

Water Resource Update
The Universities Council on Water Resources
Issue Number 116
March 2000

“Add Water and Stir”
Reflections of Leonard B. Dworsky

Leonard B. Dworsky
Professor Emeritus, Cornell University

Since my first degree from the University of Michigan, I have spent 64 years in this water mixture from the vantage point of two institutions: government and the university. The state government portion was initiated in Illinois; the local government in Cook County, Illinois, not including Chicago. These provided the learning environment for the first five years, taught by state sanitary engineers Clarence Klassen and Carl Schwob and others of their team. The second five were maturing years in the Army Sanitary Corps under Colonial William (Bill) Hardenburg and Military Government for the Far East. The next eighteen years were in federal service as a Commissioned Officer, United States Public Health Service (via a national examination). The second career, buttressed by an M.A. degree from American University in Public Administration and Political Science and, later, Doctoral studies in Natural Resources under Stanley Caine and Lyle Craine again at Michigan, started with my retirement from the Public Health Service in 1964. A concurrent appointment as tenured Professor of Civil and Environmental Engineering, Cornell University, and Director of the Cornell Water Resources and Marine Sciences Center followed. The second career was founded on the first, and the mix has continued for another thirty-six years, and still tastes good.

My only regret is that this special issue of *Water Resources Update* does not have enough pages to accommodate the many others whose words will surely be missed. Their names are in the forefront of my memory as I write this short essay. A colleague, David Loeks, who left his imprint on the classic. St. Paul-Minneapolis Regional Plan, once suggested the title “Add, Water and Stir” to an (happily suppressed) odyssey I threatened to write. With this title in mind, I will recall early days that led me to this moment of writing.

Since grade school, circa 1921, I wanted to be an airplane pilot, but my eyes said no. I then entered the water world of my father and as a child played under the shadow of the triple expansion engines of the 14th St. Pumping Station of the Chicago Water System

(just off Michigan Boulevard). In succeeding years, when he was an investigator for the Chicago Sanitary District, I accompanied him on his examination of the effects of the District's works on the Illinois River. Towns like Peoria, and of the concern of leaders in Wisconsin towns like Nena-Menasha and Oshkosh. The cause of concern was diversion by the District of Lake Michigan water into the Illinois and Mississippi River systems. Concurrently, I entered my own water world: ten years of competitive swimming for the Chicago JPI (Jewish People's Institute); Captain of the Crane Tech high swim team; water polo under the eyes of Olympian Sam Grellar; and later under the dean of swimming coaches Matt Mann at the University of Michigan. Add summers between university years as a junior civil engineer for the S. A. Healy Co in the Sanitary District's blue clay nine foot Jefferson Street tunnel under compressed air and the 36 foot tock tunnel under 39th street. The final touch of a Civil Engineering degree with the help of Professor and mentor William C. Hoad at the University of Michigan, class of 1936, makes the title "Add Water and Stir" seem fitting.

I have selected two principal issues for discussion and analysis: (1) Water Pollution Control: The Integration of Water Quality-Water Quantity Planning and Management, and (2) Safe Drinking Water. I have added a few notes here and there with several other interesting happenings along the way.

WATER POLLUTION CONTROL: THE INTEGRATION OF WATER QUALITY-WATER QUANTITY PLANNING AND MANAGEMENT

Contrary to the teachings of the 1980's that government is the problem, not the solution, the national water pollution control program stands as a positive counterpoint. The work of the Lawrence Experiment Station and the Public Health Service Hygienic and subsequent laboratories at the turn of the 20th Century; first the control of waterborne disease and second, the growing concern for safeguarding water quality for all human purposes and living things stand high among the accomplishments of modern societies.

The Congress, early concerned about the effects of water pollution, considered about 100 bills by the time it passed its first comprehensive pollution control legislation in 1939. At that time a bill, sponsored by the Water Resources Committee of the National Resources Committee under the Chairmanship of Dr. Abel Wolman, found its way through the Congress but was not approved for technical reasons by President Franklin D. Roosevelt despite his great concern for controlling pollution. Following the close of WWII, the Public Health Service submitted a legislative proposal that was enacted as Public Law 845 of the 80th Congress, June 30, 1948.

The record of the first five years of the Federal Water Pollution Control Act of 1948 is documented in my M.A. thesis, prepared under the direction of Doctor Katherine Seckler Hudson, School of Public Affairs and filed at American University, Washington, D.C. While the 1948 Act is often decried as weak, it changed water policy in two fundamental ways: it provided for the first time a federal enforcement mechanism to combat interstate pollution; and it provided a financing mechanism to assist municipal governments in the provision of sewage and waste treatment.

Other aspects of the Act were equally important. It applied to all water uses; it provided for federal cooperation with states, local governments and interstate agencies, and the private sector; it provided grants to state water pollution control agencies to strengthen their capabilities; it provided for research and, of substantial significance, for the collection of data and the development, in cooperation with the states, of comprehensive plans to control and abate water pollution in the waters of the nation. It was this last provision that has been at the center of my professional activities for the last half-century.

Upon the passage of the Water Pollution Control Act of 1948, Carl Schwob was named the first administrator and Chief of the Division of Water Pollution Control within the PHS. I believe I was the second person formally assigned to the new Division. The set of challenges that confronted the new organization are detailed in my Masters' Thesis. The Act passed by the Republican Congress was unambiguous. "Water Pollution has become a matter of grave concern . . . its damaging effects . . . are a matter of definite Federal Concern as a menace to national welfare." Federal responsibility was clearly enumerated in the Senate Committee report by republican Senator George Malone; "The Federal Government should take the initiative in developing comprehensive plans for the solution of water pollution problems in cooperation with the states."

In 1950, President Truman's Water Resources Policy Commission reported on the allocation of funds to assist municipal treatment works. "Funds . . . should be allocated on the basis of pollution-control programs developed as integral parts of comprehensive river-basin programs by the responsible Federal agency in cooperation with other Federal agencies, the states, municipalities, and industries concerned." Further, it reported on multipurpose integration: "Pollution control . . . should be an integral part of comprehensive river-basin programs, with full consideration given to this objective from the beginning of the planning process."

I make special note of these policies because they confirmed what we in the pollution

control program believed to be our purpose and course of action. Our specific responsibilities took the following form.

The comprehensive planning tasks authorized in Section 3 of the new Act were of first importance from an operational standpoint. What was most needed to get started was information about the extent of the national water pollution problem; about the extent of the interstate problems subject to the enforcement provisions; and about the quantity, quality, and location of public needs to assist in financing municipal pollution control works. (The Third report of the National Resources Committee by its special committee on water pollution, printed as H. Doc. 155, 76th Congress, 1st session, February 16, 1939, was the first national report on Water Pollution in the United States, but none of the information sought under section 3 of the new Act was available in that report for program purposes.)

Prior to my first official Division assignment as Acting Chief of Operations, I had three experiences to lean upon that helped me get started on the planning task. The first was as the PHS representative to the Subcommittee on Hydrologic Data of the Federal Interagency River Basin Committee (FIARBC) where I first met Bill Ackermann, Ray Linsley, and others. The second experience was an assignment to review agency reports and provide comments to the then Bureau of the Budget on the implication of all Federal water resource projects to the FSA-PHS. The educational opportunities attached to these assignments were immense. The third was the backlog of experience I had accumulated under the leadership of Sanitary Engineer Carl Schwob in earlier Illinois days. I had spent five years in association with Carl attending town council meetings to talk about sewage treatment and water pollution, serving under him during the great Ohio River flood of 1936-37; walking surveys on the Du Page river and other streams, and operating mobile laboratories in summers under his guidance. I served him in 1939 when he was appointed emergency manager of the ten thousand patient state mental hospital at Manteno, Illinois, during the last great epidemic that took over 50 lives in more than 500 cases of typhoid fever. When PHS Chief Engineer John Hoskins, who had for twenty five years been active in seeking a national law to manage water pollution, prepared to try again, he assigned the task to Carl Schwob. Carl, a WWI veteran, had joined the Public Health Service early in the WWI; had over twenty years experience in the Illinois Department of Public Health, Division of Sanitary Engineering; had studied under Professor Gordon Fair at Harvard; was an acknowledged leader in water pollution control; had immense resources in human relationships; and had the confidence of the state leaders.

With these experiences I shared the responsibility to initiate the development of

comprehensive pollution control plans for the nation's waterways. As Acting Chief of Operations for the Division, I remember vividly the collective concern of the: staff when the question was initially posed; what comprises a comprehensive water pollution control program? Within weeks we were intensely reviewing the monumental three volume Ohio River Report of the Corps of Engineers and the Public Health Service (House Document 266, 78th Congress, published in 1943, Page 168). Part 2 of the report designated as the United States Public Health Service Report had outlined the bare elements of a comprehensive planning process, derived from 25 years of research and field experience at the PHS Cincinnati Water and Sanitation Investigations Station.

(I digress to read from my M.S. Thesis, page 54, the following: "In the initial days of the program the concept of comprehensive programs was far from clear. Over a period of a year, through staff discussions, continuous analysis and review of other agency programs and with the advice of non-technical personnel, the plan that was ultimately to become the outline of a comprehensive program began to take shape.")

By designating 225 watershed areas within 15 major water regions and considering only the first phase of a comprehensive planning task, the states and the Public Health Service Water Pollution Control Division field offices collectively completed a national planning program between 1949 and 1951. The 1951 report "Water Pollution in the United States" (Public Health Service Publication No. 64, 1951) described 22,000 places with significant pollution discharges; 11,800 municipal and 10,400 industrial. Needed were 6,600 more municipal sewage treatment plants or additions, 3,500 more industrial waste treatment plants or additions, 7,000 other needs(1600 municipal and 5500 industrial) were as yet unascertained. The report called for municipal expenditures of \$500,000 million a year for a ten year period, plus an equal or larger sum for industrial waste abatement.

In retrospect, it is clear that the Act was a major force in changing the nation's attitude toward water pollution at the public health level as well as for the conservation of water resources. It was not easily done and it was a slow and learning process. Between 1948 and 1972, the Act was amended six times, each amendment providing a more stringent national course as demanded by an education public. The 1972 Amendment changed the course of the initial Act in the light of new developments but it had required a 24 year transition period.

In many ways it is a wonder that the nation has done as well as it has. The comprehensive planning functions authorized by and developed under the 1948 Act to

bring rationality to the vast expenditure of money (in the billions of dollars) for water pollution control were never used by the Congress. State priorities were set most often by the readiness of polluters, municipal or industrial, to act to abate their pollution contribution. The policies that proposed the integration of water pollution control planning with water resource development plans of the federal agencies were seldom honored. Congress (nearly) never concerned themselves either with pollution control planning reports or with the inclusion of pollution control in the large resource developments of the nation. Cornell Professor Ted Lowi's definition of distributional politics was the course followed (Everybody gets a share of the public money). Yet, it may be that the "real" world of democratic governance was all that could be expected. Perhaps the results are not as bad as one might think, not having tried the other options.

Americans need to understand that there is no end to the process in which they have now been engaged for a half-century since the 1948 Act. At some point the cost of the still current (and physically and biologically impossible) policy of "eliminating the discharge of pollutants to the waters of the nation" needs to be confronted in the light of other challenges that need also to be met.

"How clean is clean" still needs determination, and it is not a technical question. American culture, social equity, and the meaning of the rising exponential curve of environmental disturbance during the next quarter century must be confronted. We need to look hard at this evolving future. Much is going to depend on how it is interpreted.

SAFE DRINKING WATER

Unheralded, the Safe Drinking Water Act of 1974 has its legislative beginnings in a bill proposed by President Johnson's administration in 1968. The Public Health Service drinking water program under Sanitary Engineer C. C. Johnson had just published the last of its periodic national surveys of the nation's drinking water situation. Its finding of substantial needs to protect public health was not at the top of the HEW Department agenda at that time and so it languished, going nowhere.

In 1967 I was asked by Dr Donald Homig, President Johnson's Science Advisor and Director of the Office of Science and Technology (OST) on the advice of Professor Bob Smith of the University of Kansas, to take leave from Cornell for a short assignment in OST. The assignment was to fill the water resources staff position that Bob Smith had occupied. Bob had been preceded by Dean Peterson, Utah State; Ray Linsley,

Stanford; and by Bill Ackermann, Illinois State Water Survey who had been requested to establish this position in the President's Executive Office in early 1962.

I had long been aware of the need for strengthening the PHS Drinking Water Standards, especially with respect to chemical standards. In the normal course of communication with PHS colleagues, I was informed of the difficulties encountered in moving this water policy question to the working agenda of HEW. In discussions with Public Health Service Chief Engineer Albert Stevenson, we outlined a program that called for me to brief Dr. Hornig. Don was fully cooperative and suggested a course of action that included bringing the matter to the attention of the President's Science Advisory Committee (PSAC). As Chairman of PSAC he arranged for a place on the next PSAC agenda. Al Stevenson briefed Surgeon General Stewart on the matter and, with his approval, Stevenson and the Surgeon General presented the issue to the Committee. The Committee recommended that HEW move a Safe Drinking Water Legislative proposal forward. With that support, HEW Secretary Wilbur Cohen, with whom I had car pooled in my PHS days, sent the first proposal to the Congress in 1968, with the approval of OMB and in conformance with the President's Program.

I have often marveled at the strange ways that often attend the initiation of public policy. The inadvertence of events in this case seemed to be a classic example. Yet inadvertence had not run its course.

On the completion of the OST assignment, my colleague Professor David Allee and I brought the matter of safe drinking water to the attention of our republican member of Congress, Howard Robison. During the next several years Mr. Robison and his legislative assistant Barry Segal initiated an unusual educational program about safe drinking water on the floor of the Congress. This long investment concluded in the introduction by him of the first safe drinking water bill about 1972. By that time his educational program had been well adopted in the House of Representatives and, not unexpectedly, had been taken over by Committee Chairs in both the House and Senate. When the bill that passed the Congress in 1974 was under discussion, it was known as the Rogers (Florida) and Magnuson (Washington) bill. The Chairmen were careful to assign 'Congressman Robison his place in the scheme of things, and allowed him the honor as the first to testify in hearings on the bill. My mind still boggles over Howard's insistence that I accompany and sit alongside him during that testimony. And that's how public policy is made!

ANOTHER SET OF POLICY FRONTS

The Air Pollution Control Act has an interesting and little known relationship to the

Federal Water Pollution Control Act. The Universities Council on Water Resources (UCOWR) may want a reminder of how this came about. October 27, 1998, was the 51st anniversary of the five days of Donora. In that time, 29 citizens of Donora, Pennsylvania, died; and 6,000 making up 43 percent of the population were made seriously ill by polluted air over a five day period. From August, 1954, until July 14, 1955, several senators were deeply involved and concerned about air pollution conditions that were taking place throughout the nation, and pressed the Administration for action. On April 25, 1955, the Senate Public Works Committee held hearings on a bill to amend the Federal Water Pollution Control Act (P. L. 80-845) to provide for the control of air pollution.

Why was S 928 enacted into law as PL. 159, 84th Congress, as an amendment to the Federal Water Pollution Control Act? For one thing, the republican led Senate Public Works Committee and most of its members and staff had been in the forefront of the fight to pass the 1948 Water Pollution Control Act. It was an act with which they were familiar, and the sections they applied to the air pollution problem were taken from the language they had fought over earlier in the Pollution Control Act. Regulatory actions were not at stake; the provisions stated the policy that state and local governments have the prime responsibility. The federal programs were primarily of technical assistance to them and for research on air pollution.

The Water Pollution Control Act of 1948 was subject to six amendments over 24 years before the enactment of the Clean Water Act of 1972. Similarly, amendments to the Air Act P.L. 159 were initiated in 1959, 1960, 1962, 1963, 1965, 1966, and 1967.

At fifty years we remember. The two acts, Water and Air, in the seven years 1948 through 1955 were the forerunners of the vast transformation of public concern with matters of the environment. While much trauma may still lay ahead, we might want to thank and remember public servants that acted in the public and national interest during those years. Water and Air, perhaps the UCOWR name should reflect this combination as COW/AR.

THE BIRTH OF A NEW WATER POLICY FOR INDUSTRY

A new water policy affecting American industry came about in this way. President Truman worried about the nation's capacity for industrial materials following WWII. In 1950 he established a Materials Policy Commission to examine this concern. About this time the Water Pollution Control Program was beginning to look at industries' contribution to the pollution problem. How much? Where and when? Characteristics of

the contribution? Concurrent with this interest a report was issued by the National Association of Manufacturers entitled: "Water Use in Industry." As a routine procedure, the Materials Policy Commission had initiated a circular letter to most federal agencies inquiring of their concern with industrial materials. Having just read the new publication on Industrial Water Use, I proposed that the Water Pollution Control Division respond by inquiring if water was a matter of concern in their survey. The Commission's response was immediate: asking for a working session on the question we had raised.

The result of the session was the acceptance by the Commission staff of the inclusion of water use in industry, not merely as a major element of the study but with a wider understanding that water was perhaps the most important of industrial materials. The final report of the Commission included Chapter 10 on "Water Use In Industry," a chapter that had not earlier been on their schedule.

What started as a simple inquiry soon resulted in a survey of available information on industrial use of water. The Commission brought the Census Bureau into the discussions with the result that a new census of water in industry was formulated. on a trial basis in 1954, and added to the regular census of industry in 1955. The Public Health Service played an important part in these developments, with Sanitary Engineer Richard Green as a consultant to the Census Bureau and the Commission.

THE BIRTH OF TWO WATER RESOURCE PLANNING POLICIES

In 1951 a Committee was established by the Bureau of the Budget to review the 1950 report of the President's Water Resources Policy Commission. PHS Sanitary Engineers Sylvan (Sandy) Martin and I were members of the review committee on Water Resources Planning. Two issues of concern to the Public Health Service were presented to the committee. One was a provision to ensure minimum water flows for water quality preservation and for fish and wildlife benefits in waterways. The other was to make provision for the expanded use of water in federal reservoirs to serve the growing needs of urban communities. The specific provision allowed for the inclusion of added municipal water capacity in such reservoirs with a 10 year delay in financing costs of development. The first proposal was included in the 1956 revision of the Water Pollution Control Act as Section 4. The second was enacted the Water Supply 4 Act of 1958.

A UNIVERSITY BASED POLICY FOR THE GREAT LAKES

Great Lakes research ranked high on the original agenda of the Cornell Water Resources and Marine Sciences Center during the mid-1960s. To pursue such research effectively, a Canada-United States inter-university seminar comprising 20 institutions was initiated by the Center Director and Associate Center Director (Leonard Dworsky and David Allee) at Cornell and Professor George Francis at Waterloo University, Ontario. Four additional sessions of the seminar have extended into the 1990s.

One of the results of the initial seminar came about while presenting the first seminar report to the Foreign Affairs Committee of the House of Representatives, U.S. Congress, and then to the Senate Standing Committee on Foreign Affairs of the Canadian Parliament, at the request of both committees. One of the recommendations of the Canadian Standing Committee, as a result of the testimony provided by the seminar initiators, was to the effect that, "The International Joint Commission (IJC) should initiate a watching brief over the boundary waters" to better be prepared to advise the two governments of future issues that may arise at the boundaries. This recommended policy was a confirmation of one of the findings of the seminar. It also has played a role in changing the responsibilities of the IJC as it moves into the 21st century.

FOOTNOTE

Purposefully, I have indicated the role of Republican members of Congress in several of these policy formation illustrations. I would expand that to include the role of President Eisenhower in the Air Pollution Control Program and of President Nixon in the Executive orders establishing the EPA, NEPA, and the Safe Drinking Water Act. This was interagency and intergovernmental cooperation at its best.

But beginning with the administration of President Reagan, the role of the Federal System in water resources was turned on its head. Fifty years of Congressional effort by both parties to improve federal, state, and local cooperation to plan and manage water resource development and integrated water pollution control was severely impaired — destroyed would not be too strong a word — by the abandonment of the Federal Water Resources Council and the dissolution of the River Basin Commissions under the Water Resources Planning Act of 1965. Since 1981, David Allee and I and others have struggled to keep alive a form of federal-state-local cooperation but with little success. Senators Domenici and Moynihan had proposed ideas during the 1980s that we have reviewed for new ideas. We have, during the past two years, proposed a new type of Interagency Committee to improve intergovernmental cooperation. It is badly needed. We make reference to Warren

Viessman's outstanding editorship and leadership in the last Update on this matter, and of Dave's and my paper as the opening paper. We hope that *Update* readers will not forget this gap in our institutional arrangements and will strive to find ways to have it filled.

Hopefully the discussion above will help in the understanding of how some water policies came into being. This is where this discussion ends.