

New national atlas

A bound version of the fourth edition of *The National Atlas of Canada* is now available in bookstores across the country.

This edition, the first under the Federal Government's new national atlas program, which calls for a revised version to be issued every ten years to coincide with the census, provides a view of the expanding and changing pattern of Canadian life and graphically records Canada's development.

The maps, graphs and charts have been developed and produced by the Geography Division of the Department of Energy, Mines and Resources' Surveys and Mapping Branch to give a full geography of the country in four parts — physical, historical, population and economic.

The first edition of Canada's national atlas, published in 1906, was the second national atlas produced in the world. Finland introduced the world's first national atlas in 1899. The second Canadian edition was issued in 1915 and the third in 1958.

Waste ash as concrete ingredient

"Waste not, want not" best describes the attitude of a civil engineer at the University of Toronto who is advocating the use of a waste product called "fly ash" for making concrete.

According to Professor R.H. Mills, fly ash — a powdery substance produced by power-generating plants that burn pulverized coal — could be used as a partial substitute for Portland cement to satisfy increasing demand for this essential ingredient of concrete. "The next 20 years will see more concrete placed than the total

now in existence it is estimated," says Professor Mills. "This will require not only a greater expenditure of money for the high capital cost of more Portland-cement plants but also a search for viable substitutes for Portland cement."

Some engineering students and staff at the university have been investigating ways to improve the properties of fly ash for use in concrete production. They also have been trying to enhance the quality or purity of the particles of iron oxide extracted from this substance.

"The potential value of fly ash as a *pozzolan*, or cement-extender, is about \$5 a ton," Professor Mills estimates. "The iron, which is removed from fly ash before it is processed as a *pozzolan*, has a potential value of more than \$12 a ton."

Over a million tons of fly ash are removed annually from the flue gases of certain power-generating plants in Ontario by pollution-control equipment. However, fly ash is considered an expensive nuisance, since it costs anywhere from \$0.70 to \$1.75 a ton to dispose of (most of it is mixed with water and dumped into settling ponds). Developing a commercial use for fly ash would turn it into an asset.

"This has already been done for many years in Britain and Europe," says Professor Mills, "but because coal-burning power stations in Ontario are used to supply the peak power demand, it is difficult to control the carbon content of fly ash, and this diminishes its value as a substitute for Portland cement." But the problem can be overcome, and in fact, fly ash can improve the quality of concrete. For example, fly-ash concrete is less susceptible to expansion and contraction due to moisture gain or loss. "If this shrinkage can be appreciably reduced by use of fly ash," explains Professor Mills, "the potential savings in maintenance costs and increased service life can run into millions of dollars, since, in large concrete structures, shrinkage leads to cracking, and corrosion of the steel reinforcement."

Because fly ash converts lime, the most soluble component of concrete, into insoluble calcium silicates, fly-ash concrete is also more durable and resistant to weathering in unfavourable environments. It is slower to harden, but it may become stronger than Port-

land-cement concrete after about a month. Fly ash can be substituted for up to 35 per cent by weight of Portland cement in concrete.

Key to the U of T effort to improve the properties of fly ash as a substitute for Portland cement involves the use of additives which promote the growth of fibrous, rather than lumpy, material in the concrete just after it is placed. Engineers anticipate that this will make concrete less prone to cracking.

At the production level, the capital cost for processing fly ash is a fraction of that required for production of Portland cement, while the same holds true for the subsequent energy consumption of a working plant.

Housing figures for 1974

The final count of Canada's housing starts reached 222,123, Central Mortgage and Housing Corporation announced last month. The 1974 figure represents a decline of 17 per cent from the record of 268,529 achieved in 1973.

Provincial starts for 1974 (with 1973 figures in brackets) were: Newfoundland 4,911 (4,831); Prince Edward Island 1,334 (2,122); Nova Scotia 6,008 (7,734); New Brunswick 5,861 (7,235); Quebec 51,642 (59,550); Ontario 85,503 (110,536); Manitoba 8,752 (11,531); Saskatchewan 7,684 (6,386); Alberta 19,008 (20,977), and British Columbia 31,420 (37,627).

Housing completions for 1974, at 257,243, were the highest recorded with the bulk of the increase being in single-detached dwellings — 129,704 units in 1974 as compared to the previous record of 122,696 in 1973. Totals for other structural types were: semi-detached houses and duplexes 12,509 (13,479); row housing 19,225 (14,832), and apartments 95,805 (95,574).

Dwellings under construction at the end of 1974 at 168,406 were down from the 207,236 record level of 1973.

During 1974, CMHC financed a total of 30,352 housing starts, compared to 29,027 in 1973. Approved lender and other sources of financing supported 31,057 and 160,714 units respectively in 1974, in comparison to 75,649 and 164,033 in 1973. □

Canada Weekly is published by the Information Division, Department of External Affairs, Ottawa, K1A 0G2.

Material may be freely reprinted, for the use of which credit would be appreciated; photo sources, if not shown, will be provided on request to (Mrs.) Miki Sheldon, Editor.

Cette publication existe également en français sous le titre Hebdo Canada.

Algunos números de esta publicación parecen también en español bajo el título Noticiero de Canadá.

Ähnliche Ausgaben dieses Informationsblatts erscheinen auch in deutscher Sprache unter dem Titel Profil Kanada.