



As a result of the research of Canadians Bob Miller and Ted Tilby, this new machine, built in Canada, promises to revolutionize the sugar cane industry and turn waste products into valuable commodities.

A Sweetener For Industry

Sugar cane is treated by a new mechanical process with economic advantages. Previously discarded waste products can now be used as construction material.

—David Peat

For one Canadian a vacation proved to be more than just time to relax and try to forget about work. It provided the key for an invention which may one day revolutionize the economies of many developing nations. Bob Miller, a consultant to an architectural firm, visited a sugar plant while on holiday in the West Indies. This sparked off a train of thought which ended in the development of a new method of sugar cane processing.

Miller had visited one of the many sugar mills in the West Indies and watched a process which has remained virtually unchanged for 150 years. Cane, cut in the fields, is transported in wagons to the mill where it is transferred to a conveyor belt. It then passes through a series of heavy iron crushers and is pulverized into a sticky mass of sugar pulp, field dirt and cane fibres. This dark pulp, a far cry from the clear white crystals found in shops, is then processed through a series of filtration and purification steps before the liquid is evaporated to give pure sugar.

Miller was struck not only by the inefficiency of the process, but by the tremendous volume of waste material (called "bagasse") which the mill produced. Bagasse, made up of dirt, crushed fibres and the waxy coating of the sugar cane, is produced in large quantities (several tons per hour) and must be removed before it starts to ferment. In some factories it is burned to produce steam power for the crushers, while in others it is dumped into rivers.

That night, Bob Miller returned to his hotel room with a piece of sugar cane and began to think about what he had seen that day. He noted the soft pulpy interior and then examined the fibrous outer casing, which was normally burned or thrown away, and he recalled the suggestion of his architect colleague Ted Tilby to be on the lookout for waste material which could be used to produce low cost building materials.

Back in Canada, Tilby and Miller reasoned that it should be possible to extract the pulp in a more efficient manner, leaving the outer fibres intact for use as a potential construction material. After several trials, they devised the process which now forms the basis of machines being manufactured in Canada by Hawker-Siddeley for sale in the sugar producing countries of the world. Cane is cut into one-foot lengths, split, and the pulp extracted by scrapers. Instead of the usual dark mixture of pulp

and crushed fibres, the new process yields a milky-white pulp which requires less refining. The by-product of this pulp after sugar extraction is highly nutritious cattle feed.

And what of the sugar cane's outer shell? Since the fibres are no longer crushed in the new process they may be easily converted into a variety of useful materials. At one end of the scale, a simple compression and bonding gives rise to lightweight efficient insulation and soundproofing material. At the other end, a highly workable synthetic wood with good tensile strength and the density of red oak can be produced. In between these extremes, the fibres can be formed into a variety of desirable construction panels. Another product which can be formed from the fibres is high quality paper production without the need of trees.

The economic advantages of the new process are immediate. Cane, which in a conventional mill gives \$40 per ton in sugar, can now yield \$140 per ton in sugar, cattle feed and construction board. In addition, the cane industry has a more diversified market for its crop. Sugar is traditionally sensitive to economic fluctuations and the grower and refiner can find the market value of the product changing from season to season. By diversifying the industry into papermaking, cattle feed and construction board production, this economic situation can be stabilized.

Manufacture of the new machinery has been licensed by Canadian Patents and Development Limited to Hawker-Siddeley who produce the equipment in Canada. This revolutionary new method is still in its early stages, but several new plants are being built and the large sugar manufacturers are considering the long-term redesign of their installations.

The implications of this Canadian invention are difficult to estimate but may indeed be far reaching. Sugar cane flourishes in equatorial regions, making it an important crop for many developing countries. As a crop, it is one of the most efficient plants in the conversion of sunlight into nutrients, and needs replanting only every seven to eight years. The advantages to developing countries of exploiting sugar cane lie not only in increased profits but in the establishment of new industries, such as papermaking and the production of construction materials in areas where good lumber-producing trees do not grow.

The fortuitous interest of a Canadian on holiday may prove to be the shot in the arm so badly needed by the economies of many equatorial countries. ●