



An
Interview
With
EDWARD J. CLEARY

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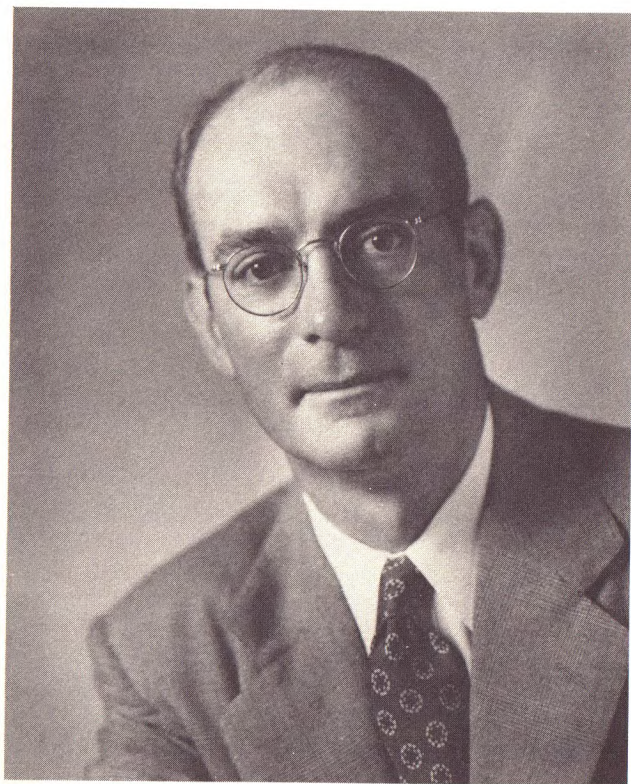
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EDWARD J. CLEARY

BIOGRAPHY

As engineer, editor, administrator and educator, Edward J. Cleary has been a major force in the field of public works for nearly a half century. He covered the key developments and people responsible for them while an editor of *Engineering News-Record* (1935-1949). He conducted a massive and successful effort to control pollution in the highly industrial Ohio River Valley during his term as chief administrator of ORSANCO (1949-1967), the largest regional water pollution control program ever attempted in its time. He has shared his knowledge and experience with professional colleagues in many lands as a consultant, teacher, and active participant in the work of many professional associations.

Edward J. Cleary has contributed to public works on every level: local, state, regional, federal, and international. His career began at Rutgers University, from which he received a B.S. in Engineering in 1929, an M.S. in Sanitary Engineering in 1933,

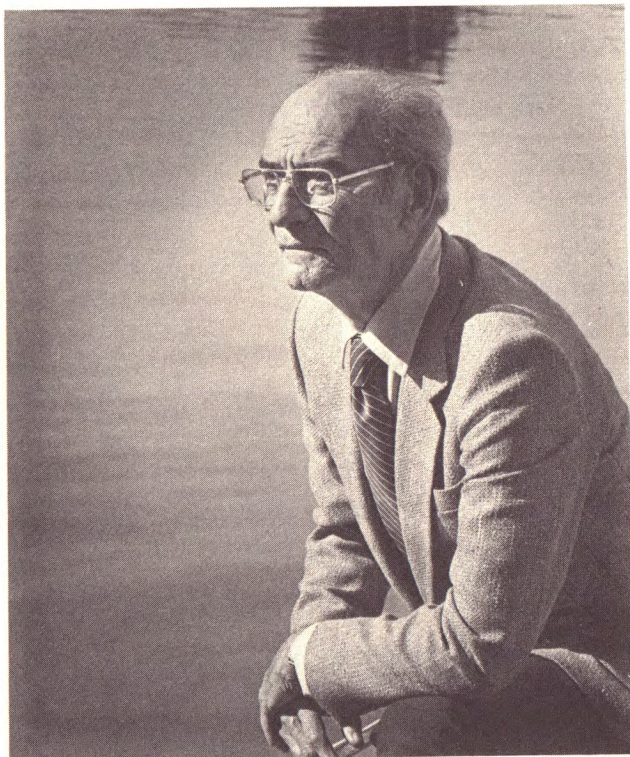
and a professional degree in Civil Engineering in 1935. While at Rutgers, Cleary was a student of the eminent sanitary engineer, Dr. Willem Rudolfs. This association developed an interest in research and education which he has maintained throughout his career. In addition to his many other duties, Cleary managed to find the time to teach courses at New York University (1937-1941) on public works administration and on environmental quality management at the University of Cincinnati (1967-1976). He has received honorary doctorates from his alma mater (Sc.D., 1959) and from Rose-Hulman Institute of Technology (Doctor of Engineering, 1972).

Ed Cleary's contributions to public works, environmental engineering, and public health have earned him numerous awards and distinctions from his peers. Included among the many honors he has earned are membership in the National Academy of Engineering, directorship of Resources For the Future, American Academy of Environmental Engineering, and honorary membership in the American Society of Civil Engineers, the Water Pollution Control Federation, the

American Water Works Association and the American Public Works Association.

Cleary's involvement with APWA dates from the first year of its formation in 1936. He served as a member of its Board of Directors, and as a Trustee and Vice-Chairman of its Research Foundation. In 1951-52 Cleary served as president of APWA. He was selected as a "Public Works Man of the Year" in 1962, and as president of the Public Works Historical Society (1976-77).

Organizations in many parts of the world sought to benefit from Cleary's knowledge and experience. He has been a consultant to the World Health Organization, the World Bank, the Agency for International Development, the Institute of Inter-American Affairs, the Economic Commission for Europe, and the Federal Republic of Germany. Cleary's recent visit to the Ruhr River Valley led to the publication of an important report, "Managing Water Resources: Lessons for the U.S.," published in the August 1983 issue of the *Water Pollution Control Federation Journal*. Cleary is the author of numerous articles and books, including *Bulldozers Come First* and *The ORSANCO Story*.



A glimpse of Ed Cleary at his waterside home in Westlake Village, California

INTERVIEW

This is a consolidated version of an interview with Edward J. Cleary conducted by Michael Robinson of the Public Works Historical Society at Westlake Village, California, on March 21-23, 1982.

Ed, what is your first childhood memory?

Chopping off the end of my middle finger on my left hand playing at the woodblock with an axe. I was about four.

Did you heat your house with wood? Is that what you were doing?

No, we heated our house with coal, anthracite. But wood kindling was needed to start the fire each morning.

Where were you living when this event occurred?

In Newark, New Jersey, in a German area of the city.

Is that the city of your birth?

That is where I was born, June 16, 1906.

Did you have any brothers or sisters?

There was a brother born before me who died in infancy. I was raised as an only child.

Had your family lived in the community for several generations?

My grandmother moved into this area right after the Civil War.

Was your grandmother a first-generation immigrant?

That's correct.

What country did she come from?

She came from Germany in East Prussia and traveled on a sailboat for about 30 days. The passengers brought their own food. The women lived below the deck. The men had their quarters on deck. It was a very stormy passage and there were many occasions when they were given buckets to help remove water from the ship. She was sixteen and was accompanied by an older sister.

What was your grandmother's name?

Bertha Manthey. She came from a farming family. I understand they had a relatively large farm, but the daughters left because the work was very difficult.

Whom did she marry?

She married a French cabinet maker who came to the United States following our Civil War. He established himself as a

building contractor in this predominantly German neighborhood in Newark. His name was John Geiges and he was born in Alsace-Lorraine.

These were your maternal grandparents?

These were the maternal grandparents. My father's father was Maurice Cleary who left County Donegal, Ireland, following one of the potato famines. He was a hat maker whose wife had died. I never had much contact with the Cleary side of the family, although my grandfather frequently came to our home for Sunday dinner.

Were your parents born in Newark?

Yes. My father married my mother shortly after his discharge as a volunteer private in the Spanish-American War. That was in 1898. He was enamoured with baseball and he played with semi-professional teams in Newark.

Did you watch him play?

No. By the time I was born, he had given up on baseball and became a brush maker. He became involved with a new technique for vulcanizing bristles in hard rubber. He developed certain skills in this technique and it led to his assignment as foreman in a company that was well known nationally — the Rubberset Company.

Were your parents active in any types of community groups?

No, they were not. I can remember that there were many community activities. People were heavily involved in getting their citizenship, going to night school and improving their living conditions.

Did your parents engage in leisure activities?

The principal recreation, notably on Sundays, would be street-car rides to parks and visits to beer gardens operated by local breweries. The food was good and a German band played away while the kids all frolicked about. It was a very happy social occasion.

Did your community have a large mix of nationalities or did it tend to be more specifically German?

It was heavily German, although there was a mixture of Irish and Italian people.

Was there much tension between the various national groups?

To my recollection, there were little if any conflicts.

Would you describe the people as industrious and self-reliant?

I certainly would. They were disciplined, sober, and took great pride in maintaining tidy homes and gardens. Most of them worked in nearby factories. A good number were engaged in operating small bakeries, dairies, grocery stores, apothecaries, funeral parlors, butcher shops, saloons, and plumbing establishments. It seemed that every block had some enterprise that would serve the people locally.

Did they have any kind of clubs or fraternal organizations?

Yes; singing and gymnastic societies, bugle and drum corps, and oom-pah band groups.

You mentioned something about clubhouses?

Nearly every block had one saloon, and with it, a free lunch counter. There was a separate section of these premises that was set aside for family gatherings. These places actually were

clubhouses, where neighbors would meet evenings for refreshments, card playing, and exchange of gossip. Only men were permitted, incidentally, to pass through the swinging main door of the establishment and stand at the bar. The wives and children used a door around the corner marked "family entrance" and they would unobtrusively seat themselves and be waited on completely separate from the men.

Were your high school teachers highly trained people?

We had an unusual faculty, many of whom were trained at prestigious colleges. My math teacher, for example, was a Harvard graduate. English and American literature were taught by a Dartmouth graduate. A man from Columbia University taught physics and chemistry. These were excellent teachers and they were all inspiring. For example, I developed a great zeal for trigonometry because our teacher demonstrated the use of a land surveying transit. He let me take it home weekends and I soon learned how to make measurements and all the computations that later led to my first job in land surveying.

What were some of your special interests during high school?

One was the assembly and operation of a radio station, which I began in 1920. This was at the earliest time of broadcasting and I spent endless hours in the shop making tuners and other devices that could be used in this connection. The second activity that enriched my high school days was playing piano in a small dance band. We played weekends, at dances, anniversaries, and birthday parties. For playing about six hours we received \$3 each.

Were you an honor student in high school?

No, but I was in the upper third of my class. I did exceptionally well in English, history, and writing. My mathematics was rather weak.

Did your parents really encourage you to do well in school?

They made it quite clear that this was quite an opportunity and gave me all the freedom to participate in many activities. Furthermore, they were disciplinarians — at least my mother was — and insisted that my scholastic work measure up to standards.

During high school did you have to supplement the family income with part-time work?

To make some money during the summer my father got me a job in a metal buckle factory. It was the worst tedium I have ever experienced. Another summer I took on a tough job in a swaging mill operated by General Electric; the pay was \$26 for a 6½-day week.

Did you participate in athletics?

I was not adept at baseball so I turned to track. Concentrating on the 220- and 440-yard dashes I managed to rack up a rather credible number of points in various high school meets. My teammates thought enough of my performance to elect me captain in my senior year.

What was the quality of the public works in your community?

Matters relating to rubbish disposal, street cleaning, and general sanitation received a pretty high priority from the city government. As a young boy I was particularly aware of this because one of my uncles, Edward Cleary, was the sanitary inspector assigned to our neighborhood. He would make his

rounds every month, quite resplendent in his slate blue trousers, double-breasted coat, and officer's cap. He looked very much like a West Point cadet. This city uniform gave him a certain status and impressed people with whom he came in contact. My uncle was known as "Mr. Ed" by virtually all the neighbors and he would inspect every back yard to see if things were in order and noted the cleanliness of chicken coops, pigeon housing, and the premises in general. He solemnly checked off in his notebook any deficiencies and then he cautioned the property owners that they must be corrected before his next visit.

In completing your senior year in high school did you have any specific career expectations in mind?

What really gave me a sense of direction was my math teacher whose brother was chief surveyor for a major title company in New York. My teacher recommended that I be hired after graduation.

Was it more or less taken for granted that you would have to get a job and become self-supporting?

There was never any discussion about higher education other than taking advantage of what night schools might have to offer. Of the 61 members in my class of 1924 only three went on to college.

What was the first job you had?

Within a week after graduation I started commuting 20 miles by train to New York City. I was employed by the New York Title and Mortgage Company as a land surveyor and draftsman.

How long did you work in this job?

For about 14 months. Meantime, one of my co-workers was completing his fifth year to meet requirements for a degree in civil engineering at the Cooper Union for the Advancement of Science and Art. I learned from him that you could get admission to this school if you passed an examination and that the tuition was free. I promptly made application; I took the exams and was accepted for night school.

Did you expect to get an engineering degree?

Because I was following the aspirations of my colleague who had obtained an engineering degree, I was inspired to do likewise. The routine of attending school five nights a week was rather difficult. I would leave my office around 5pm, grab a small supper, then get on a subway train to 14th Street where Cooper Union was located. The classes ended at 10pm; then began the long trip back to Newark by subway, train and ultimately bus. I would get home just before midnight.

At this time of your life, was there any shift in your career expectations and ambitions?

No, they were centered on participation in engineering and construction activities.

Why did you leave the firm after 14 months of work?

I had a very lucky break. In the spring of 1925 I was invited to the Delta Upsilon fraternity house at Rutgers University to spend a weekend. My host was Raymond Brandes, a third-year student in engineering who later became an authority on design of reinforced concrete structures. When my visit ended he said, "If you like what you've seen at Rutgers why don't you try for a state

scholarship?" I later learned, incidentally, that he had one. These scholarships, covering tuition for four years, were offered every year to some 60 candidates who scored highest in a statewide competitive examination. These examinations were in chemistry, English literature, history, physics, and mathematics.

How many people do you think took the examination?

I don't know. In Newark, where I took the exam, there were about 300 but this was only one of the cities where it was given. In preparation I applied myself very diligently. I couldn't take time off from my job, so I withdrew from Cooper Union and devoted evenings and weekends for the next two months in cramming for the exam.

Did your parents encourage you to do this?

Not particularly. I had reason to believe they were concerned about the drain on their limited resources if I left home for college.

How did you receive word that you had won your scholarship to Rutgers?

I got home one evening in June and my mother quietly informed me I had a letter from the university. It said: "You have qualified for a state scholarship." Instead of sharing my great joy, my mother had tears in her eyes when I told her. She said she knew that one day I would have to break away but didn't expect it to happen this soon.

Do you think that your parents might have felt that way because you were an only child?

I think my mother did. My father said, "I guess I know how you

feel — just the way I used to feel when I had the good fortune to hit a home run.”

When did you enroll in Rutgers?

On September 15, 1925, I checked in at the Registrar's Office to pay an admission fee of \$35. Then I studied a bulletin board to see what jobs were available.

Can you resurrect the feelings and events in starting this new departure in your life?

I was enthused beyond measure and thrilled at the prospect of getting involved with university life. I called on my friend, Ray Brandes and said, “Here I am. I've got to find some work and a room.” We managed to get a room in a private home near the campus and I applied for a job to wait on tables at the college dining hall.

A few weeks later I was accepted as a pledge to the Delta Upsilon fraternity and found a classmate who was willing to share his double room in a dormitory for \$62 a semester. Meals cost \$8 a week but I wasn't burdened with this expense because I waited on tables.

Did extracurricular activities attract your attention?

Virtually everyone in the fraternity was involved in athletics and I got a place on the freshman track team. At the same time I became fascinated with lacrosse which was a popular team sport at colleges along the East Coast. This was a game similar to hockey in which you netted and passed a 2 inch solid rubber ball to make a goal. I developed some skill in handling the lacrosse stick and in the spring tryouts I was selected to play on the freshman team.

Sounds like you had a very full agenda of school work, athletics, and part-time jobs. What would a typical day have been from the time you got up in the morning until you went to bed at night?

From my present perspective I'd say that the pace was rather hectic. But at that time it didn't seem too bad. I'd arise at 6am to fire a furnace, take out ashes and sweep the sidewalk at a nearby private residence. After breakfast I attended classes from 8am until 3pm. Then I had lacrosse practice for three hours. By now I was not only tired but very hungry. I hurried downtown to a dish-washing job at a local restaurant where I indulged in a big evening meal before getting home around 8pm. Without much enthusiasm I tackled my homework and got to bed about 11pm.

Did you make good marks scholastically?

No, I was not a top performer. I didn't do well in mathematics and chemistry but I had a satisfactory record in such courses as economics, psychology, literature, and writing. At the time, I attributed my deficiencies to my preoccupation with extracurricular activities.

Did you maintain civil engineering training or did you ever consider other choices?

At the end of my sophomore year I began to feel that engineering was very demanding as contrasted with a liberal arts curriculum. Because I was involved with several magazines at the university I began to toy with the notion of switching to the journalism course.

Why do you think you stuck with the engineering curriculum?

I presume it was because of a romantic and deeply ingrained fascination with the accomplishments of engineers. Furthermore, I was curious about the practical application of engineering principles — to the design of dams, bridges, and other structures.

I was enthralled with accounts of engineering achievements and personalities associated with them.

How do you think you developed a romantic attitude toward the contributions of engineering works to civilization?

It evolved from reading. I was enthralled with accounts of engineering achievements and personalities associated with them.

At college what were some of the social endeavors you would engage in?

We had many activities at the fraternity house — dances, teas, and the like. Then I frequently made pilgrimages to the other end of town to New Jersey College for Women, which we irreverently called “The Coop.”

Is that short for “chicken coop?”

Yes! It is now called Douglass College and is affiliated with the University. This is where I met my future wife in my junior year —

Adelaide Rogers. She also was a member of the class of 1929. I have a very vivid mental picture of her when she was president of the college League of Women Voters and introduced Norman Thomas, the Socialist Party candidate for president of the United States in 1928. I could hardly conceive of this vivacious young lady being so involved in matters of such serious import.

Did you become engaged to Adelaide while you were in college?

I pinned her with my fraternity badge and that was regarded as a prelude to a future engagement.

Did you make any effort to cut down on some of your extracurricular activities that were spreading you so thin?

My junior year was the turning point in athletic participation. I had displayed a little promise on the freshman lacrosse team, but this didn’t materialize when I got on the varsity squad. Despite intensive coaching my performance was rather mediocre compared to the skills displayed by other members of the team. Toward the end of the third year I received an injury that damaged a muscle in my thigh. I could hardly walk. During the long sessions of heat therapy, I began to realize that the hours devoted to lacrosse might better be employed to improving my rather anemic scholarship record.

While you were in college did you obtain employment during the summer to earn additional income?

Yes, the summers were very important in accumulating funds. Toward the end of my freshman year I wrote to a number of municipalities asking if they had any summer openings for a

surveyor or draftsman. One offer came from the Town of Montclair. This was an affluent community some 45 minutes by bus from downtown Newark. I accepted this job because it was possible for me to live at home and hoard most of my earnings. In June 1926, I reported for work in Montclair as a surveyor and as an inspector on sewer installations and street paving. The salary was \$135 a month.

Was this work under the purview of the public works department?

It was and the man I reported to was Fred Galloway who later became director of public works in Montclair. He was highly respected by his peers and was elected president of the New York/New Jersey Chapter of APWA sometime after 1952. It was rather interesting that I should have worked with him in this early stage and later we should be involved together in APWA.

How many summers did you work for the city?

Every summer throughout my college career. I worked additionally in the water department during the Christmas period. During the day I was engaged in updating distribution-system maps. On weekends I was relief operator of the high pressure valve network. Montclair was hilly and if a fire broke out, they had to have high pressure in the hill areas. It was my responsibility to activate high-pressure service when an alarm originated in a hilly region of the town.

Was this summer experience an important adjunct to the formal academic education you were receiving?

I regard it as being equally important. The practical aspects of

installing sewers or paving streets can hardly be transmitted in classroom lectures or through textbooks.

What type of work were you looking for as you approached graduation?

I expected to find work on a major construction project. Instead, I became involved in an unusual experiment that was getting underway at the Edison Industries Company in West Orange, New Jersey. Thomas Edison had engaged an industrial management specialist whose mission was to recruit a small cadre of young men and guide them in production efficiency studies.

The specialist had selected my name from a list of current graduates in civil engineering because he was looking for someone to make a review of the Edison cement-mill operations in northern New Jersey. We had an interview and he said Mr. Edison favored young men who were fresh out of college and were not inhibited by preconceived notions of how things should be done. When I told the specialist that I had never been near a cement mill and only had the vaguest notion how the product was made, he said, "Great, I think you are the man we want." Early in June 1929 I checked in for indoctrination along with six other neophytes in industrial management.

Was there a sense of excitement going to work for somebody like Edison, and did you regard this as a real plum in terms of employment?

I didn't expect to have any direct contact with Mr. Edison. It was this cement mill assignment that intrigued me. Here was an

opportunity to learn about something that is basic to all construction.

My office was a remote corner of Mr. Edison's laboratory. Often when I came to work he would be sitting at a huge roll-top desk surrounded by stacks of plants and weeds; he was seeking a process to extract a rubber-like substance from them. He then was 82 and very hard of hearing so he seemed oblivious of anyone moving back and forth in the laboratory. Although I never had any direct contact with him, he occasionally would wave his hand in greeting as I passed. For several weeks I spent my time reading critiques on manufacturing operations and participating in group discussions on how we should present our findings for Mr. Edison's attention. Finally, I was dispatched to the cement mill. The mill superintendent and others on the staff were quite tolerant and catered to my interests.

They weren't resentful in having this hot-shot college kid judging their performance?

No, because it appeared that they regarded my presence as something that was satisfying an idiosyncrasy of the "old man" back in West Orange, for whom they had great affection. While I was there I learned a lot about making cement but I did not have much to contribute on how to make it more efficiently except for reclaiming dust and thus reducing air pollution.

What other endeavors were you involved in for Edison?

At that time, the radio craze was coming on and there was a growing market for small receivers. Edison was converting one of his factories for this product. To have these assembly lines

operate properly time and motion studies were conducted. I was put in charge of one of these lines to check people as they performed. I had a stopwatch and my activities seemed to be creating more tension among these harried assemblers than doing any good. Within a short time I concluded this was hardly the place for a civil engineer and I ought to resign.

Do you have any other anecdotes about Mr. Edison?

Yes, I do recall a report that was addressed to Mr. Edison by one of my co-workers. In it he had used algebraic equations to illustrate a point about improving the productivity of certain operations. The report was returned with a notation in Edison's bold script which read, "I never did understand this $x + y$ stuff. Please give me a description in words."

What was your next job after the Edison employment?

The dean of engineering at Rutgers informed me that the Management and Engineering Corporation of Chicago was building a power plant near New Brunswick, New Jersey, and they needed a field engineer. Since my background was in surveying and public works construction, he gave my name to the superintendent. I went to the site and immediately responded with enthusiasm to an offer to participate in what I regarded as "big time" construction.

Was this a coal-fired steam plant?

Yes. It was right on the banks of the Raritan River some miles up from where it goes into New York Bay.

What was your role in this project?

The project included not only the huge structure to house the

power-generating equipment but also the building of wharves, coal-conveying machinery, transformer yards, and a small village for the workers. I was in charge of layout and inspection.

What was your relationship with regard to the contractor? Did you work closely with the contractor as he built the structure?

The Management and Engineering Corporation was the contractor. The chief engineer, my immediate superior, was a kindly Dane who took a fatherly interest in activities during work and after hours. Among other things, he taught me how to play chess.

What kind of relationship existed among the skilled and unskilled workmen on the site?

I had no supervision over the labor crews. I did develop a camaraderie with the foremen and the skilled workers that were engaged in such crafts as carpentry, concrete placement, steel erection, brick laying, dock installation, and the installation of mechanical equipment.

Do you feel you learned some practical skills intermingling with workmen?

Yes, I gained an insight into how they would do things, and it was my task to lay out what they were going to do. This meant an intimate knowledge of how to go about things in the most practical way.

How long did you stay with the project?

I was pulled off after 19 months. In March 1931, this project was nearing completion and the company was going to build another power plant in St. Louis. They sent me on ahead with

the chief engineer to get ready. Just about this time, the economy began to really slow down. The preliminary work on that plant was halted and I was shifted to the planning staff of the Laclede Power and Light Company. My work had no relation to construction and after a few months I became bored.

What was your next job?

I learned that there was an opening for a field engineer on an underwater tunnel in Wilmington, Delaware. I applied to the contractor, Parker and Graham of New York, and they accepted me at a salary of \$220 monthly.

Who was this tunnel being built for?

The Wilmington Water Department. It was designed to house water mains as well as electric and telephone services.

Could you briefly describe this project?

When I arrived on the site work had already started with excavation for a vertical shaft on one bank of the Christiana River. This was about 100 feet deep. The construction strategy was to push out the tunnel horizontally from the bottom of the shaft, and then on the other side of the river sink another shaft to which this was to connect. My big responsibility was to maintain alignment of the tunnel bore so that it joined the other shaft. That required very precise surveying.

What were the working conditions?

Rather hazardous because the tunnel had to be excavated under compressed air to prevent infiltration of river water. The workers recruited for this job were veteran tunnelers, most of them British. An air-lock was installed at the bottom of the shaft

and this was the tunnel entry. The lock was a horizontal iron cylinder with doors on each end which could be clamped shut. In order to get into the tunnel, you opened the door, stepped inside, closed it, then opened the valve and filled the lock with compressed air. When this reached the required pressure, 16 pounds per square inch, you could open the other door and walk into the tunnel. The tunnel itself was very hot and humid because of the compressed air.

Did workers contract the bends?

They did on occasions when they disregarded rules for slow decompression when leaving the tunnel. When workers developed the bends after leaving the jobsite they would have to be rushed back to the medical lock which we had on the surface. There they were put under pressure and then slowly decompressed for an hour or more to release the nitrogen gas in their blood stream, which caused severe pain in joint cavities of the body.

Did you move on to another construction project after this one?

Parker and Graham had no further contracts because of the nation-wide economic depression and I was laid off. I returned to Newark where I lived with my grandmother while searching for another job; my mother had died some years earlier. After several months nothing turned up and it occurred to me to explore opportunities for graduate study at Rutgers.

Was there financial support available for students as yourself wishing to do graduate work?

There were no funds available in the civil engineering department and it was suggested that I seek a degree in sanitary engineering at the university Water and Sewage Research Station directed by Dr. Willem Rudolfs, an eminent Dutch scientist.

What was his background and training?

He studied biochemistry at the Pasteur Institute and got his doctorate at the University of Illinois. From then on he began innovative research undertakings associated with improving sewage-treatment processes. His findings gained international recognition.

How was the Research Station funded?

It was affiliated with the university and supported by the state primarily for research that might benefit public agencies. For example, all the state institutions had sewage treatment plants and they were designed at the research station.

Did the station develop standard designs?

No, all of them were tailored for a specific situation and many of them employed innovations. Dr. Rudolfs was a frequent visitor to Europe. In his own country of Holland he saw experiments with what is known as a brush aerator. It employed a brush such as we see on a street cleaner except it was longer. Partly submerged in a tank the brush was rotated to bring up droplets of liquid for air exposure. It proved to be a simple and economical way of aerating sewage and purifying it. Rudolfs introduced that process in some of the state plants.

Did his work in technological development appeal to you?

That is right. I felt privileged when he agreed to accept me as a

research assistant in return for tuition-free instruction. Additionally, he later provided a research stipend of \$30 a month.

What was the principal focus of your research?

My initial assignment was to compile engineering data and develop design criteria for a sewage treatment facility to serve a new state hospital in a rural area. My thesis based on this project qualified for a master's degree in sanitary engineering.

In preparation for a doctorate, I then began research on the potentialities of high temperature (140 degrees) digestion of sewage sludge. It was conventional practice at that time to use 85-90 degrees, which would complete digestion in about 30 days. My pilot-plant experiments were designed to confirm laboratory observations that high temperature might reduce digestion time to 6 days. I did find this to be the case but the sludge proved to be odiferous and difficult to dry. Further research revealed that these problems could be overcome by subjecting the sludge to another 6 days of low temperature heating. This combination treatment was very attractive from an economic standpoint because total digestion time was reduced by nearly two-thirds.

Patents on the process were taken out by the company that funded the research. But the process never was aggressively marketed. There appears to be current interest in applying the process, perhaps because of patent expiration.

Were you able to complete your advanced degree during this period of time?

No, I managed to finish data assembly for a doctoral thesis.



Cleary and Dr. Willem Rudolfs who was his mentor in graduate school at Rutgers University and continued to be a major influence in his career aspirations

But then I became ill and couldn't complete certain academic requirements, primarily French and German.

What was the nature of your illness?

The doctor described it as nervous exhaustion. He said I ought to back off. So, I decided to drop all my studies for the time being.

This was a difficult decision to make during the depression. Were there other opportunities for employment available to you?

No, not immediately. Through a friend in the coal business I was offered the managership of a retail outlet in Yonkers operated by a major distributor in the New York metropolitan area, the William J. Howe Company.

Was it much of an adjustment for you to undertake this new type of work?

Yes, retail sales of coal began falling off in the 1930s because of rising popularity of cheaper and more convenient oil heating. I soon got bored with the routine of trying to reduce operating expenses, improve customer relations, maintain salesman morale and collect accounts receivable. For an engineer this provided small satisfaction. But the salary was pretty good in those days of economic doldrums — \$200 a month!

Did this new-found source of income and putting your health on the mend lead to a change in your personal life?

A major change, a long delayed marriage in June 1934 was the big event. Soon afterward I got the urge to write my thesis on combined high-low temperature digestion of sludge. Arrangements were made with the university to submit it in partial

fulfillment of the requirements for the professional degree of civil engineer in 1935. And in 1959 I was honored by Rutgers with a doctorate in science.

After you received your professional engineering degree, you went on to spend a number of years working with the Engineering News-Record. How did you obtain that position?

Well, as I said earlier, I worked for this coal company in order to gain my equilibrium and after I had been there a year or more I determined that this was not what I wanted. I wrote a letter to the publisher of *Engineering News Record*, who was then Williard Chevalier. I suggested his excellent weekly publication (of which I was an avid reader) might improve its coverage of sanitary-engineering developments. This led to an interview with the chief editor who, it turned out, was currently seeking a public works editor. This post had been vacated by Frank Herring, a sanitary engineer, who would become the first executive director of the American Public Works Association.

What was the nature of your first position with Engineering News-Record? What sort of tasks and assignments did you receive?

Well, I began my work there as an assistant editor in June 1935 preparing public works manuscripts for publication. In July a major flood hit upper New York state. That was my first reportorial assignment.

Were you often called away from New York City to do feature writing?

Yes. One of the most rewarding aspects of this association with ENR was the opportunity to travel all over the country and gain entree to personalities involved with public works. One of the distinguished practitioners was Abel Wolman. When I joined ENR Wolman was director of the Federal Public Works Administration for Maryland and Delaware. My editor said to me, "I want you to go down to meet Wolman and find out what he is doing." I dutifully went off to Baltimore in the spring of 1936. This newly opened PWA office was in a malestrom of activity processing local public works projects. When my card was taken to Dr. Wolman he popped out of his office with a gracious smile and said, "Come right in." I noted his desk was piled high with telegrams, memos, and reports. But he gave me his undivided attention. This incident was a revelation to a neophyte editor. It proved to be an example of the cordial relations ENR enjoyed in the engineering fraternity. Incidentally that was the beginning of a cherished relationship with Dr. Wolman continuing to this day.

What is the role and mission of Engineering News-Record?

For the greater part of its 125-year history the editorial content of this weekly magazine featured technical developments in engineering practice and construction techniques. Because of this focus the staff was composed of specialists with an engineering background.

The big federal program of public works beginning in the 1930s and then the war construction boom broadened the mission of the magazine. It sought to keep its readers informed on the accelerating impact of governmental policies and financing



Staff parties at Engineering News-Record were enlivened by the Dixieland Duo consisting of Harold Richardson, construction editor and Ed Cleary

along with the new business opportunities that were emerging. Toward this end staff resources were expanded to include input from editors whose competence embraced economic affairs, labor relations, and legislative developments.

What did your editorial duties embrace?

Initially they were concerned with water supply and sewage disposal. Then I became involved with urban public works proj-

My first editor-in-chief was F.E. Schmitt, a widely informed and critical observer of all aspects of engineering endeavors. He had a penchant for perfectionism and I struggled to match his standards.

ects and administration. During the war several ENR editors were accredited as war correspondents assigned to Army, Navy, or Air Forces construction activities. I spent part of 1943 in Latin America. Here I reported on airbase installations for protecting

the Panama Canal; railroad and port facilities to facilitate transport of strategic materials such as iron ore, mica and rubber; and on health and sanitation activities conducted by the U.S. Office of Inter-American Affairs. Seven countries were on my itinerary — Panama, Columbia, Ecuador, Peru, Brazil, Venezuela, and Haiti.

My experiences, along with those of the other four ENR war correspondents, were compiled in a book titled *Bulldozers Come First*, published by McGraw-Hill. The book offered an intimate account of the manifold operations of U.S. military and civilian personnel around the world.

Who were some of your superiors on the magazine after you joined the staff?

My first editor-in-chief was F.E. Schmitt, a widely informed and critical observer of all aspects of engineering endeavors. He had a penchant for perfectionism and I struggled to match his standards.

When Schmitt retired in 1942 his successor was Waldo G. Bowman. He had a long career as staff specialist in steel and concrete structures but displayed great versatility in handling a variety of assignments. During part of World War II he was attached as a correspondent to the Persian Gulf Command and later with Army combat troops that drove across France into Germany. His dispatches to ENR on the capture of the Remagen Bridge across the Rhine was one of the most exciting pieces of copy that I readied for publication. It was a rewarding experience to be associated with Bowman.

The current chief editor, Arthur J. Fox, is a civil engineer, as have been his predecessors. I was among those who welcomed him on the staff about 1945. He has embellished the tradition of ENR as the “bible” of the engineering profession.

After your initial appointment as assistant editor what happened?

Within a year I became an associate editor. Three years later I was made managing editor with responsibilities revolving around staff assignments, scheduling articles for publication, and final approval of edited copy. Shortly after Waldo Bowman became editor-in-chief he asked me to relieve him of various administrative activities such as budgeting, printing, production details, and contacts with a nationwide network of part-time field reporters. My duties were carried out under a newly created title of executive editor. Bowman was occupied primarily with writing and speaking engagements and with policy decisions. Although management duties were confining, I did find time to do some traveling and writing.

During your tenure with ENR were there opportunities to engage in other professional activities?

All editors were encouraged to participate in those associations and societies related to their areas of specialization. One of my earliest affiliations was with the newly established American Public Works Association in 1936.

Additionally, there was freedom to accept outside assignments that would enhance an editor's contribution to the engineering profession. For example, I was permitted to join the engineering



At the 1944 annual meeting of APWA Ed Cleary (right) interviews Col. William Carey and acting executive director Fred Bass on future activities of the organization

faculty of New York University where I conducted a course in public works organization and administration for five years during the spring semester. During the war I served as a consultant without compensation on sanitation projects undertaken by the U.S. Agency for Inter-American Affairs; ENR was generous in sharing with governmental agencies the services of its editors. Finally, for several years I was contributing editor to *Scientific American* magazine on civil engineering developments.

You participated in creation of the Inter-American Association of Sanitary Engineering. What prompted this development?



Interviewing Dr. Kenneth Waddell in 1943 on Brazil-USA sanitation activities in the Amazon River basin to expedite harvesting of rubber for the war effort.

Shortly before and during World War II many sanitary engineers were recruited by U.S. government agencies to assist in building health and sanitation facilities in South and Central American countries. After these programs were terminated the camaraderie that had developed among the participants inspired the notion that there would be mutual benefits in creating a permanent forum for exchange of information on sanitation practices.

Ultimately, in October 1946, representatives from 14 countries met in Caracas, Venezuela, and voted to create an Inter-American Association of Sanitary Engineering. The organization has thrived, thanks primarily to extraordinary volunteer efforts, and currently has chapters in 22 countries. International conferences are held every two years. My enthusiasm for this organization found expression in serving several years on the international board of directors and finally as president of the United States chapter.

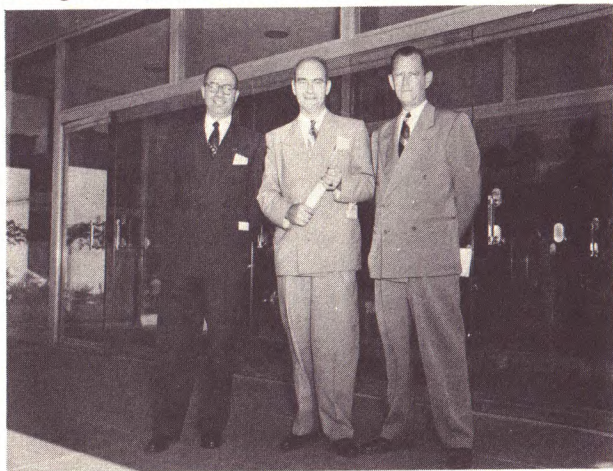
Would you recall some details of your long relationship with the American Public Works Association.

This relationship began in the autumn of 1936 when *Engineering News Record* sent me to Cincinnati to report on a merger of the American Society of Municipal Engineers with the International Association of Public Works Officials to form APWA. A year later I became acquainted with Frank W. Herring, who was then the executive director. I often visited with him at his Chicago headquarters to keep abreast of APWA progress and to get leads on public-works projects and personalities that might lay claim for coverage by ENR. Frank's frustration with the slow growth of membership (from an initial 800 to only 1,000 members in three years) seemed to be the primary factor leading to his resignation.

Succeeding him on what was to be an interim basis — but which stretched out to three years — was Fred Bass, retired professor of civil engineering at the University of Minnesota. Under the guidance of Professor Bass the service potentials of the association began to be realized. He was followed by Norman

Hebden, a specialist in traffic management; Hebden held the director's post only a year when he was called to active duty by the Army. In 1946 Donald F. Herrick, a seasoned city manager with an earlier career in the U.S. Army Corps of Engineers, accepted appointment as director.

A few years before Herrick retired in 1958 he began grooming his chief assistant, Robert D. Bugher, as a possible successor. Bugher's administrative talents soon confirmed this expectation. During the 25 years he has thus far served as executive director,



Three board members of APWA at the 1951 meeting in Detroit — Milton Offner of Los Angeles, Cleary and Allen Rogers of Garden City, New York

the membership has increased to 22,000 and the association has become a potent influence in advancing public works practice. From my vantage point of eight years on the board of APWA and as president in 1951-52 I can testify that Bob Bugher's versatility and boundless energy are exceeded only by his dedication to broadening the usefulness of the association.

Because of your early and enthusiastic participation in APWA affairs were you ever approached to join the staff?

In 1945 the association president, Stuart M. Weaver, probed my interest in accepting the director's post. The proposal held much appeal but by now I was wedded to my editorial career with ENR.

Despite broadening of your interest in all areas of public works, did pollution control dominate your attention?

It commanded a high priority because of increasing involvement of sanitary engineers with pollution problems in heavily populated and industrialized areas of the country. The condition of the Ohio River was particularly distressing. This 1,000 mile waterway was the recipient of untreated sewage from hundreds of communities as well as unregulated discharge of wastewaters from thousands of industries.

One of my editorial assignments was to follow the conduct of a three-year study undertaken jointly by the Corps of Engineers and the U.S. Public Health Service to document the nature and extent of the pollution in the Ohio Valley. The report emanating from this unprecedented exercise in diagnosing the ills and prescribing the therapy for a sick river, provided guidelines for

later execution of a remedial program inaugurated in 1948 by eight states in the valley.

Today there are many public-interest groups who are advocating environmental improvement. What was the situation in the 1930s with respect to water pollution?

The prevailing mood among citizens — public and corporate — was one of indifference. Although there was an abundance of state legislation intended to curb water pollution there was meagre political support to appropriate funds for enforcing regulations. As a result health and sanitation administrators were frustrated in their efforts to generate compliance from municipalities and industries in meeting pollution abatement obligations.

Nationally, the Izaak Walton League became a vigorous proponent of clean streams; it took the position that if water was not fit for fish it wasn't fit for any other use. The League favored federal intervention claiming that state regulation was inadequate. Toward this end it supported a Congressional measure in 1936 calling for establishment of federal regional authorities clothed with "absolute power" to control the purity of water resources.

Meantime, in the Ohio Valley, the Cincinnati Chamber of Commerce spearheaded an interstate campaign to clean up the Ohio River. In 1935 under the crusading leadership of William F. Wiley, editor of the *Enquirer* newspaper and Hudson Biery, public-relations director of the Cincinnati Street Railway Co., a dynamic program was launched. It included public education ef-

forts; rallying support from political, business, and industrial leaders; and promotion of Congressional interest. The ultimate result of this campaign was creation of the Ohio River Valley Water Sanitation Compact in 1948.

Did the Roosevelt administration become involved with water pollution?

Quite effectively under the auspices of the National Resources Planning Board, later called the National Resources Committee. Constituted as a policy-recommending body, it was composed of members of the President's Cabinet and several citizens. It recruited a competent professional staff of planners, engineers, and economists.

Among other things the NRC compiled the first comprehensive national inventory of water pollution; it included recommendations on needed wastewater treatment facilities along with estimated costs. The NRC leaned strongly to the view that the states should be encouraged to develop and conduct remedial programs. It favored interstate compacts to deal with regional pollution problems.

Indeed, the secretary of NRC, Charles W. Eliot, visited Cincinnati to urge the Chamber of Commerce Stream Pollution Committee to promote an interstate compact for the Ohio Valley. Mr. Eliot said that NRC wanted to evaluate such proposals as a basis for policy recommendations to the Congress. This request prompted the Cincinnati group to draft a suggested compact, which was prepared under the supervision of Sen. Robert A. Taft, then a member of the committee.

What was Congress doing about the pollution control problem?

Many bills for corrective action were introduced beginning around 1936. The debates centered on ideological and constitutional issues of federal versus state control. Finally, in 1948, the Congress enacted Public Law 845. It represented a compromise approach to the controversial question of whether or not it was

The states regarded it as an opening wedge for federal domination. Subsequent events proved they were right.

appropriate for the national government to assert a direct role in water pollution abatement. The decision was yes — but with qualifications.

The legislation envisioned a partner relationship in which federal activities would abet and supplement state efforts but not supercede their responsibilities for controlling pollution unless a state defaulted in meeting its obligations. To this end it authorized one million dollars to improve administrative capabilities of the states. Neither the states nor the advocates of federal control were happy with this legislation.

The states regarded it as an opening wedge for federal

domination. Subsequent events proved they were right. Repeated amendments of the law have placed increasing reliance on federal rules and enforcement procedures — coupled with generous subsidies — to effectuate clean-up measures. Currently these subsidies to local governments to comply with sewage treatment requirements average \$6 billion annually — this is 6,000 times greater than when grants were first introduced in 1956!

Coming back to 1948. That was another landmark year in pollution control history, specifically with respect to the Ohio Valley. What happened?

On June 30 — the very day that President Truman signed the first federal water pollution legislation — representatives of eight states gathered in Cincinnati to put their signatures on a compact establishing the Ohio River Valley Water Sanitation Commission. That ceremony, which took place in the Hall of Mirrors of the elegant Netherland-Plaza Hotel, combined solemn pageantry with the festivity of a victory celebration.

Let me quote from editorials that appeared in Cincinnati newspapers. The *Enquirer* said in part: “ — never since the formation of the Republic have so many states, over so wide area, moved collectively in so important an undertaking.”

The *Time-Star* reminded readers that: “Like another famous document signed in the Hall of Mirrors at Versailles in 1919 this is a treaty. It is an agreement, however, marking not the end of a war but the beginning of one — a concerted fight by eight states backed by the federal government to end the disgusting pollution

of the Ohio and its tributaries.”

What was the nature of the agreement?

Simply put, the covenant pledged the states to faithfully cooperate in abatement of existing pollution and the control of future pollution to maintain the waters of the basin in a safe and satisfactory condition. Toward this end they agreed to provide funds for a regional agency that would conduct investigations, establish standards of river quality, promulgate control regulations, and legally enforce its decisions.

How were the commissioners chosen?

The compact stipulated that each state would have three members and there would be three representatives of the federal government — a total of 27 commissioners. State delegations, which were appointed by the governors, generally included the chief health officer, the chief sanitary engineer and a citizen affiliated with conservation or business interests.

Federal members, appointed by the President of the United States, represented the Corps of Engineers, the Public Health Service and the Department of the Interior. Commissioners served without compensation but were reimbursed for expenses incurred by attendance at quarterly meetings.

What were the circumstances leading to your appointment as administrator of Commission operations?

Early in October 1948 I received a telephoned invitation to meet the next day with the commissioners who were then in session in Cincinnati to consider selection of an executive director. I had no previous intimations that a search committee had zeroed

in on me as a likely candidate. I was surprised but intrigued by this abrupt unfolding of the prospect of participating in what held promise of being the most ambitious pollution-control program in the nation.

At the meeting my views were solicited regarding execution of the Commission's mission. Although my ideas were rather sketchy, I discovered from the ensuing discussion that they were in harmony with policies then being hammered out by the commissioners. Before the day ended they voted to hire me. Having come to the meeting for what I thought would be a preliminary exploration of my interest, I was utterly unprepared to respond to this development. So I backed off asking for time to weigh the proposal.

What did this involve?

For several weeks I wrestled with the question of exchanging the satisfactions and security of an editorial career for the uncertainties associated with an enterprise that then was clothed with what some skeptics described as little more than pious hopes and paper dreams. Finally I concluded I couldn't resist the novelty and challenge of becoming involved with the Ohio Valley experiment in regional cooperation. And in January 1949 I began my duties as executive director and chief engineer of the Commission.

What resources were available to you in getting started?

From a financial standpoint they were meagre. The eight states had committed themselves to an annual budget of \$100,000, which was about half of what had been talked about prior to crea-

tion of the compact. Modest office space had been rented and it was furnished with desks and equipment on temporary loan from the Ohio River Division of the Corps of Engineers. This generous aid had been arranged by the senior civilian engineer of the division, who was one of the commissioners.

My most valuable resource was the enthusiastic support provided by the commissioners, notably those with whom I had prior professional relationships. I leaned heavily on the chairman of the Commission, Hudson Biery, with whom I first became acquainted when he was a leading figure in negotiating the interstate compact. Until I arrived on the scene Biery was operating the office with his former secretary, Verna Ballman. I was most fortunate that Mrs. Ballman agreed to stay as office manager, a post she administered with efficiency and felicity for many years.

Incidentally, when was the acronym ORSANCO introduced to identify the Ohio River Valley Water Sanitation Commission?

I coined it shortly after becoming director in 1949. It was never officially adopted but it was readily accepted as an alternative label for the otherwise cumbersome title of the interstate agency.

Did you have a free hand in selecting staff and administering activities?

Yes, the only constraint was availability of funds. But I managed to attract three sanitary engineers whose experience and aspirations fitted the variety of technical tasks to be undertaken. Their competence made it possible for me to concentrate on promoting intergovernmental relationships and public relations activities.

Eventually the staff was increased to six professionals and five secretarial personnel. Meantime, staff emphasis was placed on developing cooperative undertakings with state and federal agencies as well as with local governments and industries. This effort

I couldn't resist the novelty and challenge of becoming involved with the Ohio Valley experiment in regional cooperation.

had the dual merit of enlisting the talents of many specialists whose voluntary contributions placed small demands on the Commission's limited budget.

What were the respective responsibilities of the commissioners and those of the staff?

The role of the commissioners was to finalize decisions on policies and procedures for implementing the interstate compact. The staff was charged with initiating proposals toward this end and to translate decisions into action programs.

How did the commissioners conduct their affairs?

Transaction of Commission business was centered in the office of the chairman. He approved agendas, conducted the quarterly meetings, and appointed members of standing committees to

oversee such functions as budget presentation, financial auditing, bylaws revisions, and staff salaries. He also had at his command the counsel of an executive committee consisting of one member from each state and the federal government, selected by caucus among the three members who represented each of these entities.

The executive committee was rarely called into action because what might have been one of its primary functions — namely, screening of regulatory proposals before they reached the agenda — was delegated to an engineering review committee. This came about because so many decisions faced by ORSANCO involved appraisal of the technicalities of control measures as well as consideration of the practicality of their enforcement by the state agencies. The commissioners considered it appropriate to be guided on such matters by a committee composed of the chief sanitary engineers of the states and three technical representatives of the federal agencies.

It must have been challenging to accommodate staff activities with directives from the Commissioners.

Indeed it was — and sometimes overwhelmingly so. A sympathetic assessment of the situation came from one chairman who said: "I'm awed by the demands placed on a small staff in trying to satisfy the desires of 27 bosses." Happily, the meshing of commissioner-staff activities reflected a "partner" rather than a "boss" relationship. Regarded as a partner — albeit a hired one — the staff derived personal and professional satisfactions in its affiliation with the enterprise. One evidence of this lies in the fact

that the director, assistant director, and the office manager continued their association with ORSANCO for more than 20 years, and there was relatively little turn-over in other staff personnel.

Incidentally, the legal counsellor to the Commission, Leonard A. Weakley, who is appointed on a retainer basis, has served in this capacity for 32 years. The long tenure of staff members and many of the commissioners as well can be regarded as a remarkable dedication to ORSANCO affairs.

What specific tasks commanded staff attention?

The commissioners had formulated a statement of policies that defined how they would exercise the powers vested in them by the compact. Staff activities were organized to implement these policy directives.

A basic task was to coordinate and supplement state efforts in expediting compliance from communities and industries in building wastewater treatment facilities. Initially this involved review of existing state legislation with recommendations for correcting deficiencies that might inhibit fulfillment of obligations assumed under the compact. Another task was to undertake scientific studies of quality conditions throughout the entire length of the Ohio as a basis for public hearings concerning adoption of more stringent treatment requirements in certain stretches of the river. This required about five years for completion. Meantime, attention was given to design and conduct of an intensive public-education campaign throughout the valley.

What were the components of this campaign?

Essentially it was a combination of "buckshot and rifle"

endeavors. The buckshot approach provided broad dissemination of information concerning the regional clean-streams program. The rifle-shot program was aimed at situations where a community sought help in promoting citizen support for financing sewage treatment facilities. For this purpose the ORSANCO staff devised a packaged program of films, brochures, posters, and media releases as well as a detailed outline for conducting a five-week promotional campaign prior to the bond election date. A staff member was assigned to assist community leaders in organizing the campaign.

What was done about enlisting support from industries?

Leaders of corporations that had operations in the Ohio Valley were solicited to endorse formation of “action” committees that would aid the Commission in promulgation and implementation of pollution control measures. This effort resulted in creation of seven committees, each of which represented a separate category of industrial manufacturing or processing. Individual categories included distillery, chemical, coal, metal finishing, oil, steel, and electric-utility operations.

Endeavors of the action committees, whose membership totaled some 250 representatives from major companies, were productive in advancing conduct of ORSANCO’s mission. They opened lines of communication for sharing information and thus paved the way for agreement among the eight states on uniform procedures to expedite control of industrial pollution.

How did the state regulatory agencies respond to obligations imposed by the regional compact?

The diligence of the states can best be illustrated by what happened on the Ohio River. When the compact was signed in 1948 less than one percent of the population treated its sewage. By 1965 this situation had been reversed; 99 percent of the sewered

When the compact was signed in 1948, less than one percent of the population treated its sewage. By 1965 this situation had been reversed; 99 percent of the sewered population — 3,700,000 people — was served with treatment facilities.

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With regard to industrial-waste discharges the states could report that 90 percent of the more than 1,700 establishments discharging effluents directly into streams of the Ohio Valley were complying at least with minimum interstate requirements.

What was the magnitude of capital investment by municipalities to bring about this improvement?

For the entire district embraced by the compact it totaled over a billion dollars, averaging \$100 per capita. Nine-tenths of this outlay was locally financed. Federal grants-in-aid — which were quite limited — did not become available until 1956. By that time three-quarters of the municipal construction program was already underway.

Did you use other means to gauge progress in pollution abatement?

In 1951 ORSANCO inaugurated a river-quality monitoring program. Its purpose was three-fold: 1) to acquire data on chemical and bacteriological changes; 2) to evaluate this information for judging effectiveness of pollution abatement efforts; and 3) to guide decisions on the need for additional control measures.

This undertaking was initiated by compiling records of daily analyses of river water from managers of public and private utilities that used the Ohio as a source of supply. Supplemental monitoring activities were then established through a cooperatively funded arrangement with the U.S. Geological Survey. This manually operated network of 22 stations was augmented in 1960 with electronic sentinels developed by ORSANCO. They were named robot monitors.

What inspired this development and how was it executed?

The robot monitor was the outcome of a fantasy wherein I entertained the notion of one day being able to press some but-

tons on my desk and get an immediate reading on quality conditions at selected locations along the Ohio River. The responses I received in 1956 from instrument companies about the possibility of obtaining equipment for this purpose were not encouraging. They could be summed up in the comment from one manufacturer who said, "Your ideas are somewhat ahead of the current art of analytical instrumentation."

Eventually I discovered an electronic specialist in Cincinnati who became intrigued with the robot monitor concept. His name was Carl Schneider and he was engaged in production of sensitive measuring devices. With assistance from the ORSANCO staff, he designed and fabricated an automatic analyzer for measuring six water quality parameters as well as solar radiation at the monitor site. The first unit was placed in operation in 1960 and 12 more were subsequently installed at strategic points on the river. Equipped with telemetering devices these monitors relayed data to ORSANCO headquarters every hour on the hour. Furthermore, to fully satisfy my initial fantasy, the system had a button that can be pushed for immediate interrogation of quality conditions at any site.

In recent years even greater versatility has been added to the ORSANCO monitoring network with the installation of sophisticated equipment for the detection of organic constituents.

Did other governmental agencies display interest in robot monitoring?

This pioneering venture in the Ohio Valley captured much attention. I presented papers on its application at professional

meetings both here and abroad. Meantime, Carl Schneider began supplying ORSANCO monitors to a number of state, federal, and local agencies. Ultimately several companies developed automatic monitoring devices to satisfy the demands of an increasing market.

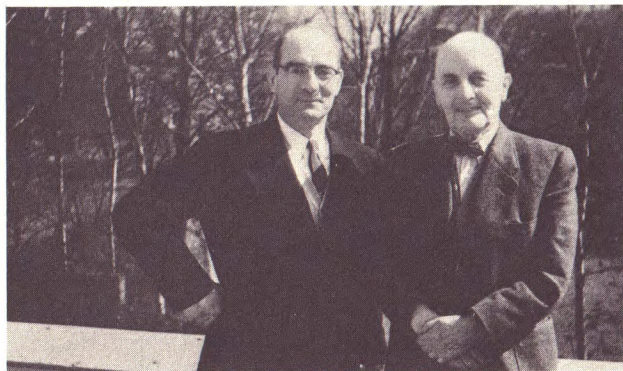
Has the Ohio Valley compact served as a model for creation of similar regional authorities here or abroad?

When the federal government asserted its intention in 1948 to concern itself with pollution of interstate waterways this diminished incentives for states to create separate compacts for this purpose. In fact, only two came into existence after 1948, namely, the Delaware and Susquehanna river compacts. Reflecting changed circumstances brought about by federal activities, they were patterned only in part on the ORSANCO model.

During the late fifties representatives of the five European nations concerned with halting pollution of the Rhine invited me to a meeting in The Hague, Holland, to describe the ORSANCO compact, notably with respect to its powers of enforcement. Despite enthusiasm of delegates from Germany and Holland for creation of an international agreement this was not shared by the other nations and nothing further happened to formalize action.

How did ORSANCO states react to federal intervention?

Not very gracefully. Having made substantial progress in coping with interstate pollution they saw no merit in federal encroachment on their domain. In particular they resented the initiation of formal "enforcement" conferences on two interstate streams in the valley. What irked the commissioners was that the



A reunion with Dr. Karl Imhoff in 1959 at his home in Essen, Germany.

federal authorities could have elicited whatever information they were seeking simply by requesting the matter be placed on the agenda of a Commission meeting. Instead, they seemed intent on ignoring the existence of the interstate agency.

This incident was but one illustration of tensions that were building up in federal-state relationships and placing constraints on the functioning of ORSANCO. Indeed, the situation reached the point where some commissioners were expressing doubts about the continuing usefulness of the interstate program. This prompted the chairman to invite my views on the future role of ORSANCO, which I presented at its January 1972 meeting with the title: "Stopping on Third Base will Add Nothing to the Score."

My point was that what had thus far been accomplished in curbing pollution in the Ohio Valley provided ample justification for asserting that the eight-state team had reached "third base." It was my conclusion that this team could contribute further to the score of regional pollution control if it had the versatility of coordinating with the new game plan then being mandated by the Congress.

Since my retirement it has been gratifying to note that ORSANCO has shown no inclination to stand still at third base.

It became apparent to state regulatory agencies that their initiatives were being systematically emasculated by frequent revisions in national legislation that broadened federal jurisdiction.

Quite to the contrary its viability as a coordinating agency has been strengthened by exploiting constructive relations with the federal Environmental Protection Agency and other entities concerned with safeguarding water resources in the Ohio Valley.

Were other states outside the orbit of the Ohio Valley disenchanted with conduct of the federal program?

There was universal discontent that federal activities were subordinating rather than supporting the partnership concept initially envisioned by the Congress. It became apparent to state regulatory agencies that their initiatives were being systematically emasculated by frequent revisions in national legislation that broadened federal jurisdiction.

Equally frustrating was adaptation to a bewildering array of changes in the administration of federal authority. During the period of 1964-72, for example, the program was lodged in four different agencies, internally reorganized seven times and directed by a succession of six administrators. It appeared to many state administrators that they had been relegated to the role of puppets in a confusing scenario of uncertainties.

Getting back to your vocational career, when did you leave ORSANCO?

In October 1967 I relinquished the post of executive director and chief engineer. However, I remained on the staff as a part-time consultant until the end of 1972. Thus I was happily engaged on ORSANCO affairs for 23 years.

What motivated you to back off from administrative duties?

It stemmed from a desire to engage in consulting activities and to become more involved with teaching at the University of Cincinnati. I had been a member of the faculty since 1955 in the department of environmental health of the Medical School. Here I lectured during spring semesters on management of en-

vironmental quality. By 1967 this subject was attracting increased attention and I was asked to develop a full-year seminar course to accommodate graduate students on engineering, law, and medical and biological sciences.

What was the content of the seminar and how was it conducted?

The focus was on principles and procedures associated with solving environmental problems. Categorical subjects that were examined included air and water pollution, solid-wastes recycling and disposal, noise mitigation, housing, and land-use controls. Case histories were used to illustrate the influence of social, economic, political, and technological circumstances on management strategies.

Conduct of the seminars emphasized student participation in the presentation of topics for round-table discussion. Advance preparation to assure such involvement included individual tutorial sessions and making available pertinent articles and reports. The student assigned to act as leader for a specific seminar prepared an outline of his findings that was distributed for class review one week prior to his scheduled oral presentation. This procedure paved the way for initiation of a discussion period during which I served as moderator and as a source of supplementary information. Collaborating with me in conducting these seminars was Dr. Scott Clark, an assistant professor, who had previously been employed by ORSANCO.

In what other academic activities were you engaged and did you find them appealing?

I was called upon to lecture at short courses for government and industrial personnel and also assigned as counsellor to students whose thesis subjects were within my area of competence. Because the department of environmental health was heavily involved in research undertakings, I was drawn into the design and conduct of several projects. Finally, I served on faculty committees, notably those concerned with program development and administration.

All of the activities were intellectually stimulating. What appealed to me most, however, were opportunities to work with students and to share in the realization of their aspirations.

What consulting activities engaged your attention?

Of particular interest were invitations to participate on consulting boards with a membership of three or four specialists. I served on boards established by the New York State Water Resources Planning Division, the Delaware River Basin Commission, the Miami Conservancy District in Ohio, and by a private engineering firm engaged in making recommendations for sewage disposal improvement in the city of Detroit. For several years I was the engineer member of the advisory board to the U.S. Army Medical Research and Development Command.

In the international arena I was engaged by the World Bank to review proposals for upgrading water and sanitation facilities in Istanbul, Turkey. The U.S. Agency for International Development utilized my services in Southeast Asia for evaluating the effectiveness of its long-term training program for sanitary engineers. Earlier assignments abroad included participation in

several underakings of the World Health Organization and serving as consultant to the Federal Republic of Germany on administration of water pollution control.

My longest consulting assignment, dating back 18 years and continuing today, has been with the U.S. Geological Survey on matters relating to the assembly of water data and assessment of river quality.

When did you accept a fellowship from Resources for the Future and under what circumstances?

It was in 1963 that I began a one-year appointment on the staff of RFF, which is headquartered in Washington. This non-profit research organization concerns itself with social, economic, and political issues related to conservation of natural resources. I participated in development of a new program concerned with management of environment. More specifically I was encouraged to write an account of Ohio Valley experiences in activating a regional program of water pollution control.

The ORSANCO commissioners thought well of the RFF proposal and I was granted a leave of absence with the proviso that I would be available for occasional consultation. My work in Washington resulted in production of a book, *The ORSANCO STORY: Water Quality Management in the Ohio Valley Under an Interstate Compact*, which was published by RFF.

After completing your fellowship did you have a continuing relationship with RFF?

In 1964 I was invited to join the board of directors. Twelve years later, having reached the age of 70, I became an honorary

director and thus continued my affiliation with RFF affairs. I cherish this involvement with research on resource conservation, energy development, and improvement of environmental quality.

You have been active in a number of professional organizations. What was the motivation?

It reflected a natural inclination to be identified with others who shared mutual interests. Membership in those groups has provided guidance in my work and ego satisfactions. Most important, it has led to the establishment of valued friendships.

Would it be fair to conclude that the American Public Works Association has been one of your dominant interests?

This indeed is the case based on a half century of membership during which I served 12 years on the board of directors and then as president in 1952. Additionally, I have been a trustee of the APWA Research Foundation since its establishment many years ago.

How did you regard APWA's Bicentennial book project, History of Public Works in the United States: 1776-1976?

As a member of the advisory council for the project, I became enthused with the scope of the undertaking being shaped by you and Suellen Hoy under the editorship of Ellis Armstrong, one of our most distinguished practitioners in public works.

Later when I reviewed drafts of various chapters it became obvious that this book would represent a unique contribution to an understanding of how public works projects have influenced the growth of our nation and the welfare of its citizens. Because this

historical record documents mistakes as well as achievements it is destined to be an invaluable guide for future generations of engineers and administrators.

What part did you play in the launching and subsequent development of the Public Works Historical Society?

Having participated in the Bicentennial book project, I became an ardent supporter of the notion that APWA should sponsor a continuing program of historical documentation. When the Historical Society was established in 1975 I welcomed the opportunity to become a member of the board of trustees. In 1976-77 I served as president and then continued for three more years as a trustee.

The trustees of the Society were chosen to promote collaboration of historians and public works practitioners. Has this been a constructive blending of mutual interests?

This alliance has been more productive than some of us could have anticipated. Historians have indoctrinated public works administrators with an appreciation of how their analytical skills can be applied for the improvement of management capabilities. In turn, the administrators have responded by shaping the Society's program to generate support for historical research.

The objectives of such research have the pragmatic appeal of using historical perspective to: 1) develop a memory bank of past experiences; 2) supply ingredients to facilitate problem solving; 3) offer clues for conduct of future planning; and 4) nurture an awareness of professional responsibilities and traditions. At least that is the way I summarized aspirations of the Society during my tenure as president.

Are you satisfied with accomplishments of the Society?

That would be an understatement; I'm excited about its progress in enhancing the service capabilities of APWA. And this prompts me to pay further tribute to the efforts of Executive Director Bob Bugher in promoting establishment of the Society, securing funds for its operation, and inspiring you and Suellen Hoy to offer such dedicated staff support in developing the program. It is most gratifying that the Society now has a membership exceeding 1,200.

What professional recognition has been accorded to you as a consequence of your activities?

My peers have been most generous with their accolades. Among my cherished honors was election in 1967 to the National Academy of Engineering. In 1962 I received a Man-of-the-Year award from the American Public Works Association as well as the privileged status of honorary member of the American Society of Civil Engineers. Earlier the Inter-American Association of Sanitary Engineering gave me its Hemisphere Award, and from the Water Pollution Control Federation I received the Charles Emerson Medal.

I cannot forbear mentioning that at my ORSANCO retirement dinner in 1972, it was announced that an award had been endowed in my name to be administered by the American Academy of Environmental Engineers. It was designated to recognize proficiency in administrative and technical skills applied to the management of environmental protection undertakings. All of the recipients thus far have been colleagues whose accomplishments I have held in highest esteem.

When did you leave Cincinnati and what prompted the move?

Shortly after retirement from the university in October 1975, my wife and I took off for California. A year earlier we had acquired a townhouse in Westlake Village, a superbly planned community in the Santa Monica Mountains half way between Los Angeles and Santa Barbara. The attraction of this area was two-fold: an equitable climate and close proximity to our eldest daughter and her children who lived in the San Fernando Valley.

We had been happy in Cincinnati where we lived in a commodious home on a high bluff overlooking the Ohio River. However, it was becoming difficult to secure help in maintaining the almost two acres of grounds around the house and since our four children had moved away from home, we opted for simpler accommodations.

Since moving to California have you been fully occupied?

Actually, there are not enough hours in the day to do all the things I want to do. Although I continue with some consulting, my participation in professional activities has gradually diminished. This has permitted greater indulgence in such personal interests as playing the organ, boating, woodworking, travel, and reading.

Living as I do on the shoreline of a man-made lake, I've developed much interest in its ecology and maintenance. The lake is managed by a property owners association of which I am a member. Tapped to serve on the technical committee, I'm involved with a host of matters relating to algae and weed control, dredging of sediment deposits, fish propagation, and minimizing

eutrophication potentials. For a former "river watcher" this is a new and challenging experience.

From the vantage point of your long association with water pollution control what significant changes have occurred?

During the past half century we have witnessed a vast change in public perception of the problem and political support for dealing with it. I have described this evolution of social attitudes as ranging from past acceptance of foulness in our waterways to recently expressed aspirations for restoring them to a condition approaching pristine purity. Politically, the response for hastening corrective action has been to shift this responsibility from state governments to a federal bureaucracy.

The "pristine purity" aspiration is embodied in the 1972 amendments to the Federal Water Control Act, Public Law 92-500. Congress mandated a national goal of zero discharge of pollutants from municipalities and industries by 1985. Thus far this extravagantly ambitious expectation is far from realization. A professionally disturbing aspect of this legislative mandate lies in the value judgment it asserts — namely, that the greatest beneficial use of water resources can be achieved only if they are safe guarded from any man-made alteration of quality. The validity of this assumption is challenged by engineers and economists.

What notions have you entertained about improving administration of pollution control endeavors?

I believe there would be merit in creating management agencies which would be charged with consolidating all pollution activities in heavily industrialized or thickly populated watersheds.

These publicly chartered, self-governing institutions would be empowered to plan, finance, design, build, and operate an integrated system of facilities to achieve river-quality standards prescribed by state and federal regulatory authorities.

Conventional administrative machinery for pollution control is geared primarily for policing compliance with prohibitions at individual sources of waste discharge. It is not suited to the more exacting task of comprehensive quality management for an en-

Congress mandated a national goal of zero discharge of pollutants from municipalities and industries by 1985. Thus far this extravagantly ambitious expectation is far from realization.

tire watershed. The practice of management requires: 1) identification and evaluation of all possible alternatives for achieving a specific goal; and 2) capability for employing whatever combination of physical facilities and operating procedures that will pro-

duce desired results at the lowest cost.

My advocacy of comprehensive drainage basin management reflects long familiarity with accomplishments of watershed agencies in the Ruhr district of Germany, some of which have been in operation for more than half a century. I plan to visit the Ruhr River valley in order to update earlier observations. (Interviewer's note: this now has been done and a detailed report was published in the August 1983 issue of the *Water Pollution Control Federation Journal* under the title "Managing Water Resources: Lessons for the U.S.")

Has there been any interest in the establishment of watershed agencies?

The perennial quest for efficiency and economy in pollution control endeavors has attracted academic interest in the concept of watershed management but has generated little political support for implementing it. One notable effort toward this end was made by Lyndon Johnson in his 1966 message to Congress on controlling pollution. Asserting that development of new organizations for this purpose was of crucial concern, the President urged that watershed demonstration projects be subsidized. There was no legislative response to this recommendation.

Because of the continuing massive federal investment in pollution control coupled with growing uncertainty about its effectiveness, the time may now be propitious for Congress to foster establishment of watershed management agencies.

Have you felt an obligation to serve as a model for other younger professionals?

Although I never had the temerity to regard myself as a model for emulation, I had occasion to inspire younger colleagues to pattern their conduct in a manner that would reflect favorably on them personally and professionally. In this regard I was discharging an obligation because throughout my career I had been a frequent recipient of the counsel generously offered by senior practitioners.

Do you think an interview such as this will be useful to younger engineers in shaping their career development?

That was the premise you advanced, Mike, in inveigling me to go through with this exercise. Consequently, I must defer to your judgment on this matter. I am concerned, however, that my prolix responses to your probing questions may cause the reader to suffer from a severe case of “I” strain.

**Oral history interview with Adelaide Cleary, March 22,
1982, in Westlake Village**

When did you meet Ed Cleary?

When I was a college sophomore in 1927.

What were his attitudes toward his studies?

He was a serious student and a very busy person because he was involved with all kinds of extracurricular activities.

As you got to know him better, did he impart to you any of his career aspirations?

He wanted to be a civil engineer and work outdoors on construction projects.

As your relationship developed, what social activities would you engage in?

In college we had fraternity dances and proms and things like that. After college he was away a good deal. But when we dated we played bridge with friends, went swimming, and attended movies. Occasionally we would go to New York to see a play.

What did you do after graduation?

I taught grade school for several years and then in high school.

What were the circumstances that enabled you and Ed to get married?

During the depression Ed lost his job as a construction engineer and this dashed our plans to get married. With the help of a small fellowship he returned to Rutgers for graduate study. Finally in 1934 he found work as manager of a small coal yard in Yonkers, New York, and a few months later we were married.

Was Ed's decision to take this job based on the fact that he wanted to get married?

Yes, that had a lot to do with it. He had left college because he was really pretty much run down. He had tried to do too much as he often does.

Did you start your family while you were living in Yonkers?

The first child was born after we had been married three years and were living in Montclair, New Jersey. By that time Ed was

happily engaged as an editor with McGraw-Hill on the staff of Engineering News-Record.

When Ed went to work for ENR, did he do much traveling?

He was absent from home a lot. However, I was so busy with babies that I managed to get along until he got back.

Did it concern you that your husband was in a profession that required a lot of travel?

Not really, he was home more than he was away. I just accepted it as part of the things he wanted to do.

Did he discuss his various assignments?

Yes, that was what made it very interesting to me.

How would you describe his rapport with his children?

On the whole it was very good. He was not too close to them when they were babies. However, he was always interested in everything they did and played with them a lot when they were little.

Have your children shared with you any special experiences that recalled growing up in your home?

My two daughters have a lot of very pleasant things to say about their father. The older daughter fondly recalls playing in the snow with him, walking in a nearby quarry, and bed-time reading sessions with the National Geographic magazine. He taught her how to handle tools in his workshop. She regarded him as a miracle man who made everything work. However, he was not one to help much with school or personal problems.

Did he go to school events that the children participated in?

Oh, he went to everything when he was home. And when he

returned from trips his bag always had presents for them.

What other recollections have your children shared with you?

Our youngest daughter can't remember much companionship when she was very small. However, she said they had grown very close after she began to grow up and was greatly influenced by him.

Were the relationship with his sons any different than with the daughters?

I don't think it was as smooth. (It never is.) They probably have the feeling that he was a very strict person. He made more noise than I did, but actually I was the one that was the strict disciplinarian.

Did he share his experiences with the family?

Definitely, he is a very good reporter. Our older son was in the fifth grade when Ed came back from South America and he was so engrossed that he asked his father to help him prepare a slide lecture that he presented at school.

As your children grew to maturity, did he try to exercise any influence with respect to the careers they adopted or their choice of friends?

Not too much. He wasn't as concerned with what they wanted to do or their choice of friends as I was.

What were some of the ways that you supported your husband?

I didn't expect or demand much of him at home. If Dad was busy then we knew we had to keep out of the way. I think that my greatest contribution was keeping other burdens away from him.

Did he enrich your life by bringing visitors home on occasion?

That was very nice for me as well as the children. Whenever he could Ed would bring home visitors, notably from foreign countries.

Did you feel fortunate to share your life with someone who gained a high level of achievement?

Yes, he was very ambitious to succeed in whatever he did. I was never one to push him but he never needed it.

As your children grew up did you begin engaging in other kinds of activities?

I have always wanted to write. During the last few years, I have been trying to produce a couple of things and offer them for publication. I have written a children's book but I haven't been able to market it yet.

After Ed retired from the university, do you see any changes in his interests or activities? Has he become a different person?

I don't think he has become a different person. He has welcomed the freedom that comes with retirement but frequently mentions how much he misses the stimulation of contact with students and professional colleagues. We have been out here six years and he has gotten very interested in his music. That takes up a lot of his time and makes him feel he is achieving, is still learning, and is doing something that is worthwhile.

What do you consider to be his greatest strength not only a member of his profession but also as a father and husband?

He has a good disposition and is an easy person to get along with. I think that has helped in his family life and probably in his profession too. He developed warm personal relationships with people who worked with him.

EDWARD J. CLEARY
A Hall of Fame Engineer
by
Waldo C. Bowman

Ed Cleary has forged a notable and ultra-praiseworthy career in his chosen field of sanitary engineering since he joined the editorial staff of *Engineering News-Record* nearly 50 years ago, which was when our enduring friendship began. I had been on the staff for 10 years, and was thus the more practiced editor. But it was a short-lived superiority since Ed rapidly developed the necessary discernment to recognize newsworthy events, technical trends, and significant people and then to report on them with an uncommon craftsmanship for a beginner. From the start Ed had a real desire to communicate with people, plus the will and the writing tools to achieve their interest and understanding.

I mention these early Cleary talents because they are supportive and basic to a thesis I shall develop in due time. I will only say now that Ed's 14-year stint as an *ENR* editor (1935-1949) not only made a lasting contribution to the magazine's growth and good reputation, but also may have provided useful training for his subsequent and principal career. This was to guide the cleanup of America's dirtiest river system as chief engineer and

executive director of the eight-state Ohio River Valley Water Sanitation Commission (ORSANCO). It was to be a formidable task — managing the quality of the water along 1,000 miles of main river flow plus that from 20 major tributaries, all laden with municipal and industrial wastes. Still it would be done — and better than well — so we know 35 years later.

But back to the beginning, and the early Cleary talents of writing and the desire to communicate. These talents merely emerged first because they were exercised first, but he had others of just as great future significance and usefulness. They largely stemmed from his engineering education at Rutgers University in New Jersey, and to his exposure there to one of the truly great and dedicated teachers and research specialists in the field of sanitary engineering, Dr. Willem Rudolfs. Initial contacts with this inspiring professor occurred during Ed's undergraduate years, 1924-1929, but more importantly when he returned for a Master's degree, 1932-34, when he served as a research assistant in Dr. Rudolfs' Department of Water and Sewage where also existed the New Jersey Agricultural Experiment Station. The

research curiosity of the teacher and his philosophy of scientific pragmatism in urging that research results be quickly put to practical use were enthusiastically embraced by the pupil. Here went into storage talents for future use.

Ed's science-oriented sanitary engineering background was welcomed on the *Engineering News-Record* staff, and particularly by staff specialist, M.N. Baker. Nearing the end of his 50-year career with *ENR*, Mr. Baker had a high standing with the sanitary engineering fraternity. For one thing he had early-on grasped the cause-result relationship between a sewage-polluted water supply and a high incidence of typhoid fever, and carried on a continuous editorial campaign for water treatment that attracted wide interest and lasting results. The public health being bettered by the application of sanitary engineering was in keeping with the kind of possibilities the young Cleary had learned to dream about from Dr. Rudolfs. Baker and Cleary in mutual admiration formed an effective team for the two years before Mr. Baker retired.

The demands on a specialist editor on such a magazine as *ENR* are not always down the specialist line. Thus in 1936 only a year after Ed joined the staff he, along with several others of us, was sent to investigate and write about the damage done to buildings, bridges, homes, and public utilities in several areas of New England by the great and unprecedented hurricane of that year. Later, in 1943, Ed went on an assignment to South America to report on U.S.-aided programs by Brazil, Columbia, Venezuela, Peru, and Ecuador to speed up the output of strategic war

materials needed by U.S. industry. The proceeds of the substantial prosperity resulting throughout the region were being invested in public works by the governments — particularly water supply, sanitation, and transportation — and by private industry in factories, commercial buildings, and housing. Ed reported on all of this in a series of articles.

By this time he had advanced to the post of managing editor where again his talent at communications showed to advantage. Frequent opportunities for public speaking came from these activities as well as from committee work in the American Society of Civil Engineers, the American Water Works Association, the Water Pollution Control Federation and, of course, the American Public Works Association, which in future years Ed would serve as president.

Five more years of writing and managerial duties, part of it under the staff title of executive editor, ensued before the Cleary desire to be more of a practitioner than an observer and commentator became irresistible. In 1949 an offer came for the position of chief engineer and executive director of the newly formed (a year before) Ohio River Valley Water Sanitation Commission. Ed quickly accepted the challenge. In rapid order he sold his home in Douglaston on Long Island, including his nearby-moored sailboat, moved his family to Cincinnati, ORSANCO's headquarters, and soon bought another boat to enjoy on an Ohio River that would become progressively cleaner, he vowed. Ed was off on a new career, his real lifework, where he could and would apply all his talents with great and useful effect.

Engineering News-Record's loss was the nation's gain. The substantially cleaner Ohio River system that was fashioned under the Cleary leadership is a great asset not only to its direct beneficiaries, but worldwide as an example of sanitary engineering's environmental impact at its best.

The Cleary years at ORSANCO must necessarily be recorded elsewhere by someone more privileged than I to have observed them in detail. Still some highlights can be reported briefly. For example, at the beginning of the Cleary era only 1% of the sewered population discharging into the main stream Ohio River were served by municipal treatment plants. Ten years later 92% were served or could expect to be from plants under construction. Likewise among industrial plants discharging directly into the Ohio only 24% made some effort to treat their wastes when ORSANCO came on the scene. Ten years later the figure had risen to 76%, and all companies were meeting standards of quality not dreamed of before, but which they had agreed to and helped to originate.

Ed's modestly admitted contribution to all this was "to work with" the ORSANCO commissioners from the eight states to get their governments to persuade their cities and industries to treat all discharges into their streams. Additionally, however, he asked each industry group — chemical, steel, coal, petroleum, pulp and paper, etc. — to form "action committees," and urged them to agree on standards of cleanliness that their particular industry would accept. Going further, ORSANCO established a half-hundred sampling stations along the rivers of the system to

monitor water quality continuously. First they were manned, then robot monitors were introduced. Thus industries can now know and plan for the kind of raw water the river will daily provide for their process purposes. It was a big step forward, and one that made industry a willing partner in the program instead of merely a reluctant or recalcitrant participant. Persuasion by lectures to concerned audiences, and personal calls on governors,

In his career at ORSANCO Ed Cleary has made a major contribution to the art and science of sanitary engineering by demonstrating the success possibilities in applying the principles and percepts of this discipline to the large scale solution of river pollution problems.

mayors, and business executives were on Ed's agenda week after week to sell the programs and keep them sold.

In his career at ORSANCO Ed Cleary has made a major contribution to the art and science of sanitary engineering by demonstrating the success possibilities in applying the principles and percepts of this discipline to the large scale solution of river pollution problems. Note that the word "applying," is used here involves the application of communication skills such as public relations techniques, speaking and writing ability, sales techniques and, of course, the scientific and professional knowledge to make the use of these skills effective and persuasive. Ed's record is one of masterful "application."

I can only conclude this pleasurable exercise of reminiscing about my good friend by stating the thesis I promised to develop

about Ed Cleary and his early talents. It is simply that he could have been a teacher, a scientist, a salesman, a consulting engineer, a business manager, or even a journalist. That he could have achieved high success in any of these pursuits seems likely from the high proficiency in all these specialities that he demonstrated in his ORSANCO years. I must also venture that it seems likely that his initial choice of journalism, at least of the kind he experienced on Engineering News-Record, afforded him a most rewarding springboard for developing the talents that would prove useful in his future.

As for the present, Ed Cleary's California retirement in a place called Westlake Village would by its name seem to offer tranquility (if he can get used to it) and perchance another sailboat to enjoy. The boat is the only sure thing to bet on.

**Interview with Dr. Abel Wolman
in his office at Johns Hopkins University
Baltimore, Maryland
August 23, 1982**

Wolman: Although the word often gets abused, I want to say that Ed Cleary is truly a “smart” person. He was always thoughtful. I have had a running battle with the media: newspapers, radio, and television. My battle with them can be summarized thus: they abuse the truth in their search for the dramatic. Ed Cleary was a notable exception.

Ed Cleary, like M.N. Baker and John Goodell, made it his business to understand the science involved in the stories they were reporting. I don’t find that is so today. My criticism of the communications media today is that they don’t want to learn the complicated science and technology we must now deal with more than ever before.

I would often see Ed Cleary in Baltimore, as well as in New York. During the late 1920s I was spending a good deal of time in New York with people such as George Fuller, M.N. Baker, and John Goodell. I often worked with editors, and I was myself named editor of the AWWA Journal.

I think that it was Ed Cleary who persuaded me to write a review of the new edition of George C. Whipple’s classic work on

the microbiology of water. This work should still be compulsory reading. In my review for the ENR I had to say that while he still had his name on it, this new edition was no longer George C. Whipple. The revision contained marvelous technology, it lost the basic values of Whipple.

Whenever Ed Cleary came to Washington for Resources for the Future (RFF), he would exchange thoughts with me. This is our custom to this day. Whenever we are in the same city we try to arrange to get together. He and I must have similar mental processes. Ed was always interested in things. He had some of the qualities which remind me of George Fuller. Ed has an enormous range of talents. He plays the organ well enough to be a professional. The spread and depth of his intellectual qualities is enormous.

Robinson: *One thing that struck me in comparing your career with Ed Cleary’s was institution building: you in Maryland, Ed in the Ohio Valley. What was the key to your success? What sorts of talents and abilities enabled you both to meet the challenges you faced?*

Wolman: I agree with James Henry Robinson, the eminent historian, who emphasized the key role of individuals in the formation of countries. I believe the same thing is true of institutions.

Robinson: *Did you have a role in Ed's selection as executive director of ORSANCO?*

Wolman: Of course.

Robinson: *What qualities did you perceive in him that made him the logical choice? After all, he had been a journalist before.*

Wolman: Ed had already demonstrated he had an understanding of the fundamentals of science and technology and also had a good perception of public understanding.

Robinson: *That was very well put.*

Wolman: Arthur Morgan, of the Miami Conservancy District (another required reading) said that you needed daily translation to the public.

Robinson: *It must be hard to find engineers with that skill.*

Wolman: Definitely. I do a lot of speaking in public. In fact I am a student of drama — the way a John Gielguld acts. It's a necessity which Ed understands.

Robinson: *Translation for the public is one important dimension of institution building. What qualities are necessary to be able to sit down with elected officials, city councils, and mayors and convince them to spend money on programs?*

Wolman: You have to like people. As I once told Ed, if you don't have a messianic impulse, don't do this work, do something else. Unless you have an underpinning of idealism, you won't be happy.

Robinson: *You have always had a knack for surrounding yourself with people of great talent. Did Ed Cleary have that ability as well?*

Wolman: Most definitely. I once made the mistake of hiring someone without first consulting with Ed.

Rosen: *This combination of technical competence and political sensitivity strikes me as being close to musical talent which combines technique with artistry.*

Wolman: There is a close relationship between mathematics and music. Ed has all of these talents.

Rosen: *What was Cleary's greatest quality?*

Wolman: He had an outstanding perception of public behavior. He was a very philosophical guy.

Rosen: *You emphasized Ed Cleary's perception.*

Wolman: It was this number one attribute upon which rested his overall philosophy of life. He made himself a master of science and technology and he had perception and understanding. I am the beneficiary of having been in contact with people like Ed Cleary.

Robinson: *What is Ed's greatest quality in terms of character?*

Wolman: He likes people. He finds something good in everyone. That is very rare. It is a quality which I cherish in him.

Robinson: *Was ORSANCO a success as a regional approach to water issues?*

Wolman: The era of EPA and OSHA in the last 15 years effectively destroyed such regional approaches. We have lost all these years. We need more ORSANCOs.

The era of EPA and OSHA in the last 15 years effectively destroyed such regional approaches. We have lost all these years. We need more ORSANCOs.

Robinson: If we did establish regional institutions, where would the Cleary's and Wolman's come from to run them?

Wolman: Environmentalism in the United States has served to establish a series of Cromwellian duchies, within the states as well as with the states. In this regard Ed and I share a great concern for the future.

Robinson: Do you see the qualities you identified in Ed Cleary (perception, intelligence, and sensitivity, in addition to technical competence) in the generation of leaders in the field of public works engineering now emerging?

Wolman: No. When I retired from active teaching, I asked who was to teach my course on the legal and social aspects of engineering. No one had the answer. I asked why? Because these engineers didn't know anything about the outside world. Ed Cleary knows about the outside. If Ed were here at Johns Hopkins he could teach that course.

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