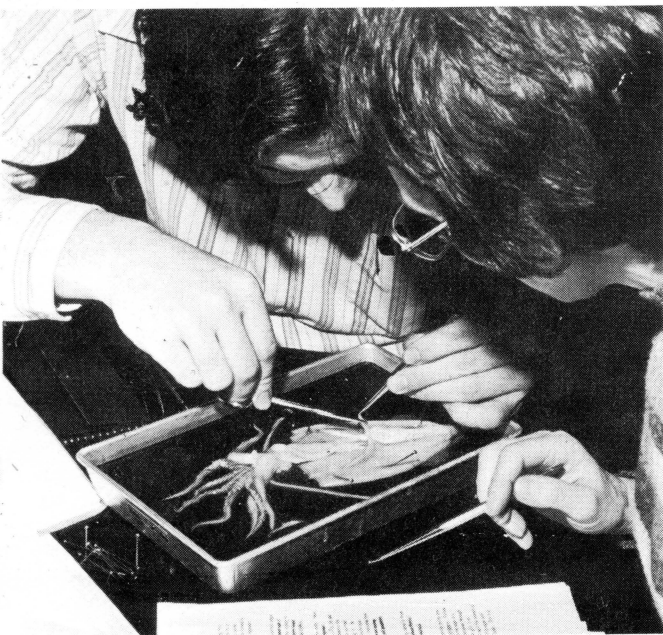


LIFE SCIENCES CENTRE

**Dalhousie
University**



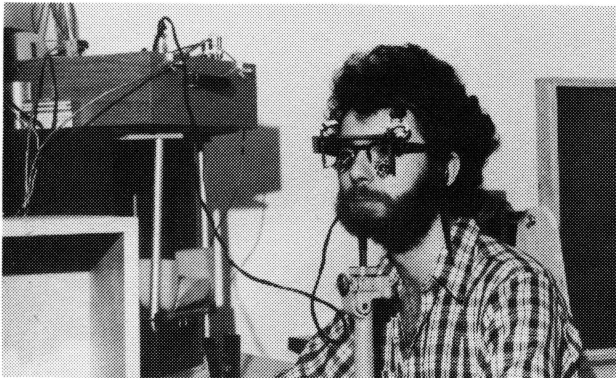
PSYCHOLOGY

Psychology is the study of human and animal behaviour. It has close connections and shares knowledge with a number of other disciplines.

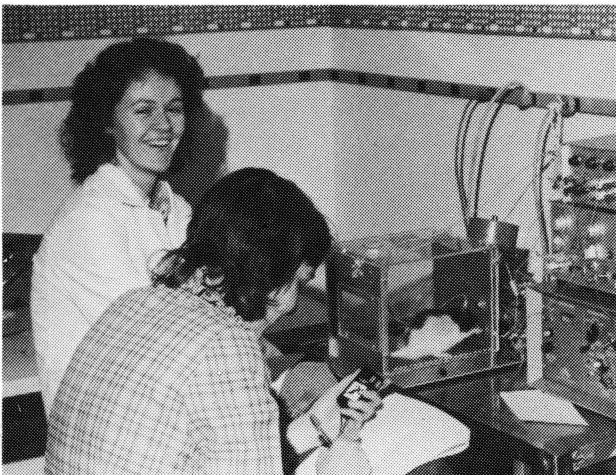
For its size, the Dalhousie Psychology Department is one of the most highly specialized departments in Canada. It has major research concentrations in animal behaviour (including animal learning), physiological psychology or neurobiology, and a third area which includes cognitive processes and social development.

Within this framework, one can find investigators seeking to better understand such processes as:

- how information within the visual system is structured and organized.
- how hormones of various glands control sexual aggressive and maternal behaviour.
- the way in which information about the world is provided by our senses and how we use this information in our behaviour.
- how complex ideas are translated into a string of words which can be understood by a listener (a skill acquired in the first few months of life).



A student demonstrates the apparatus used to record eye movements of subjects tracking visual signals.

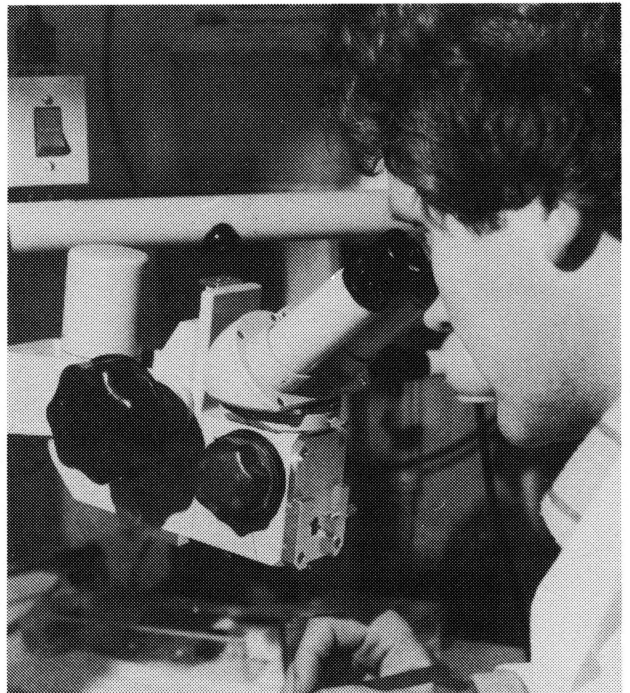


In this physiology experiment, a rat has been conditioned to press and receive electrical stimulation of the brain as a reward.

The department has been responsible for an innovative method of teaching in its first-year psychology class—one that provides self-paced instruction with individual tutorials. For students who plan to major in the subject, there's a comprehensive and integrated course of study at the undergraduate level. Students wishing to pursue advanced study in psychology are provided with specialized knowledge, tools and research methods. Statistical and experimental design, instrumentation and computer applications to psychology are on the list. And depending on their subject interest, they can concentrate on three levels of analysis - the organism, the organism's biological machinery, or the social-environmental aspects of behaviour.

There are also choices for students who wish to take a psychology class as a support for their particular course of study. For example, students in the biological sciences may seek out a course in animal behaviour or neuroscience. Social science students may look for classes in clinical, developmental or social psychology, while humanities students might lean towards a class in psychology of thought and language.

As a setting for teaching, study and research, the psychology wing of the Life Sciences Centre is ideally suited to meet all these needs. There are a number of classroom situations, cubicles for individual student experimentation, a series of lab rooms, a surgery-histology suite, specialized rooms for social interaction sessions, and standard animal areas.



A technician prepares a goldfish for a neurophysiological experiment.

BIOLOGY

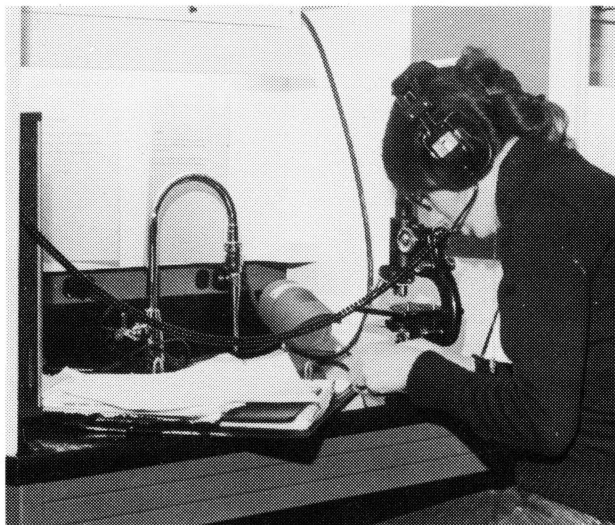
From the study of genetic patterns in generations of populations, to the examination of the tiniest living matter, research in the Dalhousie Department of Biology confirms the basic interrelationship of all living things.

As a discipline, biology has become a diverse subject. To keep pace with this diversity in subject matter, the department has expanded its teaching and research capabilities. It now includes studies in molecular biology, microbiology, ecology, environmental studies, physiological cell biology, genetics, developmental biology, entomology and parasitology. Further interest is emerging in the field of biotechnology. Research activities in microbial mineralogy, fermentation processes, agricultural technology, marine aquaculture and environmental toxicology are either under way or about to begin.

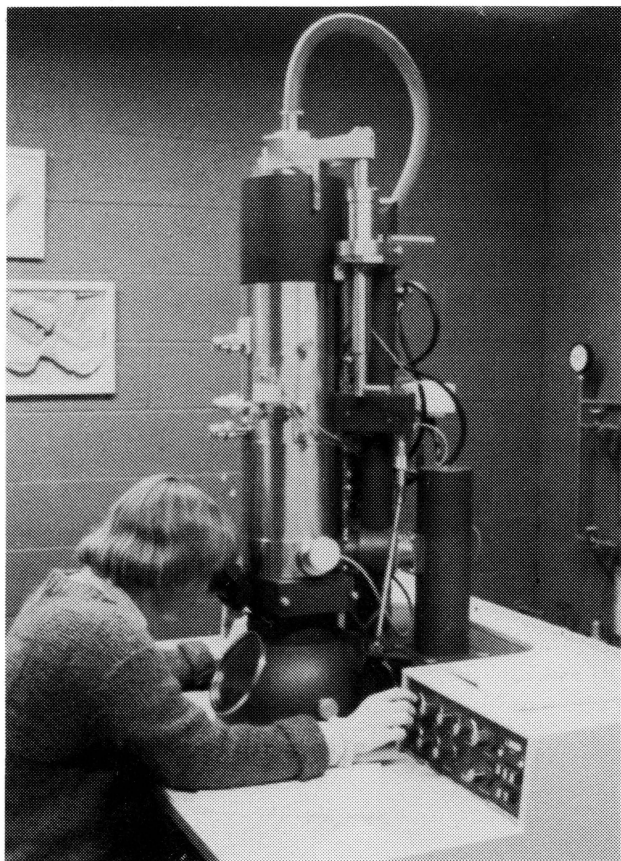
The department's facilities are an essential support for these activities. There is a block of wet labs, an aquarium room with holding areas for live specimens, a radiation facility, an eight-section green-

house with controlled humidity chambers and the pool tanks located in the Life Science's laboratory.

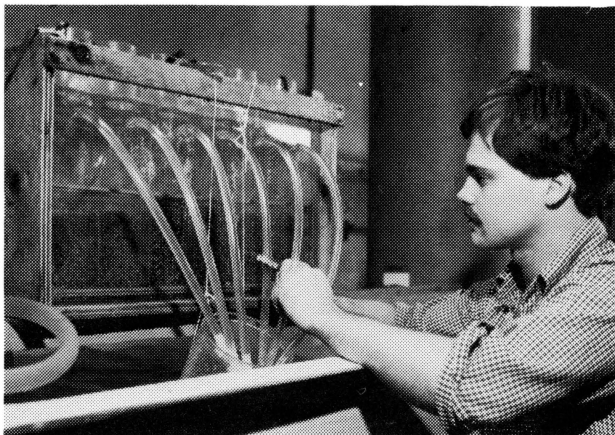
Because of the research strengths in major areas of biological studies and the research facility, the department is in a unique position to offer its expertise to colleagues within the university and beyond, and at the same time is able to draw on the resources of affiliated institutions in the area.



Attention is given to the best in terms of teaching methods. This begins with the audiotutorial, self-paced approach in the introductory biology class. There's also team teaching among staff in the department, with other departmental members (such as microbiology) and faculty exchanges with collaborating institutions. These are some of the ways the department contributes to a student's liberal education in the short space of three years and how it strives in the four-year honours program to set the stage for advanced studies in biology or other health related fields.



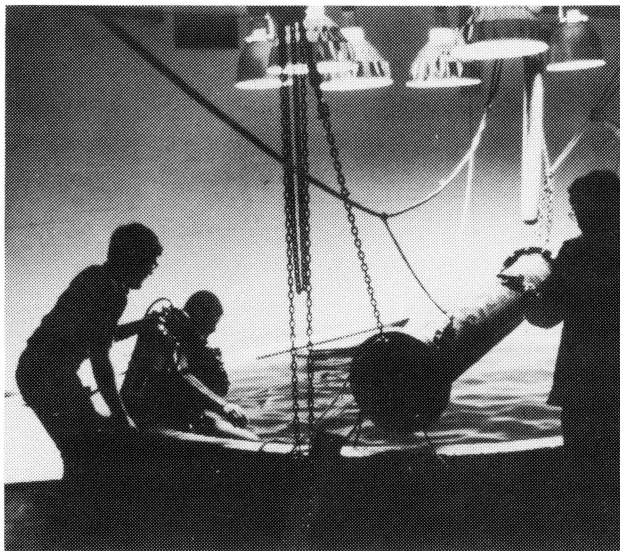
A fully functioning instrumentation unit, housed in the Biology Department, and consisting of a scanning electron microscope and two transmission electron microscopes, accommodate users at Dalhousie as well as microscopists from other labs.



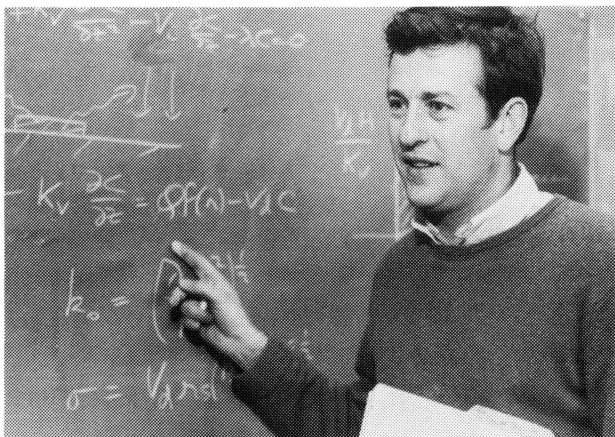
A science degree in marine biology is a recent addition to the biology programs. This student is monitoring an oyster breeding project. But there are other options. With the help of faculty advisers, and depending on their individual bent, students can consider other possibilities — environmental or human biology, a combination of economics and biology, or a course study in molecular biology.

OCEANOGRAPHY

Oceanography as a recognized discipline is little more than 100 years old. In the past several decades, however, the significance of ocean phenomena has attracted the attention not only of scientists, but politicians, the business sector, and the international community of nations.



The Oceanography Department houses an Aquatron Laboratory, a specialized marine research facility which allows scientists to control environmental variables within the confines of the laboratory. Consisting of a deep tank and high tower tank (shown here), they are supplied with sea water which can be heated, cooled, filtered and continuously circulated.



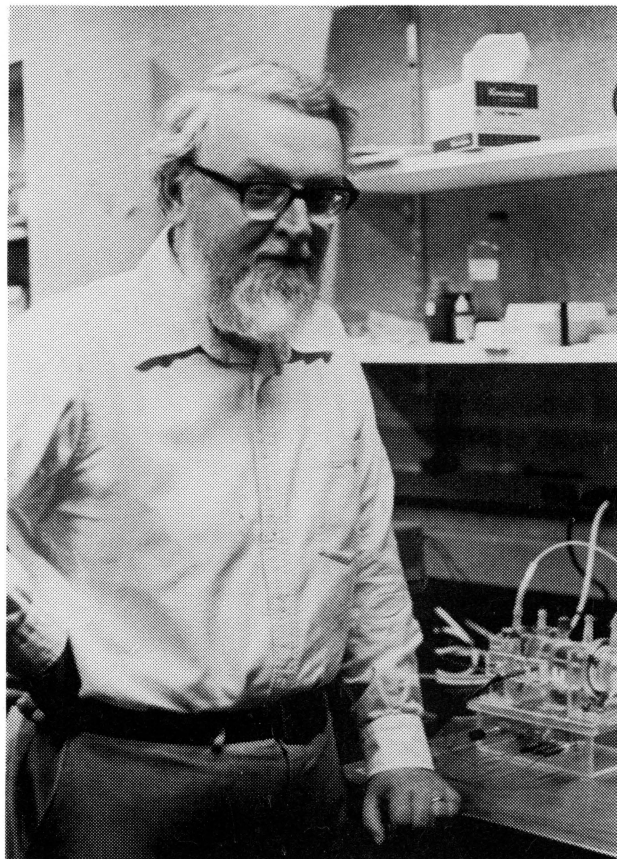
This scientist is involved in ocean mixing studies. The subject is closely linked to a number of issues: the forecast of short-and medium-range weather trends, the capacity of the oceans to accept waste (such as radioactive materials), the security of offshore gas and oil rigs, production platforms and undersea pipelines, the feasibility of tidal power, and the management of fish stocks.

Today there is discussion about ocean floor mining, the impact of oil exploration on marine life, the application of new technologies for chemical analysis of seawater, ocean circulation and world climates, and fisheries jurisdiction in certain coastal waters.

At Dalhousie, a small core of researchers have special expertise in physical, chemical, and biological oceanography, as well as marine geology and geophysics.

Research is currently under way on Fundy tides, shoreline transport, the fate of carbon dioxide in the oceans, fisheries plankton populations dynamics, biological production on the Scotian Shelf and earth tides.

The department is committed to graduate education of oceanographers. This is accomplished by undertaking active research programs and engaging student participation in the theoretical, experimental and field program process.

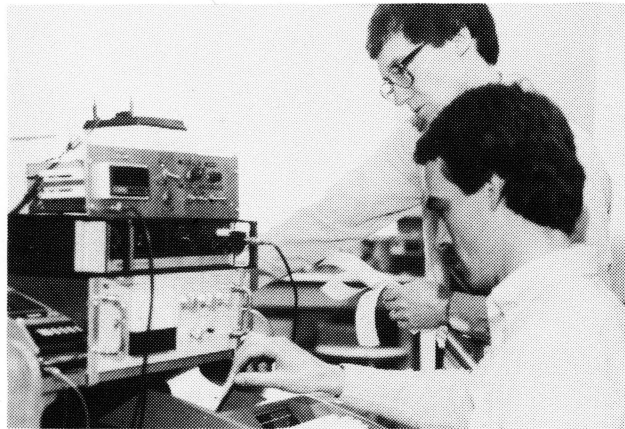


An instrument called a Turbidostat that is small enough to hold in the palm of your hand was designed and built by this chemical oceanographer. It's one of many new technological devices that aid oceanographers in their investigations. In this case it allows the scientist to grow phytoplankton cultures in controlled conditions.

GEOLOGY

For over two centuries, geologists focussed most of their attention on the continents. They regarded the ocean basins as some sort of submerged continental material. In the 1960s, when the plate tectonics revolution shook the geological world, earth scientists realized that the ocean basins held the key to understanding the earth's crust. The plate tectonics theory holds that the earth's crust is divided into a few large plates that are in motion relative to each other. New ocean floor is constantly created at mid-ocean ridges while old ocean floor is destroyed at deep ocean trenches. Where plates collide there are earthquakes and volcanism, and mountain chains ultimately form. The plates carry the continents with them, creating the phenomenon of continental drift.

Geologists and geophysicists at Dalhousie study plate tectonics through their work in marine geology and Appalachian geology. The modern ocean crust is studied by geophysical observations from ships and by sampling the ocean bottom by dredging and drilling. Ancient ocean crust can be studied in places like Newfoundland and Cyprus where the crust is uplifted during plate collisions. The continental margin, where the transition from continental to oceanic crust occurs, is the



Potassium - argon age dating equipment helps to unravel the story of how and when ore deposits were formed.



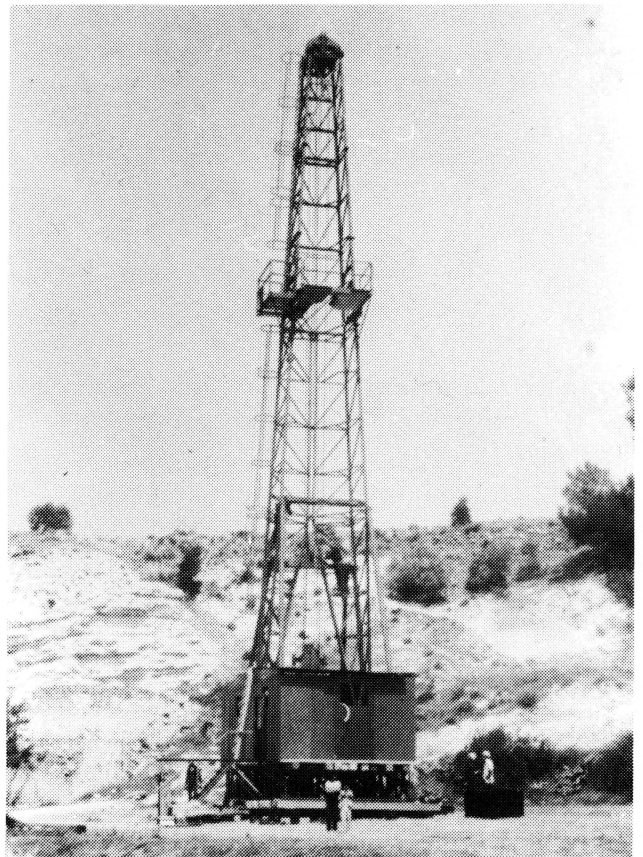
Field trips, part and parcel of the teaching program, are an added bonus for students who in the process, learn by doing.

site of thick accumulations of sedimentary rocks that are the target for offshore oil exploration in Eastern Canada. This too is an interest of the marine geologists.

Appalachian geology encompasses all the disciplines of earth sciences, and is therefore a major support for undergraduate education and training. In this field of activity rock from the Appalachian mountain range (which extends from Newfoundland to Alabama) is being matched with that of northern Europe and northwestern Africa. These rocks were formed when an ancient ocean closed, causing the two continents to collide.

The university department has achieved prominence in teaching and research in marine and continental geology. Field work is done at sea through cooperation with Bedford Institute of Oceanography, and on land not only in Nova Scotia but at sites in Newfoundland, Iceland, Cyprus, and Morocco.

Laboratories at Dalhousie include facilities for analyzing the chemistry, magnetism, age, and microscopic characteristics of rocks, minerals, sediments and fossils. Undergraduates learn not only a variety of traditional geological techniques but may take advantage of the opportunity to study marine geology.



Ocean crust drilling is one of a number of research activities carried out by faculty. Other projects deal with geophysical studies, passive margins, quaternary studies, micropaleontology, coastal, rare isotope studies, and energy-related work.

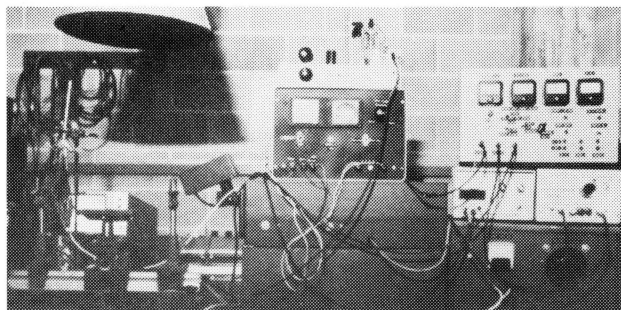
TRACE ANALYSIS RESEARCH CENTRE (TARC)

Analytical chemistry is essential to the infrastructure of our technological society. At Dalhousie, a small group of scientists within the Department of Chemistry have joined forces to apply trace analysis procedures in order to identify and determine very small amounts of elements and compounds in a wide range of materials.

This covers a broad spectrum of analytical research, much of it made possible with the use of sophisticated instrumentation. Such instrumentation is used for fundamental research projects leading to the development of new apparatus. Applied research in marine (sediments, water and fish), atmospheric (acid rain) and biological (blood, plants) chemistry is in progress.

The centre is also taking part in a five-year international development project linking it with the Centre for Analytical Research and Development at the University of Colombo, in Sri Lanka. Projects under way are related to agriculture, mining and minerals, industry and the environment—all are designed to contribute to the development of Sri Lanka.

The operation of the university's SLOWPOKE Facility is the responsibility of specific TARC faculty. This neutron source has a number of uses, among them the analysis of anti-cancer drugs, toxic elements in fish and ocean sediments, and trace elements in disease diagnosis. It is also available to other users in the university and to local research laboratories in developing methods for measuring concentrations of trace elements in a variety of forms.



Zeeman-modulated atomic absorption spectrometer developed in TARC

