PRESIDENT'S MESSAGE

With the full cooperation of the Department of Planning and Community Development of the City of Alexandria, Virginia, we are able to deliver to each of our members the enclosed excellent brochure on the Alexandria Canal. Our former President, Dr. Tom Hahn, had an important part in the archaeological work necessary to explore and make plans for restoring the long-buried Lock Number One at the foot of the canal. Other ACS members were also involved in supplying material for the brochure, as indicated. We recommend it to your careful attention.

I am happy to report that much interest appears to be developing throughout the Northeast in the stabilization and interpretation of our historic canal remains. As you can see, from separate items in this issue, the important Illinois Michigan Canal Bill has passed both houses of Congress, two States in New England have pooled their efforts in creating a Blackstone Canal Park, and a national organization is now encouraging the formation of Greenway associations along rivers of the eastern states with canal relic preservation as one of the considerations. All this bodes well for the objectives of the American Canal Society.

Another ACS Member — Franz J. Katz of New York City — has just joined the ranks of our Life Members, bringing this important group to a total of forty-four. His article about travel on our inland waterways appears in this issue.

Bill Shank

CANADIANS MEET

Colin K. Duguay, President of the Canadian Canal Society, reports that they had an attendance of approximately forty people at their Spring Meeting and Tour of the Desjardins Canal May 12, 1984, with headquarters in St. Catharines, Ontario. Their evening program included a showing of the British film, "World of the Waterways," and Dr. Roger Squire’s slide-lectures on canals of Great Britain — all supplied by the American Canal Society. Colin says they are looking forward to their combined meeting with ACS in the Spring of 1985, which is expected to include a boat trip through the famous Peterborough Lift-Locks on the Trent Canal.

Margot Y. Jackson, Akron

On October 26, 1983 the city of Akron dedicated a handsome bit of park holding a refurbished canal lock and the skeletal frame of a canal boat.

One hundred and ten years earlier, in 1873, William Payne had opened his own boatyard and dry dock at the same spot, Lock 2 of the Ohio and Erie Canal, just north of Exchange Street. He had previously been in business at Lock 3 and, before that, had built boats in Boston Township. He is credited with building a total of nearly 150 canal boats in his long life.

Now, the land on which he worked, the area that once held brick or coal or wood or pottery for shipment and/or storage, is the youngest of Akron's city parks, properly sodded and treed and with stone benches for pedestrians' pleasure. The background noise is not of the hooves of horses or the ring of hammers and anvils, but of squealing tires and screaming sirens.

Yet the sight of the water must be quite similar. Again it comes down from Lock 1, dividing at the southern tip of the dry dock site. Some water tumbles down the spillway while the rest narrows through the lock before exploding in a fast drop to the lower canal level. The newly-built walls are a fine, clean sandstone block from the Briar Cliff Quarry at Glenmont, Ohio just south of Millersburg in Holmes County; the skeletal frame of the pseudocanal boat is of bars of solid steel. There are stone steps so that one may walk down between spillway and lock fall, feeling the mist of the churning water or seeing the droplets at diamond dust in the bright air.

Dedication speeches on that bright October day spoke of the financial and business hopes behind this restoration. Developers committed themselves to building condominiums alongside, so that Akron will be able to offer downtown residents of quality. This park at Lock 2

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VCNS ANNUAL MEETING

Bill Trout (holding “bull horn” to the right) tells the Tour Group about the Bernardsburg Locks, one of which appears in the foreground.

Bill’s eye view of the registration area at the Palmyra Court House.

A buffet-style meal was served at the Lake Monticello Clubhouse, followed by the V.C. & N.S. annual business meeting, entertainment by a local singing group (who offered us some canal ballads) and a talk by Tom Hahn, entitled “The Life and Times of the Canal Boatmen.”

Sunday found the group reassembled at the old Canal Town of Columbia for a tour of Columbia’s canal-era buildings, the St. Andrew’s Street Lock, the remains of the Rivanna Aqueduct and the Columbia Lock — all from the days when Columbia was the junction point for the Kanawha Canal and the Rivanna Navigation. A “Show and Tell” party was held after lunch. The accompanying photos were made by Bill Shank.


CLAYTON SMITH
1983 - 1984

Bill Moss, of the Canal Society of New Jersey, has informed us of the passing (April 23, 1984) of Clayton F. Smith, founder of the Canal Society of New Jersey (1965) and former CSNJ President. Clayton was personally responsible for many of the early activities of the Society, centering around Morristown and Waterford Village. He also conducted several successful CSNJ canal tours of the British Canals.

AMERICAN CANALS, NO. 49 - May 1984
AMERICAN WATERWAYS CRUISING BOOM

By Franz J. Katz, CTC

The current surge in North American waterway cruising is phenomenal. It is a dramatic development, eminently visible and geographically pervasive. Its western pivots are Alaska and Hawaii, with Newfoundland at the eastern extreme. The southern outreach areas, on the Atlantic/Caribbean side are Louisiana, Jamaica and the U.S. Virgin Islands. On the Pacific Coast, Mexican Lower California constitutes the terminal stretch.

Waterway cruising, as distinguished from mere excursion sailings, now covers most, though not all, rivers, lakes, canals, inland, coastal, inter-island and off-shore marine lanes of the North American continent. The waterway cruise fleet consists of both, deep and shallow draft vessels. The shallow water contingent provides the impressive new cruising wave, accounting for a 1983 passenger total of 57,000 persons. Deep water passenger cruising on the coastal and insular waterways functions in well established tourist regions and continues to accommodate numbers vastly in excess of the new shallow water patronage.

Long distance ferry services on coastal and insular routes employ primarily deep water craft. They function in Canada's "Maritimes," on the sea lanes from the Pacific Northwest to Alaska, through the "Inside Passage," and in the Sea of Cortez which separates the mainland from Mexican Lower California.

Another deep water coastal run is provided by the Delta Steamship Lines' West Coast Cruise, from Los Angeles to Vancouver, and back. Actually, this portion is part of the company's round South America route. The latter will be continued, but under elimination of its passenger service before the end of the year. Each of the vessels employed carried one hundred passengers, i.e., "Santa Magdalena," "Santa Maria," "Santa Mariana" and "Santa Mercedes."

North America's prime insular waterway ferry is provided by American Hawaii Cruises. They are operating the 30,000 ton sister ships "Independence" and "Constitution" year round on one week circular cruises around the islands of Hawaii. Once a year, each of the vessels makes a trans-Pacific roundtrip, from Honolulu to San Francisco and Los Angeles. The two ships had gained popularity and renown on the Mediterranean route of the erstwhile American Export Lines. In 1983, the two vessels carried no less than 57,000 passengers on their Hawaii cruises.

Ferry services impart all the romance of exotic sea travel. They are a unique genre in the coastal waterway field. They are either government-operated or, at least, government-controlled. Their amenities are excellent and their fares low, expressive of a beneficent public transportation policy.

Canadian National Marine, known as "CN Marine," is an outgrowth of the famous Canadian National Railway system. It functions in Canada's maritime provinces, also linking the latter with the U.S. Northeast. Its star operation is the 31-hour summer season run between the Newfoundland ports of Lewisporte and Goose Bay. This shuttle, in the best sense of the word, is a mini-ocean cruise.

The 13-hour voyage from Argentia, Newfoundland, to Sydney, Nova Scotia, is CN's runner-up. Americans are most familiar with the line's Maine-Nova Scotia route, from Bar Harbor to Yarmouth, a six-hour crossing. CN Marine's coastal and insular sailings offer some of the lowest priced quality sea travel arrangements in North America. CN Marine's 1983 passenger total amounted to 7,251,000 persons.

"Alaska Marine Highway" is the trade name of the Alaska State Ferry System. For years, it has been and continues to be a "bestseller" in the tourist market, setting higher records year after year. Oddly enough, this is accomplished without any standard commercial promotion! The weekly Seattle-Skagway sail-

"Great Rivers Explorer", of the Exploration Cruise Lines, navigates a lock at Bonneville Dam on the Columbia-Snake River cruise, out of Portland Oregon. The "Explorer" transits giant locks at eight-dam locks that are from 83 to 105 feet in height. (Photo courtesy Bob and Iris Spring).

ing takes 65 hours and is a year round operation. Intra-Alaskan ferry runs range from one to three days duration. The 4,000 ton motor vessel "Columbia" is the System's flag ship. It accommodates 1,000 passengers and 180 vehicles. Nine vessels constitute the System's fleet, serving 28 Alaskan ports, in addition to Seattle, Washington, and Prince Rupert, British Columbia. The Alaska state ferries carried 363,000 passengers in 1983.

Another striking sea ferry venture is the British Columbia Ferry Corporation. It serves fifteen provincial ports, with 26 vessels. Its seaway run proceeds through the "Inside Passage," from Port Hardy, on the northern tip of Vancouver Island, to Prince Rupert, normally negotiated in 24 hours, during the summer season. M.V. "Queen of the North" is the Corporation's flag ship, 9,000 tons in size, with a capacity of 753 passengers and 157 cars. Most of the Corporation's ferry operations cover a circumferential traffic density area between Vancouver City and Vancouver Island. The Corporation's

(Continued on Page Four)

The "Canadian Empress" of the Rideau-St. Lawrence Cruise Ships, on its run between Kingston and Quebec, on the St. Lawrence Seaway.

The "Cantamar" in the Sea of Cortez, Mexico.
The "New Shoreham II", of the American Canadian Line, drops its special ship-to-shore gengplank on a southern cruise.

(Continued from Page Three)

Shallow waterway cruising is now largely performed by eight carriers. The Delta Queen Steamboat Company of Cincinnati operates the country's two largest shallow draft vessels. They are the historic "Delta Queen," a national historic landmark, and the ultra-modern "Mississippi Queen." The former accommodates 150 passengers, the latter four hundred. These ships attracted almost 30,000 passengers in 1883. This is tantamount to 53% of the year's shallow water passenger total. The line's all-year sailing program takes the vessels as far north as St. Paul/Minneapolis, on the Mississippi River, and as far east as Pittsburgh, on the Ohio River.

Another Mississippi River cruising program is offered by the Paddleford Steam Packet Co. of St. Paul. Well known for sightseeing excursions at its home port, this company features cruises aboard the 50-passenger "Viking Explorer," formerly based in Little Rock and known as the "Arkansas Explorer." An unusual attraction of the Viking Explorer cruises is the company's own touring boat. It takes the passengers sightseeing at all stops and also serves as shuttle transportation for one-way cruise passengers, taking them back to their home base or vice versa, as the case may be. The Paddleford Mississippi program is sold for the entire river itinerary or sectionally, as preferred, covering the St. Louis - New Orleans route in both directions. Upon completion of the Mississippi River program, the ship proceeds to Fort Myers, Florida, whence it will return in the spring. During the winter, Paddleford's mini-cruiser will offer Trans-Florida cruises, from Ft. Myers to West Palm Beach, across Lake Okeechobee, in both directions. Paddleford attracted 1,200 passengers in 1983.

A newcomer to the field of cruising is American Cruise Lines. This line is based in Hadley, Connecticut. It operates four vessels, including the brand new paddle-driven vessel "Savannah," which commenced operating in mid-April. Lake Okeechobee cruises will also be offered by this carrier, shuttling between Ft. Myers and Hatteras, South Carolina, in both directions. These programs will be run by three of the company's four vessels, i.e. M.V. "Savannah," M.V. "America" and M.V. "Independence." An equally popular cruise itinerary of American Cruise Lines is its Southern Seaboard waterway run, with Baltimore and Savannah as embarkation points, as well as Oxford, Maryland and Beaufort, South Carolina. New England/Northeast and Hudson River cruises are the summer and early fall programs of this line. The M.V. "American Eagle" will be a major participant in the latter program. Operating with three vessels in 1968, American Cruise Lines accommodated a passenger total of 13,500 persons, establishing it as one of the shallow water front runners of the year! American Cruises' vessels were built by the Chesapeake Shipbuilding Co., at Salisbury, Maryland.

The nation's shallow water cruising pioneer is the American Canadian Line, located at Warren, Rhode Island. Its earliest sailings occurred in 1967. The cruising venture's parent is the famous Blount Marine Corporation, also at Warren. Paddleford's "Viking Explorer" and some of Exploration Cruise Lines' exceedingly successful ships have the distinction of being Blount-built. The Motor Yachts "New Shoreham II" and "Caribbean Prince" constitute the line's attractive, trim and modern fleet. During the winter season, they cruise in the Bahamas and around Jamaica. During the spring, summer and fall season, a "Northern Cruise" program proceeds through the Long Island Sound, up the Hudson River, through the Erie Canal, Lake Ontario, and the Thousand Islands, onto the St. Lawrence River and into the Saguenay River fjordland. Another one of their summer itineraries features the Weland Canal, as well as Lake Ontario.

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and Lake Huron. The line's sailing are distinguished by 12-day programs, in addition to three-day weekend excursions. And, of course, there are the trips from the North to the South, and back, at the beginning and end of the winter season, as well as the Florida, Jamaica and Florida routes. American Canadian Line's vessel becase offers some of the most varied and waterways of the industry. In 1983, it draws a complement of 1,600 tourists.

Exploration Cruises, based in Portland, Oregon, has made a distinct impact on the tourist world. It originated with Exploration Holidays, a major national Alaska tour operator. Its key figure is Robert Giersdorf, who played a major role in the early history of Alaska Airlines. The line's appearance on the tourist scene contributed substantially to the popularization of shallow water cruising. Simultaneously, it helped make the country West Coast-minded.

Alaska tourism it added the attraction of shallow water cruising. Some of Exploration Cruise Line's vessels were built by Blount. The carrier operates four vessels, the smallest of which is the "Glacier Bay Explorer," built in Boston, but high on the list in the 列Alaska coastal waters. The other ships are named "Great Rivers Explorer," "Mississippi Queen," and "Pacific Northwest Explorer." In addition to Alaska coastal runs, the line cruises on the Columbia, Willamette and Snake Rivers. Previous programs featured the Sacramento and San Joaquin Rivers, as well as British Columbia waters. The line's vessels are also charted out to other interests, for Lower California and Alaska cruises. During the month, the line operates to 24 ports, including 1,000 passengers in 1983, rendering it the third top performer in the shallow water cruise class.

The Mid-Lakes Navigation Co., of Skanesetlites, N.Y. previously confined itself to Finger Lakes sightseeing excursions, on which it carried 6,000 persons in 1983. Now, it has turned its "Miss Americ" into an Erie Canal cruiser. It now runs three-day cruises on both the eastern and western halves of the Erie Canal, including Syracuse and Waterford and Syracuse and Lockport, respectively, as well as a three-day cruise on the Champlain Canal between Albany and Whitehall.

The "Emera II," a converted ferry boat, operated by the Mid-Lakes Navigation Company, clearing a particularly low bridge on the western section of the Erie Canal. The pilot house is taken down for most portions of this cruise.

With the exception of the American-Canadian Line, no cruise operation exists on the Hudson River, Long Island Sound and the offshore waters linking New York Bay with the coast of New Jersey. The Clipper Cruise Line was established by waterway enthusiasts in St. Louis, Missouri. It entered the shallow water fray in October, 1983. Its "ultra-yacht," the "Newport Clipper," ran eleven cruises in 1983. All of them were sold out. The passenger total came to 1,100 persons for the three months period! The "Newport Clipper" was built by Offshore at Jeffersonville, Indiana, which also constructed the "Mississippi Queen." The "Newport Clipper"'s original sailings covered the Southern Seaboard. They were followed by Caribbean sailings, from Charlotte Amalie, St. Thomas, U.S. Virgin Islands. The latter were so successful that the line continues its station on the "Newport Clipper." All of them are available to an affluent clientele, hence the company's promotional form "ultra-yacht." The new vessels, as well as the "Newport Clipper," will accommodate 100 passengers.

On the St. Lawrence Waterway and the St. Lawrence River proper, Rideau St. Lawrence Cruises provides a summer season service. The line's original concept called for sailings on the Rideau Canal which, however, is currently navigable because of the contractor dispute. The "Canadian Empress" has sumptuous accommodations for 66 passengers. It links Kingston, Ontario, with Montreal and Quebec City, on five night runs. The ship's interior is fashioned after the turn of the century elegance. 2,400 tourists patronized the "Empress" in 1983.

On a distinctly non-luxurious level, by way of understatement, functions M.V. "Fort Morgan." It is operated by Logan's Navigational of Cleveland. It accommodates almost two hundred passengers on its three day St. Lawrence River run, from Rimbou to Blaine Sabion, with numerous intermediate stops, on a schedule extending from April to December.

Another two-day Lake Okeechobee cruise is available to and from Fort Myers, during the winter season, operated on a round-trip basis for $195 per person. The schedule by Everglades Jungle Cruises.

North America's oldest operating steamship is S.S. Segwun. It was constructed in 1887 and twice rebuilt, in 1970 and 1980. It runs two day cruises on Lake Muskoka, from Gravenhurst, Ontario. Its operator is the Muskoka Lakes Navigation & Hotel Company.

The newly built sternwheeler "Columbia Gorge" is owned and operated by the Port of Cascade Locks, Oregon. Once or twice annually, it undertakes two day cruises on the Columbia River, carrying 280 passengers. During the balance of the year, the ship is engaged in excursion sailings.

Additionally, Sea of Cortez cruises are offered from both Southern California and Mexican Lower California ports. Some $300 per person and expenses. Many cater to naturalists with special proclivities, such as bird watching, whale watching, hiking, etc. Two of the most prominent cruise vessels in this area are the Mexican flag boats "Don Jose" and "Cantamar." Shallow water cruising will pass another milestone in the fall. On September 29th, to be precise, the recently established Coastwise Cruise Line will enter its vessels - the "Pilgrim Belle" and "Pilgrim Belle II" - into the cruise field. The line is a division of Hyannis Harbor Tours, one of the nation's major excursion boat operators. The vessel can carry a total of 110 passengers, its first sailing will start in Hyannis and proceed to Newport, Martha's Vineyard and Nantucket Island. Subsequent destinations will be New England, the Hudson River, the Southern Seaboard and the Florida East Coast, followed by a gradual return to Northern waters. This vessel, too, will appeal primarily to a substantial class of travelers. Advance promotion of the new venture is likely to bring the success of the new entry in the field.

With 57,000 patrons of shallow water cruising in 1983 and a vastly larger number of deep water cruising clientele on our waterways, shallow water cruising is emerging as a rapidly growing major element within the framework of North American tourism.

Franz Katz is an ACS Life Member and a feature Writer for Travel and Tourism Research Association International. His address: 33 East End Avenue (A) New York, N.Y. 10022.
A CANAL-WALLAH IN INDIA (Part I)

Hindri River Aqueduct on the Kurnool-Cuddapah Canal in Kurnool. Note that the canal is no longer used for navigation, firewood is carried into town on bullock carts such as this. (Bill Trout).

By Dr. William E. Trout III

(This is the latest of our reports on foreign canals, designed to help pave the way for others lucky enough to reach exotic places. Readers are urged to contribute.)

India's navigation canal era corresponded roughly to ours: it began in the early nineteenth century, declined as the railways and then trucks took over, and is now in a relatively quiescent state. The difference is that all of the canals which have been abandoned for navigation were also irrigation canals so are still flourishing even though their locks are derelict.

Someday, perhaps, an archaeologist will find a genuine Indian navigation structure on an early canal, but by all accounts the canals had no locks until the British became the paramount power in India and began building them in the 1820's. India's canal system is therefore a museum of British engineering as adapted to India's geography, geology, and labor force.

While in India in 1883 I had a fortnight to sample different parts of the canal system, and was able to visit the unfortunate Kurnool-Cuddapah Canal in the southern interior, the Krishna River Delta system on the east coast, and the Dooab and Upper Gangetic canals in the northern plains. This is a report on that brief visit.

My first stop was to be "Houghly Point" in Poona, the home of Capt. U. Shanker Rao, who was the subject of articles in the British Waterways Board's magazine back in 1977. Capt. Rao, 'The Mark Twain of India,' had been a pilot on the Houghly River for 33 years before he retired in 1966 to found the "Indian Centre for Maritime Economics and Creative Innovations," a personal effort to encourage improvement and appropriate use of more of the inland waterways, and to improve the lot of the boatmen. His motto was "Small is Beautiful" and a favorite proposal was the use of "baby dredgers" to make the small rivers navigable again. Several years ago the Indian Navy invited him to create the National Maritime Museum (unfortunately for us with nothing on canals) located on Maritime Island off the Gateway to India in downtown Bombay. Your boats at the Gateway can take you there, but make sure first that it is open - in India you need to ask several people and take the majority opinion! Capt. Rao and I were going to work out a grand tour of the canals but I found that he had died a year ago. His files on inland canals, and the manuscripts of his book on inland waterways, are, I hope, in the museum or another safe place. This article is respectfully dedicated to the memory of Capt. U. Shanker Rao.

The Kurnool-Cuddapah Canal

My canal explorations began far from the teeming cities in the teeming town of Kurnool (all Indian towns are teeming), a 100-mile, 6-hour, meter-gauge steamtrain ride south from Hyderabad, in central southern India. Here the Kurnool-Cuddapah, or "K-C" Canal was constructed in 1883-1870 by the Madras Irrigation and Navigation Co., Ltd. According
to the Triennial Review of Irrigation in India, 1918-1921 (Calcutta, 1922), the canal was "a chapter of failures" and as large a scale as the classic works have been successes." It was intended to be part of India's most ambitious irrigation and navigation scheme with 4,000 miles of navigable canals forming a continental route through Kurnool. Unfortunately, cost overruns and engineering mistakes forced the work to stop due to lack of funds and the government took it over. With only the isolated 414-mile, 47-lock K-C section begun. According to the Review, the local farmers had been doing quite well without any irrigation, and as for navigation, "the canal runs from a few inches to now are in particular, and consequently there is nothing and nobody to carry."

Now, with India's population burgeoning, the canal has regained its importance for irrigation, but navigation has been long abandoned. With no more need to maintain a relatively slow flow for navigation, in 1956 the locks at the locks were eliminated and the canal bed lined with concrete in order to increase the flow to 3 feet per second. Ironically, the K-C Canal may once again become an artery of commerce as part of the 2,000-mile north-south Ganga-Cauvery Link Canal for irrigation, hydroelectric and transport. The 1972 United Nations study of the National Water Grid (UNDP #72-45107) is ever acted upon, and if history does not repeat itself.

Next to the local canal office on Railway Station Road I was shown one of the cut-stone locks. There is a drop of only a few inches now are 105 feet, essentially the same size as canal-era locks in the U.S. The old locks in India generally range from this size up through 20 by 150 feet.

From the lock I took the ubiquitous cycle rickshaw, or pedicab, a few blocks downstream to the canal's best-known feature, the Hindri River Aqueduct. This is an impressively long, 14-arched structure; whether there is stone or concrete is not known. The banks of the wide river are covered with clothes drying in the sun, and by women beating more noisy clothes against the rocks to literally pound the dirt out.

In a country with few cars, the Indian canal is particularly unprofitable and expensive, so for 70 cents I was able to take an afternoon excursion to the head of the canal, at Sunkeal Anicut (or Dam), 27 km upstream. A bus ride in India is quite an experience, paralleling along on one lane roads with horn blaring (Continued on Page Seven)

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to clear the way of trucks and buses, sacred cows, water buffaloes, goats, donkeys, bullock carts, women piled with firewood or hay, and the odd camel, veiled lady, monkey and python, and rarely hitting any of them. In the middle of December this was also a harvest time so there were piles of hay in the road for the bus to run over, to help with the threshing. There was more excitement when my bus had to stop while I was informed the driver and a passenger had an argument about the route the bus should take.

Sunkesula is a little firewood cutters village with several thatched-roof cottages. Sticks and limbs are floated down to the Anicut on reed rafts and carried to the village where everyone in the family spends all day cutting and splitting wood into foot long sections, tying up small bundles with reed, and loading them into bullock carts for a long, slow trip into Kurnool. On the way back at night the bullock carts are tied together in a string so all but the lead driver can get some sleep. In the old days, perhaps the wood might have been sent down the canal. Nearby is the Anicut, an impressive stone and concrete dam spanning the wide Tungabhadra River, from the canal headworks and official's bungalows on one side, to a walled village with temples on the other. There is no sign of any guard lock now, but there is a stagnant canal nearby which I was told was never a success - perhaps it leads up to the original guard lock and anicut, which is part of the sad story of the canal were almost completed before the site was found to be unsuitable and had to be abandoned.

The Krishna Delta Canals

From Kurnool I spent a day on a bus, climbing over the coastal range to Vijaywada, one of the several towns along the east coast at the head of a river delta canal system. Here where the Krishna (or Kistna) river flows between two solid hills three-quarters of a mile apart is the Prakasam Barrage, from which fans out a network of 349 miles of main canals and some 2,000 miles of distributaries, irrigating over 700,000 acres. In the model museum nearby one can see how the barrage began in 1953 as a low stone structure 15 feet high, built on the river's shifting sands. Planks to raise the water level were added in 1953, then automation from hand shutters in 1958. A model of self-propelled steam 'plough' shows how it used to rumble along the dam, automatically levering each shutter up to the vertical position. The plough itself (now without its steam engine) is still at the west end of the dam at the Plough House.

All this was superseded in 1963, the anicut's centenary year, by the present barrage, the city's most spectacular sight, a line of some 70 yellow stone piers with lift gates between them, spanning the broad river. It also serves as the highway bridge for the region so one can take a long cycle-rickshaw trip across it, or better, walk, to properly appreciate its length and to see the mason's marks. My favorite mason is "VB" who was skilled at stonework but not at spelling, usually managing to put the "i" in the wrong place - on its back, or backwards, or looking like a pair of spectacles. You'll find his work at Gate 69 near the museum, and also near the middle of the barrage. Someday a study of these marks should tell us something about these otherwise anonymous workmen. You'll also find mason's marks on older structures in India, including the mosques around the Taj Mahal.

There is a stone lock at each end of the barrage, with 16 by 150-foot chambers, and (now) metal miter gates opened by a rack and pinion, and with counter-weighted gate sluices: there is quite a variety of lock architecture in India. The 40 or so locks in the canals which fan out from here are of the usual 15 by 105 feet, some with balance beams. The locks at the barrage are in pleasant parks complete with monumants and shrines. The lock at the west end leads south to the Buckingham Canal in Madras, and is in open, palm-studded irrigated farmland. In its lock park is a little domed pavilion in Vijaywada on the Krishna Delta canal system. (Bill Trout).

"In memory of Sri K.V. Sankara Iyer, Superintending Engineer, and his wife, who were drowned in the Krishna Western Main Canal at O.M.S.E. on 15-10-1935."

At the east end of the barrage, in town, is the Vijaywada Lock and the Model Museum. When I was there the lock was being drained to remove a boat which had sunk a few months back in the monsoon season. Since the boat blocked open the upper gate, scores of men and women were busy carrying baskets of sand on their heads from a barge moored in the river, throwing the sand into the canal to build a temporary dam. The pumps had made some headway, revealing a few deck planks and a metal tiller, but the operation was clearly going to take a long time. The Superintending Engineer told me that in any event, few boats used the canal anymore, now that trains and trucks had taken over. I only saw two canalboats during my three days in Vijaywada, and they weren't going anywhere.

In Vijaywada, the Kistna Eastern Main Canal branches into three navigable canals, each with a look downstream: the Elleor Canal, which is the main line up the coast; the Bundar Canal next to the river; and Rythala Canal in between. Together with the river they give a seaside air to Vijaywada and are handy landmarks as you travel by rickshaw or look down on the city from the heights of the Temple and Gandhi Hill.

Other Canals in the South

There are scores of other canals along India's east coast, especially in the Ganges, Mahanadi, Godavari, Kistna, and Cauvery delta. Most of these are linked by the Buckingham, Elleor and other coastal canals so that except between the Mahanadi and Godavari deltas, one could travel by canal along the entire east coast, from Calcutta almost down to Sri Lanka (which also has a canal system), and make use of hundreds of miles of branch canals.

(To be concluded in the next issue of AMERICAN CANALS.)
STILL AND THE PANAMA CANAL

A typical steam shovel photographed during Panama Canal construction, handling some particularly heavy loads, circa 1912.

By William T. Richards

"Steam and the Panama Canal" was originally published as a series of short articles in "Engineers and Engines Magazine." ACS Director William J. McKelvey, Jr., made arrangements with the author - William T. Richards - to publish it as a series in AMERICAN CANALS. However, we have taken the liberty of putting it all together, with the excellent photos supplied by Mr. Richards, and with some editing. For the complete story of the politics and engineering behind the original building of the Panama Canal, see TOWPATHS TO TUGBOATS (May 1982) as published by American Canal and Transportation Center, York, Pa.

When Count Ferdinand de Lesseps had completed the Suez Canal in 1879, he was hailed as the greatest canal builder in the world. Such praise went completely to his head and he turned his attention to promoting a canal through the Isthmus of Panama. With complete confidence Lesseps brushed aside several engineering surveys and began work at Panama with the excavating equipment which had worked well at Suez. Removing great amounts of sand in the Suez project was vastly different from rock and unstable material encountered at Panama. Result, after bankrupting two companies and squandering the proceeds of a National French Lottery, Lesseps gave up the project of Panama and abandoned the equipment to the jungle. Moreover in the 10 years of French effort (1879-1889), 2000 Frenchmen lost their lives to Yellow Fever.

Just as soon as America completed political arrangements with the Republic of Panama, arranged financial payments with the defunct French Company they began a program of sanitation to wipe out the mosquito and Yellow Fever. Now attention could be given to "make the dirt fly!"

With the shortcomings of the French effort and more particularly French digging equipment before them, American engineers designed equipment - all steam powered - to cope with the known difficult project before them.

This article describes the new and specifically designed steam powered machines which - in the hands of able and determined Americans performed the greatest feat ever undertaken by ancient or modern day engineers. The intent here is to share with readers a pride in American ability and a better respect for the might of steam power.

The Steam Shovel

The introduction of the American Steam Shovel to Canal excavation at Panama takes first place in success of the undertaking - in contrast to failure and abandonment by the French. Against all engineering studies, the French excavating companies brought to Panama steel bucket conveyors which, admittedly had been very effective in moving great quantities of sand at Suez.

The Continental Divide at Panama, however, was rock, interspersed with dirt which became muck during the prolonged rainy season. Result: French workmen spent much time and dynamite breaking rock to be loaded on conveyors by hand and in cleaning, by hand, conveyor buckets and chains fouled by sticky dirt which stopped further operation. It must be said that the French achieved some progress, failed only by epidemic deaths from Yellow Fever and from excavating tools wholly inadequate for the work at hand.

Judged by modern standards the American shovels sent to Panama seem primitive. What with greased log chains to hoist the bucket, a pair of operators, one to operate the hoist and swing-engines and a second man on the boom to operate the cross-engine and the trip rope. In operation this team of operators were able to handle any material in the path of the shovel - on occasion balancing rock weighing 10 to 12 tons and to efficiently place such a rock on the dirt train - nudging it into a secure position.

There were 101 such excellent machines shipped to Panama - nearly all railway-mounted - few equipped with wood-faced caterpillar treads for special situations. The total of the 101 machines was 220,000,000 cu. yards of material. Someone has calculated this to be the equivalent of digging a hole, 13 feet square through the earth at the equator. Certainly it is construction of the Canal at Panama that stands as the greatest modification of Nature ever attempted by man - ancient or modern - and this by a factor of 3 to 1.

The Track-Shifters

As Americans took over from the French to dig a canal at Panama, they took note of and corrected a French weakness which, in itself, would have prevented success in the venture. You see, the French contracted digging by sections, paying scant attention to the light rail and gauges varying at the whim of the several contractors. American engineers, by contrast, viewed the undertaking as a unit - knowing full well that mighty real estate was being built for rail transport on the job.

Accordingly, American Railroad engineers laid our standard gauge, heavy rail tracks using standard switches and 161 locomotives - principally 2-6-0 switching type. During the peak of operations this was the busiest railroad in the world, having 14 parallel tracks and dispatching a loaded dirt train every few minutes.

Obviously, when a steam-shovel completed a cut, a track 9 feet closer to the bank is required for another cut to be reached. This was the function of the track-shifter. With this machine a crew of 9 men could shift 100 feet of track - rails and ties together - normally shifting 5400 feet, or just over a mile of track in a day's time. This amount was the labor of 800 men if the track had to be dismantled and put together again by hand.

Also, when the dirt train reached its destination - a dump site or a site where spoil was used in construction - the track-shifter was used to keep track near enough to deposit dirt in its intended place.

Nine track-shifters were in use at Panama. Early models were complete with boilers while later models took steam from its attending locomotive. It is interesting to note that track shifting was (Continued on Page Nine)
regularly done under torch light at night so come the next morning shovels or dirt-trains found a track in place upon which to resume work. It is also to be noted, in this greatest excavation project ever completed on earth, that ingenuity was matched by a spirit of dedication which has seldom been equalled.

The Legmerwood Unloader

Without a doubt few people have taken time to realize the quantity of water required to operate a lock canal such as the Panama Gateway. For example, one lock full of water is lost to the Atlantic and to the Pacific Oceans for every ship that traverses the Canal. Consider that a Panama lock is 1,000 feet in length, 100 feet in width and 40 feet in working depth; now, realize the locks are double for two lanes of traffic and they operate night and day and you come up with a demand for a considerable and constant demand for water, accordingly, it was determined the flow of the Rio Chargos would do the job.

The result was the Gatun Dam on the Atlantic end of the Canal – an earthen structure far larger than any like structure ever undertaken by man – ancient or modern. Gatun is nearly a mile in total length, half a mile thick at the base and 136 feet in height to maintain a lake of a few hundred square miles at a surface level of 85 feet above ocean level. The amount of fill-earth required for a dam of this magnitude; 21 million cubic yards, was transported either from the excavation of the famous Gulebea Cut, through the Continental Divide at Panama, or pumped into the core of the Dam from impervious material near the Dam site.

In the 70 years of continuous Canal operation, with the Gatun Dam controlling the Rio Chargos, there has been either a shortage of water for lock operation, nor has there been any serious damage from flooding; this is proof of engineering at a high level. Moreover, the Gatun Dam has blended into the terrain so well that visitors, including the author, have had to be shown the finished article to realize the Dam really exists.

Material for Dam construction was brought to Gatun by dirt trains consisting of 20 flat cars, side-board on one side only, none on the other. At the unloading site the towing locomotive was uncoupled and shuttled aside – in it's place a second locomotive then pushed to the last car a powerful winding drum, which took steam from the locomotive, this had a cable running the length of the train and attached to the drum, which in turn pulled forward a large plowshare; the 'eiderwood' plow, which very effectively pushed everything off the cars on the open side. Thus in the usual and normal operation, rocks, mud and dirt – some 500 cubic yards were deposited along side the track in a matter of 8 to 10 minutes without hand labor.

The 'Legmerwood' plow could now be returned to the rear car by steam power, then the train recoupled to the towing locomotive and was now ready for the trip back to the excavating site. This unique application of steam-power stands in contrast to the French methods where the bulk of dirt handling was manual labor and where much hand labor and down-time was spent in unloading and cleaning conveyor equipment, totally unsuited to the material to be handled. Also by the use of such effective and ingenious machines, the project at Gatun Dam, the flood control spillways, and the hydroelectric generating plant were completed and working on schedule.

Press reports and especially comment by engineers from around the world, were full of amazement and commendation at the vastness of this project. Little wonder such praise, all visitors whether they may have been trained to appreciate the genius and organization they were witnessing, were looking upon the most daring and unique application of power ever undertaken to modify and harness Nature as man had found it.

The Spreader

The fourth machine, designed specifically to apply the might of steam to successful completion of the Canal at Panama was the Spreader. This machine, as the picture shows, is essentially a blade which attached to the side of a flat-car. The angle of the blade, its tilt, and extension from the flat-car were controlled by pistons taking power from the steam locomotive – which in addition could extend the blade tip 11-1/2 feet from the car. The locomotive, quite obviously, also furnished the forward motion. By such a design the spreader blade was capable of moving spoil-dirt at a fill-site as well as placing it precisely where needed to maintain the slope of the dam as the structure rose at Gatun. In addition to such dirt handling, the spreader left a level bed for the track shifter when required – all with little or no hand labor.

(To be concluded next issue.)
By David G. Kinnelley

The Hocking Canal was originally a privately owned canal known as the Lancaster Lateral Canal. The Lancaster Lateral Canal was completed in 1832 connecting Lancaster with the town of Carroll on the Ohio and Erie Canal. In 1836, the State of Ohio took control of the Lancaster Lateral Canal with the intention of widening it and extending it to the town of Athens. In 1841, the canal was completed to Nelsonville and by 1843 it was completed to Athens. The canal covered a linear distance of 56 miles connecting Athens with the Ohio and Erie Canal.

As a result of the Hocking Canal several towns were built, including Carroll, Nelsonville, Athens, and Hocking. The actual layout of these towns was determined by the availability of flat land suitable for development. The Hocking River Valley provided this flat land, but it took the innovation of the Hocking Canal to provide the economic stimulation also necessary for development.

The 1875 map of Carroll shows the arrangement of the streets in the town in relation to the canal. Both the Ohio and Erie Canal and the Hocking Canal played a role in determining the arrangement of the town. Carroll was plotted after both canals were completed. The Ohio and Erie dominated the pattern as evidenced by the arrangement of East and West Canal Streets, which are parallel to the canal. The Basin of the Hocking Canal also played a role in that it served an important economic function. While boats were docked in the basin commodities were brought for transport on the canal. The basin was a market place and fittingly the street parallel to it is named Market Street.

Sugar Grove, which lies south of Lancaster, was laid out in 1836 soon after construction of the Hocking Canal began. Similar to Carroll, Sugar Grove was a market place where goods were brought for transport on the canal. Although there was no basin in Sugar Grove it was the site of several locks. The locks caused delays and therefore there was time for transactions to take place. Main Street in Sugar Grove is wide providing room for horse and wagon to turn around and to provide space for general activity that occurred along the canal. Perpendicular to the canal are much narrower streets including Canal Street and Market Street which perform the town's function.

The town of Nelsonville exhibits a variety of factors in its location and arrangement. The original plat, which consists of Franklin, Washington, and Columbus Streets was laid out in 1818. Since this part of town was laid out before the Hocking Canal was built there is no canal influence. The impact of the Hocking Canal on the street pattern came in 1871 when an addition to the town was made. The addition included Chestnut, Poplar, and Walnut Streets which were placed parallel to the canal and had a completely different orientation than the original plat. Nelsonville was a coal mining town that was stimulated economically by the Hocking Canal and the Columbus and Hocking Valley Railroad. By 1871 the Hocking Canal was losing business to the railroad, but the canal was still a physical landscape element interfering with the street pattern. Today, the Hocking Canal has been paved over through Nelsonville and the street has been appropriately named Canal Street.

The influence of canals on street patterns in towns can be found in other areas of the United States besides the Hocking River Valley. Other towns which exhibit similar patterns are Freeport, PA, Lockville, OH, and Hancock, MD. By observing the street patterns in canal towns it is possible to derive a model of a typical canal town. A typical canal town is rectangular or linear in shape with a wide Main Street parallel to the canal. Perpendicular to the canal are narrower streets, which are usually numbered. However, there are street names that are commonly used in canal towns, including Lock Street, Water Street, Market Street, and Canal Street.

I recommend that all canal enthusiasts make observations when they visit a canal town and make their own model of a typical canal town based on their observations. It is important that we study the towns canal went through simply for the purposes of preservation.
and reconstruction. The model canal town is a guide to be used for reconstruction of a canal town for tourism and also to point out the uniqueness of canal towns for preservation. Canal towns need to be protected as much as canal engineering features, because they owe their existence to the economic advantage a canal brought to a region.

There are some excellent examples of successful preservation projects involving canal towns. Roscoe Village, OH is an excellent example of what can be done and New Hope, PA is very successful in attracting tourists. However, there is still a lot of work to be done to protect and preserve the canal town in the United States.

**TWO STATES PLAN FOR BLACKSTONE**

The following item, from the Fall, 1983 issue of the New England Rivers Center Bulletin was sent by ACS Life Member Bill Gerber. For previous developments on the Blackstone, see page 6 of our February 1984 issue.

In 1982, the Blackstone River and Canal Commission was created by the Massachusetts legislature to plan for the Blackstone River and Canal Heritage State Park. This spring, according to the Blackstone River Watershed Association, the commission announced its plans to "restore the Blackstone Canal, establish recreational facilities and highlight the industrial history of the area."

Meanwhile, Rhode Island is planning a Blackstone River Greenway. According to the RI Canoe Association, Congressman St. Germain has announced that funds have finally been approved for the National Park Service to study the feasibility of establishing a national park on the river from Worcester through Providence.

**D & R CANAL CELEBRATION**

Several events are being planned for the Sesquicentennial Celebration of the Delaware and Raritan Canal. On June 16, the Canal Commission, the New Jersey Historical Commission, and the State Museum are jointly sponsoring a one-day conference on the D & R Canal. The conference will include speakers on the history of the canal workers, on the meaning of the canal to the development of central New Jersey, and on the future of the canal in the region. The conference will be held the same day as the opening of a major exhibit on the canal at the State Museum.

The Delaware and Raritan Canal Commission, the Trenton City Museum, and the Princeton Art Association are jointly sponsoring another kind of exhibit. This is an invitational show; one hundred artists have been invited to submit work: one work of art each, that relates in some way to the canal. This show will be mounted in September in Eslarise.

Several projects that will have a lasting effect are being undertaken in the name of the sesquicentennial.

1. The canal park staff is preparing new miles of waterway to replace those missing or beyond repair.
2. Planned is a catalog project for the location and content of primary source material on the canal.
3. The New Jersey Canal Society plans are covered in a separate item, printed elsewhere in this issue.

**C.S.M.J. TO SPONSOR D & R CANAL REUNION**

In support of the Delaware & Raritan Canal Sesquicentennial Celebration weekend activities, the Canal Society of New Jersey will host a reunion/reception of Delaware & Raritan Canal Company employees and boatmen who used the waterway. The gathering will be held at 2:00 P.M. on Sunday, June 24, 1984 in Morven, Princeton, the former residence of Robert F. Stockton, the first president of the Delaware & Raritan Canal Company, and, more recently used as the Governor's mansion. In addition to the honored workers and boatmen, representatives of historical organizations, the local press, the full membership of the Delaware & Raritan Canal Commission and the Canal Society of New Jersey will be formally invited.

The program will include introductions of honored guests; presentation of "Friends of the Delaware & Raritan Canal" certificates to the boatmen and workers, the presentation of a plaque commemorating the canal company's first tug boat "The Robert F. Stockton"; an opportunity to reminisce with the "Old Timers"; a group photo session; viewing of the barns; the surrounding buildings and the grounds; and an opportunity to visit the interior of the old canal offices, Yvonne, located across the street.

(Fore further details contact: McKeelley 103 Dogwood Lane, Berkeley Heights, New Jersey 07922.)

**THE GREAT CANAL CAPER**

The City of Rochester, New York, celebrates its 150th birthday on April 28, 1984. There will be a number of festivals scheduled throughout the year. Among them will be the Lake Ontario Festival with a contingent of tall ships arriving from Toronto, and the Canal and Upper River Festival or "The Great Canal Caper".

The "Great Canal Caper" on July 6, 7, and 8 will be a "sessui salute to the City of Rochester from towns along the Erie". In addition to local canaliste festivities consisting of band concerts, fireworks, games, sing-a-longs and tug-of-wars across the canal, about 15 towns will launch their boats and set out on the waterways of Rochester: The Erie Canal, the Genesee Valley Park, the New York State, and the Erie Canal and Lake Ontario.

Genesee Valley Park will be the site for dozens of special events including games and contests, hot-air balloons, Civil War reenactments, demonstrations, musical entertainment, street shows and music on July 7 these floats, in barges provided by the N.Y. State Dept. of Transportation will be part of the Sesquicentennial Flotilla parade along the Barge Canal. Nine boats, including some antiques, and some private boats decorated for the event will be part of the flotilla parade. Prizes will be awarded for the best decorated boats and floats and first Ragnar.

At sunset on July 7 and 9 the Sesquicentennial Pageant will be presented on a floating stage in the Genesee River at Genesee Valley Park. The pageant will have as its theme the founding and settling of Rochester and the waterways of Rochester: The Erie Canal, the Genesee Valley, and the Lake Ontario.

Waldo Nielsen, ACS, is on the steering committee for The Great Canal Caper, headed by Judy Kaplan, the prime mover behind the preservation of Erie Canal Lock 62. For further details, write Waldo J. Nielsen, 343 Easton Rd., Rochester, N.Y. 14617.

**ROY CREVELING**

1907 - 1984

Marsha Kleedorfer, of the Canal Museum at Easton, Pa., reports the death (April 27, 1984) of Roy C. Creveling of Phillipsburg, N.J., a writer and movie maker. Roy's movie film "Paradise Ditch" has been a favorite at the Easton Museum for the last ten years and is probably the only movie film in the country showing actual footage of male teams and canal boats on a working canal. It shot looks at work levels of the Lehigh and Delaware Canals in operation in the early 1930's.
I & M Bill Passes

A unique new federal designation that combines park and recreational planning with commercial and industrial development was approved by Congress. The House and Senate have passed legislation to establish the Illinois and Michigan Canal National Heritage Corridor, a 100-mile linear historic park system in Chicago and northeastern Illinois. The United States Senate passed HR 3,746 to establish the Corridor Monday, February 27, 1984 and the House of Representatives followed suit on H. R. 2014 on Tuesday, February 28, 1984.

CANAL CALENDAR

May 26-Oct. 8, 1984 — Mill and Canal Tours in Lowell; Pawtucket Canal Tours; Write Lowell National Historic Park, 133 Merrimack St., Lowell, MA 01852.

June 14-17, 1984 — Society for Industrial Archaeology Annual Conference, Boston; write Charles River Museum of Industry, 350 Muddy St., Waltham, MA 02154.


June 24, 1984 — CNJ - hosted Reunion of Delaware and Raritan Canal Company employees at Princeton N.J. (See article this issue.)

July 6-8, 1984 — Great Canal Caper. City of Philadelphia 200th Anniversary. (See article this issue.)


And so again canal waters carry a hope for Akron just as they did long ago -a hope for growth despite the fashionable fancy dress.

This article was published by Margot Jackson in a recent issue of "TOWPATHS" the quarterly bulletin of the Canal Society of Ohio. We regret to report that William V. Miller, Jr. of the place and of the canal’s role in the growth of Akron. These panels are to be fitted into the canal boat structure, but - at this writing - have not yet been placed.

ACS Member Harold Eatwell of Harrington Park, New Jersey, calls our attention to an error in the caption to the photo of Lock 12 on the Farmingdale Canal on page 11 of AMERICAN CANALS #48. Instructions for finding this lock should read “take Route 42” not Route 44, off Route 10, etc. Harold feels that other ACS members may go astray (as he did) in looking for this reconstructed lock.

The Baldwin Mansion was built in 1861 by Deacon Henry Baldwin and altered to its present appearance by his grandson, Colonel Leammi Baldwin in 1890. The mansion sits near the outlet of the Middlesex Canal, which was to be the ‘father’ of the noted Baldwin apple and a Revolutionary War patriot and soldier. His son, Leammi 2nd, is called the “Father of American Civil Engineering,” and was responsible for construction of the first naval drydocks in the western hemisphere. The Colonel’s other sons also had careers in civil engineering. George, Runtward Baldwin, James Bowie Baldwin, and Benjamin Franklin Baldwin were all early engineers of a national stature.

Construction of the Middlesex Canal commenced in 1793 and it was opened to through traffic from Boscov to Lowell in 1803. The Middlesex was the first regional transportation canal in the United States, preceding the Erie Canal by nearly twenty years. Colonel Leammi Baldwin of Woburn was Chief Engineer and Construction Superintendent.

The town of Woburn Massachusetts was the center of the canal’s social and commercial life. Here, at the three locks at Horn Pond, a thriving tavern, hotel and entertainment complex developed — one of the earliest resort centers in the country. The passage of the canal through the birth of the expanding shoe and leather trade, changing the town from an agricultural to a commercial center.

Today, the first water-bearing remnants of the old canal are fittingly found in Woburn. The Baldwin Mansion is now a National Historic Place.

In the Mansion is now located a gourmet restaurant known as “Baldwin Landing.” (Item sent us by ACS Life Member Bill Gerber of Chelmsford, Massachusetts.)