed as to meet current needs of the fishing industry in terms of providing the students with knowledge on the most recent developments in technology, legal and political aspects of international fisheries, and what is the most important in a rational exploitation of resources, their preservation and processing. Five year programs are offered to high school graduates, i.e., to those who have completed a 12-year course of pre-college school education or its equivalent, both domestic and foreign.

ADMISSION AND REQUIREMENTS

Documents required for admission to the Faculty should be deposited at the Secretary Office before May 30. Entrance examinations for the domestic applicants are held between 1–10 July. The required subjects are:

GENERAL EDUCATION PROGRAM (REGARDLESS OF MAJOR SUBJECT)

Subjects	Semester						
	I	II	III	IV	V	VI	VII
Humanities and Social Sciences Philosophy	x	x					
Economics			x	x			
Political science					x	x	
Seminar in social sci.							x
Labour and social sci.							x
Natural Sciences							
Mathematics and statistics	x	x					
Physics	x	x					
Chemistry	x	x					
Physical chemistry				x			
Biochemistry				x			
Hydrobotany	x						
Aquatic zoology	x	x					
General microbiology				x			
Ichthyology and Marine Sciences							
Fish anatomy and embryology		x					
Fish physiology			x				
Fish systematics			x				
Fish biology				x			
Fishing resources and their exploitation				x			
Oceanography and sea climatology	x	x	x				
Hydrochemistry and water protection			x				
Engineering Technical drawing	x						
General engineering			x				
Linguistics Conference languages	x	x	x	x	x	x	x
Polish (for foreign students)	x	x	x				
Health and physical education	x	x	x	x	x	x	x

biology
 mathematics or chemistry
 foreign language (one of conference languages).

Foreign applicants are expected to complete a 1-year course of Polish language (University Center for Foreigners in Łódź and (or Kraków) before beginning the education at our Faculty. The course provides a candidate with satisfactory knowledge of Polish as the studies are conducted solely in this language. Besides, the completion of the course entitles the foreign applicants to enter the studies without entrance examinations.

Required documents are as follows:

- a) application form completed in English,

**COURSE PROGRAM FOR STUDENTS MAJORING IN "ICHTHYOLOGY,
 RESOURCE EXPLOITATION AND PROTECTION"**

Subjects	Semester					
	V	VI	VII	VIII**	IX	X
Economy and politics in fish industry	x					
Population dynamics	x					
Geography of world's fishing industry		x				
Fish diseases		x				
Outline of fish processing		x				
Fisheries	x	x				
Fish preservation technology			x			
Management and organization of production			x			
Fishing vessels and ports			x			
Fishing technology			x		x	
International cooperation in fishing					x	
Legal aspects of living resources exploitation					x	
Protection of marine environment					x	
Set of optional subjects*					x	
Monographic lectures					x	
Diploma seminar			x			x

* – listed separately

** – semester internship

- b) curriculum vitae,
- c) photograph (4.5x4.5 cm portrait),
- d) medical certificate issued by the last school attended.

The prospective student submits his/her relevant documents to a Polish embassy or consulate, Ministry of Science, Higher Education and Technology Warszawa, Miodowa str. 10, or directly to the Faculty of Marine Fisheries and Food Technology.

The total period of time necessary to complete the studies at the Faculty amounts to 4 or 5 years. A student completing a 4-year program graduates with a B.Sc.-equivalent diploma, whereas after the completion of a 5-years program, the Master of Science degree is conferred upon candidates who have successfully completed and defended a thesis prepared under supervision of a senior scientific worker.

List of sets of optional courses for students majoring in "Ichthyology, Resource Exploitation and Protection" within semester IX:

- I. Oceanography and Water Protection:
 - 1. Methodology of oceanologic survey.
 - 2. Fundamentals of dynamic ecology of aquatic environment.
 - 3. Bioproductivity of water ecosystems.
 - 4. Methods of sea water pollution control.
- II. Ichthyology and Aquaculture:
 - 1. Fish breeding and rules of selection.
 - 2. Applied hydrobiology.
 - 3. Fish culture centres design.
 - 4. Fundamentals of fish feeding and nutrition.
- III. Fishing Technology:
 - 1. Mechanization of catch.
 - 2. Exploitation of fishing vessels and harbours.
 - 3. Theory of fishing gear operation.
 - 4. Ichthyolocation and fishing navigation.
- IV. Economics of Fish Industry:
 - 1. Economic analysis and calculation
 - 2. Marketing
 - 3. Organization in fish industry.
 - 4. Labour knowledge and ergonomomy.

List of sets of optional courses for students majoring in "Marine Food Technology" within semester IX:

- I. Preservation and Storage of Marine Raw Material:
 - 1. Quality assessment of fish from commercial vessels.
 - 2. Construction and exploitation of refrigeration facilities.
 - 3. Initial processing and preservation of cath at sea.
 - 4. Selected topics of designs.
- II. Food Technology:
 - 1. Selected problems of food technology.

COURSE PROGRAM FOR STUDENTS MAJORING
IN "MARINE FOOD TECHNOLOGY"

Subjects	Semester					
	V	VI	VII	VIII**	IX	X
Outline of general food technology	x					
Food microbiology	x					
Outline of marine fishing technology	x					
Construction and exploitation of fish processing machinery		x				
Fish preservation technology		x				
Economy and politics in fish industry		x				
Quality assessment of marine food			x			
Marine food technology			x			
Management and organization of production			x			
Principles of bromatology					x	
Feed and by-product processing					x	
Fish industry hygiene					x	
Set of optional subjects*					x	
Monographic lectures					x	
Graduate seminar			x			x

* – listed separately

** – semester internship

2. Food industry engineering.
3. Designing of fish processing plants.
4. Economic calculation in production.

III. Assessment of Food Quality:

1. Standardization and quality assurance.
2. Sanitary and veterinary supervision in fish industry.
3. Assessment of microbiological quality of food.
4. Food toxicology.

IV. Gastronomic Technology:

1. Technology of fish dishes.

2. Assessment of microbiological quality of food.
 3. Selected topics of designs.
 4. Hygiene in gastronomic industry.
- V. Processing and Utilization of the Feeding Stuff:
1. Feed and fodder technology.
 2. Engineering in feed and utilization industry.
 3. Selected topics of designs.
 4. Sewage utilization in food industry.
- VI. Economics of fish industry:
1. Economics analysis and calculation.
 2. Marketing.
 3. Organization in fish industry.
 4. Labour knowledge and ergonomics.

ADDITIONAL INFORMATION CONCERNING STUDIES

Students showing particular scientific interests may proceed according to individual programs under the sponsorship of a senior scientific worker. They also take part in scientific projects carried out by the Faculty researchers. Individual program is established in cooperation between the applicant and a scientific sponsor.

Specific scientific interests may also be pursued in students' scientific societies. These associations provide conditions for an independent research work. In cooperation with a scientific sponsor, the students prepare papers for symposia and organize scientific field trips during holidays. The scope of field trips is closely related to the current research activity of a particular department.

Students are provided with accommodation in dormitories and with free medical care; they are offered meals in college canteens, are entitled to library privileges, participate in cultural events and entertainment at student clubs, and recreation at sport grounds.

DOCTORAL STUDIES FOR FOREIGN CANDIDATES

Doctoral studies last 3 years (there is a possibility of extending this period depending on justified circumstances).

Doctoral students are expected to possess a fluent command of one of the conference languages, completion of Polish language being thus not required. Lectures and seminars are conducted in English and/or Spanish. Dissertation is submitted in Polish or in one of the conference languages together with summary in Polish.

There are two obligatory examinations for the doctoral candidates:

- relevant scientific discipline determined by dissertation subject,
- philosophy or political economy.

Doctoral studies include 4 semesters of obligatory seminars aimed at expanding the candidate's knowledge.

Total cost of doctoral studies amounts to US \$ 4200.00 per year. Required documents for the application are as follows:

- a) application form completed in English
- b) curriculum vitae
- c) photograph
- d) University graduation certificate
(M.Sc. degree required).

The prospective doctoral student submits his/her relevant documents to a Polish embassy or consulate, Ministry of Science, Higher Education and Technology, or directly to the Faculty of Marine Fisheries and Food Technology.

PROGRAM OF DOCTORAL SEMINARS

Subjects	Semester			
	I	II	III	IV
Conversatory in Polish language	x			
Lectures: Poland – its history, economy and people	x	x		
Methodology of research		x		
Oceanography		x		
Fishing techniques and resource exploitation		x		
Ichthyology and aquaculture			x	
Food of marine origin – methods analysis			x	
International cooperation in fisheries				x
Major Seminar			x	x
Statistical interpretation of research data		x		
Visits to enterprises of commercial fisheries				x
Excursions to Polish cultural and historical centres	x			x

IV. OTHER ACTIVITIES OF THE FACULTY

Depending on specific interests and needs the Faculty organizes postgraduate studies (1 year duration) in:

- preservation and processing of food of marine origin,

- international cooperation in fisheries,
- water pollution control,
- other fields of specific interests.

Moreover, professional training courses for specialists (especially from countries developing the fisheries) are organized in the area of:

- planning and management of fishing development,
- ichthyolocation and catch technique,
- aquaculture,
- preservation and processing of food of marine origin.

The courses are organized according to the programs set up concomitantly with particular interests of candidates. The course last from 1 to 6 months.

Additionally, the Faculty of Marine Fisheries and Food Technology offers:

1. Primary production studies and assessment of fish stocks.
2. Hydrochemical surveys of lakes, rivers and marine coastal waters from the standpoint of their utilization for various aspects of fishery.
3. Designing of lay-out and equipment of oceanologic laboratories.
4. Designing and preparation of technical documentation of fish stock production centres and fish culture installations in ponds, bays, lakes, rivers, dam reservoirs, and cooling waters.
5. Preparation of general background for and documentation of fishing vessels and gear adapted to operate in a stated area to catch desired fish species.
6. Testing of pelagic trawls and their improvement on the basis of model studies, underwater observations and photography.
7. Advisory, instructing and consulting services in the area of designing, construction and exploitation of fishing gear with special reference to trawl nets.
8. Preparation of technological and technical background for freezing process of raw fish and fish products, and for frozen storage of fish (technological data for store-rooms designs).
9. Preparation of technological documentation and technical – economical background for plants manufacturing fish hamburgers, sausages, balls, fillets and fish sticks.
10. Working out the analyses of current status, conditions and needs in fisheries development, and development programs for inland fisheries, marine fisheries and fishing fleet in selected countries.

Appendix I

NATIONALITY OF THE FOREIGN STUDENTS

Nationality	No. Graduated up to 1983	No Studying at present at the Faculty
Bulgaria	3	—
Brasil	—	2
Cyprus	—	1
Egypt	3	—
Greece	1	1
Iraq	1	1
Yugoslavia	15	1
Columbia	—	1
PDR of Korea	14	—
Costarica	—	1
Cuba	2	1
Nicaragua	1	3
Panama	1	3
Peru	15	3
Vietnam	15	—
Hungary	2	—
Venezuela	—	1

Appendix II

NATIONALITY OF THE FOREIGN DOCTORAL STUDENTS

Nationality	Complered disertation up to 1984	Dissertations in preparation
Argentina	1	1
Chile	1	—
Egypt	7	2
Yugoslavia	1	—
Mexico	1	2
German Democratic Republic	1	—
Peru	3	3
Vietnam	11	1
Venezuela	—	1

Autor's address:

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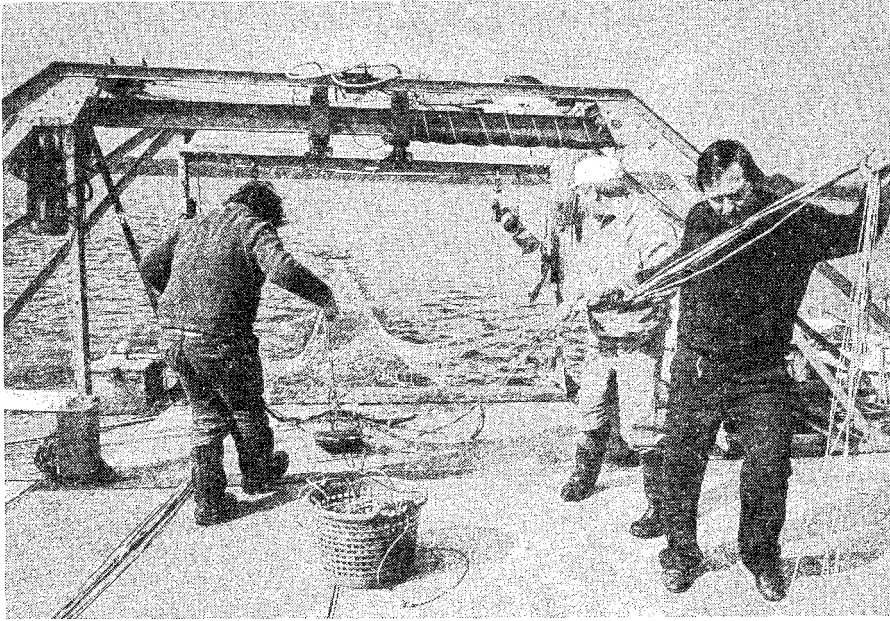


Fig. 1 Trawl trekinggear testing on board a catamaran at Fishing Gear Model Research Station at Ińsko

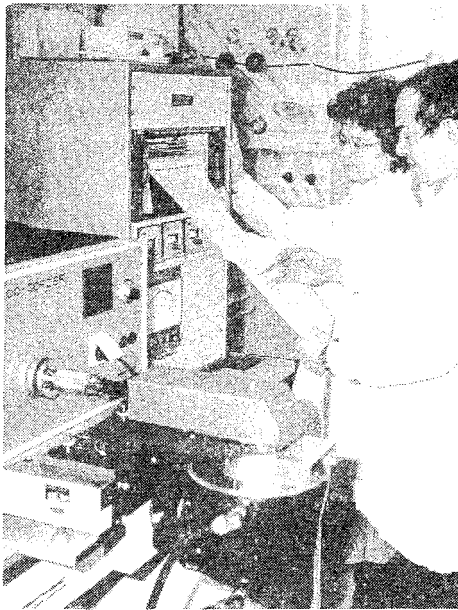


Fig. 2 Analyses in fish processing laboratory