

Cleaning up Hamilton Harbour



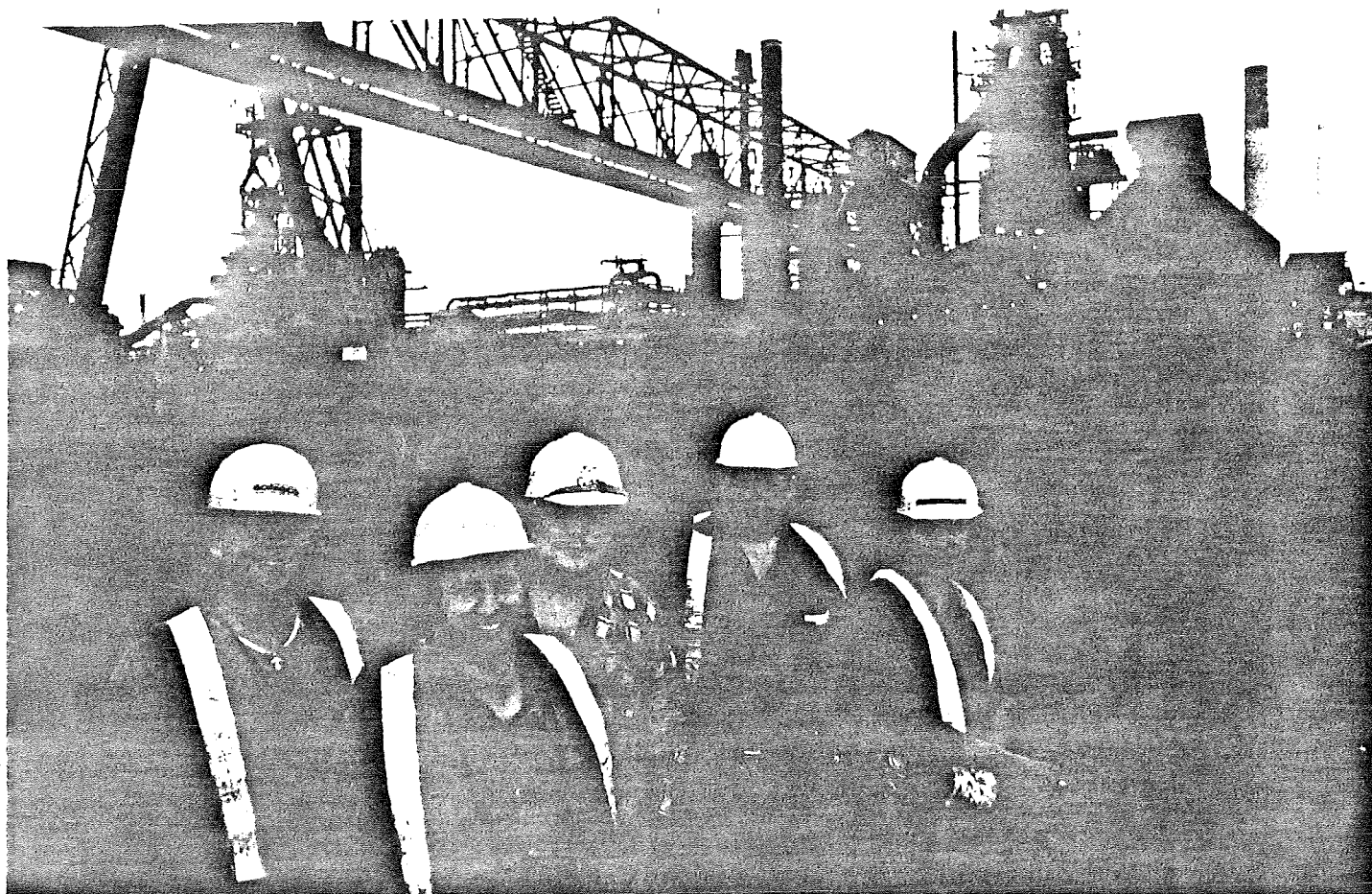
Geochemist Tania Mayer operates a centrifuge to determine the concentration of heavy metals in the water of Hamilton Harbour.

By Peter Gorrie

A VISTA of sun-sparkled, deep blue water fills the large picture window in the dining room where Gill Simmons serves coffee and shortbread. To the right, through the maze of tree limbs framing the window, children can be seen playing on a small, flat, grassy point of land that juts into the water. In the other direction, ducks and geese paddle around a rocky peninsula where, in summer, wildflowers bloom in bright profusion. Straight ahead, and down a short hill, are the weathered wooden docks of a marina. The far shore, about two kilometres away, is lush with trees; a backdrop of green in summer, a starkly beautiful



*An ambitious effort is underway
to bring back one of the worst-polluted
bodies of water on the Great Lakes*



from smokestacks protruding from the massive jumble of blast furnaces, factories, warehouses, wharves and dark mountains of coal that lines the curving waterfront. Squat freighters tie up at the docks to disgorge cargoes of iron ore pellets, coal and other raw materials. The water lapping at the grubby pilings and sea walls is a murky, grey soup — a concoction whose appearance is only a hint of the nightmare mix of lethal chemicals it contains.

Both those views — from Simmons' dining room, and from the skyway bridge — come into play in the attempt to restore Hamilton Harbour after decades of neglect and abuse. One gives the effort hope and a purpose; the other is a reminder of how difficult and expensive it will be.

Some Hamiltonians still relish their city's tough-guy image, and continue to celebrate it in such local products as the "eat-'em-raw" Canadian Football League Tiger Cats, and Steeler beer. But many have concluded it is time for change. Some are worried about health; others simply want to be able to enjoy the harbour. And many have a

practical motive: to protect jobs in the city.

Stelco and Dofasco have invested \$1 billion to modernize their operations, a sure sign they intend to stay. But their new processes require fewer workers. As well, employment is declining at other industries that grew up around the blast furnaces. Some firms are moving to industrial parks elsewhere in the region. Other plants have closed down as multinational companies retreat to the United States or shift production to Third World nations.

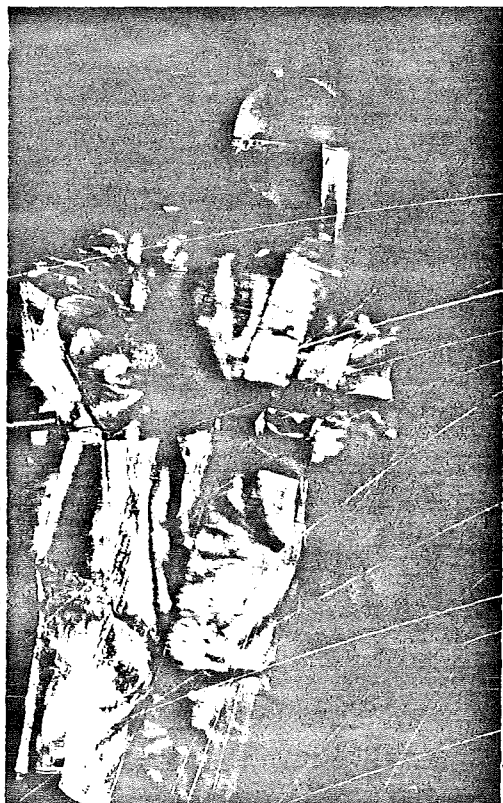
The trend is to tourism, as well as to high-tech and service industries. Although a few firms have moved in, the city's tough-and-dirty reputation is blamed for turning away many others.

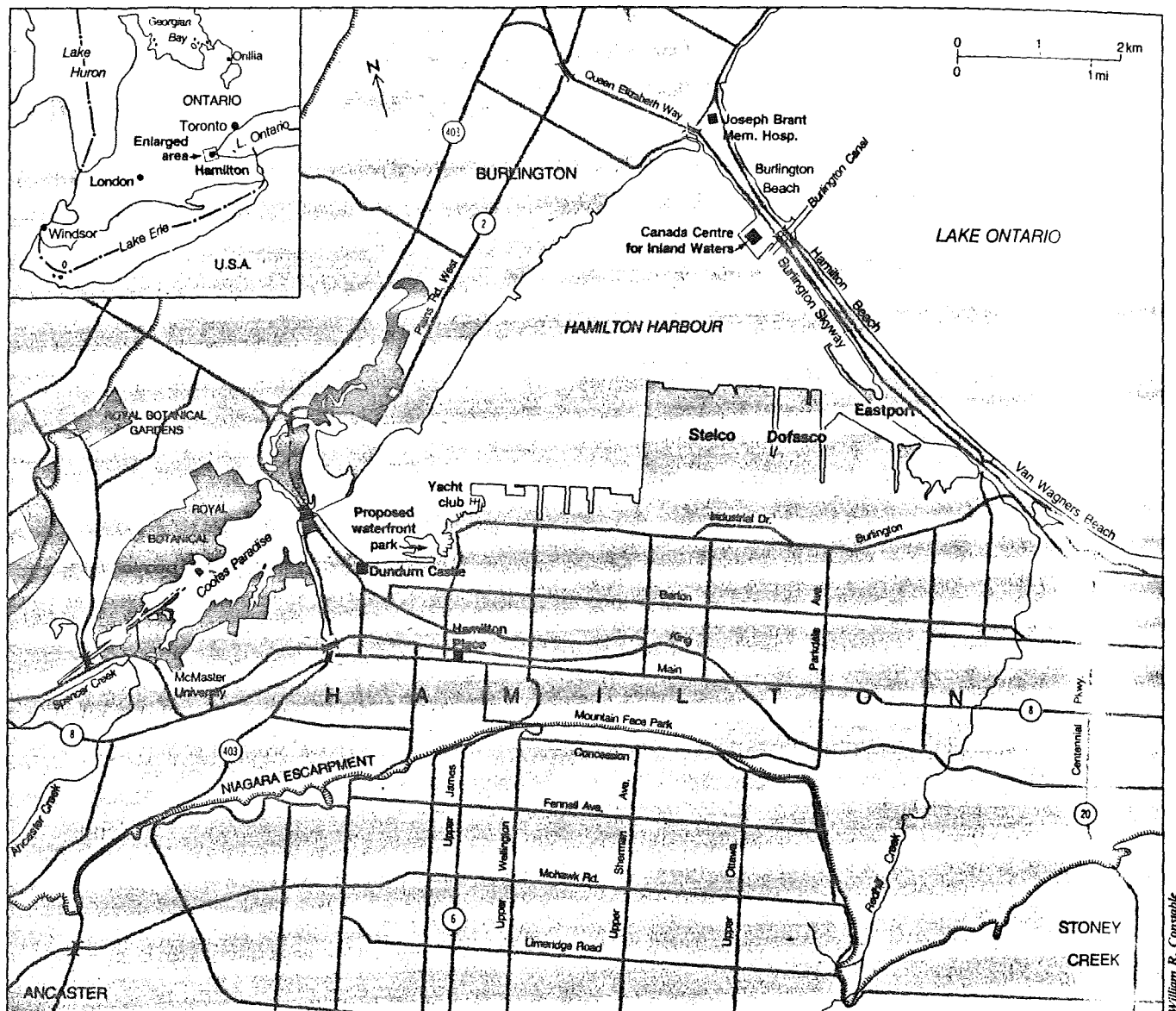
City boosters insist that Hamilton has a lot to offer, particularly a system of parks along the Niagara Escarpment that forms a dramatic backdrop to the city, and Cootes Paradise, a placid inlet off the harbour ringed by nature trails and teeming with birds and aquatic life.

Much has already been done to revitalize the city itself. In the past decade, the downtown was rebuilt, with new

Above: workers at the Dofasco pier where coal and iron ore are stockpiled. Many Hamiltonians still cherish their tough-guy image.

Below: steel companies have invested millions to clean up and modernize their operations. An unfortunate result has been fewer jobs.





convention and arts centres, office towers, pedestrian malls, shopping plazas and a coliseum, accompanied by restaurants, theatres, a much-improved civic orchestra and other amenities.

Even the harbour is cleaner than it used to be. The steel companies have spent hundreds of millions of dollars to reduce air and water pollution, while the Hamilton-Wentworth regional government, which includes the city and five surrounding municipalities, has built two major sewage treatment plants. Some fish species have returned to the bay, and government scientists detect other signs that the clean-up is having an effect.

Serious problems remain, as does

that view from the skyway, which creates the first, and usually only, impression of Hamilton for hundreds of thousands travelling the busy six-lane Queen Elizabeth Way through what has been dubbed the Golden Horseshoe — Ontario's agricultural, industrial and urban heartland.

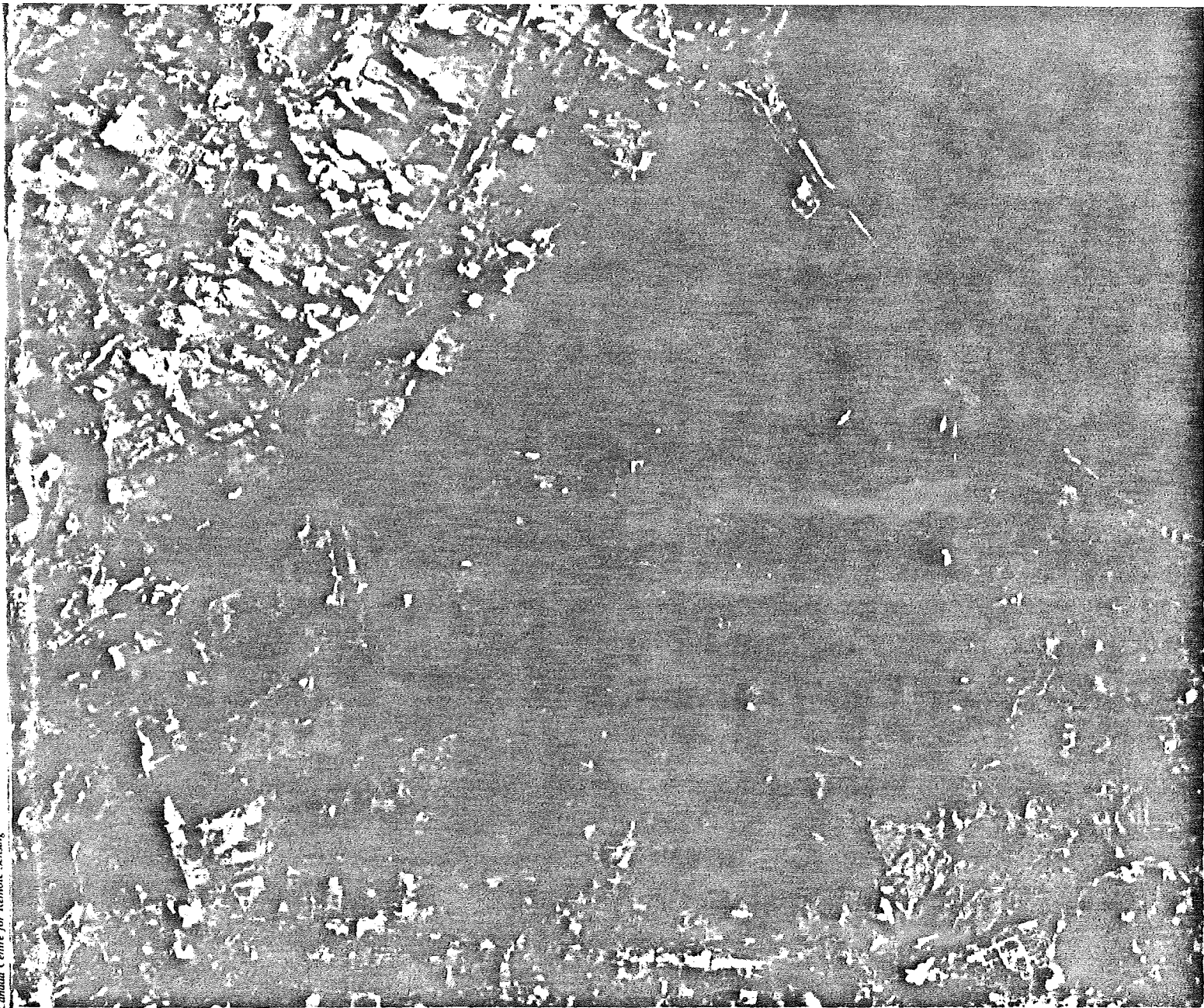
The bright spots and continuing flaws were both recognized at two recent conferences on Hamilton's future, which noted that while a publicity campaign should get high priority, cleaning up the harbour is essential.

Liquid wastes still pour into the harbour at a rate of 118 billion litres a year, fully 40 percent of the volume of the

bay itself. The pollution will increase as the population of Hamilton and its fast-growing surrounding communities climbs from the current 500,000. And the legacy of decades when the harbour was treated as an open sewer remains in the sediments — waiting to be recirculated by dredging, winds, waves and the turbulence of passing ships.

It's a far cry from the pristine treasure viewed by René-Robert Cavalier de La Salle who, in 1669 while searching for a route through North America to China, became the first European to visit the bay. At the end of Lake Ontario, he noted, "there is a fine, large sandy beach, at the top of which is the outlet of another little

Can we get a detailed breakdown



Landsat image (above) and map (facing page) drawn to the same scale, show Hamilton Harbour's triangular shape and the narrow sandspit separating it from Lake Ontario. In the satellite image, red dots indicate intense heat (blast furnaces or slag heaps) at the Stelco and Dofasco steelworks; the curving black line south of downtown shows the outline of the Niagara Escarpment; built-up urban areas are purple and blue; parks, golf courses, etc., are green; and suspended sediment (blue) filling Cootes Paradise, the harbour's western inlet, indicates serious erosion problems.

lake discharging itself”.

The crystal-clear bay was then a 27-square-kilometre stretch of water, in the shape of a triangle. The base of the triangle was a sandbar, six kilometres long and up to 350 metres wide, which cut off the bay from Lake Ontario.

A vast swamp, choked with sword grass so tough that only leather clothing offered protection against painful slashes, continued along the southern side of the triangle. There were hundreds of rattlesnakes “as big as a man’s leg”, swarms of mosquitoes, as well as plenty of bears and wolves. But the site improved, La Salle recorded, as the southern shoreline rose onto a high, steep gravel bank. The western point

aimed up the steep-sided Dundas Valley. The gravel bank blocked the mouth of the valley, trapping run-off waters to form what is now the shallow, marshy Cootes Paradise.

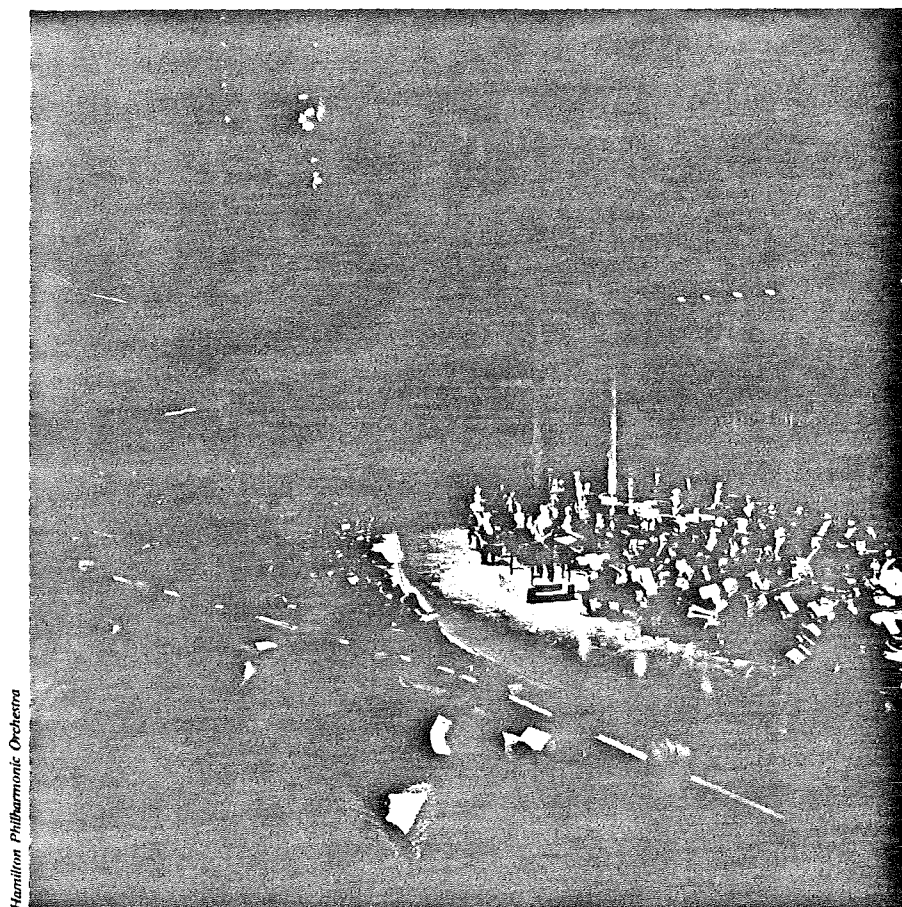
This west end of the bay was a wilderness paradise, fringed by willows and elms, where fish swam against a backdrop of clean gravel and sand. At night, thousands of waterfowl and groups of deer came to feed and drink. Herons waded in the shallows.

The place so impressed the native people they called it *macassa*, or “beautiful waters”.

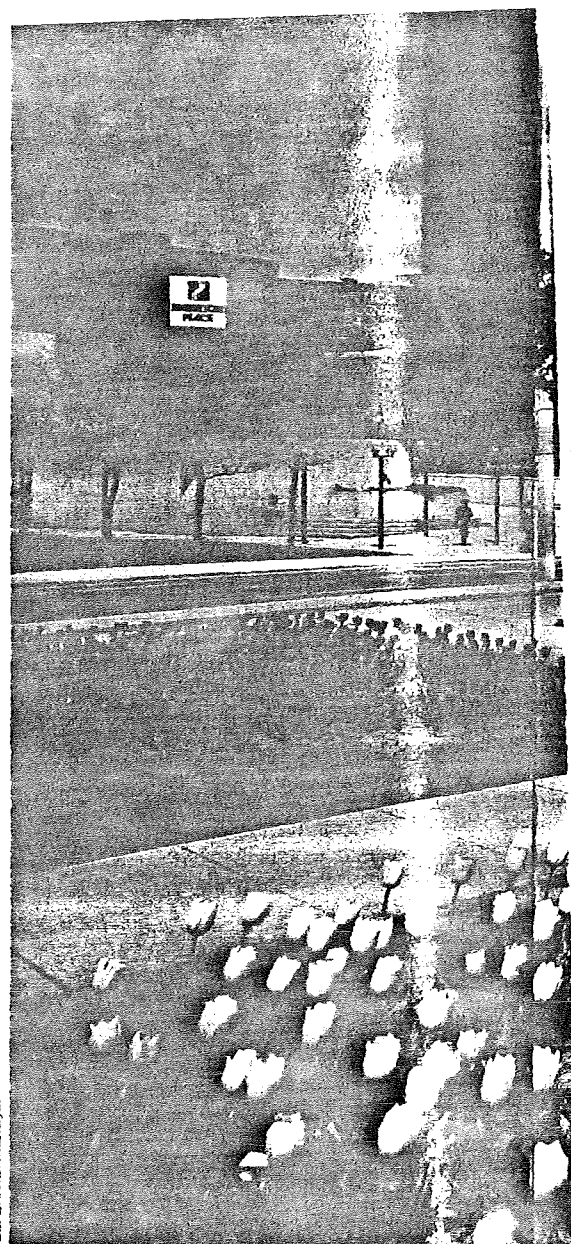
Three hundred years later, the bay is scarcely recognizable, although the shape and landforms remain. The com-

...g... Hamilton Place, with its concert hall and two theatres, has done much to revitalize the city's downtown in recent years.

Below: under the direction of Boris Brodt, the Hamilton Philharmonic has given the city a reputation for making fine music as well as steel.



Hamilton Philharmonic Orchestra



Bill Brooks/Masterfile

munity grew around the long sides of the triangle, on a sloping plain between the water and the abrupt rise of the escarpment a short distance to the south. The escarpment, which curves westward from Niagara Falls and then north to the Bruce Peninsula, gives Hamilton its most prominent feature, a 300-metre "mountain".

The sandbar (Hamilton Beach) became a summer playground for cottagers and picnickers and, in the 1960s, the foundation for the skyway. Some houses remain in the shadow of the

bridge's massive pillars. The beach is also home to the Canada Centre for Inland Waters, a modern complex of offices and laboratories where federal and provincial scientists try to solve Great Lakes water problems.

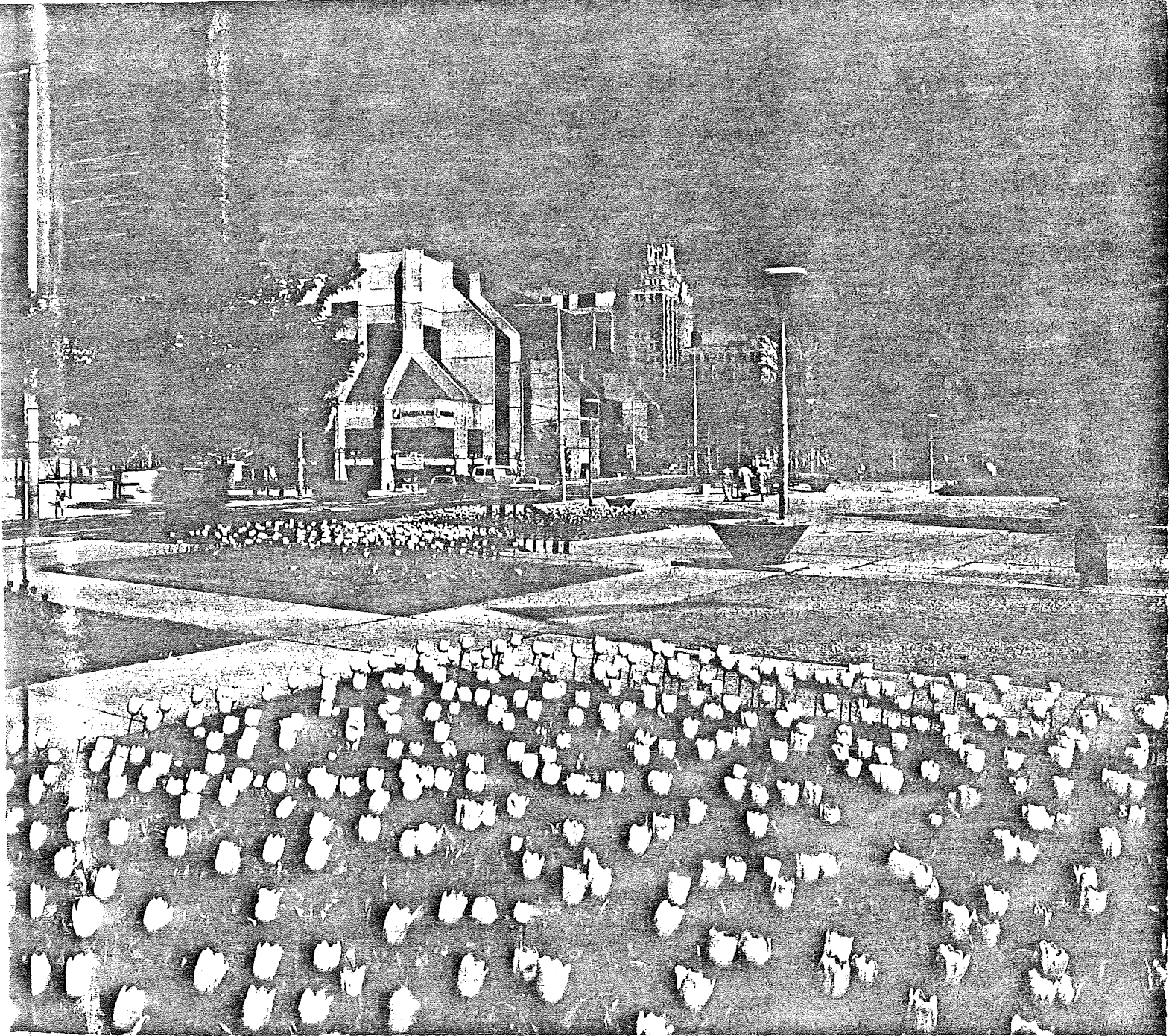
The marsh has been filled in and the old outlet is now the site of the Joseph Brant Memorial Hospital. A ship canal was cut through the sandbar in 1832 and has been enlarged several times.

The rest of the marsh is now Hamilton's industrial heart — steel mills, other heavy industries, a huge sewage

treatment plant and wharves operated by the Hamilton Harbour Commission. It is all on landfill that reduced the area of the bay by 20 percent.

The west end of the harbour, with its steeply sloping shoreline, has residential areas, marinas, golf courses, a cemetery and the city's main transportation corridor, with a major highway and rail yard.

A height of land overlooking the harbour is crowned by Dundurn Castle, a 37-room, classical-Italian villa built in the 1830s by Sir Allan Napier



MacNab, a member of the conservative Family Compact that then ruled Upper Canada, and prime minister of Upper and Lower Canada (when they were united) from 1854 to 1856. Nearby are the Royal Botanical Gardens, 1,100 hectares (2,700 acres) of floral splendour and parkland, with 3,000 rose bushes, a rock garden blooming in a former gravel pit and a profusion of lilacs that graces each spring with delicate, sweet scent (see *CG* April/May '84).

Cootes Paradise, once a lush tangle of aquatic plants that provided a haven

for birds and fish, is now open water. The marsh plants were wiped out by high water levels and pollution. Erosion and wastes from an upstream sewage treatment plant have made the water so turbid that sunlight no longer reaches the bottom. Even so, some bird species remain, and the area is popular with birders and hikers.

The changes in the harbour accelerated after World War I; demand for armaments had set the stage for Hamilton becoming a brawny, steel-making

town. Within living memory, the water was still relatively pure and teeming with pike, bass and yellow perch. It even supported a commercial fishery.

But as industry grew, the bay experienced a series of ecological assaults. Filling the swamps wiped out spawning grounds, food sources and a natural system of water purification. At the same time, shallow, rocky areas that had served as feeding grounds were dredged either to improve navigation or supply building materials. Sedimentation, and turbulence from ships, cov-

why add another one to the list



Don Rolner/Canapress

Hamiltonians are now waking up to the recreation potential of their waterfront. Here, Alderman Geraldine Copps examines a model of the \$35-million park and marina proposed for a landfill site at the west end of the harbour.

ered shoals with silt. Massive industrial and domestic wastes killed fish and the tiny invertebrates that they fed on. It also covered much of the bottom of the bay with a thick, foul ooze. Ammonia and phosphorous from the steel plants, domestic wastes and agricultural run-off robbed the water of oxygen.

(Ammonia consumes oxygen directly. Phosphorous is a nutrient that encourages thick blooms of algae. When the algae die, they settle to the bottom and decay, consuming precious oxygen. The algae also block sunlight from

reaching plants and microscopic animals on the harbour bottom.)

By 1930 the pike, bass and perch were gone. Swimming was banned shortly thereafter. Of the few fish still caught today, many are disfigured by tumours.

In the 1940s and '50s, nobody even bothered to study what was happening to the bay. Serious concern did not develop until the 1960s, when the harbour was found to be virtually devoid of all aquatic life. By the end of the decade, pollution control measures were begun,

but the scope of the damage wasn't understood for several more years.

A 1984 study detected some improvement. Scientists were surprised to find 40 fish species in the bay, and that some tiny organisms at the bottom of the food chain had returned. Today, although a few salmon are found, most species are among those considered less valuable — sucker, carp and the like — and the bay is still a long way from being able to support more desirable species.

Despite the pollution controls, contamination remains. Clear evidence came in July 1986 when 25 Pekin ducks were released into the industrialized end of the harbour. Within five weeks, 14 were dead, and only three of the survivors were considered healthy. That same month, an Ontario government report stated that levels of pesticides, polychlorinated biphenols and some heavy metals in the harbour exceeded its guidelines.

Although their wastes now contain lower concentrations of pollutants, the industries and sewage plants still pour large amounts of effluent into the harbour. In fact, sewage treatment plants are themselves the largest sources of contamination now.

In addition, untreated pollutants pour into the harbour after heavy rains, when the old sewer system, which combines sewage and storm run-off, overflows and discharges human wastes directly into the harbour. There are hundreds of other sources of contamination, leaking garbage dumps, illegal sewer pipes, and run-off from farms or city streets. It will take an estimated \$1 million just to determine what poisons these "other sources" contribute.

In 1985, the International Joint Commission produced a list of 42 "areas of concern" where attention should be focused. Clean-up work should start immediately, the commission said, at 17 Ontario and 25 American pollution hot spots. Hamilton Harbour was at the top of the list.

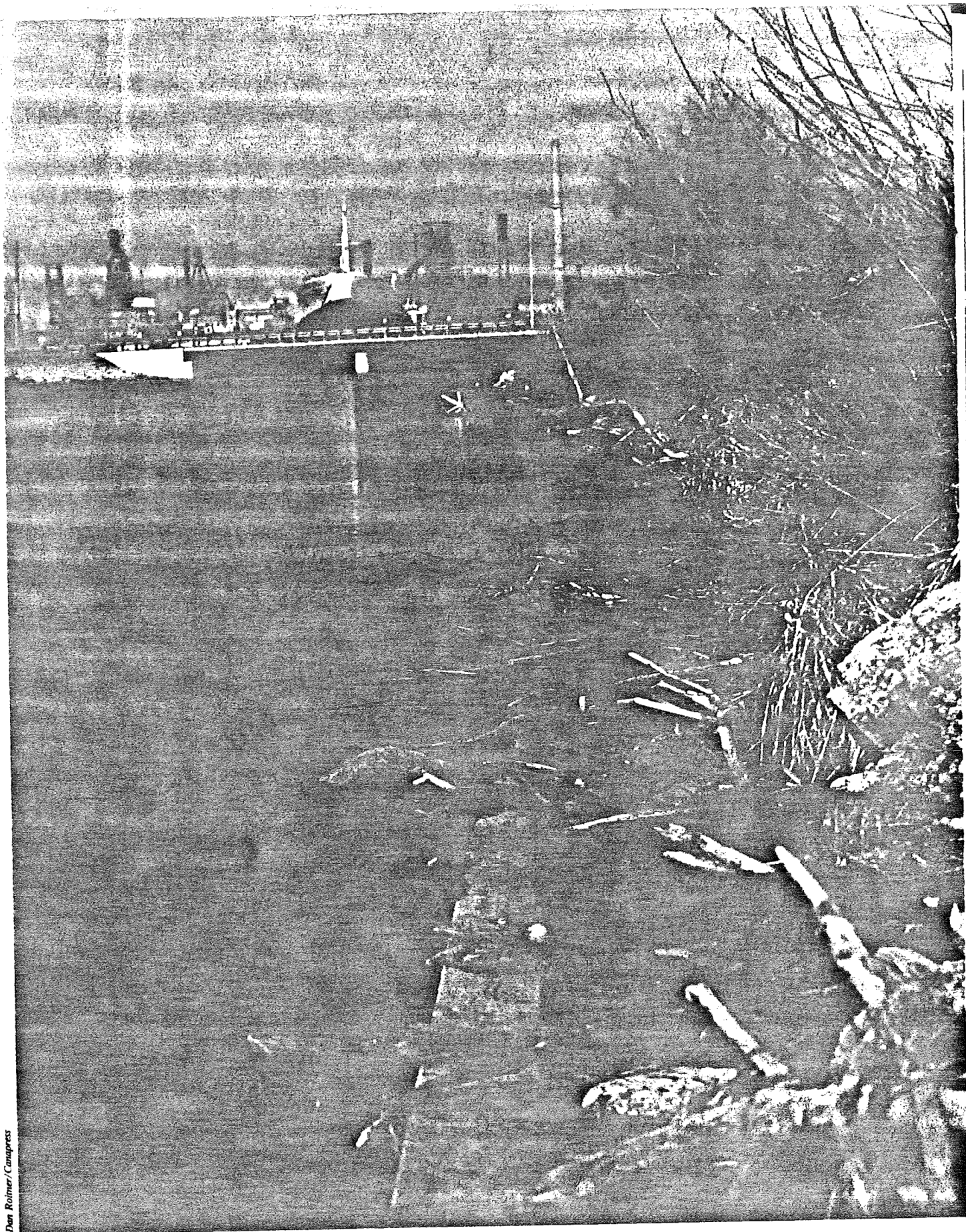
In June 1986, the federal and Ontario governments announced the start of Hamilton's clean-up program at a meeting that attracted some 300 people.

what does CRA say about this

what document is this in

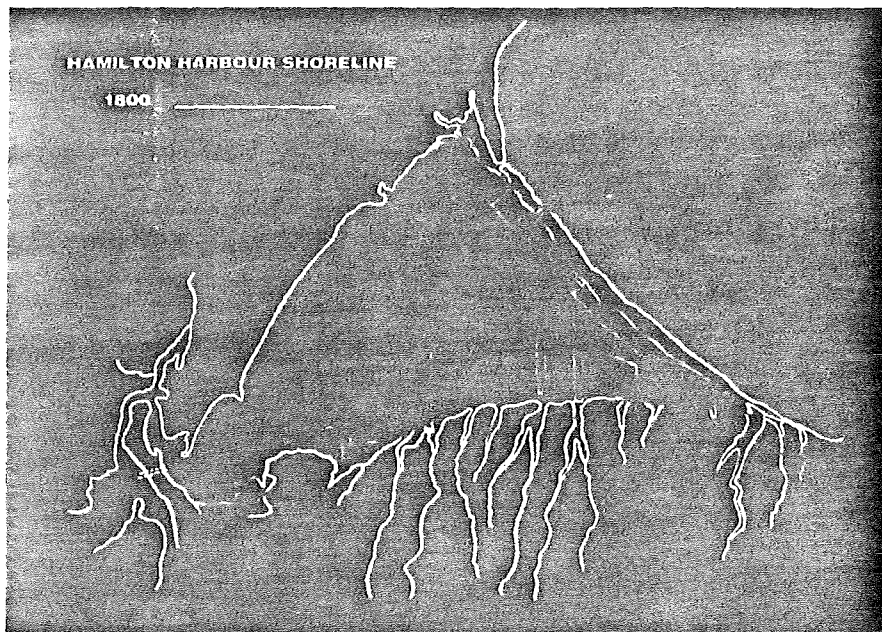
what publication

Why should Region of Halton + Min of Env - add a water one.



Dan Roimer/Canapress

For years Hamilton Harbour has been used as a convenient place to dump garbage and landfill.



Above: over the years about 20 percent of the harbour has been taken up by landfill, chiefly for piers and dockyards.

Below: sewage effluent and erosion have turned the water in Cootes Paradise into a turbid soup. The Royal Botanical Gardens, which owns this prime wildlife habitat at the western end of the harbour, plans to return parts of it to its original marshland.

*If Reg of
Hamilton
is doing this
why should
Reg of Halton
undo.*

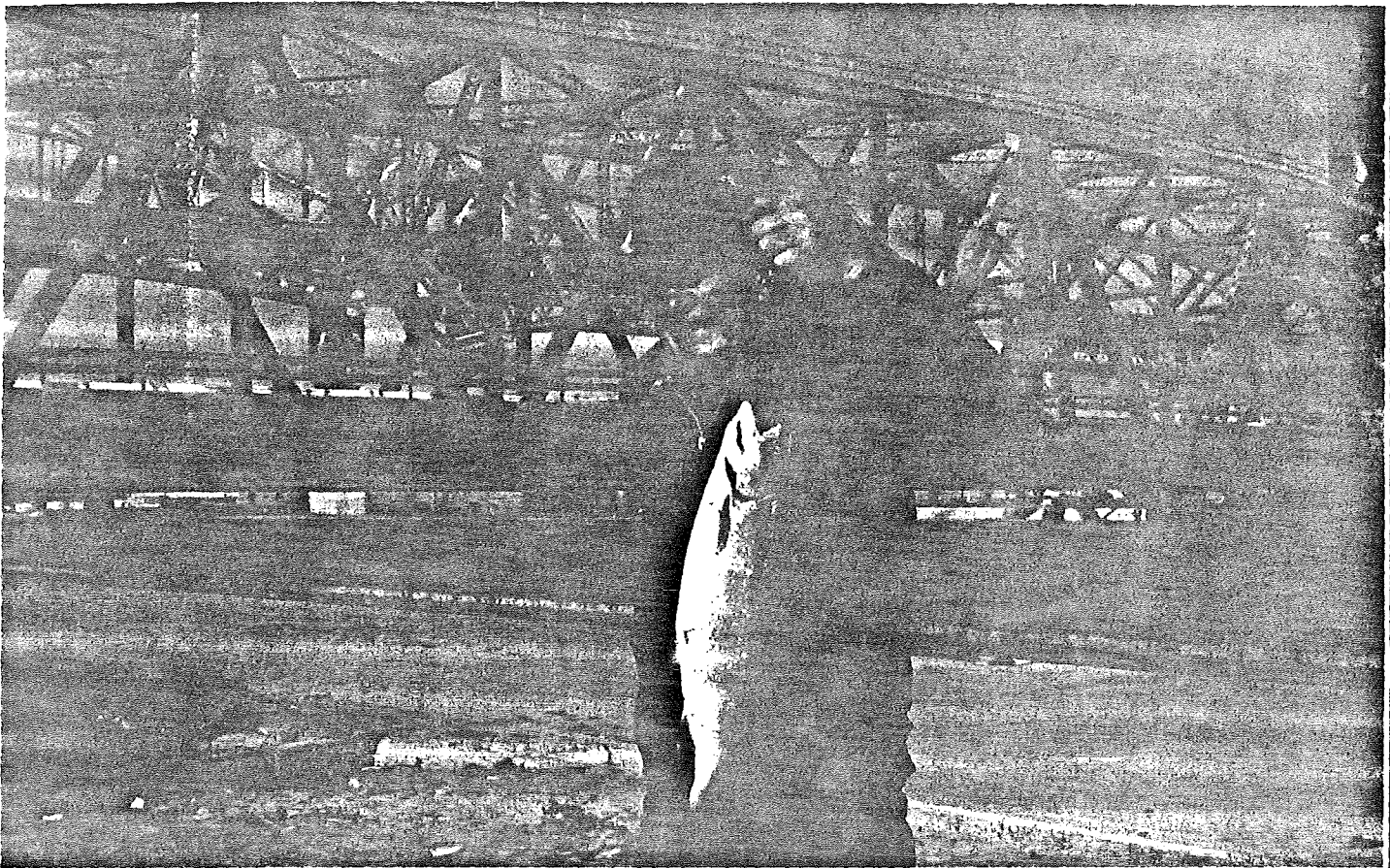
The process required public consultation, as well as scientific studies, so the governments also brought together the 49 stakeholders to discuss goals and priorities.

The group has decided to try to bring back the fish as the first priority. The target seemed reasonable and would require action on all the pollution problems.

Among the proposals:

- Add oxygen to the water, either by injecting it directly or agitating the water to bring more to the surface where it will contact the air.
- Stricter controls at sewage treatment plants, or directing the treated discharge into the open water of Lake Ontario.
- Separate storm and sanitary sewers. (The regional government has already promised to spend \$100 million on a system of holding tanks to retain storm-generated overflow water until it can be released gradually to the treatment plants.)
- Reducing soil erosion in the harbour's drainage basin.
- Building berms in parts of Cootes Paradise to lower water levels and en-





Vestige of what once were abundant: salmon. This one was caught by John McGuire in the Burlington Canal, the narrow link between the harbour and Lake Ontario.

courage restoration of marshland.

- Adding limestone or iron to the water to settle out suspended solids.

Plans are to be presented to the International Joint Commission by March 1988. The cost is estimated at \$120-180 million, not including the cost of controlling other sources of pollution. No one knows where the money will come from, but most are confident governments will eventually agree to pay.

At the same time, another group is working on a proposal to develop a \$35-million waterfront park in the west end of the harbour. The 16-hectare (40-acre) site, shaped roughly like a clover leaf, which juts out into the harbour, can be seen to the left through the Simmons' dining-room window. It was created in the mid-1970s by landfilling, carried out with the blessing of the harbour commission to create space for more industry. By then, however, Hamiltonians were awakening to what was happening to their harbour. They

raised a fuss; the city expropriated the land and announced plans to turn it into a showplace.

The property is now a jumble of rock and concrete and wild vegetation. But a model in the foyer of Hamilton city hall shows landscaped expanses of grass and trees, with shops, restaurants and public attractions. The centrepiece is a crystal palace, an elaborate series of greenhouses that will be home to Hamilton's annual chrysanthemum show. The park would also feature a man-made lake for swimming and skating, a small open-air stage with seating on a grassy hill, and a theatre to present three-dimensional films. A gondola would carry visitors across the end of the bay to Dundurn Castle, a scenic road would allow leisurely drives past rejuvenated boat clubs, and a boardwalk might curve around the shoreline, past the railway lines, to the canal linking the harbour to Cootes Paradise. But again, no one has promised money to pay for the project.

Neither plan — improving water quality or a waterfront park — calls for elimination of industry or shipping from the harbour. But those uses would be restricted to the south end, while the west half is improved for recreation.

No one knows whether the water clean-up will work. Solving some problems might create others. For example, dredging sediments might spread the contaminants around. Reducing erosion to clarify the water might simply produce more profuse blooms of algae.

But the people pushing for change remain optimistic. They also believe they can't afford to fail, for the sake of their city and for other Great Lakes communities that face the same struggle to restore their waterfronts that years of heedless abuse have damaged so severely.

Peter Gorrie is a reporter with Press in Toronto.

Who is preparing plans?

ie Hamilton Harbour model for Great