

AMERICAN CANALS

BULLETIN OF
THE AMERICAN CANAL SOCIETY

BULLETIN NUMBER 33

Editorial Address - Box 310, Shepherdstown, W.Va. 25443

MAY 1980

PRESIDENT'S MESSAGE

The big news is that our new book, "The BEST from AMERICAN CANALS", is turning out to be a "best-seller"; not only to our own members, but to canal and marine buffs all over the country! Since the book was issued, just two months ago, we have received well over one hundred individual mail orders, as well as orders for 400 more copies for bookstores in Northeastern USA. We are still holding our special price of \$4 per copy (postage included) to all ACS members, even though the retail price (in the bookstores) is \$6. Some of the marine publications have already given our book high praise, and we are receiving inquiries from inland waterways travelers daily, not to mention new applications for ACS membership.

Since our last issue, we are pleased to welcome into our ACS LIFE MEMBERSHIP GROUP two new men: *John Barratt* of Tixall Mews, Staffs., England and *L. M. Clark* of Hull, Quebec, Canada. Our sincere appreciation to both of them!

Your Principals have decided to reactivate the ACS Canal Index Committee whose work was so ably begun under the direction of Peter Stott. We now have standard ACS forms completed for about two-thirds of the major, historic canals in the United States. Peter has other activities occupying his time, and has asked to be relieved of this assignment. We appeal to the various canal societies for help. It is to your interest, as well as ours, to complete the rest of this important work. Due credit will be given to all individuals and canal organizations for their assistance. Please write me about this.

My telephone continues to ring, almost daily, with inquiries from individuals who have heard about the American Canal Society and are interested in learning more about our activities. A few months ago I had a call from the Columbia Broadcasting System, which resulted in a short interview (about ACS) on the Douglas Edwards' national CBS broadcast entitled "Date-Line America". More recently, I had a pleasant phone conversation with Susan Denny of the British Broadcasting Corporation in London, who wanted a tape of an "American Voice" telling about historic canals and waterways in the USA. I made a 20-minute tape for her, and air-mailed it. Our ACS Director in the United Kingdom (Dr. Roger Squires) has just told me that this tape will be part of a BBC broadcast, scheduled for March of 1981, entitled "Home and Away: Waterways". All this, of course, helps the image of our Society on a national and international basis.

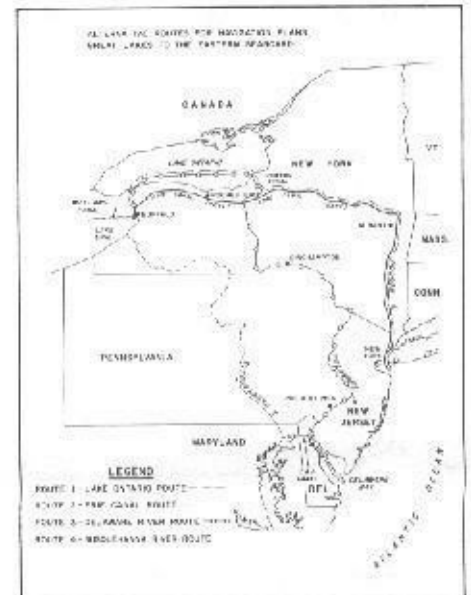
Bill Shank

French Canal Snubbing Post

After nearly three years of efforts by Bill McKelvey, a stone snubbing post from the *Canal du Midi* has arrived at the museum of the Canal Society of New Jersey at Waterloo Village. This 425 pound stone, deeply scarred by the ropes of the many boats that passed through the lock it stood beside, is probably over 300 years old. The Canal du Midi was opened in 1681, following a route originally surveyed by Leonardo da Vinci in 1515 to link the Atlantic Ocean and the Mediterranean Sea. It was the first major canal to cross a watershed, and the greatest work of engineering in the world at the time of its construction. Its 150 miles were visited by Francis Egerton, the future Duke of Bridgewater, and inspired him to pioneer the development of canals in England. This stone thus provides the CSNJ Museum with a link back to the earliest development of canals in the western hemisphere, a solid example of the engineering heritage behind the Morris and Delaware & Raritan Canals of New Jersey.

The stone was discovered by Bill by the side of the roadway on a bridge over the canal in the town of Castlenaudry, having apparently been moved from its place by the canal after breaking off at ground level. Describing it as a 'fallen soldier', Bill arranged for the stone's donation to the museum and handled the two years of dealing with 'red tape' that it took to get it to Waterloo. We hope it will rest happily there, and that this little french 'soldier' will find New Jersey's Waterloo a more hospitable place than the village it was named after was for the army of Napoleon in 1815.

All-American Canal



The Army Corps of Engineers is currently conducting a series of Public Information Workshops in connection with a survey-study for a "Great Lakes to Eastern Seaboard All-American Canal". The four possible routes for such a major canal are shown above. Your comments are invited, and may be sent to the New York District, Corps of Engineers, 26 Federal Plaza, N.Y.C. 10007.

SHADES OF THE "QUEEN MARY"!



This unique undated photograph shows the R.M.S. QUEEN MARY transiting Lock #6 of the New York State Barge Canal, Erie Division, at Waterford, N.Y. This, as well as many other local photo post card canal views are on sale at the George No. Michon Store, 66 Broad St., Waterford, N.Y. 12188. (Submitted by Bill McKelvey)

American Canals

BULLETIN OF THE AMERICAN CANAL SOCIETY

"DEDICATED TO HISTORIC CANAL
RESEARCH, PRESERVATION
AND PARKS"

AMERICAN CANALS is issued quarterly by the American Canal Society, Incorporated. Objectives of the Society are to encourage the preservation, restoration, interpretation and use of the historic navigational canals of the Americas; to save threatened canals; and to provide an exchange of canal information.

Annual subscription to "AMERICAN CANALS" is automatic with a minimum ACS dues payment of \$8.00. Individual copies may be purchased at \$2.00.

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Alexandria Canal Tidelock

The Alexandria Canal Tidelock at Alexandria, Virginia is now on the National Register of Public Places, culminating three year's work by Vivienne Mitchell (ACS) and other interested citizens. Restoration of the lock and a park are the final aims, but work in that direction has been held up pending a title suit as to the ownership of the land on which the lock is located.

Morris Canal - ASCE Landmark

A unique civil engineering system that enabled vessels in northern New Jersey's old Morris Canal to surmount 900-foot high mountainous terrain along the canal route has been named a National Historic Civil Engineering Landmark by the American Society of Civil Engineers.

The system, which used 23 hydraulic-powered inclined planes in combination with canal locks, permitted canal boats to "climb" more than 914 feet from the tidewater area of Newark Bay to the Summit level at the tip of Lake Hopatcong. From there the boats were gradually lowered 760 feet to the Delaware River at Phillipsburgh, Pa. The total rise and fall was just over 1,674 feet in slightly more than 90 miles - an impressive civil engineering achievement for the early 19th century.

The canal operated for almost a century following its opening in 1831, reaching a peak activity in 1866, just after the Civil War, when more than 889,000 tons were shipped.

ACS PRINCIPALS' ANNUAL CONFERENCE



Once a year, during Bill Trout's annual trek from California to the East, the three Principals of the American Canal Society get together for an informal discussion of the affairs and policies of the Society. This year, their meeting was held on May 3, 1980 at the home of the Hahns in Shepherdstown, West Virginia. Left to right: Bill Trout, Bill Shank and Tom Hahn. These three men founded the American Canal Society (in Maryland) in 1972.

CANAL CALENDAR

May 24-June 30 - Lowell, Mass.: Mill and Canal Tours; Northern Canal Tours; Power Canal Tours. Contact: Lowell National Historic Park, 171 Merrimack St., P.O. Box 1098, Lowell, MA 01853

July 12-13 - Summer meeting, Steamship Historical Society of America, Seattle, Washington. Contact: Austen Hemion, 415 W. Mercer St., Apt. 604, Seattle WA 98119

June 23-26 - Tour of historical sites (some canals) in southern New England. Contact: Canal Society of New Jersey, Box 737, Middletown, New Jersey 07060.

August 17-19 - Coshocton Canal Festival. Contact: Nancy Lonsinger, 381 Hill St., Coshocton, Ohio 43812

October 10-12 - Pennsylvania Canal Society Tour, Chesapeake and Delaware Canal, (from Wilmington). Contact: Dr. "Zip" Zimmerman, 1361 River Road, R. D. #1, Yardley PA 19067

October 15 - Showing of various North American Waterways films; Sutton College, Sutton, England; sponsored by U.K. Section of A.C.S. Contact: Dr. Roger Squires, Bailiffs Cottage, 4 Manor Way, Beckenham, Kent BR3 3LJ, England.

October, 1980 - Canal Society of Ohio Tour, Miami and Erie Canal, Piqua to Dayton (assisted by Great Miami River Corridor Committee). Write: Herb Verity, 6363 Grand Vista Ave., Cincinnati, OH 45213

October, 1980 - Canal Society of New Jersey, New York Harbor boat tour of canal structure. Write: Bill McKelvey, Jr., 98 Waldo Avenue, Bloomfield, New Jersey, 07003

(Editor's Note: Please send us further details of your Fall 1980 canal meetings or tours in time for our next issue; deadline August 1, 1980)

Destruction of D&R Canal Lock



Lock 13 of the Delaware and Raritan Canal at New Brunswick has now been destroyed in accordance with the desires of the Department of Transportation and the State of New Jersey and in opposition to the Canal Society of New Jersey, the Delaware and Raritan Canal Coalition, the American Canal Society, and others. The view above, taken in 1978 (from the West) shows the intact lock. The view below (from the East) shows the lock being destroyed in 1980. The lock will be filled in and the locktender's house will be moved East to the outlet lock which is scheduled to be restored in a trade-off. Preliminary work on the restoration has been done by volunteers. (Submitted by Bill McKelvey)



The Canal at Sainte Marie Among the Hurons

by Christopher Andreae

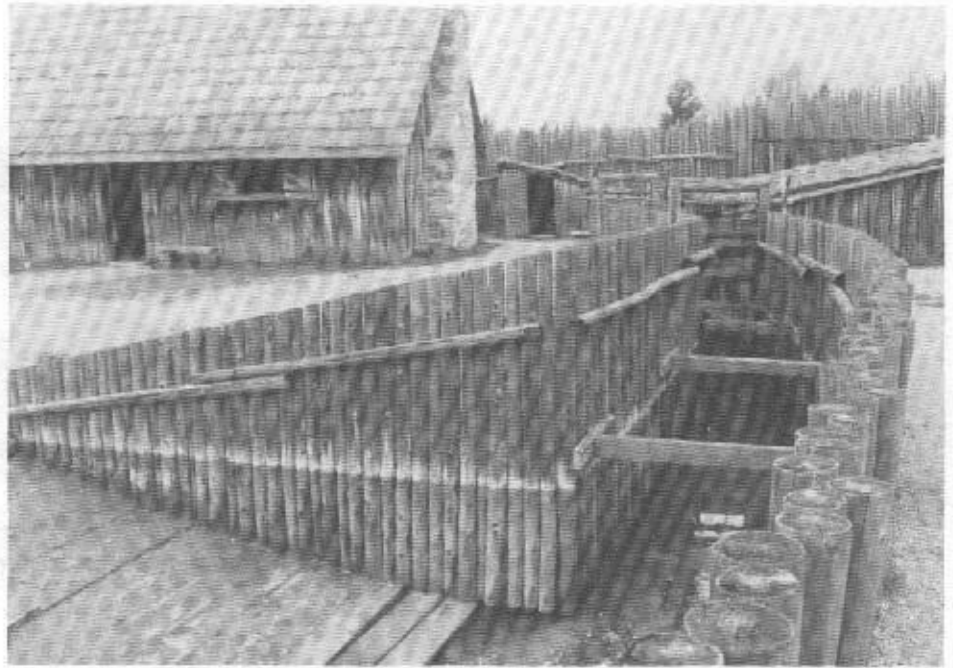
Near the Town of Midland, Ontario stands the reconstructed Jesuit mission of "Sainte Marie-among-the-Hurons." This fortified mission was originally constructed in the 1640's as part of the Jesuit's efforts to Christianize the Huron Indians. Among the attractions of the mission is a very short canal, roughly 76 meters long, containing three locks with a total lift of about 3.7 meters. If a canal had been built on the site, and considerable controversy surrounds this hypothesis, this structure would have been the first artificial canal dug in North America.

But why would a canal have been dug in the wilderness and isolation of French North America? Most of southern Ontario prior to the arrival of the white man was the territory of the Huron Indians. French traders and missionaries only ventured into the area after 1610 to gradually establish friendly relations and a flourishing fur trade with the Indians. Jesuit missionaries, concerned with the social welfare of the Indians, went among the tribes to bring Christian ideas. In 1639 a group of Jesuits established a mission called "Sainte Marie Among the Hurons" on the bank of the Wye River, about one kilometer inland from Georgian Bay and near the modern Town of Midland (see map). Over the approximately ten years that the site was occupied, the mission was enlarged to accommodate a large number of Europeans and Indians. The canal was presumably built in the mid 1640's.

This canal was thought to have served two purposes (see plan). After the initial mission had been constructed of wood, new buildings were erected in stone. A canal would have provided the lift needed to raise barges of stone into the mission complex. In addition, landing areas were provided along the canal at locks two and three. These landing areas would have facilitated the loading and unloading of canoes. Although not a fur trading post, the missionaries received furs as gifts from the Indians.

As reconstructed, the overall impression of the structure is of an irrigation or drainage system with sluices and gates rather than that of a navigable canal. The canal and lock banks are made of wooden stakes, roughly 12 cm. in diameter, driven into the ground. The locks vary considerably in size, the first being only 5.5 meters, the second 12.5 meters, and the third, a massive 18.6 meters long. The canal has a standard width of 1.2 meters and a depth of about one meter. The lock gates move vertically and are operated by windlasses. When the gate is lifted there is about one half meter of clearance above the water. Each lock provides a lift of approximately one meter. In order to operate the lock, the gate is lifted slightly to allow water from the upper chamber to flow into the lower chamber. Since the chambers get progressively larger with each lift, excess water flows into the lower chambers which is allowed to flow over the top of the lower gates. Water for the original operation of the locks is thought to have been taken from springs located several hundred meters from the mission and brought to the canal in an aqueduct. Today water is pumped from the river to provide demonstrations of the lockage. Above the third lock, the canal makes a sharp bend and continues for another ten or twelve meters before gradually disappearing. This bend effectively prevents navigation above the third lock and this section of the canal is thought to have provided a water supply for the mission and act as a reservoir for the locking operations.

This is how the canal was described and reconstructed for the Ontario Government under the supervision of Wilfrid Jury during the 1950's and 1960's. Mr. Jury is a respected archaeologist of Indian and European sites in Southwestern Ontario. Unfortunately there appear to have been few physical remains on which to base the theory of a canal reconstruction. Detailed notes



The miniature Sainte Marie Canal, shown in this photo by C.A. Andreae, has been de-watered for winter maintenance. At the left is the canoe launching ramp (#3 in sketch) with the upper gate for Lock Two just visible. Behind the far palisade flows the River Wye.

of Jury's excavations have not been made public and there seems to be more doubt that the canal existed than proof that it did. When the mission was abandoned by the French in 1649 they burned the site. Thus the only archaeological remains to be found were those that lay below ground or underwater and thus escaped the flames. One thing is virtually certain, though, that a manmade waterway did pass through the mission. Before the mission was excavated, the channel of the assumed canal was a prominent feature. Nineteenth and twentieth century visitors to the site all commented on this feature. Remains of the bank pilings were discovered but no conclusive evidence of lock structures could be determined.

If a navigable canal with locks had been built, it is not surprising that it was undertaken by the Jesuit Order. As a teaching religious order they would have been aware of the technological developments of canals in Europe. The theory of locks was understood in Europe and had been applied in several cases by the seventeenth century. But the construction in France of a canal such as the Briare Canal connecting the Loire and the Seine Rivers, dug between 1605 and 1642 and reputed to contain the first locks in France, is a far cry from that of a small wooden canal in the wilderness of Canada.

Canals such as the Briare Canal were built to cheapen the cost of transportation. Some canals, such as the later Rideau Canal in Canada, were

dug primarily for military purposes. Neither case would apply at Ste. Marie. The cost of transportation was dictated by the long canoe trip from Quebec and not by the last lift into the mission compound. Similarly the canal provided minimal defensive protection. A canoe would have to travel over a kilometer from Georgian Bay down the Wye River, exposed to enemy attack from both banks before reaching the safety of the mission.

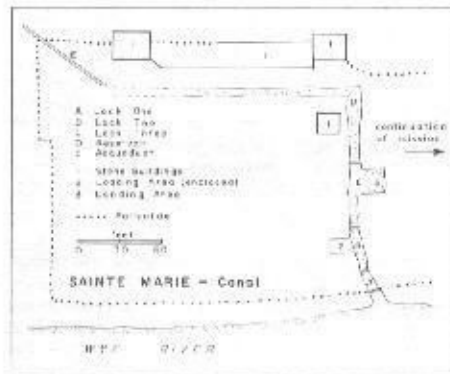
The use of the canal to simplify stone movement into the mission has some credibility except that easier alternatives were available. All of the four meter lift between the river and the mission is at the river's bank and the rest of the site is relatively flat. An incline hoist could have been built with far less effort. Given the more pressing needs of shelter, protection and religious activities, it seems unlikely that the Jesuits would have taken the time to erect locks in the mission.

In any case, to reach the site of Ste. Marie from Quebec, the traveller had to endure over 35 portages. Why would they need to treat themselves to a lock trip for the last four meter rise into the mission?

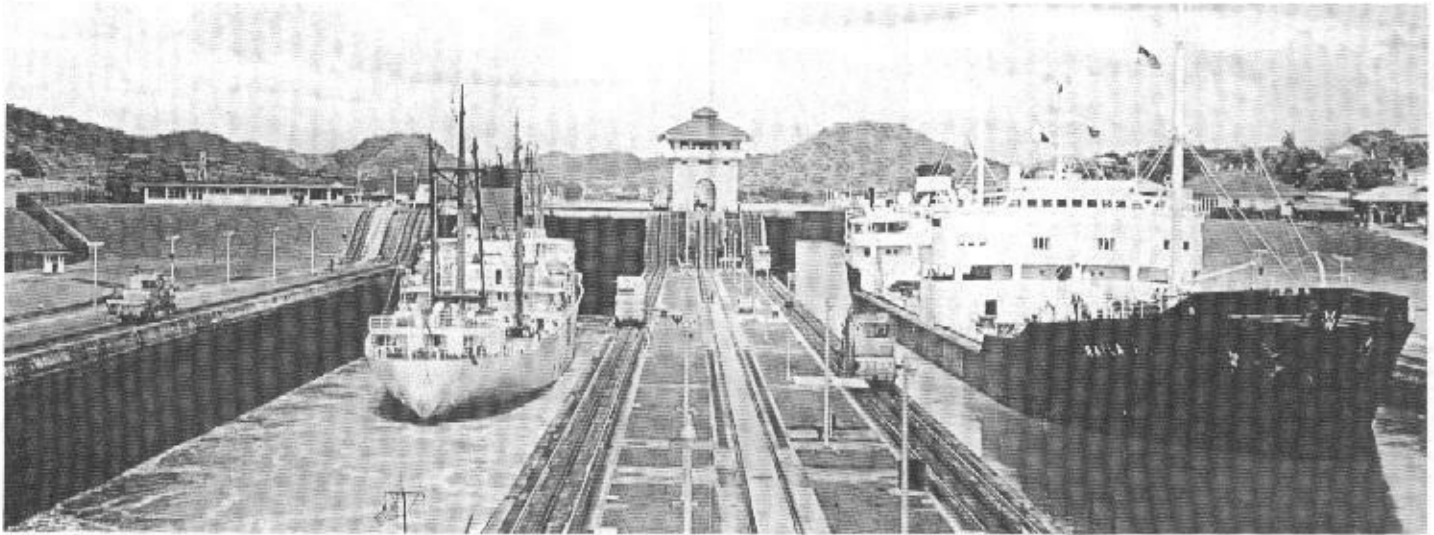
What could this channel have been used for since all evidence suggests some sort of water course? Various theories have been put forward, including a defensive moat, a mill race for a grist mill and a drainage ditch. It could also have been used to supply water or as a sanitary system.

The staff of the reconstructed mission have developed a theory that the waterway may have been used for religious purposes. The Jesuits, in their efforts to Christianize the Hurons, attempted to prove the white man's importance by controlling and predicting various elements that played an important role in the Huron religion. Since water was an essential component of their religion, the Jesuits may have constructed the canal to demonstrate their control over water.

The Ontario Government took the Jury theory of a navigable canal with locks and restored this in the mission during the 1960's. Although enveloped in controversy, the reconstruction provides interesting speculation. Anyone wishing to pursue the arguments for, and against, the canal, should visit the site, watch a canoe being locked through and come up with your own theory.



PANAMA CANAL SWEEPSTAKES: POLITICS VS ENGINEERING (Part II)



The Panama Canal, at Miraflores Locks, with two ships passing through in opposite directions.

by Ernest H. Schell

The two fundamental questions about an American canal – what type of canal it should be and where to build it – remained highly controversial, the question of a sea-level project versus a lock canal coming under Congressional review even after construction of a lock canal had already begun. The decision to pick up where the French left off in Panama had been a political issue to begin with. Senator John Tyler Morgan, the strongest proponent of an American canal in Central America, was adamantly against a Panama route, favoring Nicaragua, a more politically stable country with a magnificent lake and terrain that would allow the lowest elevation for a canal anywhere on the isthmus. Nor was Nicaragua, unlike Panama, a land of pestilential jungle. That a canal at Nicaragua would also be nearly 800 miles closer to the Gulf States and Morgan's home state of Alabama was certainly a further point in its favor. But for several decades, beginning with the 1876 report of the Canal Commission, the opinion of a variety of American technicians and engineers who had explored the possibility of an interoceanic canal also confirmed the advantages of a Nicaragua route, so Morgan, who was chairman of the Senate Committee on Interoceanic Canals, could rely on more than his own personal prejudices in support of what had become for him a lifelong cause.

Leaving aside the complex issue of international politics that ultimately determined the location of the American canal, and focusing instead on technical questions, we find that here too politics played a crucial role. Rather than going ahead at Nicaragua, as nearly everyone assumed the United States would do, Congress set up the Walker Commission in 1899 to make a final decision on the canal route. The decision to create this body came only after a strenuous lobbying effort on the part of William Nelson Cromwell, the New York lawyer serving as agent of the French canal company, who was eager to have the Americans buy out the French interests in Panama. Cromwell, a clever backstairs manipulator, was also influential with President McKinley in gaining the appointment of several engineers to the committee whom he considered amenable to his plans. Arranging for the Commission to begin its research in Paris, not Central America, Cromwell skillfully managed the presentation of technical data in such a way as to win over a majority of the commissioners.

Foremost among the engineers on the Walker committee was George Shattuck Morrison, a brilliant bridge engineer who was no patsy for the likes of Cromwell. Yet he, too, came away con-

vinced of the superiority of Panama. Panama would make possible a shorter canal with fewer curves than the one at Nicaragua. Fewer locks would be required, better harbors were available. A Panama canal would be less expensive to run, and the railroad that had already been built there would greatly facilitate construction, to say nothing of the head start afforded by the French work.

It was not the report of the engineers on the Walker Commission alone, however, that resolved the issue. As David McCullough points out in his superb study, *The Path Between the Seas*, the Senators who had to make the final decision were not likely to have either read or digested the technical reports presented to them. Two other factors came into play. The first was Cromwell's conversion of Senator Mark Hanna as an advocate of the Panama route, and the other was the Nicaragua volcano issue raised by Philippe Bunau-Varilla, who had a large interest in the French company that owned the uncompleted Panama canal. Orchestrating a timely and melodramatic campaign to point out the dangers of constructing a canal at Nicaragua, Bunau-Varilla convinced a majority of the Senate that volcanic activity on Nicaragua would threaten the ultimate success of any canal there. Based on very flimsy but adroitly assembled evidence, this last-ditch lobbying effort paid off for the Frenchman, as did Cromwell's conversion of Hanna, whose influential contribution to the debate over the canal in the Senate emphasized that Panama was the preferable route in the opinion of the engineers on the Walker Commission.

There were reputable engineers, though, who remained convinced that Nicaragua was the better route. One of the Commission's own engineers, Lewis Haupt, had endorsed the Walker report only for the sake of unanimity. While there was a strong case in favor of the superiority of Panama, the fact remains that there was no convincing case against the feasibility of a Nicaragua canal, aside from the specious volcano issue. The then-unsolved problem of disease in Panama, in fact, offered a stronger case against Panama than any of the arguments against the Nicaragua route. When the Senate voted for a canal at Panama, the advantages of locating the canal there, even from a technical standpoint, did not appear overwhelming.

The most critical issue, however, in the entire American effort to construct an isthmian canal was not in the long run the question of its location, but rather the type of canal it was to be, the debate to settle the matter taking place fully three years after work on a lock canal had been au-

thorized. When test borings taken on the Chagres in 1905 seemed to indicate that the proposed dam at Bohio, the key element in the lock canal plan, could not be securely built, John Wallace, the Chief Engineer at Panama, summarily denounced the lock plan and convinced William Howard Taft, the Secretary of War, that a canal at sea level was the only feasible project. While excavation work continued in Panama, a newly constituted Isthmian Canal Commission set about to determine if the original plans for a lock canal would have to be abandoned. To aid them in their deliberations, an ad hoc Board of Engineers was appointed by President Roosevelt to study the problem and report to the Commission on its findings.

The eight Americans and five Europeans who served on the Board of Engineers conducted extensive hearings both in Washington and in Panama, subjecting to review a great deal of the enormous body of technical data that has been amassed over the years on an isthmian canal. Besides rehashing what several prior commissions had already considered in careful detail, the Board took testimony from Wallace and others who had had extensive personal experience working on both the French and the American projects.

Like nearly everyone associated with an isthmian canal – like nearly everyone participating in any great enterprise – they also brought the prejudices of their own past experience with them. Unable to reconcile their various predispositions, they consequently were unable to agree on the essential criteria for evaluating the lock canal and sea-level canal systems, and thus were unable to issue a report in which they could all concur. Eight members of the Board issued a majority report in favor of the sea-level project, with the five dissenting members elaborating their support for a lock canal in an extensive minority opinion published along with the Board's final report to the Isthmian Canal Commission. Then, ironically, on February 5, 1906, less than a month after the Board's report appeared, the Commission voted to reject the plan favored by a majority of its consulting engineers and to recommend to Congress that a lock canal be built by the United States in Panama.

When the Senate was called upon to review the Commission's recommendations and the evidence presented by the consulting Board of Engineers, it is easy to understand why the debate on the canal should have been conducted almost at cross-purposes. The technical experts themselves had officially disagreed. How were the politicians, who had to rely on the expert

testimony of others, to make sense of the alternatives before them and decide what kind of canal should be built? How had this honest but disturbing impasse been reached?

The confusion had arisen in large measure because the engineers had actually concurred, rather than differed, on the feasibility of a dam across the Chagres, the issue that had provoked a re-evaluation of the lock canal in the first place. All of the European engineers on the consulting Board, though they unanimously rejected a lock canal, had agreed that the Chagres could be safely dammed, not at Bohio (where the original dam was to be built), but at Gatun. Their principle objection to a lock canal did not involve creating the lake across the isthmus necessary to such a system, but rather to the reliance that would be placed upon the operation of the locks themselves. In the preceding nine years, the majority report declared, there had been three occasions in which ships passing through the St. Marys Falls Canal at Sault St. Marie—the "Soo" Canal—had crashed into the lock gates, and three accidents of the same sort on the Manchester Ship Canal in England. The danger of such accidents on a lock canal in Panama seemed to the majority of the Board to pose too great a risk for the United States to assume in the construction of what was likely to be one of the most heavily travelled and vitally important commercial links in the world. Believing that a sea-level canal would take only two additional years and a mere \$100,000,000 more to build, the elimination of a fallible and possibly dangerous lock system seemed to be the preferable recommendation for the construction of a "convenient and safe ship canal" that "will endure for all time."

The minority report of the Board of Consulting Engineers countered the fears of the majority by stressing that recommendations for sets of double lock gates of the type that had recently been installed at the Poe lock on the Soo Canal would make the destruction of the locks by accidental collision virtually impossible. The gates of the Poe lock had been "struck three times and injured more or less," they pointed out, "but they continued to support the summit level." There was far greater danger, they believed, of an accident shutting down the canal in the narrow excavated channel of a sea-level canal, where ships would not be moving as slowly and under as much control as they would be at the locks on a lock canal. Groundings in the Suez Canal, the minority pointed out, had resulted in shutdowns totalling nearly 300 hours during the first eight months of 1899. In time of war, the risk of a ship being sunk in the channel of a sea-level canal was as great as the risk of damage being inflicted on the locks in a lock system.

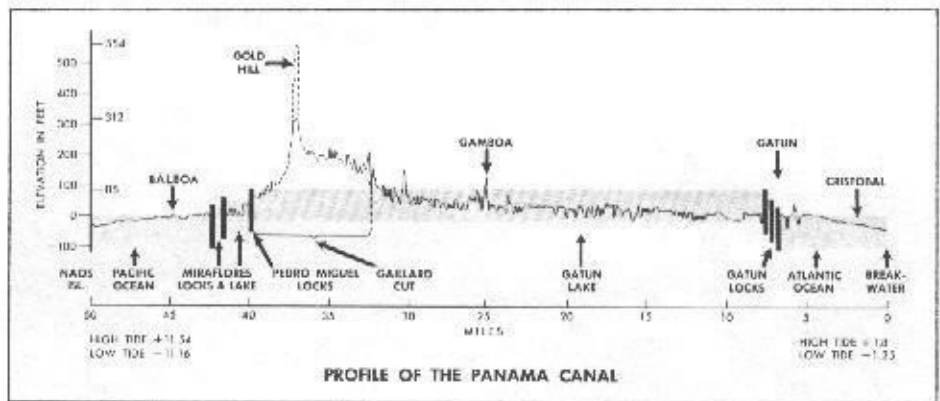
New Panama Canal?

A new larger canal across Panama could be opened in 12 years if Japanese officials already interested in the project agree to participate in the construction.

The new, sea-level canal would run alongside the 85-year-old Colon-Balboa waterway, which uses a series of locks to pass ships between the Pacific and Atlantic oceans. The new canal would be owned and operated by Panama, but construction would be financed largely by Japanese banks.

The canal would be built 10 miles west of the existing waterway and would cost about \$8.5 billion at present prices. If construction is started by 1984, the canal could be finished by 1992. But initial studies provided by Japanese companies recommended a canal that could accommodate 500,000-ton ships. The Japanese recommended a waterway 60 miles long and about 100 feet deep.

(From the Cleveland Press)



The debate in the Senate managed largely to ignore the central issue of the safety of locks on ship canals. Senator Knox of Pennsylvania, whom McCullough supposes to have made "the major speech," and whose interest in a lock canal may have been influenced by the Pittsburgh steel companies who were likely to receive contracts for work on the proposed locks, spent most of his time and placed greatest emphasis on stressing the safety of the Gatun dam, a point which he reminded his colleagues had been agreed upon by both the majority and the minority of the consulting engineers. Taking the dam issue one step further, he made the majority of the engineers hoist to their own petard by pointing out that the sea-level canal also depended on the construction of four dams to control the Chagres and other rivers. If any one of those should fail, the resulting cataract would be far more damaging to the isthmian canal than the potential failure of the Gatun dam would be to the lock system.

Senators Dick of Ohio and Kittredge of South Dakota presented the major speeches in favor of the sea-level route. Their arguments were clearly based on the assumption, as Senator Dick put it, that "there can be no question at all that, other things equal, a sea-level canal is preferable to a lock canal." The import of their speeches was that other things were indeed more or less equal, and that above all a sea-level canal "possesses the incomparable advantage of being a final and completed enterprise. Nearly every supporter of a lock canal," added the Senator from Ohio, "regards such construction as a half-way measure, as merely the beginning of what is in time to be changed to a sea-level canal." That being the case, the United States ought to go ahead and do things right in the first place. Both senators deplored the arguments of the lock canal supporters who seemed willing to sacrifice the opportunity to build a canal for the ages simply to save a few years in construction time and a few hundred million dollars.

Only a few of the proponents of the lock canal system actually thought of it as temporary. Among them the most prominent was Bunau-Varilla, who had testified before the Board the previous autumn. His suggestion for later conversion to a sea-level canal was a throw-back to the days of de Lesseps, when the old hero of Suez had been forced to save face in the revision of his grand plans for a sea-level canal by explaining that it was only a temporary measure. Significantly, none of the engineers who signed the minority report agreed with that interpretation. On the contrary, the thrust of their entire report was the reverse: "The sea-level canal may . . . be called 'provisional' with far more propriety than the lock canal," they concluded.

Two senators aside from Knox made lengthy speeches in favor of a lock canal at Panama. Senator Cullom was not convinced by the report of the majority of the Board of Engineers that the channel to be excavated for a sea-level canal could be as wide or as deep as the locks and the lake channel proposed in the minority report. "We have had more experience with locks than

any other country," he declared, and he did not lack confidence in the ability of the American engineers who would design the locks for the Panama canal to provide suitable structures to assure the safe and continuous operation of the canal. If Europeans mistrusted lock systems, it was because they were still under the spell of the Suez sea-level project. Finally, he doubted that a sea-level canal could be constructed as quickly and cheaply as the majority of the engineers claimed it could. "I want a canal constructed so that the present generation who will bear the cost of it will enjoy some of its benefits," he said.

Senator Foraker had the last word in favor of the lock canal. He admitted to being a sea-level man at heart; he had opposed a Nicaragua route to begin with because a sea-level canal could not be built there. At some time in the future, he hoped, as did Bunau-Varilla, the lock canal would be converted to a sea-level system, but he could not now in good conscience oppose the plan for a lock canal. The wisest thing to do, he said, was to acknowledge the preference of the President, the Secretary of War, and the Chief Engineer of the Canal, John Stevens, all of whom now favored the lock plan. "I do not feel, under the circumstances, like voting for a different kind of canal as to which, if they were to go on with the construction of it, would be proceeded with on their part with a great deal of misgiving as to its wisdom."

What factors finally contributed to the passage of a revised bill in the Senate in favor of a lock canal, by a vote of 36 to 31, is impossible to say. The debate had been unfocused and ill-defined, side-stepping for the most part the central issue of the safety of canal locks that had been the central concern of the Canal Commission's Board of Engineers. Once the Board of Consulting Engineers had issued its inconclusive and contradictory report, though, such a confusion of facts and opinions with no coherent focus for debate was almost inevitable. Examining the data from a political point of view, who could really say which were the independent and which the dependent variables?

When the uncertainties of science meet the imperfections of politics, and vice versa, no one can find easy answers to difficult but important questions. We face that sort of dilemma today in the areas of food additives and energy policy, to name two examples. At the turn of the century, the most pressing technological issue before Congress was the type of canal that the United States should build at Panama. What is most remarkable about the entire episode is that in the long run, it is safe to say, the final decision was not the result of a systematic review of technical data, but rather a leap of faith based on dead reckoning, a faith—fortunately to be vindicated—that those on the scene and those ultimately responsible for them knew what in the world they were doing.

Copyright 1979 by Ernest H. Schell. The author, a Philadelphia-based freelance writer, is a doctoral candidate in history at Temple University.

A HOLIDAY TO REMEMBER



The Handfords work their boat (the "Pisgah") through a stair-case lock on the French canals. (Photo by Michael Handford).

by Michael Handford
Bristol, England

There is no doubt about it. The French canals are superb and make an unusual and fascinating holiday for anyone interested in waterways. We shall certainly go back again and again.

There is for a start the marked contrast with British canals. In France the canals are invariably well maintained and have friendly keepers at most locks only too delighted to work the locks and supply you with fresh garden produce. The lack of a common language and our own hazy knowledge of French proved no problem as local people enjoyed practising their broken English and helping our faltering pronunciation. The other contrasts include the weather - the sun blazed down for almost the entire fortnight - and the excellent choice of inexpensive food. And what food! There are wines (at 80c a litre), cheeses and pates which make enjoyable picnic lunches on deck and even meals out in cafes and restaurants are both reasonable and appetising. We fed ourselves well and ate out two or three times for about \$25-30 each a week.

The boat we hired was a well converted nine berth ex-River Avon grain barge, the "Pisgah", which had a large and comfortable saloon, dining room and kitchen, four double and one single berths, shower and toilet as well as acres of deck space for sunbathing. At the height of the season it cost us less than \$80 a person each week and that included the services of a friendly skipper with a weakness for bacon and eggs which he fried up in his own self contained cabin separate from the main accommodation. If hirers prefer, the crew can provide breakfasts and probably lunches but these are so easy with French food it hardly seemed worthwhile to us. Nevertheless, with meals out in the evenings in reasonably priced local cafes, the boat can be used as a hotel boat if required.

Our journey of discovery began near Nevers on the Loire Lateral Canal with regular glimpses of chateaux through the trees. From Decize we joined the secretive and beautiful Canal du Nivernais climbing through cornfields and woodlands to the summit at Baye where several large lakes feed the canal. The narrow summit pond is not usually wide enough for two boats to pass but with the end of commercial traffic there was no need to wait. We passed through a succession of limestone cuttings and short tunnels hidden away from the public gaze. Huge banks of blackberries along the summit proved irresistible.

Emerging from the last of the three short tunnels we began the long descent to the River Seine at Fontainebleau through some delightful Burgundian countryside.

About a decade ago the Canal de Nivernais was threatened with closure as the small locks proved unsuitable for modern sized commercial boats. Afraid of losing their canal towns like Clamecy built luxuriously appointed showers, toilets, shaver points and baths on the canal side to encourage pleasure traffic. Now there is a light but growing interest in holidays on this canal - mostly British and Americans - and in another decade it could easily become one of the most well-loved cruising grounds in Europe. So far the French have not really thought of using their canals for pleasure and still stand slightly puzzled but interested at the sight of 'les anglais' using them for holidays and having a marvellous time. But it is obvious the idea interests them and it is only a matter of time before they join the overseas visitors on their own canals.

So my advice to anyone interested in waterways is to discover the French canals for yourself while they are still peaceful. They are different, stimulating, friendly and hugely enjoyable. It is a holiday I could recommend to anyone without reservations. And for less than \$80 a week each - why it's cheaper than almost any holiday at home! How about an ACS trip for 1980?

(If anyone is interested in the details of the boat we hired, I will gladly send them the name and address of the firm we used if they will write to me, Michael Handford, at 6 Spa Lane, Hinckley, Leics LE10 1JB or Studio Flat, 52 Park Street, Bristol BS1 5JN (tel 0455 611508). A stamped addressed envelope would be appreciated.)

"Canalphone"

United Press International

LONDON - In case you get stuck on a British canal, pickup a telephone.

The British Waterways Board inaugurated "Canalphone," a 24-hour-a-day information service several years ago to provide details of events on Britain's inland waterway system and to warn of maintenance work, tunnel closures or canal-blocking accidents. The London number is 723-3485. (Contributed by George Wills)

Concrete Canal Boat

Reinforced concrete canal boat U.S. #117 was recently found by ACS Director and Chairman of the Canal Boat Hulks, Wrecks, and Remnant Sub-Committee, Bill McKelvey, on the east bank of Neshaming Creek about a mile up from the Delaware River in Croydon, Pa. This vessel was built in 1919 by the Structural Concrete Company at Ithaca, N.Y. and was operated by the New York Canal and Great Lakes Corporation. The official registry number is 167649 and specifications were length 149.3', beam 21.1', net tons 289 and capacity 500 tons. In 1959, U.S.



#117 was purchased from a marine salvage firm in Miami, Fla. by Mr. Warren C. Worthington who had it towed to his property at Croydon. A "berth" was dredged in the bank of the creek at the rear of Mr. Worthington's home and the concrete hull was sunk and filled with earth. The vessel continues to serve well as both a bulkhead and a dock. One 24" double-horned deck-cleat from the U.S. #117 is on display at the Canal Society of New Jersey Museum at Waterloo, N.J. Several views of these unique vessels appear in McKelvey's *Champlain to Chesapeake*, pages 38 & 39.

English Canal Vacation



How would you like to spend your vacation living in a lock house on the Oxford Canal in England? This is a possibility because ACS member Greg Klaes and family have a house at Somerton Deep Lock (shown above) which they are willing to share as they only use it part-time. The house is furnished for sleeping for four, cooking facilities, two bikes, etc. They also have a 60-foot narrow boat which they are willing to share. Greg is an American who teaches at the NATO air base at Upper Hayford. If you are interested in making a private arrangement with the Klaes', write to them at Box 4952, APO, New York, NY 91094.

A New Lock at Port Charlotte

During the past two years a new era of small lock construction has taken place at Port Charlotte, Florida. The General Development Corporation, one of the largest developers within the State of Florida has constructed two new small locks adjacent to Charlotte Harbor.

The location of these two locks will play a very important part in the future expansion of GDC properties that border on canals and waterways south and west of U.S. #41. Several of these canals and waterways are navigable for small craft, and, provide a means of transportation for residents whose property borders on either side of these beautiful waterways. Construction of these two locks serve a dual purpose: their location can control the water level in waterways for navigation as well as prevent tidewater from entering and polluting waterways. In case of a tropical storm, the excess water in canals and waterways can be released slowly by the lock, thus preventing damage to canal banks and property.

The Midway Lock was the first small lock built for the General Development Corp. (See the November 1979 issue of *American Canals*.) There is a remarkable difference between the South Gulf Cove Navigation Lock and the Midway Lock in construction details, size, and location. It was completed in October 1979 by the engineering firm of John A. Blume & Associates, of San Francisco, California. This firm has had considerable experience in building small locks at different locations in California.

Location of lock is on the west shoreline of the Myakka River. NNW by SSE. And adjacent more or less to Charlotte Harbor.

This lock (also known as "Marina Lock") is of concrete & steel construction. It has two sets of steel gates that were to be of the mitre type, but builders plans mention the sector type gates, therefore I am not sure which type was used. Both sets of gates are hydraulically operated from a pump, each one can be operated separately, or both together. All of the mechanism connected with the operation of this lock is handled from the Control Panel on the lock deck.



South Gulf Cove Navigation Lock on the Myakka River, Port Charlotte, Florida, looking south, south east through the lock into the wide Connector Waterway. (Photo by Alden Gould)

At both ends of the lock a ramp is provided which leads down to tidewater, or, canal level at the other end. Attached to these ramps at water level are long floats, used for loading passengers from boats.

This lock is 80 feet long and 20 feet wide. Its total length including all structures at each end of the lock chamber would appear to be over 100 feet. Having explored this excellent lock on the 25th of January 1980. And admired the fine workmanship of its builders, left me with but one last thought in mind. Congratulations! For a job well done.

From the Edison Bridge in Fort Myers, Fla. Take U.S. #41 north to Punta-Gorda, cross the Peace River; Follow U.S. #41 into Port Charlotte and continue to the Seaboard R.R. crossing and turn left on route #771 and follow to Myakka River Bridge & cross it. Watch for sign on left side "Cattleman Dock Road". Follow to end and turn left. If gate is locked park your car and walk to the lock. Distance approximately. 37 miles one way.

(Alden Gould, ACS Director), 775 Marsh Ave., Fort Myers, Fla. 33905.

Canal	Location	Length		Width		Depth		Number of Locks	Year Opened	Tonnage Carried in 1976*	
		In mi.	In km	In ft.	In m	In ft.	In m			Short tons	Metric tons
Albert	Belgium	80.8	130	335	102	16	5	6	1939	39,758,000	36,068,000
Amsterdam-Rhine	Netherlands	45	72.4	246	75	14	4.2	4	1952	98,877,000	89,700,000
Cape Cod†	Massachusetts	17.5	28.2	480	146.3	32	9.8	0	1914	11,485,000	10,419,000
Chesapeake and Delaware	Delaware, Maryland	14	23	450	137.1	35	10.7	0	1829	10,790,000	9,788,520
Chicago Sanitary and Ship†	Illinois	30	48	202	61.5	24	7.3	1	1900	26,568,000	24,102,100
Corinth†	Greece	3.9	6.3	81	24.6	26	8	0	1893	5,089,400	4,617,000
Houston Ship Channel	Texas	30.6	81.4	300-400	91.4-121.9	36-40	11-12.2	0	1914	83,674,000	75,907,800
Inner Harbor Navigation	New Orleans, La.	5.2	8.4	200	61	30	9.1	1	1923	25,559,000	23,186,700
Kiel (Nord-Ostsee)†	West Germany	61.3	98.7	336-531	102.5-162	36	11	8	1895	60,006,500	54,437,000
Lake Washington Ship	Seattle, Wash.	8	13	300	91.4	34	10.4	2	1917	1,798,000	1,631,100
Manchester Ship	England	36	58	121	37	28-30	8.5-9.1	5	1894	17,317,300	15,710,000
Moscow	Russia	80	129	98	30	11	3.5	11	1937	15,200,000	13,789,000
New York State Barge System†	New York	52.4	84.3	45	13.7	12	3.7	57	1918	1,941,000	1,760,800
North Sea	Netherlands	17.2	27.7	525	160	49	15	4	1876	61,840,000	56,100,000
Panama†	Panama	50.7	81.6	110-500	33.5-152.4	37-40	11.3-12.2	12	1914	159,954,000	145,107,800
Sabine-Neches Waterway	Texas	52.8	85	200-800	61-243.8	30-36	9.1-11	0	1916	79,296,000	71,936,100
Sacramento River Deepwater Ship	California	42.8	68.9	200	61	30	9.1	0	1963	1,695,000	1,537,700
Saint Lawrence Seaway†	Canada, New York	182	293	80-800	24.4-243.8	27	8.2	7	1959	54,330,000	49,287,300
Soo (Sault Sainte Marie)†	Canada	1.3	2.1	60-150	18.3-45.7	18.3	5.6	1	1895	564,000	511,700
Soo (Sault Sainte Marie)†	Michigan	1.8	2.9	80-110	24.4-33.5	23.1-32	7-9.8	4	1855	88,829,000	80,584,300
Suez†	Egypt	101	163	390	120.3	48	14.5	0	1869	129,690,200**	117,653,000**
Volga-Baltic	Russia	68.4	1,100	70	21.4	11	3.5	7	1964	11,192,000	10,153,000
Volga-Don	Russia	62.8	101	59	18	11	3.3	13	1952	9,364,000	8,495,000
Welland Ship†	Canada	26	42	80-200	24.4-61	27	8.2	8	1932	64,262,000	58,297,500
White Sea-Baltic	Russia	141	227	46	14	11	3.4	19	1933	4,640,000	4,209,000

*Figures are for 1978 for Panama Canal, 1975 for canals in the United States, 1974 for canals in The Netherlands, and 1970 for canals in Russia.

†Has a separate article in WORLD BOOK.

**The Suez Canal was closed during the 1967 Arab-Israeli war and remained closed until 1975.

Sources: Canal officials; American Waterways Operators, Inc.; U.S. Corps of Engineers.

For the general information of ACS members, we have secured permission to publish the above chart, entitled "Important Canals of the World", with its very interesting statistics of recent date. It is reproduced in its entirety from the *World Book Encyclopedia*, copyrighted 1980, by World Book-Childcraft International, Inc., Chicago, Illinois.

ANOTHER MINDERMAN "ORIGINAL"



This is another Chesapeake and Ohio Canal Scene by Maryland artist Earl Minderman, 5010 Jamestown Road, Bethesda, MD 20016. This painting depicts Lock 21 (Swains Lock) in the canal operating days. The lock house at this lock is longer than others on the canal. Swains Lock is now a popular canoeing spot near Washington, D.C. Canoes are for hire by the Swains, an old canal family.

TENN-TOM WATERWAY

Governors and Congressmen from southern states urged a House appropriations subcommittee not to let the controversial *Tennessee-Tombigbee Waterway* become a victim of budget cuts.

The Waterway known as the Tenn-Tom, is a 232-mile shipping channel that will connect the *Tombigbee River* in Alabama with the *Tennessee River*. The Tenn-Tom would open the Ten-

nessee River basin in Tennessee and Kentucky – where shippers now must go by rail or round-about on the Mississippi River – to direct barge access to the Gulf of Mexico. The waterway has been a favorite target of environmentalists, who argue it is economically unsound.

(Alden Gould, ACS Director, from the *Fort Myers News Press*.)

WHAT IS HAPPENING HERE?



Can anyone identify the location, the year, and tell us what the men are doing in this photograph? The boat seems to be the type used on the *Ohio canals*.

LETTERS TO THE EDITOR

Two ACS members wrote in concerning the oldest canal in the United States. One candidate was the *Middlesex Canal*, the other the *Cut River Canal*, both in Massachusetts.

Bev Morant reminds us that the *Middlesex Canal* was the longest (27½ miles) single canal at the time of its "day of celebration" in 1803. It had aqueducts, 48 bridges, and 20 locks.

Herb Verity suggests that the *Cut River Canal*, a tidewater canal from Plymouth Bay to Green Harbor affording an inland route to the north of Scituate, some 17 miles from Plymouth, first cut c1626 was the oldest "canal" without locks. In 1636 the General Court ordered that "the cut at Green's Harbor for a boat passage shall be eighteen feet wide and six feet deep." It probably closed for practical purposes in 1850.

English Canal Course

The Avoncroft Residential College (near Birmingham on the *Worcester & Birmingham Canal*) 26 July to 2 August is presenting a canals course entitled "The Midland Canals – In Town and Country." The course includes lectures, films, and field trips, and two half-day boat trips. Cost includes board, meals, tuition, and visits: Shared room L70, single room (L74), both plus tax. Details from Avoncroft College, Stoke Heath, Bromsgrove, Worcs, B60 4JS, England.

TRENT-SEVERN WATERWAY

In the article on the *Trent-Severn Waterway* in the February issue of *American Canals* we neglected to say that the author was Herman Granz, Chief, Canals Engineering Division of the Engineering and Architecture Branch of the Canadian Department of Indian and Northern Affairs. The railway is operated by Parks Canada, in the Department of the Environment.

M. R. Byrne and Associates Ltd., Burlington, Ontario were the consulting engineers who designed the system and the builders were: General Contractor, Ambro Materials and Construction; Carriage, John T. Hepburn, Ltd; Hydraulic System, Viceroy Ltd.; and Winch System, Canadian General Electric Co. Ltd.

CLASSIFIED ADS

Britain's Lost Waterways (Ware) – These two books look at the canals and waterways during their heyday with many photographs not previously published. Vol. 1: *Inland Navigations*, 96 pp, 142 illustrations, \$14.00. Vol. 2: *Navigations to the Sea*, 96 pp, 138 illust, \$14.00. Hardcover.

Champlain to the Chesapeake (McKelvey) – A journey via historic photographs of a trip from Lake Champlain to the Chesapeake Bay including the D&R Canal, the C&D Canal, and the Dismal Swamp Canal. 224 pp, over 475 photos, biblio., map, hardcovers. \$25.00.

American Canal & Transportation Center, Box 310, Shepherdstown, W.Va. 25443.