

ON CAMPUS

Professor Patching is working on a problem in mining on the failure of rock in metal and coal mines. The research in Mining at this or other universities is not so prolific as it is in Metallurgy. The reason for this is that the problems which arise in mines can not be as readily investigated in the lab as the problems in Metallurgy.

More research on specific mining problems could be done, but the mining industry has been very lax in promoting such research. Indications

LAX PROMOTION

are that, at long last, the mining industry is recognizing this deficiency, and there is some hope now that greater efforts will be made to promote research on specific mining problems.

Research is financed, to a large extent, from monies provided by outside sources. Grants in the past have come from Eldorado Mining and Refining Co., International Nickel, Consolidated Mining and Smelting Co., Defense Research Board, Atomic Energy of Canada, National Research Council and others.

The total grants in the department vary from \$80,000 to \$120,000 annually. This money is used not only to buy equipment, but provides funds to pay salaries of full-time research associates and give assistance to graduate students. Besides the five academic members in the department who direct the research, there are at the moment five full time Research Associates. Fourteen graduate students are working towards their M.Sc. or Ph.D.



Small river in the hydraulics lab.

CIVIL

Professor Longworth is acting head of a department that possesses a unique facility in Western Canada—a hydraulics lab which enables them to study many of the problems of river engineering. A (controlled) river bed extends the full length of the three-year-old lab, but unfortunately, there are no opportunities for making sandpiles, except for those qualified to do so!

The river bed may be used as a hypothetical model, or it may simulate the conditions found in any particular river. The advantages of a lab like this are obvious even to an ex-artsman like me! The problems of rivers, erosion, accumulation of silt, to mention only a few, can be studied in detail by simulating the physical phenomena. To the extent that this model simulates physical phenomena, it is an analog computer, such as is now found in electrical engineering.

WATER LOST

In the same lab, a graduate student from Barbados is studying the flow of water under a coral island. Much of Barbados' fresh water supply is lost by its flowing out to sea. At the moment, the situation is not critical. However, Mr. Sealy will go home and implement the results of his research here.

Research is also being done on highways, soil mechanics, building foundations, frost heaving and soil swelling, to name only a few. A new lab for load testing and bridge construction will be available next fall.



It is to be hoped that these excellent facilities will attract more graduate students into research in civil engineering.

MECHANICAL

"Research in Engineering is the search for fundamental knowledge, and its application for the benefit of mankind. In engineering, we know certain things work, but are not always certain why they work," said Mr. Bellow. An example of this from another department, is Professor Lilge's hydrocyclone—it is effective, but research has been going on for a number of years to ascertain why it is so effective!

"Research as carried out in the Department of Mechanical Engineering is, to an extent, applied mathematics," said Mr. Bellow, in reply to my naive question as to whether it was all about engines and such... He is at present engaged in doing research for his doctorate on "analyzing transverse curvature of simply supported plates subjected to

large longitudinal curvature." This means, in layman's language, that he subjects the ends of supported metal plates to various weights, and discovers the strain at various points across the centre.

To do this, he built a 200 channel digital data processor, which measures the strain at 100 strain gauges

MAN-HOURS REDUCED

in 90 seconds, instead of the five man hours previously required! The processor, costing between \$12,000 and \$14,000 is adaptable for all kinds of different problems, such as those encountered on aircraft or bridges.

The collective opinion of the people I interviewed, was that most of the research in engineering is of a fundamental or basic nature. Yet, "there is a difference between the engineering point of view and the point of view of so-called basic science. It is essential that this difference be preserved. Because it is fundamental, this does not mean that there is no 'practical' value to it," said Professor Longworth. Professor Lilge expressed the view that "the ultimate importance of research is that it will allow us to understand and do better, those things that need doing."