

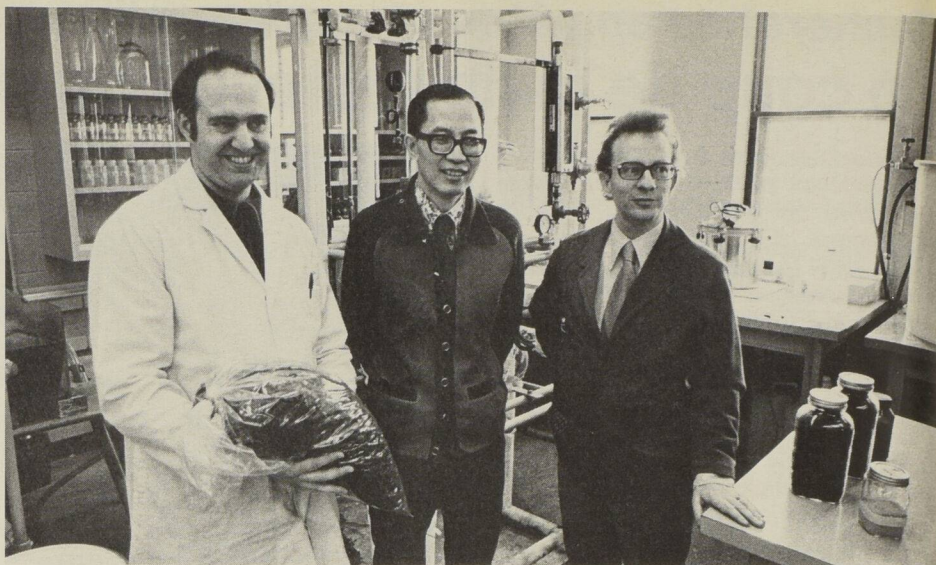
every bit as good as that of chickens from standard feeds.

Scientists are now planning experiments with larger animals such as pigs, thanks to a larger experimental production unit that will yield eight pounds of biomass per day. At present, about 60 per cent of the feedstuff used in Quebec farms is imported from Western Canada or the U.S.A.; biomass might therefore offer an important contribution to the Quebec farming industry since local sulfite pulp mills yield thousands of tons of residual liquor every day.

The economic feasibility of biomass exploitation is being studied by the industrial engineering department of the UQTR, assisted by an NRC grant. Results of the study should be available within six months.

The pulp and paper research group is also interested in the exploitation of the other major component of pulp effluent, namely sulfur-lignin compounds called lignosulfonates. Biological treatment of residual liquors extracts only carbohydrates and proteins, and leaves lignosulfonates in solution; by changing the liquor pH (degree of acidity), however, these compounds precipitate out as well. Being a renewable source of natural polymers, lignosulfonates could become the foundation of a plastics industry to replace petroleum-based compounds and UQTR researchers are currently looking for useful lignosulfonate derivatives.

Yet another facet of their work involves a search for ways of quickly



UQTR

Three members of the UQTR team developing the biological treatment method for pulp mill wastes. From left to right, technician Jean-Pierre Aubin, holding a bag of biomass, Drs. S. N. Lo and Jacques-J. Garceau.

Trois membres de l'équipe de l'UQTR qui travaille sur le traitement biologique des effluents d'usines à papier au sulfite. De gauche à droite, M. Jean-Pierre Aubin, technicien en pâtes et papiers, les Drs S. N. Lo et Jacques-J. Garceau.

measuring the quality of mechanical pulp, a type that is made by grating logs on large grindstones. Mechanical pulp is cheaper than chemical pulp (100 tons of wood yield about 96 tons of mechanical pulp and only from 35 to 75 tons of chemical pulp) but the paper made from it is weaker since wood fibres are broken during the mechanical pulping process. Newsprint is usually made from mechanical pulp, with just enough chemical pulp to give it the necessary strength. One of the main problems in the fabrication

of mechanical pulp is quick detection of variations in the quality of the product. Standard quality control testing requires fabrication of a sheet of paper that is submitted to a six hour-long series of strength, tear and burst resistance tests, a process that is far too slow to help with the routine production of hundreds of tons of pulp daily. Existing quick quality checks tend to be rudimentary and based on rule of thumb.

Explains Professor Garceau: "we are trying to devise quick and accurate methods for measuring the quality of mechanical pulp and for characterizing wood fibres. Our long-term goal is continuous control of pulp production, thanks to quality indices that would allow a computer to correct any production problem quickly."

Biological treatment of sulfite pulp and characterization of mechanical pulp are but two aspects of the active research program of the UQTR group. It has also launched a professional M.Sc. program in pulp and paper technology that is unique in North America. Group scientists are also working on the exploitation of tree branches and needles and other projects such as using mechanical pulp for making fine paper and finding new products through use of "chemical grafting" techniques.

Concludes Professor Garceau: "if our research work could prevent a single pulp mill from closing in this area, it would prove to be a profitable investment for the tax payer indeed." □

Michel Brochu



Canadian Government Photo Centre/Centre de photographie du gouvernement canadien

Faced with increasingly stringent pollution control regulations, Canadian pulp mills are going to have to redouble their efforts to protect the quality of our rivers and lakes. Biological treatment of sulfite mill effluents may be part of the solution.

Les usines canadiennes de pâte à papier devront redoubler d'efforts pour satisfaire aux nouvelles normes de lutte à la pollution et préserver ainsi la pureté de nos lacs et rivières. Le traitement biologique des effluents d'usines au sulfite pourrait contribuer à résoudre ce problème.