10TH ANNUAL SUMMARY 1958

OHIO RIVER VALLEY WATER SANITATION COMMISSION

a report on the interstate crusade for clean streams to the Governors of:

ILLINOIS INDIANA
KENTUCKY NEW YORK
OHIO PENNSYLVANIA
VIRGINIA WEST VIRGINIA

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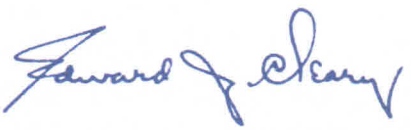
OHIO RIVER VALLEY

WATER SANITATION COMMISSION

10TH ANNUAL SUMMARY

To the Chairman and Members of the Commission:

This report prepared for your transmittal to the Governors of the signatory states is more than an annual summary. It records accomplishments that have been inspired by a decade of dedicated effort among eight states in their regional crusade for clean streams. Ten years is a short time in a pollution-control program of the scope and magnitude of that presented in the Ohio Valley. But in this period the trend of half a century of river abuse has been reversed. The satisfaction this brings can be exceeded only by aspiration it creates for perfecting regional coordination of control procedures. To this end the signatory states are now pioneering in development of new concepts embraced by the term river-quality management.

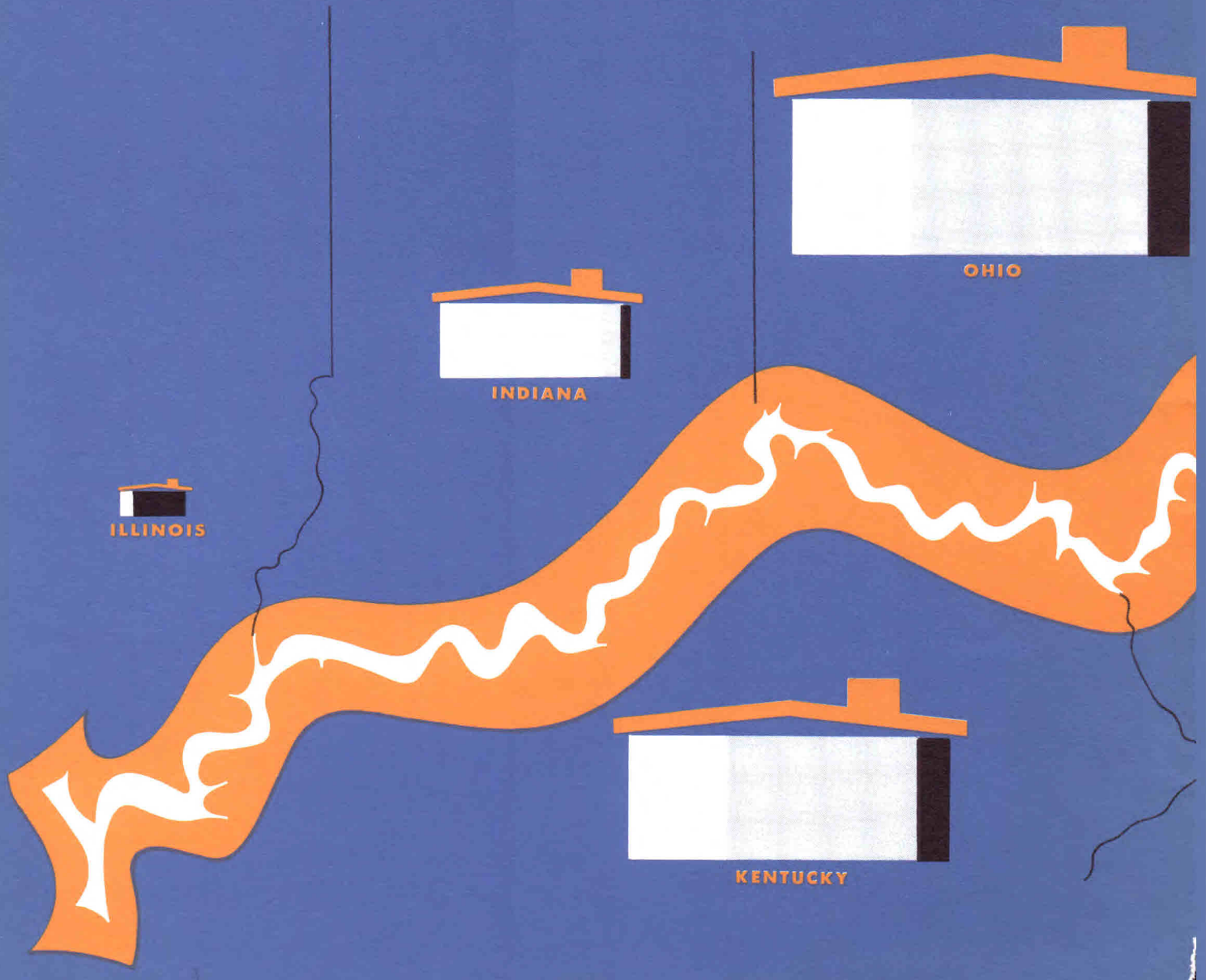


December 1, 1958

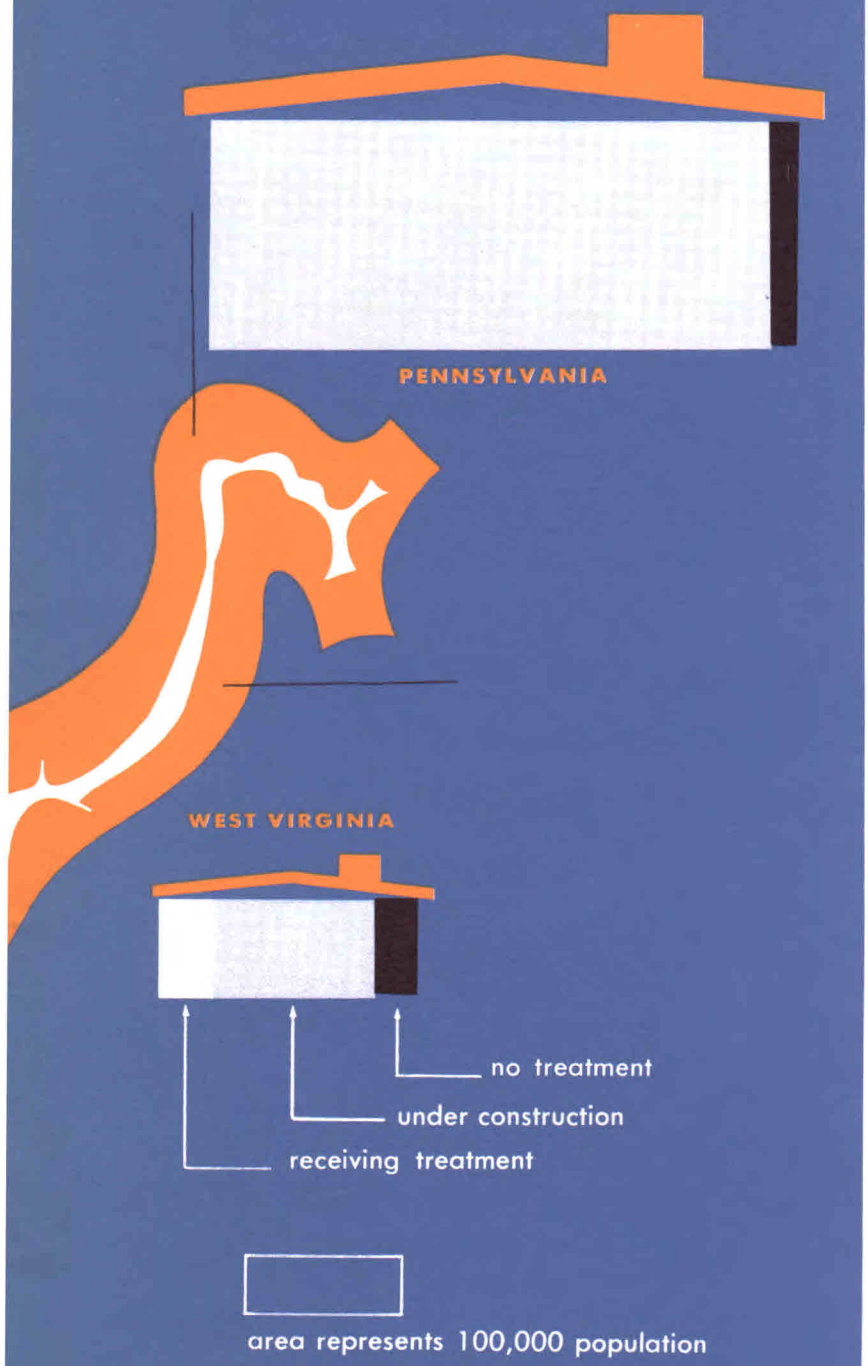
Executive Director and Chief Engineer

HEADQUARTERS: 414 WALNUT STREET • CINCINNATI 2, OHIO

SOMETHING'S HAPPENING ON



THE OHIO RIVER . . .



Treatment facilities are now operating or under construction to serve 92% of the sewered population.

Ten years ago it was less than 1%!

Matching pollution-control progress on the main-stem are the accomplishments in the eight states on streams tributary to the Ohio River. The record shows that 8,095,000 people—79 percent of the sewered population—in the entire drainage district are now served by sewage-treatment plants operating or under construction.

Meantime, final plans for construction of treatment facilities to serve an additional 1,210,000 people in 180 communities throughout the Ohio Valley have been approved by the signatory states.

Details by states on the status of some 1,600 communities—almost 900 of which already have treatment plants in operation or under construction—are given on page 23 of this report.

. . . WITH REGARD TO

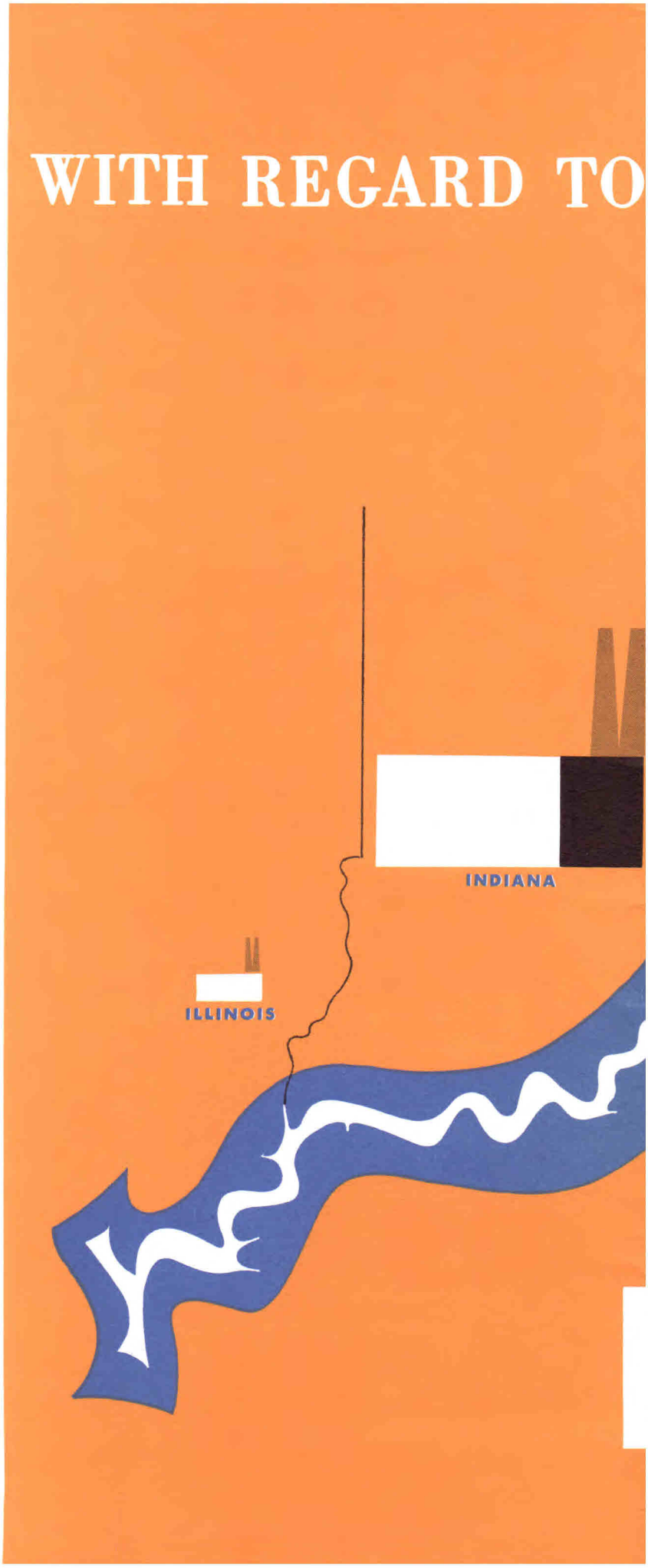
Along the Ohio River 7 of every 10 industries are complying at least with minimum requirements.

Ten years ago less than 3 out of 10 were in this category!

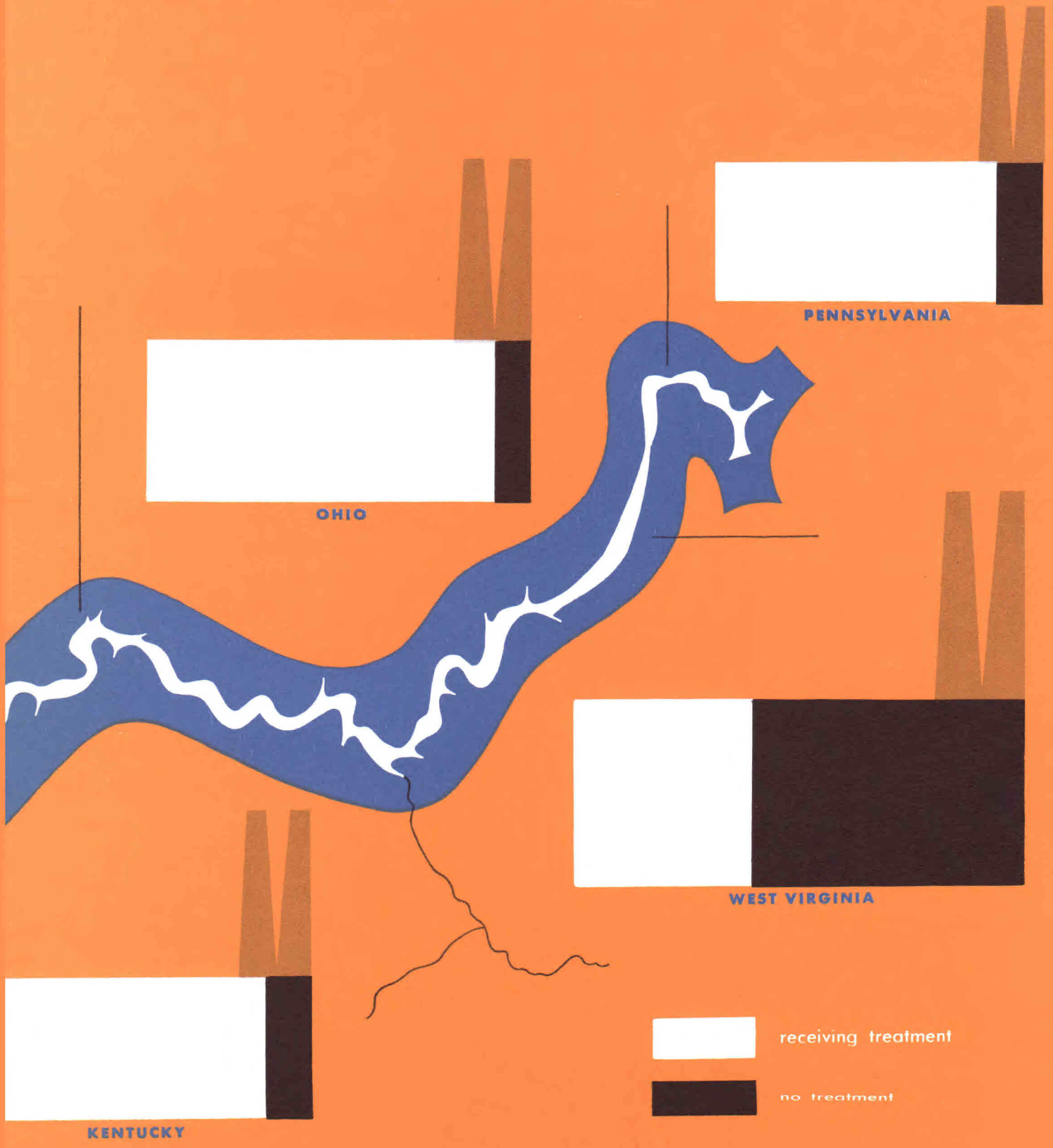
Progress on industrial-waste control throughout the entire Ohio Valley parallels that for the main-stem alone—three-quarters of the 1,459 industries discharging effluents directly into streams are complying at least with minimum requirements established by the Commission.

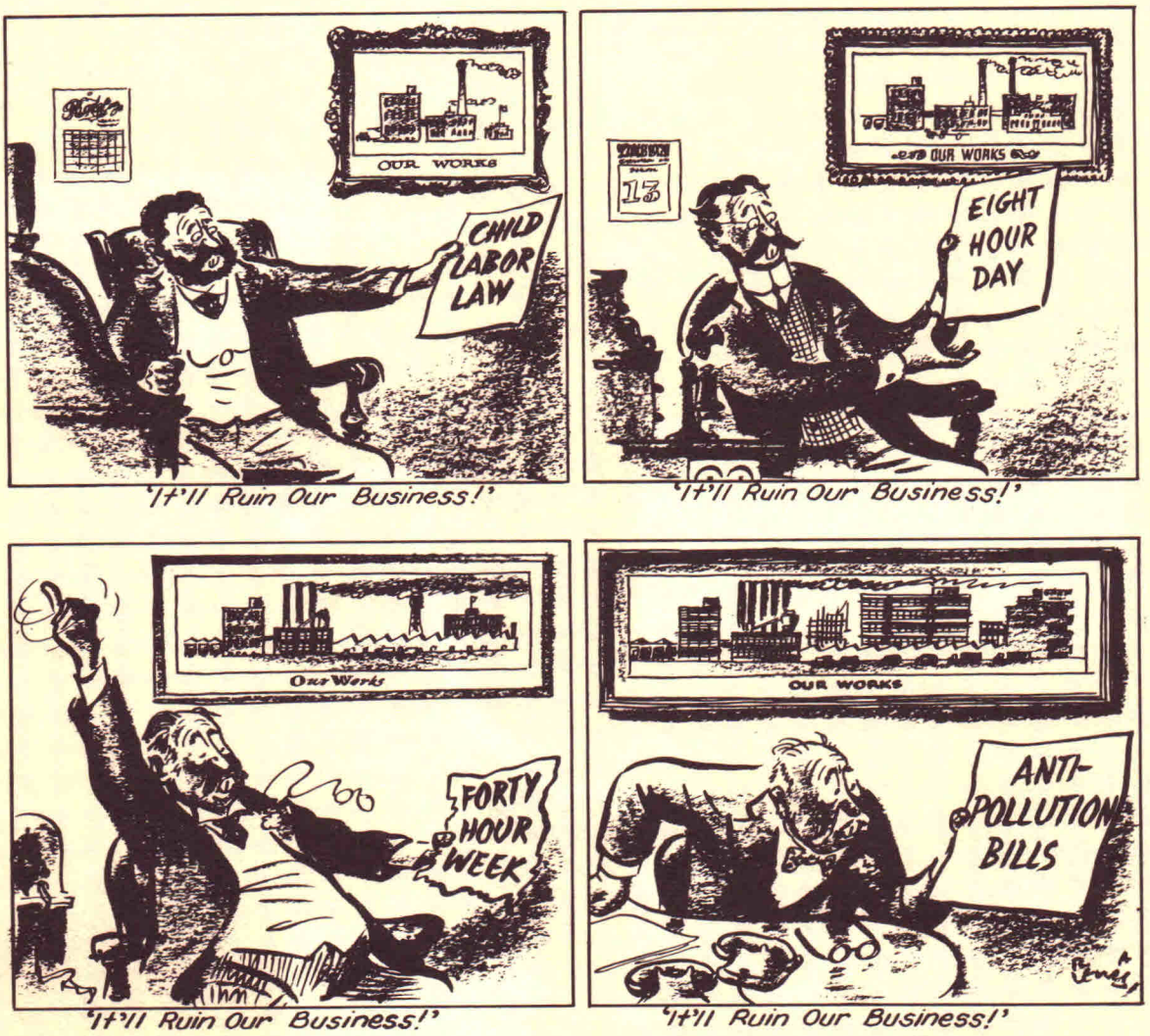
And more than half of these industries—788 to be exact—are credited by the states with providing adequate control facilities. This is double the number that could be so rated five years ago.

Details on the status of industrial installations in each of the eight states and totals for the district are given on page 22.



INDUSTRIAL-WASTE CONTROL





Since the start of the crusade for clean waters in 1948 new capital investment for industrial expansion along the shores of the Ohio River has averaged more than ONE BILLION DOLLARS ANNUALLY! This fact dramatically dispels an early-expressed fear in some quarters that the Ohio Valley pollution-control compact might throttle industrial expansion.

Quite to the contrary, the enforcement of quality safeguards by the signatory states is providing assurance to Ohio Valley industries that their vital water resources will not be degraded.

In the light of what has happened it seems appropriate to reproduce a cartoon from the *Milwaukee Journal*, the original of which was presented to the Commission when it was organized ten years ago.

ON THE AGENDA

The eight states maintain a staff and headquarters in Cincinnati for the day-by-day conduct of Commission business. These affairs encompass a variety of sanitary-engineering investigations and appraisals related to the promulgation and maintenance of water-quality safeguards. They include also liaison activity among the signatory state and federal agencies as well as servicing the industry-action, advisory and other committees of the Commission. And, in addition, staff supervision is provided for technical and research projects that are being carried out under contract.

Details concerning the nature and status of current activities are as follows:

CONTROL PROPOSALS

On the agenda for Commission action are five proposals for the control of industrial discharges and one for the control of municipal sewage discharges. The latter concerns the Monongahela River, a major interstate tributary of the Ohio.

The industrial-control proposals are in various stages of development. In all cases they are predicated on a Commission resolution directing the staff to make an investigation and to prepare a report on findings along with recommendations. Throughout the development of such reports the staff counsels with the engineering committee of the Commission (composed of the chief sanitary engineers of each of the signatory states) and with appropriate industry and advisory committees. When the Commission receives the staff report it formally transmits copies to the engineering, industry and advisory committees as well as other interested parties for review and comment. Opportunity for the exchange of viewpoints is provided at regular meetings of the Commission.

For the period ending June 30, 1958, decision had been reached on only one regional industrial-waste control proposal—establishment of general policy and adoption of minimum requirements affecting discharges from all industries regardless of size or type. This all-embracing and fundamental step was taken on April 6, 1955. It is fully described on pages 11-13 of the Seventh Annual Report.

Meantime, detailed studies on specific types of discharges for the determination of supplementary control measures have been advanced to the stage where reports and discussions are approaching the point of decision among the eight states. The challenge in developing these proposals is to prepare control measures that will satisfy Commission responsibilities for safeguarding water-quality and yet provide flexibility so that they can be independently administered by each of the states. Following is a resumé of proposals under consideration:

Chloride Control—In July 1955 the staff was directed to make a comprehensive investigation and report on the discharge of chloride-bearing wastes. The action was prompted by an increasing number of requests from industries in West Virginia for permission to discharge chlorides. In January 1956 industry-committee viewpoints were invited on preliminary findings of the staff; in May 1956 the engineering and industry committees jointly discussed the findings. A staff report was received by the Commission in March 1957 and distributed for formal comments. These comments were heard at the Commission meeting in July 1957.

An ad hoc committee consisting of Commissioners McKay and Devendorf and Secretary Waring was appointed to reconcile viewpoints. Before rendering its report the committee met with industry representatives in January 1958. At the April 1958 meeting the Commission deferred action on the ad hoc committee report for ninety days pending further suggestions from industry committees.

In brief, the control proposal provides for the scheduled release of chloride-wastes in accordance with flow variations in the receiving stream. The object is to equalize or "even-out" chloride concentrations in a receiving stream. An appraisal of flow and quality variations in the Ohio River reveals that a program of equalizing chloride discharges would not only eliminate the present peak concentrations but would also permit the assimilation of many times the amount of chloride now being discharged.

The concept of scheduled discharges, equalized in accordance with stream flow variations, is not limited in application to chloride control. It could serve as an integral part of an effective control program for many other discharges. In fact, it is incorporated as part of a staff recommendation for control of taste-and-odor-producing substances.

Taste-and-odor Control—On April 30, 1958, the Commission referred to the industry committees and other interested parties a staff report and recommendation relating to control of taste-and-odor-producing discharges. The report stems from findings that have been developed since 1949, when the Commission first authorized investigations on phenolic wastes. These investigations, which included joint undertakings with the Steel Industry Action Committee and the Water

Users Committee, pointed up, among other things, the practical desirability of taste-and-odor control on an over-all, rather than a specific constituent basis. The logic of this conclusion is that the Commission is not so much concerned with the control of phenolics *per se* (or any other specific substance that contributes to taste-and-odor problems), as it is with control of all substances in an industrial effluent that may have this obnoxious characteristic.

Accordingly, the proposal now under scrutiny would establish control of taste-and-odor by application of the threshold-odor test on industrial effluents with discharge adjusted to the availability of dilution water in the stream.

Oil Control Proposal—Complaints of visible and sometimes substantial quantities of floating oil in the Ohio River have increased in frequency, notably during the past two years. Investigations have shown that much of the oil pollution has resulted from careless or accidental discharges by those who are using, transferring, transporting or storing oil. In other words, this pollution is not necessarily associated with industrial-waste effluents. In most cases the pollution involves operations associated with marine oil terminals, loading areas, storage and river-transportation facilities.

Accordingly, the staff prepared a memorandum outlining preventive procedures and practices based on experiences throughout the nation that have been found helpful in minimizing oil pollution. The Commission in January 1958 authorized informal review of this draft by the Oil Industry Advisory Committee, the American Waterways Operators' Association and the U. S. Coast Guard. In April the Commission received the views of these groups and ordered that a revised draft be circulated for formal review and comment from all industry committees and interested parties at the next regular meeting.

Mine-Drainage Proposal—In April 1955 when the Commission adopted minimum requirements for industrial-waste control it specifically exempted mine-drainage "until such time as practical means are available for control."

Meantime, the staff was instructed to make an assessment of possible measures for curbing acid discharges based on more aggressive application of research findings and notably from experiences already gained in the field. Consultation with the engineering committee revealed progress in minimizing acid discharges in Pennsylvania, Indiana and Ohio. A subcommittee with membership from these three states evaluated these experiences and made recommendations in December 1957.

The subcommittee concluded that control methods for ameliorating the degradation of streams by mine-drainage should include: Diversion and rapid removal of water from mines; disposal of sulphur-bearing mine refuse in such a manner as to minimize contact with water; elimination of "slug" effects of intermittent pumping of mine water into streams; sealing and terminal activities at mine workings to prevent movement of water; and chemical treatment of acid waters under certain circumstances.

Based on these recommendations a preliminary draft of a staff proposal for control is being informally discussed with the subcommittee and certain members of the Coal Industry Advisory Committee.

Toxicity Proposal—Since 1951 when The Kettering Laboratory-ORSANCO project was inaugurated to further "a better understanding of the physiological aspects of water quality," the Commission has been concerned over the discharge of potentially toxic substances. Each of the eight states prohibits the discharge of any known toxic materials.

When the Commission adopted its minimum industrial-waste discharge requirements (IW-1) in April 1955, it considered a proposal that would have placed the burden-of-proof for non-toxicity of a waste on a discharger of an effluent and also require the submission of suitable evidence to support the finding. This proposal was not adopted.

In January 1958 a special committee consisting of Commissioners Teague, Dwork, Klassen and Meehean proposed an addition to the Commission's minimum requirements to include: "Freedom from substances in concentrations or combinations which are known to be toxic or harmful to human, animal or aquatic-life." The proposal has been referred to the engineering, industry and advisory committees for review and comment.

Monongahela River Study—In cooperation with Pennsylvania and West Virginia, a report is being completed on stream-quality observations, specifically with regard to bacteriological and dissolved oxygen conditions.

On the basis of this study, recommendations will be made to the Commission concerning standards for the treatment of sewage from municipalities that now discharge into the Monongahela River.

WATER-QUALITY SURVEILLANCE

A systematic check on stream conditions is maintained through water-quality observations at 44 monitor stations. Nineteen stations are on the main-stem of the Ohio River and 25 are located on seventeen major tributaries (see Eighth Annual Report, page 16, for location map). This monitor network, now in its seventh year of operation, is providing essential data to appraise pollution-abatement efforts and to guide the Commission in development of additional control measures.

One-third of the monitor stations are operated on a volunteer basis by managers of public, private and in-

dustrial water-treatment plants who are organized as the Water Users Committee. Another third are operated under a cooperative agreement between the Commission and the U. S. Geological Survey. The remaining stations are serviced by the U.S.G.S. under cooperative arrangements with the various states.

Analyses at stations operated by the Water Users Committee are made on samples collected at river intakes twice or more weekly. At the U.S.G.S. stations samples are collected each day and from these ten-day composites are prepared and analyzed by the Columbus and Philadelphia district laboratories of the U.S.G.S. Assistance in collecting samples at nine stations that are located at navigation dams is provided by the U. S. Corps of Engineers.

Monitor records for the past year evidence some quality improvement on two fronts—coliform bacteria levels (an index of sewage pollution) and phenolic taste-and-odor conditions. The percent of time the coliform content in the Ohio River is meeting the Commission's objective of 5,000 or less organisms per 100 milliliters suggests the beginning of improvement brought about by the operation of newly-completed sewage-treatment installations.

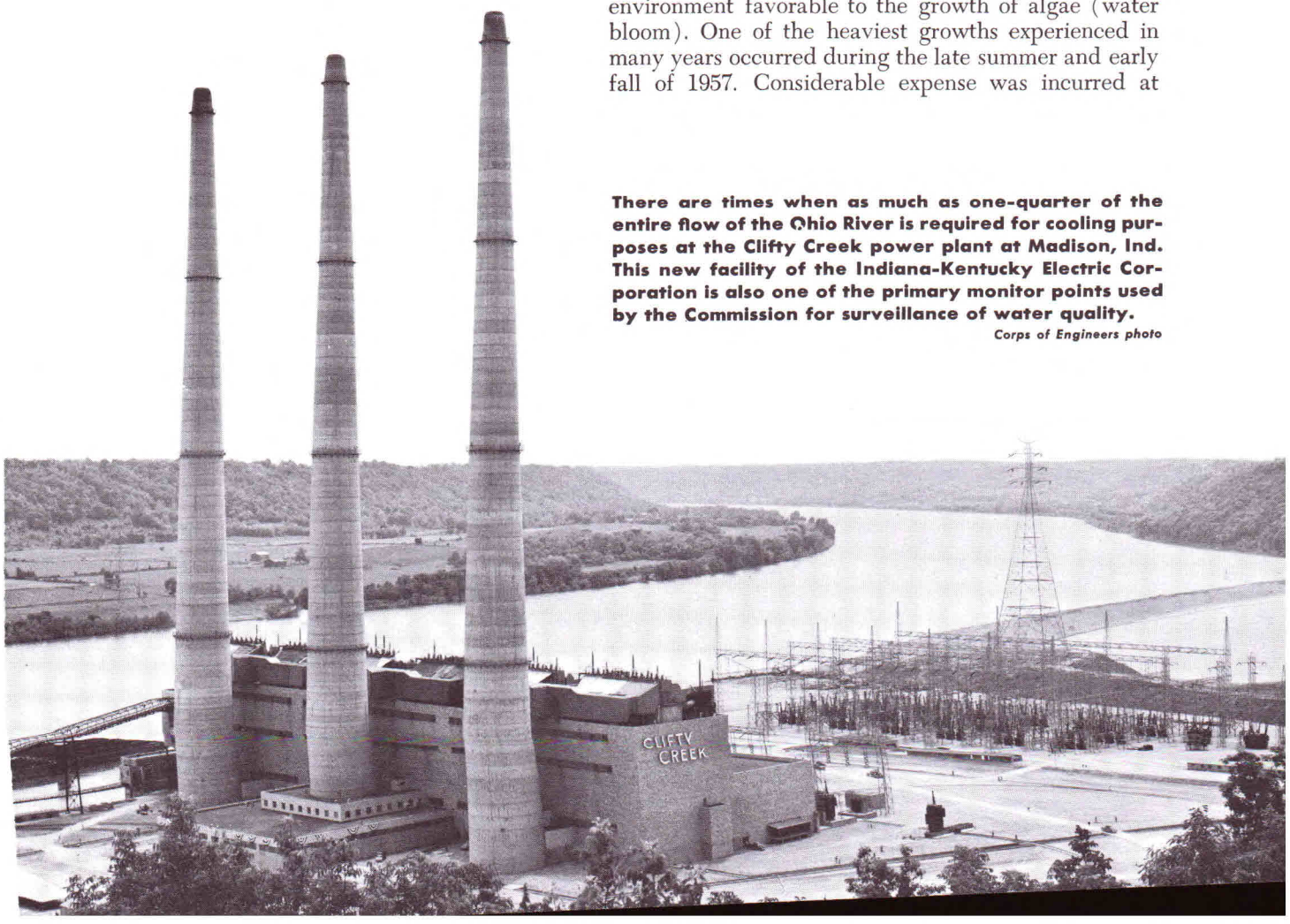
At Wheeling, which has been a critical point for the occurrence of phenolic taste-and-odor difficulties, conditions during 1957 were among the best of record. Monitor data during the past year offers a possible clue to the reason: On only 12 days during an eight-month period did phenol concentrations exceed 10 parts per billion. But for similar periods during previous years phenol concentrations over 10 ppb have occurred on 113 to 180 days.

Further review of water-quality data collected during 1957 indicates that the dissolved-mineral content of the Ohio River, especially in its upper stretches has increased to some of the highest levels on record. Peak monthly-average concentrations (in parts per million) for some mineral constituents in the upper, middle and lower stretches of the Ohio River are as follows:

	Upper	Middle	Lower
Manganese	2.4	0.8	0.3
Chloride	122	82	66
Fluoride	1	0.5	0.5
Sulfate	339	197	130
Hardness	330	204	214
Dis. solids	565	394	330

During periods of low-flow, such as occurred in the upper Ohio River during 1957, concentration values increased because of reduction in dilution water. The 1957 flows dropped to levels that can be predicted to occur with a frequency of about once in ten years.

Low-flow conditions (and the consequent longer periods when the river was "in pool") produced an environment favorable to the growth of algae (water bloom). One of the heaviest growths experienced in many years occurred during the late summer and early fall of 1957. Considerable expense was incurred at



There are times when as much as one-quarter of the entire flow of the Ohio River is required for cooling purposes at the Clifty Creek power plant at Madison, Ind. This new facility of the Indiana-Kentucky Electric Corporation is also one of the primary monitor points used by the Commission for surveillance of water quality.

Corps of Engineers photo

some water-treatment plants to combat taste-and-odors caused by the algal growth, one plant (Cincinnati) reported expenses for water-treatment chemicals during a 30-day period to be $30,000 above normal.

Continuing its policy of making river-quality data available for water-resources planning and stream pollution control, the Commission will publish data collected under its monitoring program for the years 1956 and 1957. This will supplement the four-year record of data published last year under the title "Water Quality and Flow Variations in the Ohio River—1951-55."

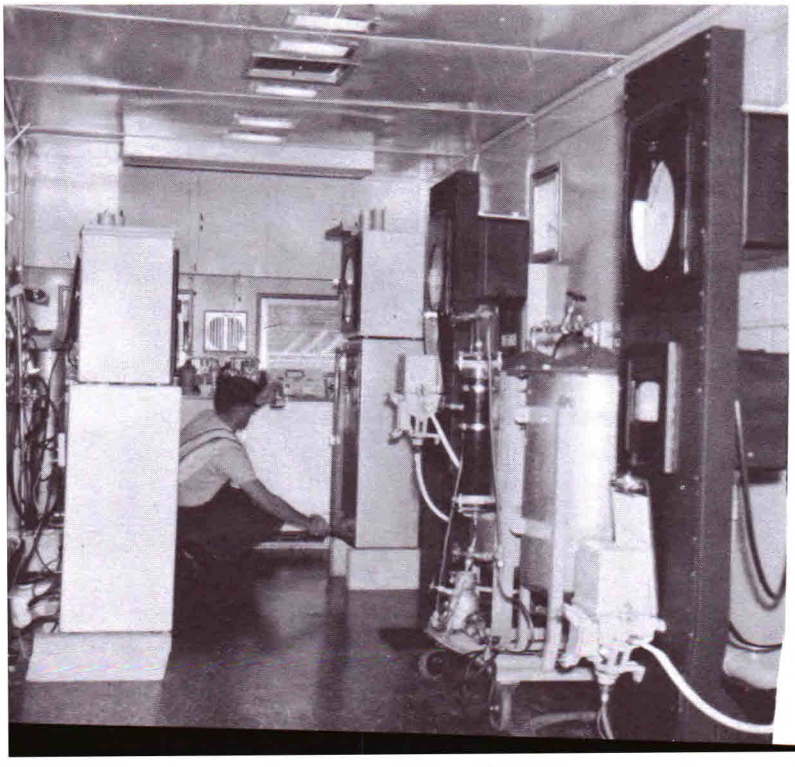
ROBOT-MONITOR PROJECT

Basically, a pollution-control program is a problem in river-quality management. And for this purpose data on variations in quality should be continuously acquired and evaluated. During the past seven years the Commission has developed a network of manual monitor stations to secure quality data.

Meantime, impetus has been given to imagineering a robot system for this purpose. The word imagineering may be defined as the process of combining ideas to devise something new; and robot is another coined word that is used to describe an automatic device. In brief, the Commission is seeking to devise a system for automatically analyzing, recording and transmitting data on quality conditions in the river.

The purpose and desirability of such an undertaking can be appreciated by recalling that management of the Ohio River system involves a main stem almost 1,000 miles in length and into which drain 20 major tributaries. Quality conditions in this system reflect the impact of waste discharges from thousands of industries and municipalities as well as the influence of a host of natural variations.

Automatic analyzers and recording equipment that are undergoing field tests for adaptation to water-quality monitoring.



What happens to the quality of this river has a profound effect on more than two million people who depend on it for a potable water supply, as well as on industrial enterprises that alone require some 13 billion gallons a day for their operation. And the quality of the water also has an influence on the aquatic-life resources of the stream, on navigation, recreation and even esthetic values.

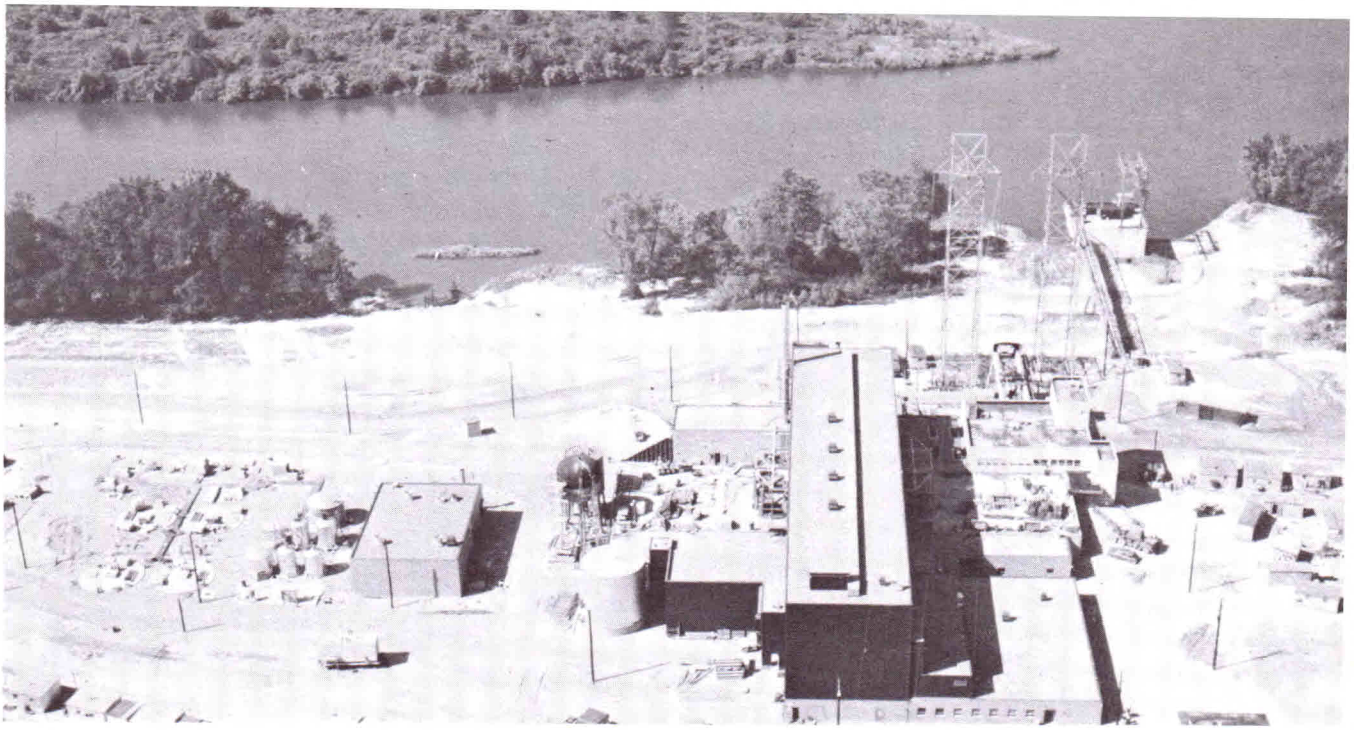
With regard to quality variations as related to potable and industrial water supplies—certainly among the most important uses of the Ohio River—this possibility presents itself: By means of a robot monitor system the central office maintained by the Commission would be in a position to relay to the state agencies such information as would aid them in more effective management of water quality in their respective areas. And in addition it would permit the alerting of water-treatment plant operators and other water users of changes in river quality.

Seven years' experience of the Commission on the Ohio River with its network of manually-operated monitor stations (probably one of the most extensive in the nation, but nevertheless, a rather crude operation as contrasted with the imagineered system of robot monitoring) provides many instances where advance notice of up-river changes has benefited down-river treatment plants. Virtually in every case where the Commission has been able to alert water plants of changing quality conditions this has aided operators to take appropriate steps for minimizing difficulties in producing a palatable finished water.

In this connection, one should reflect that purveyors of river water are probably the only "manufacturers" who are expected to take a raw material that varies from day-to-day and yet be prepared to turn out a uniform product regardless of what they must start with. Therefore, any system that will permit advance information on changes—and perhaps the anticipated rate of change—of quality of the raw material could mark one of the most useful advances in the art of water-supply management.

Alerting water users of quality changes is only one application, however, of a robot-monitor system. From the standpoint of those who are charged with the control of pollution, as are the eight states of this Commission, development of robot monitors offers opportunities to move out of the horse-and-buggy era of operation. Today, with such intensive use and re-use of river water, it is anachronistic to place reliance only on sporadic stream surveys and occasional sampling of rivers to obtain data that is vital to the safeguarding of water resources.

Initial efforts on the robot project were directed toward determining the availability and adaptability of



On the banks of the Ohio River near Shippingport, Pa. (Mile 34.5), the United States' first full-scale central station atomic power plant devoted exclusively to civilian use, went into operation on December 18, 1957. The plant was built as a joint venture of the U. S. Atomic Energy Commission and the Duquesne Light Company. Westinghouse Electric Corporation designed and developed the nuclear portion under the direction of and in technical cooperation with the Naval Reactors Branch of the AEC. The Duquesne Light Company is operating the station which has an initial rated capacity of 60,000 kilowatts net electrical output.

Stone and Webster Engineering Corp. photo

automatic analytical equipment. In addition, possibilities for development of equipment not now available were outlined. During the past year several instruments have been under test at various locations. The Commission staff has nurtured this idea for some years and it became possible to exploit it with the availability of federal funds granted under Public Law 660.

RADIOACTIVITY MONITORING

By arrangement with several federal and state agencies who have established radioactivity monitor stations, the Commission is compiling a record of radiation levels in the Ohio River and its tributaries. Among the agencies supplying data are: U. S. Atomic Energy Commission, U. S. Public Health Service, Ohio State Health Department, Indiana State Health Department, Illinois State Water Survey and Kentucky Stream Pollution Control Commission. These agencies now have in operation 70 monitoring stations throughout the Ohio Valley district (see location map in Ninth Annual Report).

Stations have been located to determine background radiation from natural sources, detect radioactivity variations, and to monitor industries and research facilities where atomic material is processed or used. Samples at all locations are collected for analysis once or more monthly.

In the laboratory the suspended and dissolved components of the sample are separated. Then the rate of gross alpha and of gross beta radiation emission from atomic disintegrations is measured for each of the two components. Total radiation content of the sample is the sum of these four measurements. When the situation warrants it, a more elaborate radio-chemical analysis is performed to identify specific radioactive substances.

The nature of atomic radiation is such that the alpha measurement may be considered in most cases as an approximation of radioactivity originating from natural sources. The beta count may be considered as representative of radioactivity created by man.

Unlike chemical analysis of water, where concentrations are measured as weight per unit volume of water, the radioactivity analysis provides a measure of the rate of atomic disintegrations per unit volume (milliliter or liter) of water. The accepted unit for measuring the rate of radioactivity is the curie, established at 2,200 billion disintegrations per minute. Because of the extremely small amounts of radioactivity present in streams, concentrations are expressed in micro-micro curies per liter. One such unit is equivalent to 2.22 atomic disintegrations per minute in about one quart of water.

Appraisal of the data received during the past two years reveals for the most part that the present radioactivity content in the waters of the Ohio Valley district are below levels considered to have any public health significance. For 91 percent of the time (namely, in 885 of 976 water samples analyzed) the total

Detailed examination of fish specimens from the Ohio River forms part of the aquatic-life resources project, which the Commission has under contract with the University of Louisville. Many of the specimens are preserved for future reference.

Clay photo

activity concentrations were less than 100 micro-micro curies per liter. Further, for 50 percent of the time the samples had total radioactivity levels less than 30 micro-micro curies per liter. The provisional guide of the National Bureau of Standards (Handbook 52) lists maximum permissible concentrations of gross radioactivity in water where continued exposure is experienced over periods of several months at 100 micro-micro curies per liter for beta emitters and the same for alpha emitters. These values refer to man-caused additions to the natural background radioactivity.

Alpha activity made up only a small part of the total radioactivity measured. The highest alpha count observed was 56 micro-micro curies per liter; 99 percent of the samples showed an alpha activity of less than 20 micro-micro curies per liter.

There is considerable fluctuation in activity levels at various stations. During periods of significant increases in radioactivity levels the variation pattern is somewhat similar throughout the network of monitor stations. For example, during the summer of 1957, there was a general increase in activity at most stations.

By the latter part of 1957, the radioactivity had decreased to normal levels. The two years of data indicate other periods of activity build-up, but they were smaller in magnitude and less widespread in occurrence.

The activity during periods of highest build-up consisted mainly of beta radiation in the suspended components of the samples. The majority of these build-ups occurred during rising river stages.

To sum up: On the basis of data collected during the past two years it is concluded that the radioactivity in the streams of the Ohio Valley district is well within limits defined by radiological health experts. There is considerable fluctuation from time to time in radioactivity levels, with occasional widespread increases. The available data points to the need for more information on, and further investigation of, the suspended radioactivity that may be carried along as part of the stream-bed silt load. Such an investigation is now being conducted by the Commission under contract with the University of Louisville.

AQUATIC-LIFE RESOURCES PROJECT

Inventory and evaluation of the aquatic-life resources of the Ohio River has been underway since March 29, 1957. At that time a contract was made with the biology department of the University of Louisville to undertake the task, which is estimated to occupy a three-year period. A primary object of the project is to secure an appraisal of the suitability of the river for the maintenance of aquatic life and the production of a harvestable fish crop.

Efforts during the first year were directed toward determining the species composition, distribution and relative abundance of the various fishes. Sampling of fish population has been facilitated through the use of chemical treatment in the lock chambers at the navigation dams of the Ohio River and at tributary streams and back-waters; seines, nets and otter trawls have been used at other locations throughout the 981 miles of the river.

Meantime, work has been proceeding on these additional phases of the project: Creel census, commercial fishing activities, museum collections, flavor-testing and limnological investigations. Briefly, these are the findings to date:

Fish Population—A catalog of specimens from 60 sampling locations in the Ohio River from Pittsburgh to Cairo reveals 131 species of fish. The emerald shiner is numerically the most abundant species. Among the catfishes, the channel cat is perhaps the most plentiful, both numerically and by weight, although the flathead cat also has wide distribution. The freshwater drum is one of the commonest fishes in the river; it is particularly abundant in the lower and middle stretches but is relatively scarce in the upper river. Gizzard shad constitutes more than half the total weight of all fish taken.

The bluegill apparently is the commonest sunfish and is widespread in distribution. The white and black crappie, among the other sunfishes desirable to anglers, are the next most common. The largemouth and the spotted bass are fairly common throughout the Ohio

River, but the smallmouth bass is confined largely to the upper stretches of the river and its tributaries.

From nineteen studies of the standing-crop yield per acre of river surface the range was from a low of 35 to a high of 1,733 pounds; the average was 207 pounds per acre.

Commercial Fishing—Preliminary data from fishermen in the 660-mile stretch of Kentucky who have agreed to keep accurate records reveals that the bulk of the catch is made up of channel catfish, carp, freshwater drum, flathead catfish, paddle-fish and buffalo fishes.

One fisherman at Louisville reported taking more than a ton of paddlefish during the week of April 28, 1958. The roe from those fish was shipped to New York to be processed as caviar. During the same period so many carp were taken in the nets that the market became glutted and the fish were returned to the river.

Creel Census—Conservation officers in Kentucky were engaged in obtaining this data, which has not yet been processed. Meantime, key personnel in other states bordering on the Ohio River have been enlisted to gather comparable information from individual fishermen on number and kind of fishes caught.

Flavor-testing—Three kinds of fishes—channel cat, flathead cat and freshwater drum—from different sections of the river have been prepared as food and eaten by project personnel and their acquaintances.

Channel catfish from eleven locations were eaten by the test panel on 19 occasions; in 16 instances oily taste was registered. All catfish taken from Lock 41 at Louisville had a disagreeable taste.

Flathead catfish have all been reported to have an oily taste. And a similar distinct odor and taste of oil is reported for freshwater drum, but it is not so strong as in the catfishes.

Limnological Studies—A section of the river up-stream from Louisville has been selected for baseline investigations on the physical, chemical and biological relationships that exist. The invertebrate fauna, along with the chemical and physical conditions of the water, indicate a relatively healthy stream. With this data at hand it is likely that contrasting conditions caused by pollution in other areas will be readily recognized when they are encountered.

Supplementary Studies – To establish a baseline from which to evaluate future changes in radioactivity, the University of Louisville project has been expanded to measure radioactivity levels in muds, fishes and aquatic organisms. Further amplification of the project contemplates study of factors relating to algae growths in the river and their relationship to taste-and-odor problems at municipal waterworks.

The entire project is under direction of Dr. William M. Clay, head of the biology department, University of Louisville. He is assisted by Dr. Louis A. Krumholz, field biologist, and Dr. Gerald A. Cole, limnologist. Funds are provided from part of federal grant to the Commission under Public Law 660. The Commonwealth of Kentucky has set up a related project to study the fish resources of the Ohio River within Kentucky waters; Mr. Minor Clark, commissioner, and Mr. Bernard T. Carter, director of fisheries, of the Kentucky Department of Fish and Wildlife Resources, provide liaison between the two projects. Personnel of the state conservation agencies of Illinois, Indiana, Ohio, Pennsylvania and West Virginia are assisting the field work in waters of these states.

The Ohio River Division of the U. S. Corps of Engineers, through its various district offices, arranges for use of the locks and provides other assistance to facilitate fish-population studies.

TASTE-AND-ODOR STUDY

In April 1957 the Commission contracted with The Kettering Laboratory of the University of Cincinnati for systematic examination of Ohio River samples with a view toward identifying substances contributing to taste-and-odor problems. A further objective of the project is to encourage development of improved techniques for analysis of those substances.

The procedure followed thus far has involved the use of activated-carbon filters for adsorption of organic materials from water samples. A known volume of water is passed through the filter over a one-week period. Organic matter is then extracted from the carbon with a solvent, after which it is concentrated and subjected to chemical and physical analyses.

Carbon filters were installed first at Cincinnati where tests were begun on both river water and city tap water. Subsequently, filters were installed on river-water intake lines at two other Commission monitor stations —Wheeling, W. Va. (in November 1957) and Weirton, W. Va. (in January 1958). This was done to secure comparative information on water supplies affected by different types of up-stream waste discharges and subject to other varying influences. By mid-1958 some 120 samples had been collected from the three stations.

First step in the analysis of material extracted from the carbon is fractionation into its acidic, basic and neutral components. Each component is subjected to further examination in an attempt to identify specific compounds.

The chemical and physical methods of analysis initially employed failed for the most part to yield consistent and reliable results. Therefore, new methods of identification were investigated regarding which the Kettering investigators report:

"After some preliminary testing, the gas chromatographic procedure was found to be sufficiently sensitive for detecting some phenolic materials, and this technique was adopted for the routine examination of

the organic material recovered from the water samples. Attention is being given initially to the phenolic compounds, since some of these are known to contribute taste-and-odor when present in very low concentrations . . . The gas chromatographic examination of the chloroform extracts of a number of waters from the three stations have indicated the presence in many samples of at least seven specific forms of phenol or cresol—phenol, ortho-chlorophenol, ortho-cresol, m-p cresol, guaiacol, dimethylphenol, dichlorophenol. Other phenolics, which cannot be detected because of the limitations of the available equipment with respect to temperature, may also be present."

Results to date show that concentrations of four of the phenolics—phenol, m-p cresol, guaiacol and dimethylphenol – do not differ significantly at the three sampling stations. However, concentrations of o-chlorophenol and o-cresol show significant differences.

The investigators say: "O-cresol was absent in samples of Cincinnati water, and only one or two of the samples examined thus far contained measurable quantities of o-chlorophenol. Raw river water collected at Wheeling and Weirton, on the other hand, usually contained these materials in appreciable quantities, although the concentrations did not always vary directly with the increase in the threshold value for odor." It is concluded, however, that at this time data are too meager to appraise the significance of this finding.

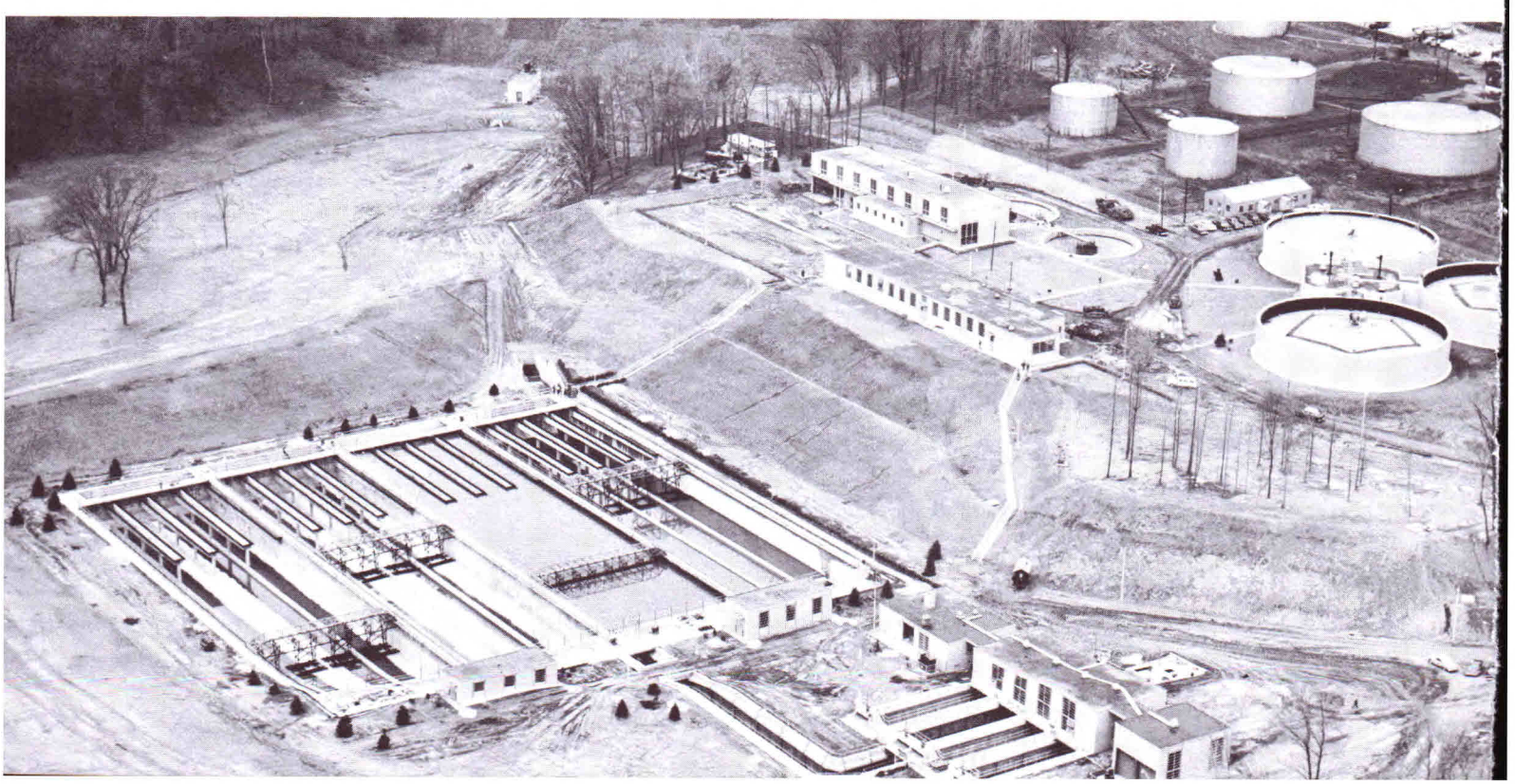
Regarding the relationship between threshold-odor values and concentration of these various chemical constituents thus far analyzed, this comment is made: "The data appear to indicate that the average threshold value of odor increases with the average concentration of organic matter and also with its most abundant component, which is the neutral material." This is not considered as a definite conclusion. However, it pointed up the need for further investigation of the neutral component. Such work is now underway using columnar chromatography to separate the aliphatic, aromatic and oxygenated-compound fractions. Further examination of each of these fractions using gas chromatography techniques is contemplated in order to observe differences in composition that may be related to the odor and taste of the water.

Findings thus far lead the Kettering investigators to reach the following general conclusions: "No single compound or class of compounds can be used as a reliable indicator of the need for treating the water supply in order to reduce the odor and taste."

The project at the Kettering Laboratory is under the direction of Mr. J. Cholak, associate professor of industrial health; analytical work is being done by Mr. E. S. Parkinson, senior research associate and Dr. L. Ertl, chemist. The project is being financed with a portion of a federal grant made available under Public Law 660.

Sewage is already being treated at Louisville, Ky., although the facilities are not yet fully completed. Built for an ultimate capacity of 100 million gallons a day, the plant (at Mile 612 on the Ohio River) includes aerated grit chambers and settling tanks (left) and sludge digesters and incinerators (right). Consulting engineers are Metcalf and Eddy of Boston.

Courier-Journal & Louisville Times photo



MEMBRANE FILTER ADOPTED

Bacterial quality of Ohio River water is now being measured by a simpler, quicker and more precise means. Acting on findings from a comparative bacteriological study carried out with the aid of its Water Users Committee, the Commission adopted in January 1958 the membrane-filter (MF) technique as optional procedure to the orthodox most probable numbers (MPN) method for determining bacterial content of river water. Approval for use of the new technique has been granted by several of the signatory states to Ohio River water-plant laboratories where ability to perform the test has been demonstrated.

The MF technique, developed in Germany during World War II, permits the direct count of coliform organisms on a selective culture medium—the water sample is simply filtered through a porous disk containing the medium and then incubated for 18 hours. In contrast, the MPN count is based on a statistical interpretation of a series of water samples planted in fermentation tubes where gas is produced if coliform bacteria are present; it requires an incubation period of 48 hours or more.

In view of the apparent practical advantages of the MF technique, the staff recommended Commission sponsorship of a comparative study with the 40-year-old MPN method to determine the adaptability of the new procedure for water-quality monitoring. With the cooperation of members of the Water Users Committee, who made available certain facilities and personnel, the Commission found it possible to sponsor this investigation at a nominal cost. The total cost to date for supplies and materials has been $4,500.

Committee laboratories and members that participated are: Wilkinsburg-Penn Joint Water Authority, Mr. R. B. Adams; South Pittsburgh Water Company, Mr. F. R. Perrin; Weirton Water Treatment Plant F. J. DeFranco; Wheeling Water Treatment Plant, Mr. C. E. Shroyer; Portsmouth Water Treatment Plant, Mr. H. C. Growdon; Cincinnati Water Treatment Plant, Mr. Dan Enright; Louisville Water Company, Mr. W. L. Williams; Evansville Water Treatment Plant, Mr. W. C. Corpening. Tests were initiated in November 1956 after laboratory personnel received training in the MF technique at the Taft Sanitary Engineering Center in Cincinnati.

Evaluation of the first twelve months of test data by staff consultant Harold W. Streeter led to the following findings:

The MF technique is adaptable to conditions experienced in Ohio River water plants.

The MF procedure is much simpler than that for the MPN test; however, considerable practice in conducting the MF test is needed to acquire the necessary skill for identifying and counting the coliform colonies.

MF counts are more precise than those of MPN and consequently they appear to offer more accurate enumeration of coliform density.

MF results are obtained within one day, whereas the MPN method takes two or more days to complete and obtain results.

Overall operating costs, including labor, for conducting the MF test will range from about the same to one-third less than the cost for the MPN test.

In analyzing the comparative results, Mr. Streeter observed that agreement between MF and MPN determinations ranged from 66 to 100 percent at five of the plants, as measured by individual results, to somewhat poorer agreement at the remaining three stations. Further, the combined data from all the laboratories for the first six months' period showed agreement between MF and MPN counts of 64 percent based on individual daily results and of 61 percent based on monthly averages.

Evidence of greater familiarity in performing the MF technique appeared in the second six-month's period. Agreement of results during this period increased to 84 percent for daily results and 82 percent for monthly averages. Results were termed "in-agreement" if the MF count was not less than 0.3 nor more than 3 times the corresponding MPN count; this is the range frequently used in defining variability of MPN counts. In general, the MF counts tended to run lower than the MPN's.

In response to further interest expressed by the Water Users Committee, the Commission authorized an extension of the membrane-filter study to determine what modifications of the present MF procedure might best facilitate the identification step. This involves a comparative study of the merits of the modified Hajna-Damon media one-step incubation previously used with: (1) those of the same media with an enrichment step added; and (2) those of the one-step MF-Endo media. Limited results from the new study indicate that both the enrichment and one-step MF-Endo procedures provide higher coliform recovery than the one-step Hajna-Damon media; moreover coliform colonies are more easily identified with the MF-Endo procedure than with the Hajna-Damon media.

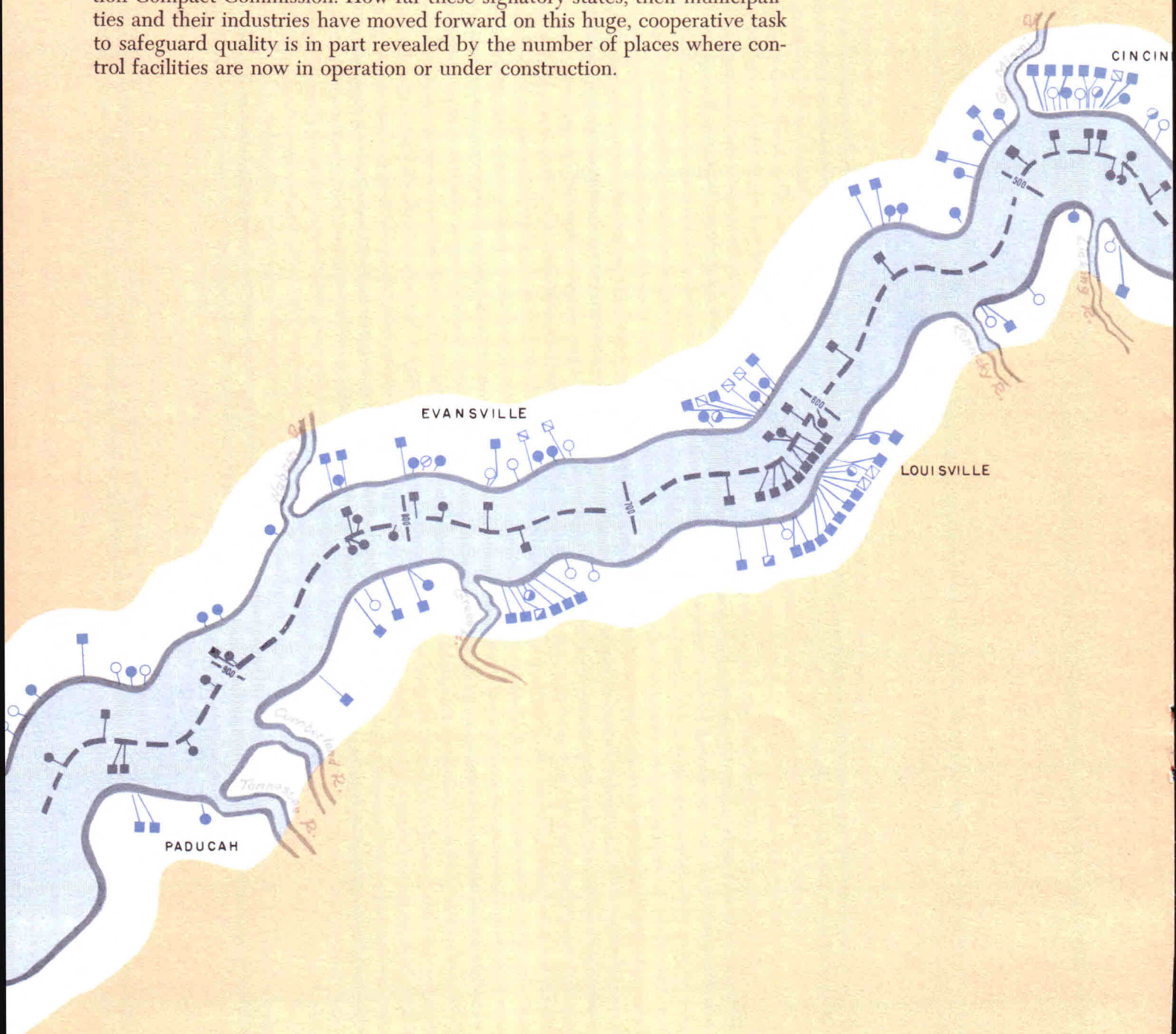
ADVISORY COMMITTEE ACTIVITIES

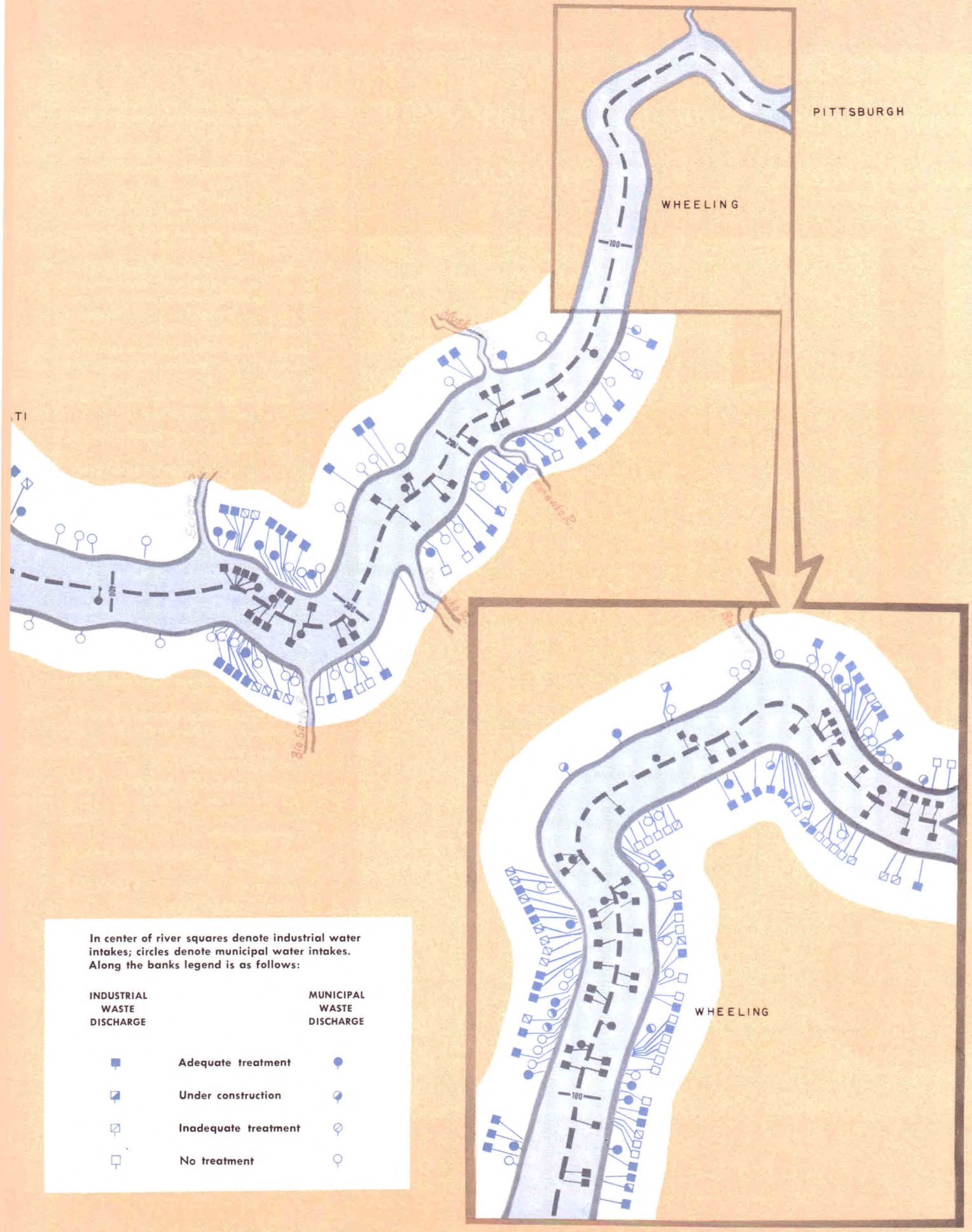
Within a year after its organization in 1948 the Commission invited industry groups in the Ohio Valley to share in the development and promotion of the regional stream clean-up program. This led to the establishment of eight "industry-action" committees. Two of these (chemical salts and organic chemicals) are now combined in a single chemical committee; one group, the distillery committee, is inactive. The remaining six committees, with a total membership of

WATER USE and WASTE DISCHARGE

No river serves a region more intensively – nor has the potential for meeting even greater demands – than does the Ohio. Depicted on this map is the location of the hundreds of municipal and industrial-water intakes and also the points of discharge for used water. Add to these vital services rendered by the river its role as one of the world's greatest transportation arteries and its rapidly expanding use for recreation. These are some of the reasons why this 1,000-mile waterway is a treasure to be safeguarded.

Preventing abuse of the river by uncontrolled discharge of used water is the goal of the eight states that created the Ohio River Valley Water Sanitation Compact Commission. How far these signatory states, their municipalities and their industries have moved forward on this huge, cooperative task to safeguard quality is in part revealed by the number of places where control facilities are now in operation or under construction.



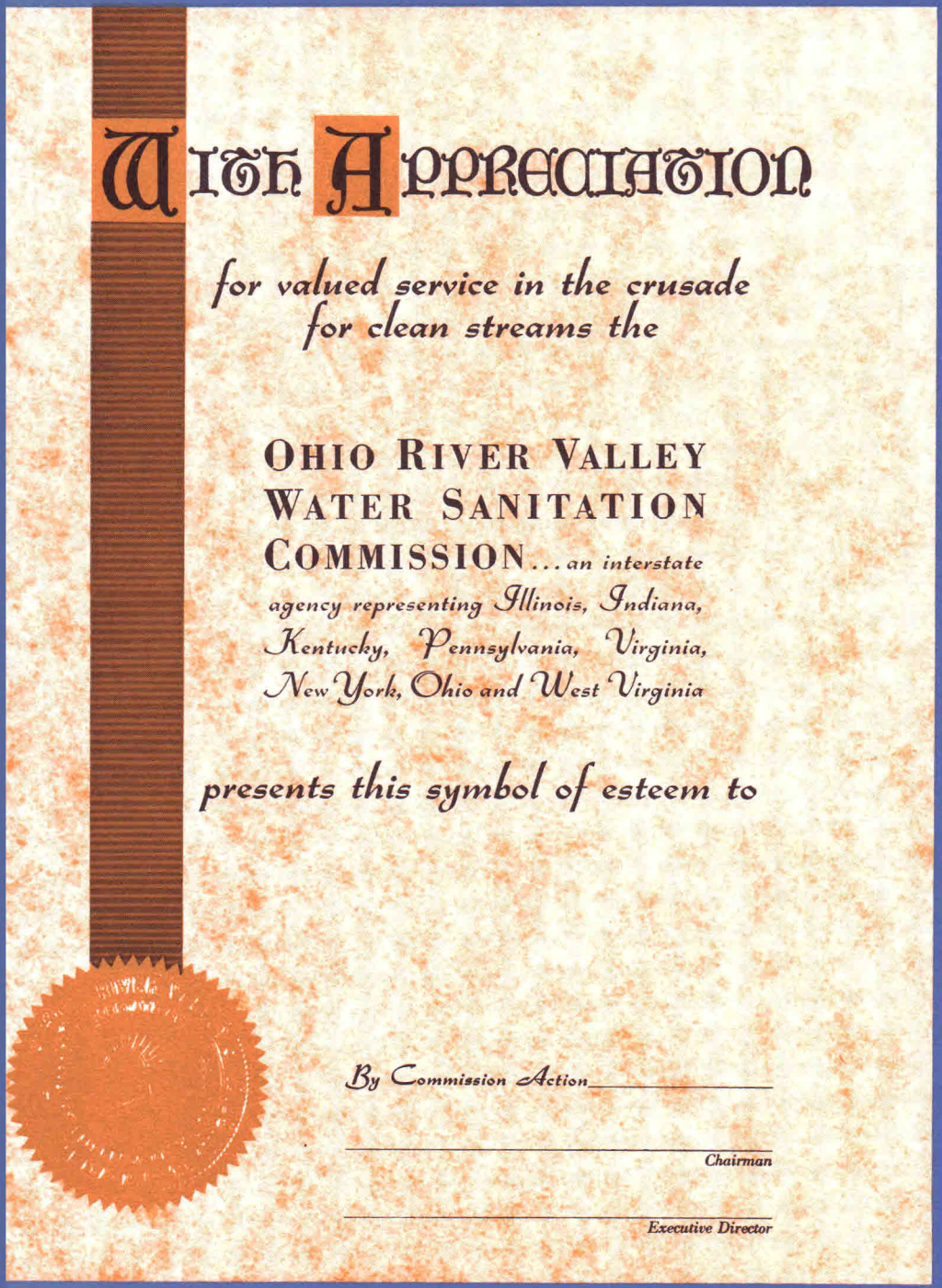


In center of river squares denote industrial water intakes; circles denote municipal water intakes. Along the banks legend is as follows:

INDUSTRIAL WASTE DISCHARGE		MUNICIPAL WASTE DISCHARGE
	Adequate treatment	
	Under construction	
	Inadequate treatment	
	No treatment	

OHIO RIVER VALLEY WATER SANITATION COMMISSION July 1, 1958

service award established in april 1958 and the names of initial recipients...



F. H. Waring, Secretary of the Ohio River Valley Water Sanitation Commission since its organization in 1948.

Vance Crawford, General Electric Company (retired); For development of visual aids and exhibits.

Dan Heekin, Ohio River Committee, Cincinnati Chamber of Commerce; For sustained interest over the years in Commission affairs.

Douglas Fuller, Cincinnati Chamber of Commerce; For support and cooperation in promoting the Commission's program, particularly in connection with Cincinnati's Clean Water Rally in 1953.

Lloyd L. Smith, Chairman of Aquatic-Life Advisory Committee since its organization in 1952.

Walker Penfield, Chairman Chemical Salts Industry Committee 1950-52.

U. T. Greene, Chairman Chemical Salts Industry Committee 1952-54.

W. T. Dickens, Chairman Organic Chemicals Industry Committee 1952-53.

George F. Jenkins, Chairman Chemical Industry Committee 1953-54.

H. L. Jacobs, Chairman Chemical Industry Committee 1954-55.

E. R. Price, Chairman Coal Industry Committee 1951-55.

Walter L. Pinner, Chairman Metal-Finishing Industry Committee 1950-52.

R. G. Chollar, Chairman Metal-Finishing Industry Committee 1952-54.

L. J. Hibbert, Chairman Metal-Finishing Industry Committee 1954-57.

Alex S. Chamberlain, Chairman Oil-Refining Industry Committee 1952-54.

T. A. Anderson, Chairman Oil-Refining Industry Committee 1954-57.

Virgil A. Minch, Chairman Pulp and Paper Industry Committee 1954-58.

C. W. Weesner, Chairman Steel Industry Committee 1952-53.

Grant A. Pettit, Chairman Steel Industry Committee 1953-54.

Charles A. Bishop, Chairman Steel Industry Committee 1954-55.

Joseph A. Sample, Chairman Steel Industry Committee 1956-57.

Arthur R. Todd, Chairman Water Users Committee 1952-53.

Dan Enright, Chairman Water Users Committee 1953-54.

T. W. Heiskell, Chairman Water Users Committee 1954-55.

H. A. Stobbs, Chairman Water Users Committee 1955-56.

W. L. Williams, Chairman Water Users Committee 1956-57.

about 150, are vigorous participants in the ORSANCO program.

Distinguished by continuity and scope of service are two other advisory committees—the Water Users group and the Aquatic-Life committee.

Following are the committees, their date of organization and current chairman:

Steel Industry—April 13, 1950, H. A. Stobbs, industrial-wastes engineer, Wheeling Steel Corp., Wheeling, W. Va.

Metal-Finishing—June 20, 1950, C. C. Cupps, assistant chief engineer, Rockwell-Standard Corp., Newton Falls, Ohio.

Chemical Industry — January 24, 1951, Nelson J. Ehlers, assistant to the president, Columbia-Southern Chemical Co., Pittsburgh, Pa.

Coal Industry—August 29, 1951, Henry F. Hebley, research consultant, Consolidation Coal Co., Pittsburgh, Pa.

Water Users—January 7, 1952, Robert G. Call, head of general laboratories, American Electric Power Service Corp., Huntington, W. Va.

Aquatic-Life—March 31, 1952, Dr. L. L. Smith, Jr., chairman of the department of entomology and economic zoology, University of Minnesota, St. Paul, Minn.

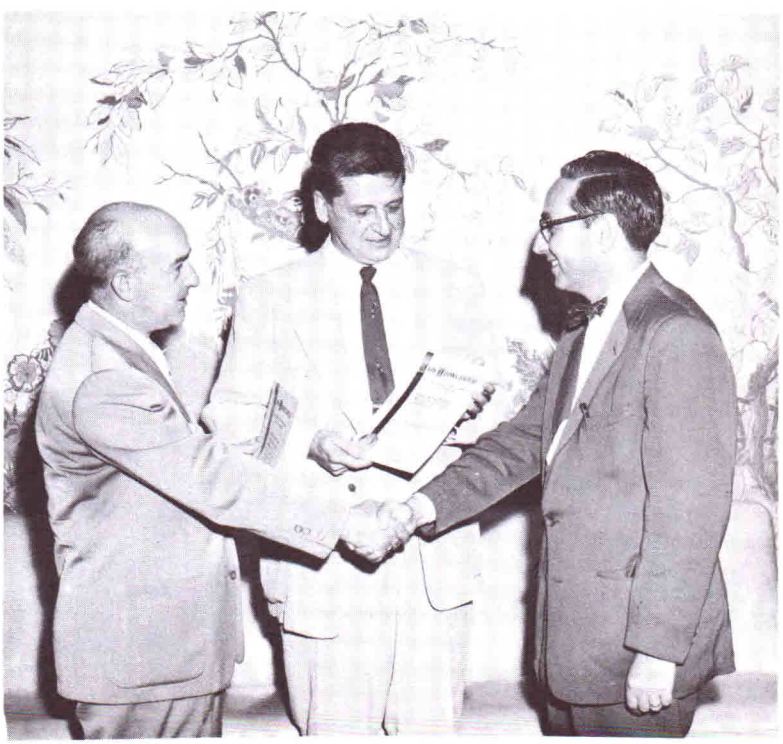
Oil-Refining – October 17, 1952, Joseph Hitz, chief chemist, Louisville Refining Co., Louisville, Ky.

Pulp and Paper—June 22, 1954, E. W. Petrich, production engineer, Howard Paper Mills, Inc., Urbana, Ohio.

Industry Committees—During the past year major attention of the industry committees has been directed to the review of control proposals under consideration by the Commission. These relate to chloride wastes, taste-and-odor producing substances, oil pollution from terminal and marine installations, toxic wastes and mine drainage.

Regarding chloride control, all committees were invited and they participated in presenting their views on the staff proposal, which was formally reviewed by the Commission in July 1957. And in January 1958 the committees sent representatives to meet with an ad hoc committee for further discussion.

Commanding attention with the chloride-control proposal has been the question of taste-and-odor control. The steel committee, in particular, has long devoted itself to this matter. In July 1956 the committee developed reports for the Commission, based on data assembled by the committee in cooperation with the Water Users Committee and the staff, regarding the relation between phenolic materials and the occurrence of tastes and odors in water supplies. Three additional



Commissioner Ralph E. Dwork of Ohio presents ORSANCO appreciation scrolls to William L. Pinner of the Houdaille-Hershey Corp. and L. J. Hibbert (center) National Cash Register Co. for their service as past chairmen of the Commission's Metal-Finishing Action Committee. The scrolls were adopted this year.

reports, constituting appendices to the original report, were issued during the current year; two of these related to Mahoning-Beaver River surveys in 1956 and 1957 (released October 1957 and February 1958). The third was based on work supported by the American Iron and Steel Institute fellowship at Mellon Institute with regard to phenol concentrations in four reservoirs (released May 1958).

The chemical committee reviewed findings of the steel committee and other investigators and then reported its recommendations to the Commission in November 1957.

By action of the Commission at its April 30, 1958 meeting, the industry committees were invited to submit views and recommendations regarding a staff proposal for the control of taste-and-odor-producing substances. The proposal is aimed at control of the total effect of an effluent rather than at prescription of limitations on known or suspected constituents in an industrial discharge. The novelty of the proposal has stimulated evaluation studies at industry-committee member plants.

Steel Committee—The steel committee continues to spearhead a variety of activities to keep its industry alerted on all possibilities for pollution abatement in the Ohio Valley District. One of these pertains to the development of manuals of practice. The most recent is titled: "Dust Recovery Practice at Blast Furnaces." It was published in January 1958 as one of the Commission's series of reference-data publications.

Another pollution problem resulting from steel-mill operation under scrutiny by the committee is that caused by mill scale. Research on this is being conducted through the American Iron and Steel Institute's fellowship at Mellon Institute. Work during the past year has encompassed an investigation of the effects of scale on downstream water uses, a laboratory study on scale-settling rates and the evaluation of measures for improving scale recovery in the mills.

Operation of the pilot plant at Niles, Ohio, for evaluation of the Blaw-Knox-Ruthner process for recovery of spent pickle liquor was completed during the year. A task force has been appointed by the steel committee to make an economic evaluation of the process along with an evaluation of other processes now available for the regeneration or disposal of spent liquor. These others include the neutralization, Koppers Zahn, Chemical Construction Co., and National Lead Co. (Mantius) processes.

Development of improved analytical procedures for steel-mill wastes continues to capture committee attention. An electrometric procedure for determination of chloride was offered to the Commission this year for evaluation of the procedure by laboratories of the signatory states.

Two other activities under consideration by the steel committee are an economic survey regarding quality of water used by steel mills and the development of a pollution-control educational film for use in steel mills. Questionnaires for the quality survey have been completed, but not yet distributed. The script for the film has been virtually completed but the project is temporarily suspended until additional funds become available.

Chemical Committee – The chemical committee developed a report titled "Selecting Sites for Chemical Plants." Publication was authorized by the Commission and it appeared in the March-April, 1958, issue of *Industrial-Wastes* magazine. The report outlines factors relating to waste-disposal and pollution control.

A sub-committee of the chemical committee continues to study and report on developments regarding synthetic detergents. Periodic review is made of research projects sponsored by member companies through the Association of American Soap and Glycerine Producers and by other agencies.

Other matters under consideration by the chemical committee include: Studies on the relation of the following constituents in water to chemical-industry operations—iron, manganese, hardness, dissolved solids, temperature; development of a definition of acidity and basicity; delineation of research projects that might be undertaken under sponsorship of the Manufacturing Chemists Association; promotion of education and information services among Ohio Valley chemical plant installations.

Metal-Finishing Committee – The metal-finishing committee, which has contributed to the Commission's program since 1950 through the preparation of industry manuals on pollution control and in the assembly of information on the toxicity of wastes, operated on a stand-by basis during 1956-57. In 1958 the committee re-established its regular schedule of meetings in order to fully avail itself of the Commission's invitation to review pending proposals on industrial-waste controls.

Oil-Refining Committee—The oil-refining committee was chiefly occupied with a critical review of a Commission staff draft of recommended practices for the prevention of oil pollution from marine terminals. This material is designed for the guidance of the signatory states.

The committee also completed a report on "Foul Condensate Treatment and Disposal." Publication was authorized by the Commission and it appeared in the February 1958 issue of the *Sewage and Industrial Wastes* journal. The report summarized the experience of refiners who have solved one of the three most urgent problems with which they are faced; the two other problems are oil separation and the disposal of spent caustics.

Other matters with which the committee is concerned include: A survey on the amount of iron, manganese, oil and heat discharged in refinery effluents; planning of research on the effect of effluents on taste-and-odor conditions in receiving streams.

Coal Industry Committee—Members of the coal industry committee are reviewing initial efforts of the Commission staff in the development of a mine-acid drainage control measure. In conjunction with this review the committee has arranged for field inspections by the staff to observe mining practices.

Aquatic-Life Committee—The aquatic-life advisory committee has begun preparation of its third progress report. This will include a discussion on the use of bioassay for evaluating water quality, and recommendations on maximum permissible concentrations of the following substances: Iron, manganese, cyanide and phenolic compounds. The first and second progress reports were published in the March 1955 and May 1956 issues of the *Sewage and Industrial Wastes* journal .

Water Users Committee—Climaxing efforts of the Water Users Committee was Commission adoption of the membrane-filter technique for testing the bacterial content of Ohio River water. This action was the culmination of a comparative study of the MF technique with the standard MPN procedure in the laboratories of eight water plants of the committee. The committee is now engaged in a further study aimed toward development of refinements and modifications.

The committee has been alerted on the increasing manganese content in the upper third of the river. Manganese presents a troublesome problem for municipal water suppliers because its removal is quite difficult and its presence is readily noticeable by consumers. Manganese in concentrations greater than a few tenths parts per million (ppm) causes clogging of water mains and meters, staining of clothes during laundering, and discoloring of water. Yearly average concentrations of total manganese below Pittsburgh are now running about 1.0 ppm.

In view of the growing importance of manganese as a pollution problem in the Ohio River, the Water Users Committee and the U. S. Geological Survey have been requested to participate in a study to learn more about the origin and fate of manganese in the river. The data from this study, coupled with existing monitor-station information, will form the basis of a comprehensive report on manganese being developed by the Commission staff.

The "alert" system whereby monitor stations operated by the Water Users Committee notify Commission headquarters of sudden or unusual changes in river water quality was activated several times during the past year as a result of spills and accidental discharges of waste. This system is proving its usefulness in warning downstream water users of impending trouble as well as aiding in tracing the source of the trouble.

Pondering a question of significance in development of the Commission's industrial-waste control program are members of the Chemical Industry Advisory Committee. This meeting, under the chairmanship of Nelson J. Ehlers, assistant to the president, Columbia-Southern Corp., was held in Albany, N. Y. The committee rotates its meetings among the capitols of the signatory states in order to permit participation of the ORSANCO commissioners in their deliberations.

WHAT THE SCOREBOARD SHOWS

Other sections of this report (pages 2-5 and 16-17) highlight pollution-control progress on the main-stem of the Ohio River. Here are the details for the entire 155,000 square mile area that comprises the Ohio River Valley Water Sanitation Compact drainage district. The tabulations and summaries are compiled from information supplied by the eight signatory states and they represent the status of municipal and industrial waste control facilities as of June 30, 1958.

Municipal Status – Sewage-treatment facilities are now in operation or under construction to serve 8,095,000 people—this represents 79 percent of the total sewered population (10,226,000). Ten years ago sewage-treatment facilities were provided for only 3,150,000 people.

Of the 1,574 communities that are sewered in the Ohio Valley, treatment facilities for 881 are in operation or under construction. Meantime, 180 communities have had final plans approved for early construction. The discharge from another 177 communities (in which the average population is less than 850) is considered of minor pollutional significance. Details for each signatory state on the status of its communities are shown in the tabulation on the opposite page, along with a comparative summary.

Industrial Status—Of the 1,459 industries whose effluents are discharged directly into streams 54 percent are now provided with control facilities that are rated adequate by the signatory states. Five years ago (complete records were not available prior to this time) only 26 percent of the 1,247 industries were in this category.

Another 25 percent of the industries (367 plants) have provided some form of control but these facilities are not yet considered adequate. With regard to meeting the minimum requirements established by the Commission in 1955 almost three-quarters of the industries can now be listed in this category.

Details for each of the eight states are given in the tabulation titled "Status of Industrial-Waste Control Facilities."

STATUS OF INDUSTRIAL WASTE-CONTROL FACILITIES—JULY 1, 1958
for industries discharging effluents directly into streams

STATUS	ILL.	IND.	KY.	N. Y.	OHIO	PA.	VA.	W. VA.	TOTAL	% OF TOTAL
Adequate control facilities	7	168	118	14	244	96	20	121	788	54.0
Control provided, not adequate	8	39	58	15	140	51	13	43	367	25.2
Control facilities inadequate, improvements under construction	0	0	10	0	18	3	0	3	34	2.3
New control facilities under construction	0	2	0	0	2	18	0	28	50	3.4
Plans for facilites completed or in preparation	0	1	1	7	1	57	2	29	98	6.7
No action by company	0	1	0	12	0	25	5	65	108	7.4
Companies not in operation	0	0	9	0	1	0	0	4	14	1.0
TOTAL NUMBER OF INDUSTRIES	15	211	196	48	406	250	40	293	1,459	100.0
Complying with ORSANCO IW-1	15	175	140	13	341	225	31	121	1,061	72.7

STATUS OF MUNICIPAL AND INSTITUTIONAL SEWAGE-TREATMENT FACILITIES—JULY 1, 1958

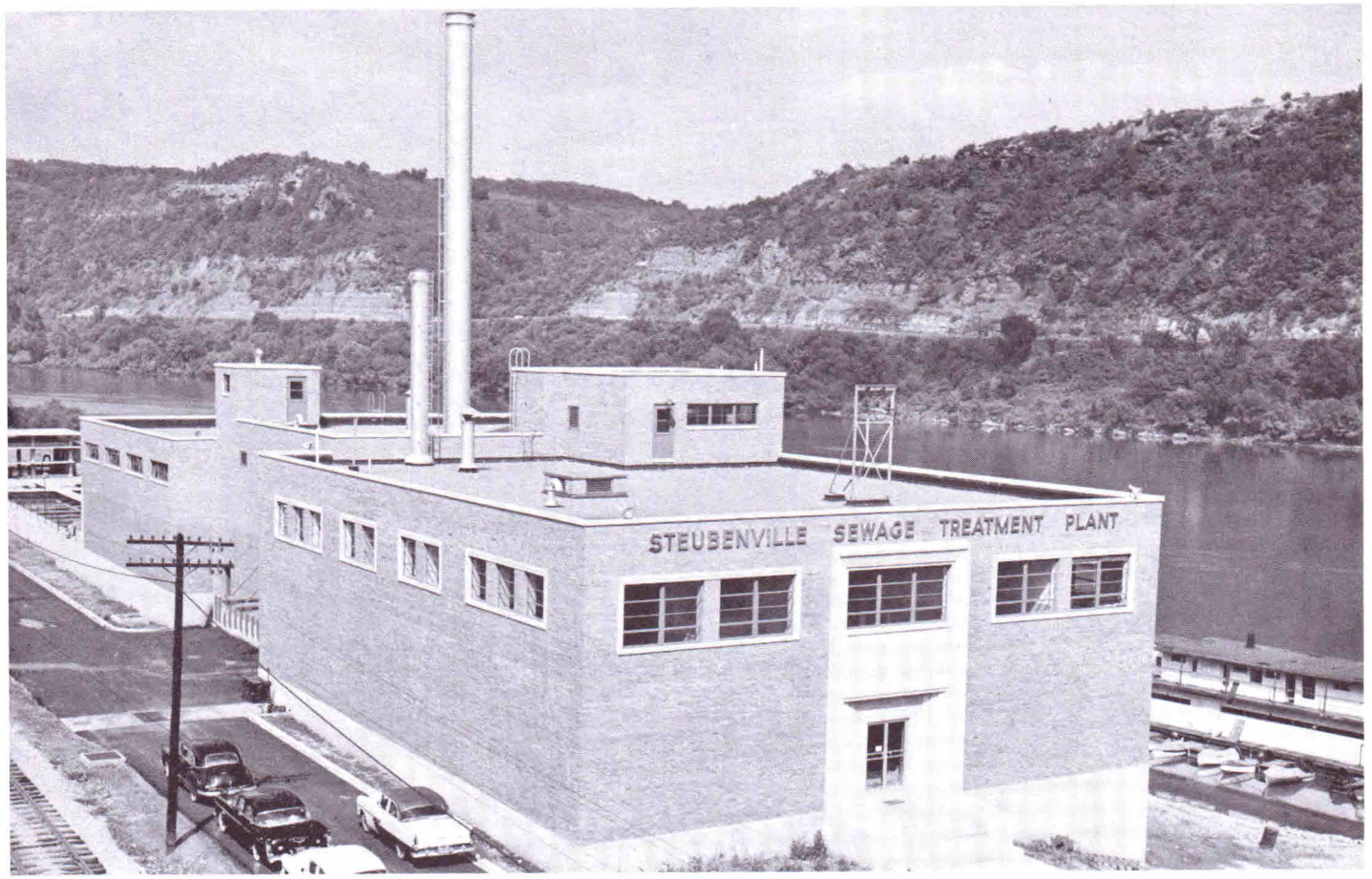
Number of communities (top number) and population served (bottom number)

STATUS	ILL.	IND.	KY.	N. Y.	OHIO	PA.	VA.	W. VA.	TOTAL	% OF TOTAL
Adequate treatment	41	111 (a)	114	5	195 (d)	69	23	23	581	36.9
	239,961	762,454	478,665	69,994	1,441,383	332,200	67,919	105,228	3,497,804	34.2
Treatment provided, not adequate	4	21 (b)	14	9	31	14	26	10	129	8.2
	17,995	95,547	84,074	24,968	238,849	48,945	28,695	29,341	568,414	5.6
Treatment provided, not adequate; improvements or additional plants under construction	0	5	2	0	16 (e)	2	0	2	27	1.7
	0	473,787	4,351	0	487,721	7,489	0	11,870	985,218	9.6
New treatment works under construction	0	7	8	1	33 (f)	80	3	12	144	9.2
	0	70,650	413,752	1,492	735,909	1,483,692	6,208	331,974	3,043,677	29.8
Final plans approved	3	22 (c)	7	0	27	97	4	20	180	11.4
	10,703	173,611	15,139	0	306,170	581,518	9,047	113,847	1,210,035	11.8
Final plans in preparation	0	1	6	0	11 (g)	11	3	7	39	2.5
	0	1,536	48,652	0	55,230	37,942	20,638	13,315	177,313	1.7
Preliminary plans or report approved or in preparation	0	10	6	3	37	27	11	28	122	7.8
	0	13,462	17,810	10,795	66,089	79,973	21,393	59,680	269,202	2.6
Treatment program under discussion	0	27	8	0	1	4	1	24	65	4.1
	0	40,386	26,329	0	2,018	5,142	1,568	42,521	117,964	1.2
Order, notice or recommendation for treatment issued by state	1	1	0	3	0	5	1	7	18	1.1
	3,196	1,061	0	2,684	0	23,026	1,347	6,980	38,294	0.4
Discharge of minor significance	4	65	0	2	92	0	4	10	177	11.3
	7,324	53,202	0	1,801	71,286	0	5,064	10,892	149,569	1.5
No tangible progress	4	5	29	0	0	13	12	29	92	5.8
	22,000	14,350	44,786	0	0	43,672	8,573	35,056	168,437	1.6
TOTAL	57	275	194	23	443	322	88	172	1,574	100.0
	301,179	1,700,046	1,133,558	111,734	3,404,655	2,643,599	170,452	760,704	10,225,927	100.0

(a) Includes West Evansville serving 98,636
(b) Evansville counted in this category
(c) Includes East Side Evansville serving 30,000
(d) Includes Little Miami plant serving 122,000 and 7 communities
(e) Cincinnati counted in this category
(f) Includes Mill Creek plant serving 520,000 and 17 communities
(g) Includes Muddy Creek plant serving 32,000 and 1 community

SUMMARY ON COMMUNITY SEWAGE-TREATMENT INSTALLATIONS

	LAST YEAR		THIS YEAR	
PLACED IN OPERATION				
New treatment plants for	23 municipalities and 4 institutions serving	296,300	19 municipalities and 2 institutions serving	178,000
Additional facilities for	23 municipalities and 3 institutions serving	191,900	12 municipalities serving	105,100
	53	488,200	33	283,100
PLACED UNDER CONSTRUCTION				
New treatment plants for	9 municipalities and 1 institution serving	143,300	41 municipalities and 1 institution serving	368,800
Additional facilities for	16 municipalities that are serving	87,200	14 municipalities and 1 institution serving	135,300
	26	230,500	57	504,100



Further clean-up of the upper Ohio River (at Mile 68) was advanced when the Steubenville, Ohio, sewage-treatment plant went into full operation in October 1957. This facility is designed to serve an ultimate population of 65,000. Consulting engineers were Alden E. Stilson and Associates, Ltd. of Columbus, Ohio.

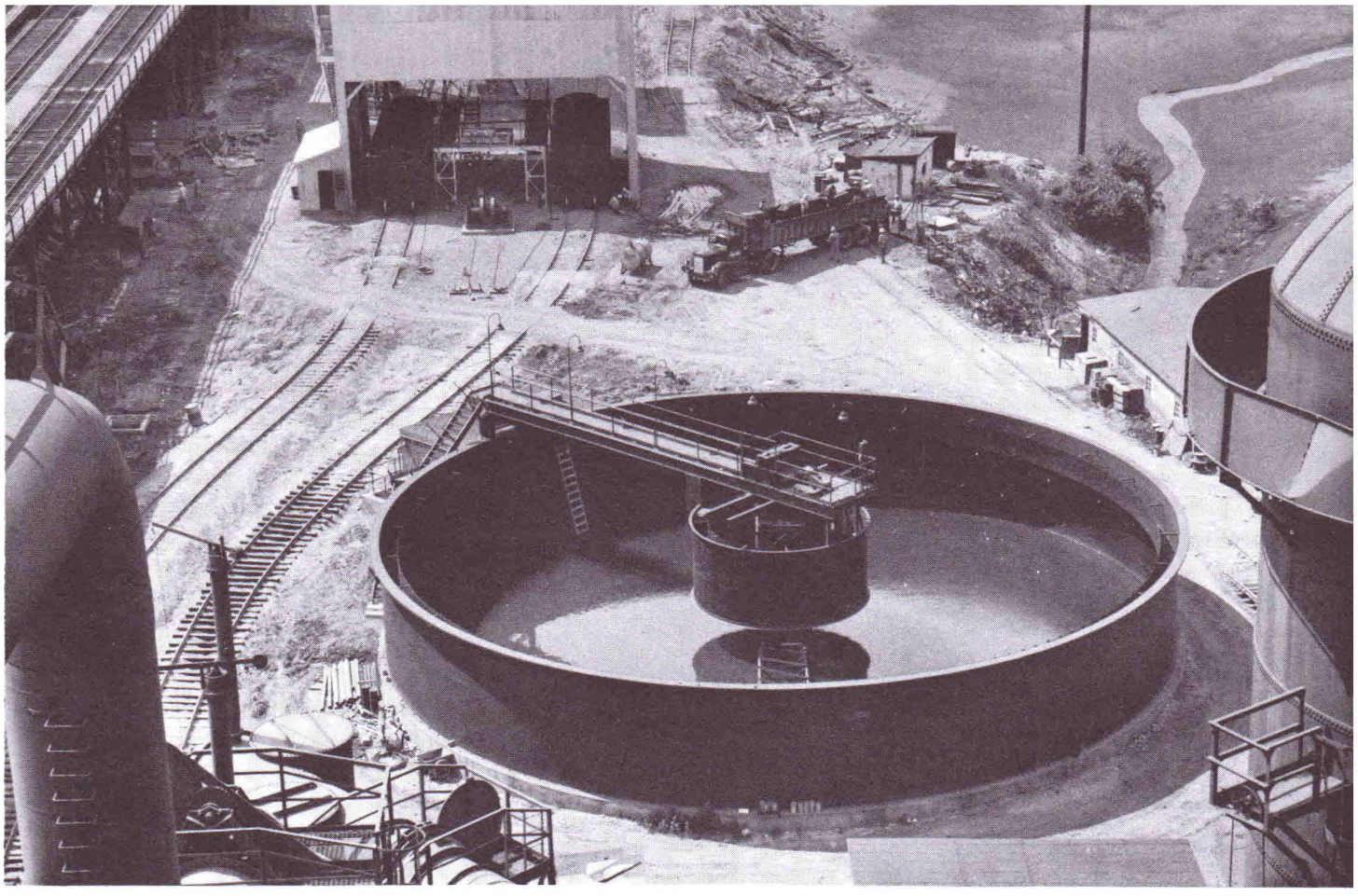
Action by communities—During the past year 33 communities placed in operation new or enlarged sewage-treatment plants. And 57 communities started construction on new or enlarged facilities.

New sewage treatment installations were completed and placed in operation at:

Place	Population	Watershed
Hutsonville, Ill.	600	Wabash
Fairmont, Ind.	2,600	Wabash
Greenwood, Ind.	3,100	Wabash
Huntingburg, Ind.	4,100	Wabash
Monon, Ind.	1,400	Wabash
Morristown, Ind.	700	Wabash
Seymour, Ind.	9,600	Wabash
Frankfort, Ky.	11,900	Kentucky
Paducah, Ky.	32,800	Ohio
St. Bonaventure University St. Bonaventure, N. Y.	1,000	Allegheny
Buckeye Lake Sewer Dist. Licking Co., Ohio	6,000	Muskingum
Butler, Ohio	800	Muskingum
Campbell, Ohio	12,900	Beaver
Canfield, Ohio	1,500	Beaver
East Liverpool, Ohio	24,200	Ohio
Middletown, Ohio	33,700	Miami
New Boston, Ohio	5,400	Ohio
Titusville, Pa.	8,900	Allegheny
Independence High School Independence, Va.	800	New
Moundsville, W. Va.	14,800	Ohio
Ravenswood, W. Va.	1,200	Ohio

Additions or improvements to existing sewage treatment facilities were completed at:

Place	Population	Watershed
Catlin, Ill.	1,000	Wabash
Winchester, Ind.	5,500	Wabash
Madisonville, Ky.	11,100	Green
Bolivar, N. Y.	1,500	Allegheny
Jamestown, N. Y.	43,400	Allegheny



Freeing the Ohio River from a burden of iron-ore particles is the function of this new clarifier-thickener installed at the Ashland, Ky., plant of the Armco Steel Corporation. Waste water containing blast-furnace flue dust is settled in the circular tank to remove solid particles that would otherwise form deposits in the river.

Frank B. Elam photo

Beaver Creek Sewer Dist. Montgomery Co., Ohio	15,800	Little Miami
Eaton, Ohio	4,200	Miami
Gahanna, Ohio	600	Scioto
Glendale, Ohio	2,400	Ohio (trib.)
Piqua, Ohio	17,400	Miami
Reynoldsburg, Ohio	700	Scioto
Glen Dale, W. Va.	1,500	Ohio

During the past year construction of new treatment plants was started at:

Place	Population	Watershed
Alexandria, Ind.	5,100	Wabash
Galveston, Ind.	900	Wabash
Jonesboro, Ind.	2,000	Wabash
New Albany, Ind.	29,300	Ohio
Paoli, Ind.	2,600	Wabash
Vincennes, Ind.	18,800	Wabash
West Lafayette, Ind.	11,900	Wabash
Conrad Hts. Sub-Div., Ky.	400	Ohio
Eminence, Ky.	1,500	Kentucky
Gainsway Sub-Div., Ky.	800	Kentucky
LaGrange, Ky.	1,600	Ohio (trib.)
Lynch, Ky.	5,500	Cumberland
Muldraugh, Ky.	700	Salt
Mayville, N. Y.	1,500	Allegheny
Canal Fulton, Ohio	1,300	Muskingum
Flushing, Ohio	1,200	Muskingum
Lowellville, Ohio	2,200	Beaver
McDonald, Ohio	1,900	Beaver
Millersburg, Ohio	2,400	Muskingum
Seaman, Ohio	700	Ohio (trib.)
Shiloh, Ohio	700	Muskingum
Tiltonsville, Ohio	2,200	Ohio
Washingtonville, Ohio	800	Ohio (trib.)
Waynesburg, Ohio	1,300	Muskingum
Wellsville, Ohio	7,900	Ohio
Zanesville, Ohio	40,500	Muskingum
Aliquippa, Pa.	26,100	Ohio
Baden, Pa.	3,700	Ohio
Elizabeth, Pa.	2,600	Monongahela
Greenville, Pa.	9,200	Beaver
Monaca, Pa.	7,400	Ohio
New Brighton, Pa.	9,500	Beaver

Oil City, Pa.	19,600	Allegheny
Osborne, Pa.	500	Ohio
Sewickley, Pa.	5,800	Ohio
Warren, Pa.	14,800	Allegheny
Galax, Va.	5,200	New
Rich Valley High School Smyth Co., Va.	400	Tennessee
Huntington, W. Va.	86,400	Ohio
New Martinsville, W. Va.	4,100	Ohio
Weirton, W. Va.	24,000	Ohio
Williamstown, W. Va.	3,800	Ohio

Additions to existing treatment facilities were placed under construction at:

Place	Population	Watershed
Charleston, Ill.	9,200	Wabash
Huntington, Ind.	15,100	Wabash
Lebanon, Ind.	7,600	Wabash
Logansport State Hospital Logansport, Ind.	2,300	Wabash
New Castle, Ind.	18,300	Wabash
Osgood, Ind.	1,200	Ohio (trib.)
Tipton, Ind.	5,600	Wabash
Morehead, Ky.	3,100	Licking
Murray, Ky.	6,000	Tennessee
Owenton, Ky.	1,200	Kentucky
Ashland, Ohio	14,300	Muskingum
Brewster, Ohio	1,600	Muskingum
LeRoy, Ohio	300	Muskingum
Mansfield, Ohio	43,600	Muskingum
Somerset, Pa.	5,900	Monongahela

FEDERAL-AID PROGRAM

Grants-in-aid to municipalities for construction of sewage-treatment facilities were authorized in 1956 by the Federal Water Pollution Control Act (Public Law 660 — 84th Congress). For the fiscal year ending June 30, 1957 the Congress appropriated $50 millon to be distributed among the states, pro-rated according to population and per-capita income. For the year ending June 30, 1958 funds appropriated for grants-in-aid totaled $45 million. Each state determines the eligibility of communities within its jurisdiction and this determination is subject to final approval by the Surgeon-General of the U. S. Public Health Service. The grant to a community is limited to 30 percent of the reasonable cost, with a maximum amount not to exceed $250,000.

During the first year of the grant program 30 community projects in the Compact District with an estimated cost of some $17 million were allotted federal aid totaling $3.8 million. The population to be served by these plants is 1,492,000. Details are given in the Ninth Annual Report of the Commission.

This past year 50 community projects in the Ohio Valley received federal aid. Total cost of the projects is estimated to be about $31 million; the federal grants total $5.7 million. Population to be served is 823,300. Details are given in the following summary; T indicates treatment plant only; S is sewers only and T-S denotes both facilities:

FEDERAL GRANT PROJECTS IN THE OHIO VALLEY DISTRICT — 1957-58

Municipality	Pop. 1950	Type	Est. Cost Dollars	Fed. Grant
Evansville, Ind.	128,600	T-S	$2,720,000	$243,625
Galveston, Ind.	900	T-S	178,734	53,620
New Albany, Ind.	29,300	T-S	3,340,000	250,000
Paoli, Ind.	2,600	T-S	396,683	119,005
Petersburg, Ind.	3,000	T-S	324,426	97,238
Vincennes, Ind.	18,800	T-S	840,000	250,000
Bardstown, Ky.	4,200	T	341,000	102,300
Carrollton, Ky.	3,200	T-S	315,000	94,500
Cumberland, Ky.	4,200	T-S	290,000	87,000
Flemingsburg, Ky.	1,500	T-S	195,000	58,500
Hazard, Ky.	7,000	T-S	687,500	206,250
LaGrange, Ky.	1,600	T-S	176,500	51,130
Louisville, Ky.	369,100	S	1,659,410	250,008
Muldraugh, Ky.	700	S	71,178	21,350
Owenton, Ky.	1,200	T	19,875	5,963
Pikeville, Ky.	5,200	T-S	804,136	241,242
West Liberty, Ky.	900	T-S	127,350	38,200
Jamestown, N. Y.	43,400	S	352,200	105,665
Brewster, Ohio	1,600	T-S	260,580	78,170
Brilliant, Ohio	2,100	T-S	174,000	52,204
Campbell, Ohio	12,900	T-S	636,918	33,400
Canal Fulton, Ohio	1,300	T-S	145,316	43,595
Flushing, Ohio	1,200	T-S	154,874	46,462
LeRoy, Ohio	300	T-S	120,000	36,000
Lowellville, Ohio	2,200	T-S	344,043	103,213
Mansfield, Ohio	43,600	T	4,024,746	250,000
Millersburg, Ohio	2,400	T-S	341,144	102,343
Seaman, Ohio	700	T	79,969	23,991
Shiloh, Ohio	700	T	127,500	29,640
Tiltonsville, Ohio	2,200	T-S	266,595	53,850
Washingtonville, Ohio	800	T-S	59,633	17,890
Waynesburg, Ohio	1,300	T-S	166,600	30,600
Wellsville, Ohio	7,900	T-S	432,774	129,832
Coraopolis, Pa.	10,500	T-S	1,400,000	250,000
Greenville, Pa.	9,200	T	985,000	250,000
Osborne, Pa.	500	S	111,553	33,466
Pleasant Hills, Pa.	3,800	T-S	1,364,544	250,000
Galax, Va.	5,200	T-S	458,300	58,247
Lebanon, Va.	1,700	T	128,000	25,596
Elkins, W. Va.	9,100	T-S	851,752	250,000
Madison, W. Va.	2,000	T-S	215,000	62,262
Moundsville, W. Va.	14,800	T-S	203,192	60,957
New Martinsville, W.Va.	4,100	T-S	600,000	180,000
Princeton, W. Va.	8,300	T	139,624	41,887
Ravenswood, W. Va.	1,200	T-S	171,760	51,528
Weirton, W. Va.	24,000	T	1,500,660	250,000
Weston, W. Va.	8,900	T-S	845,651	250,000
Whitesville, W. Va.	1,000	T-S	98,025	29,407
Williamson, W. Va.	8,600	T-S	1,043,352	250,000
Williamstown, W. Va.	3,800	T-S	219,400	65,820
50	823,300		$30,509,497	$5,665,956

ADMINISTRATIVE AFFAIRS

Execution of the provisions of the Ohio River Valley Water Sanitation Compact is the responsibility of 27 commissioners. Each of the eight states is represented by three commissioners appointed by the Governor of the state. The federal government has three representatives appointed by the President of the United States. Commissioners serve without compensation but are reimbursed for expenses incurred in connection with their duties.

Operating funds are provided by the eight signatory states, the amount from each being pro-rated according to the area and population of the state within the compact district. For the first year the states appropriated on the basis of a total budget of $40,000; in each of the succeeding five years the allotment was $100,000. During the past four years the budget request has been $130,000 annually.

Under provisions of Public Law 845, the Federal Water Pollution Control Act of 1948, the Commission received grants of $29,000 in 1949; $24,538 in 1950 and $26,084 in 1951. In accordance with the Federal Water Pollution Control Act of 1956 (Public Law 660) the Commission received a grant of $69,802 in 1956 and $112,424 in 1957.

A financial statement for this fiscal year is given on a following page.

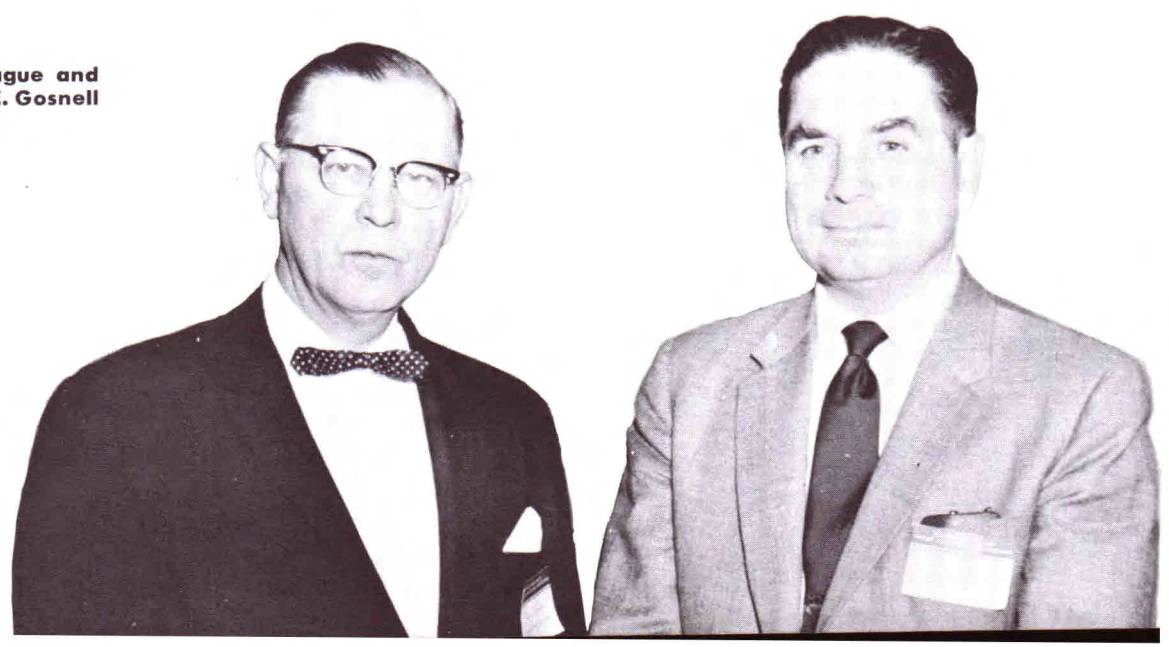
New Officers—During the year summarized in this report, Mr. Blucher A. Poole of Indiana served as chairman. Elected to take office on July 1, 1958, were Dr. Russell E. Teague of Kentucky as chairman and Mr. Maurice E. Gosnell of Illinois as vice-chairman.

Chairman-elect Teague, health commissioner of Kentucky, has the distinction of having represented two of the signatory states during the past seven years. Throughout his tenure as health commissioner in Pennsylvania during 1951-55 he also served as a member of the interstate compact commission.

No state medical officer has had more intimate contact with water-pollution control in general, and interstate relations in particular, than Dr. Teague. Currently he is secretary of the Kentucky Water Pollution Control Commission. In Pennsylvania he was chairman of the state Sanitary Water Board. During the past year he acted as vice-chairman of this Commission.

A 1929 graduate of the University of Louisville Medical School, Dr. Teague did graduate work at The Johns Hopkins University where he received the degree of master of public health. He was a local health officer in Kentucky and served the state health department for fifteen years. In 1945 he entered the U. S. Public Health Service.

Chairman Russell E. Teague and Vice-Chairman Maurice E. Gosnell



COMMITTEE ASSIGNMENTS

For Year Ending June 30, 1959

EXECUTIVE COMMITTEE

Chairman	Russell E. Teague, M.D.
Vice-Chairman	Maurice E. Gosnell
Past-Chairman	Blucher A. Poole
Illinois	Clarence W. Klassen
Indiana	Joseph L. Quinn, Jr.
Kentucky	Laban P. Jackson
New York	Earl Devendorf
Ohio	Kenneth M. Lloyd
Pennsylvania	Karl M. Mason
Virginia	Ross H. Walker
West Virginia	W. W. Jennings
U. S. Government	O. Lloyd Meehean

AUDIT

Ralph E. Dwork, M.D., *Chairman*
W. W. Jennings
Laban P. Jackson

BY-LAWS

Hudson Biery, *Chairman*
Blucher A. Poole
Marion K. McKay

FINANCE

Ross H. Walker, *Chairman*
Kenneth M. Lloyd
Maurice E. Gosnell

PENSION FUND TRUSTEES

Ross H. Walker, *Chairman*
Clarence W. Klassen
Robert K. Horton

ENGINEERING

Karl M. Mason, *Chairman*
Clarence W. Klassen
Blucher A. Poole
Louis F. Birkel
Earl Devendorf
Fred H. Waring
A. H. Paessler
Bern Wright
Will Brewer
W. W. Towne
O. Lloyd Meehean

From 1951 to 1955 Dr. Teague was commissioner of health in Pennsylvania. He then went to Washington for one year to take charge of the poliomyelitis program of the U. S. Public Health Service. In 1956 he returned to Kentucky as commissioner of health. Dr. Teague is certified by the American Board of Preventive Medicine and is a Fellow in the American Public Health Association.

A roster of the commissioners, the officers and the staff is given on the inside front cover of this report.

Membership Changes—It is with profound sadness that the Commission records the death on November 13, 1957 of Howard E. Moses, commissioner representing the Commonwealth of Pennsylvania and a past chairman. No member of the Commission was more devoted to its affairs than Mr. Moses. For many years he assisted the negotiating committee that developed the Ohio River Valley Water Sanitation Compact. He served as a member of the Engineering Committee for nine years. In 1952 he was appointed a commissioner and the esteem with which he was held is reflected by his election to the chairmanship in 1953.

Karl M. Mason, director of environmental sanitation of the Pennsylvania State Health Department was appointed by Governor Leader on January 7, 1958 to succeed Mr. Moses.

Dr. Charles L. Wilbar, Jr., secretary of health of the Commonwealth of Pennsylvania was appointed by Governor Leader on November 19, 1957 to succeed Dr. B. F. Mattison who resigned that post to become executive secretary of the American Public Health Association. Dr. Mattison served on the Commission from January 18, 1955 to December 1, 1957.

Commission Committees – The accompanying list shows committees and their membership as announced by Chairman Teague for the year ending June 30, 1959.

A DECADE OF SERVICE

This being the tenth-year report, it is appropriate to summarize membership changes. Fourteen of the 27 commissioners first chosen to represent their states and the federal government are still active; three have died and ten have resigned.

Following is a tabulation of the names and terms of service of all those who have been appointed as commissioners. Unless otherwise indicated, these men are presently active. Names marked with an asterisk were signers of the compact.

STATE OF ILLINOIS

*Roland R. Cross, M.D. – 1948
Maurice E. Gosnell – 1955
*C. W. Klassen – 1948
W. H. Wisely – 1952-55
Resigned – succeeded by M. E. Gosnell
*J. J. Woltmann – 1948-52
Deceased – succeeded by W. H. Wisely

STATE OF INDIANA

*L. E. Burney, M. D. – 1948-54
Resigned – succeeded by A. C. Offutt, M.D.
A. C. Offutt, M.D. – 1954
*Blucher A. Poole – 1948
*Joseph L. Quinn, Jr. – 1948

COMMONWEALTH OF KENTUCKY

P. E. Blackerby, M.D. – Appointed but died before signing of compact. Dr. R. B. Fulks, acting commissioner of health, signed the Compact.
Laban P. Jackson – 1955
Russell E. Teague, M.D. – 1956
Bruce Underwood, M.D. – 1948-56
Resigned – succeeded by R. E. Teague, M.D.
*Earl Wallace – 1948
*Henry Ward – 1948-55
Resigned – succeeded by Laban P. Jackson

STATE OF NEW YORK

Earl Devendorf – 1954
*Martin F. Hilfinger – 1948-54
Resigned – succeeded by Joseph R. Shaw
*Herman E. Hilleboe, M.D. – 1948
*Charles B. McCabe – 1948-54
Resigned – succeeded by Earl Devendorf
Joseph R. Shaw – 1954

STATE OF OHIO

*Hudson Biery – 1948
Ralph E. Dwork, M.D. – 1954
*Kenneth M. Lloyd – 1948
*John D. Porterfield, M.D. – 1948-54
Resigned – succeeded by Ralph E. Dwork, M.D.

COMMONWEALTH OF PENNSYLVANIA

*E. A. Holbrook – 1948-56
Resigned – succeeded by M. K. McKay
Karl M. Mason – 1958
Berwyn F. Mattison, M.D. – 1955-57
Resigned – succeeded by C. L. Wilbar, Jr., M.D.
Marion K. McKay – 1956
H. E. Moses – 1952-57
Deceased – succeeded by Karl M. Mason
*H. P. Sorg – 1948-52
Resigned – succeeded by H. E. Moses
Russell E. Teague, M.D. – 1951-55
Resigned – succeeded by B. F. Mattison, M.D.
*Norris W. Vaux, M.D. – 1948-51
Resigned – succeeded by R. E. Teague, M.D.
C. L. Wilbar, Jr., M.D. – 1957

COMMONWEALTH OF VIRGINIA

*E. Blackburn Moore – 1948
*T. Brady Saunders – 1948
*Ross H. Walker – 1948

STATE OF WEST VIRGINIA

*N. H. Dyer, M.D. – 1948
*W. W. Jennings – 1948
Harry K. Gidley – 1954-56
Resigned – succeeded by John Lester
John Lester – 1956-57
Resigned – succeeded by Bern Wright
Robert F. Rocheleau – 1949-54
Resigned – susceeded by H. K. Gidley
*Kenneth S. Watson – 1948-49
Resigned – succeeded by R. F. Rocheleau
Bern Wright – 1957

UNITED STATES GOVERNMENT

Edwin E. Abbott – 1954
L. E. Burney, M.D. – 1956
*O. Lloyd Meehean – 1948
*Leonard A. Scheele, M.D. – 1948-56
Resigned – succeeded by L. E. Burney, M.D.
*Robert G. West – 1948-53
Deceased – succeeded by E. E. Abbott

Resumé of officers—The by-laws of the Commission establish six officers. Of these the chairman and vice-chairman are elected from the membership; the others need not be selected from the membership.

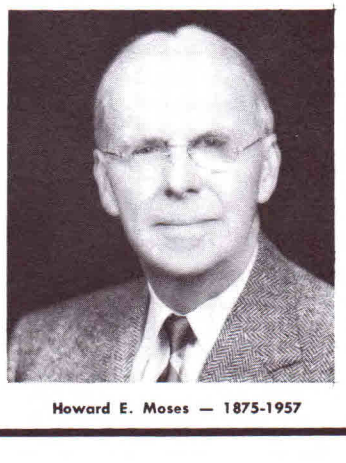
Chairmen of the Commission and their respective terms of office include:

1948-49	– Hudson Biery	(Ohio)
1949-50	– Joseph L. Quinn, Jr.	(Indiana)
1950-51	– Henry Ward	(Kentucky)
1951-52	– Clarence W. Klassen	(Illinois)
1952-53	– E. Blackburn Moore	(Virginia)
1953-54	– Howard E. Moses	(Pennsylvania)
1954-55	– W. W. Jennings	(West Virginia)
1955-56	– Earl Devendorf	(New York)
1956-57	– Kenneth M. Lloyd	(Ohio)
1957-58	– Blucher A. Poole	(Indiana)
1958-59	– Russell E. Teague, M.D.	(Kentucky)

All of the chairmen, with the exception of Hudson Biery, served as vice-chairman the year prior to their election. The current vice-chairman is Maurice E. Gosnell of Illinois.

The office of treasurer has been held by Ralph M. Strotman (1948-50); Robert K. Horton (1950-56); and since 1956 by Mrs. Verna B. Ballman.

No change has occurred since the formation of the Commission in the secretaryship, which is held by F. H. Waring; in the office of legal counsel, which is occupied by Leonard A. Weakley; and in the post of executive director and chief engineer, which is filled by Edward J. Cleary.



Howard E. Moses — 1875-1957

FINANCIAL REPORT

For Year Ended June 30, 1958

STATEMENT OF RECEIPTS AND DISBURSEMENTS

RECEIPTS:		
From signatory states *(For detail see schedule attached)*		$130,322.50
From U. S. Department of Health, Education and Welfare *(Grant from Public Law 660)*		112,424.00
Sale and handling of publications		618.27
Interest:		
Bank deposit		1,194.16
U. S. Treasury Bills		955.50
Total receipts		$245,514.43
DISBURSEMENTS:		
From state funds:		
Auditing	$ 900.00	
Consulting services	4,800.00	
Contractual service	436.81	
Electricity and water	562.78	
Employees' pension trust	8,815.75	
General office equipment and furnishings	1,624.80	
Insurance	386.71	
Legal services	3,600.00	
Maintenance and repairs	1,051.49	
Meetings	1,134.29	
Membrane Filter Study	2,222.96	
Miscellaneous	618.01	
Office rent	6,576.00	
Office supplies	1,992.08	
Postage	834.87	
Printing	5,985.84	
Salaries	58,049.06	
Service fees and subscriptions	327.62	
Social security tax	1,066.14	
Telephone and telegraph	2,226.63	
Travel:		
Advisory committees	2,153.27	
Commissioners	6,359.39	
Staff	5,033.21	
U. S. Geological Survey	20,000.00	
		$136,757.71
From federal funds:		
Administrative expense	26,016.13	
Aquatic-Life Resources Project	25,231.85	
Mine Acid Control Project	189.12	
Taste and Odor Detection and Identification Project	18,545.15	
Radioactivity Monitoring Project	12,014.00	
Robot Monitoring Station Project — Note A	4,184.42	
		$ 86,180.67
Total disbursements		222,938.38
Excess of receipts over disbursements		$ 22,576.05

Note A: As of June 30, 1958 federal funds in the amount of $27,346.80 were encumbered for equipment for the Robot Monitor Project.

STATEMENT OF RESOURCES — June 30, 1958

	STATE FUNDS	FEDERAL FUNDS	TOTAL
Available resources to June 30, 1957	$ 62,429.90	$ 8,411.51	$ 70,841.41
Add: Annual budget — July 1, 1957 to June 30, 1958	130,000.00		130,000.00
U. S. Department of Health, Education and Welfare		112,424.00	112,424.00
Sale and handling of publications	618.27		618.27
Interest:			
Bank deposit	1,194.16		1,194.16
U. S. Treasury Bills	955.50		955.50
	$195,197.83	$120,835.51	$316,033.34
Less: Disbursements July 1, 1957 to June 30, 1958	136,757.71	86,180.67	222,938.38
Available resources for period to June 30, 1958 before encumbrances	$ 58,440.12	$ 34,654.84	$ 93,094.96
Encumbered resources at June 30, 1958 for equipment for the Robot Monitor Project		27,346.80	27,346.80
Available resources June 30, 1958, after encumbrances	$ 58,440.12	$ 7,308.04	$ 65,748.16

The above amount of $93,094.96 is comprised as follows:

Cash on deposit with Central Trust Company — Note A		$ 91,042.24
Cash on deposit with American Airlines, Inc.		425.00
Petty cash on hand		200.00
Accounts receivable:		
State of Illinois		322.50
Advances for employees:		
Employees pension trust	$ 974.72	
Hospitalization	130.50	
(Hospitalization expense and employee pension trust contributions are advanced by the commission and repaid by the employees through monthly payroll deductions)		
		1,105.22
		$ 93,094.96

Note A: Of the $91,042.24 on deposit with The Central Trust Company, June 30, 1958, $27,346.80 is encumbered for equipment for the Robot Monitor Project.

SCHEDULE OF ACCOUNTS RECEIVABLE — June 30, 1958

	BALANCE JUNE 30, 1957	ANNUAL BUDGET	RECEIPTS	BALANCE JUNE 30, 1958
Illinois	$645.00	$ 6,695.00	$ 7,017.50	$322.50
Indiana	.....	22,945.00	22,945.00	.....
Kentucky	.....	27,560.00	27,560.00	.....
New York	.....	1,430.00	1,430.00	.....
Ohio	.....	30,420.00	30,420.00	.....
Pennsylvania	.....	20,215.00	20,215.00	.....
Virginia	.....	4,875.00	4,875.00	.....
West Virginia	.....	15,860.00	15,860.00	.....
	$645.00	$130,000.00	$130,322.50	$322.50

In our opinion, the accompanying statement of receipts and disbursements, statement of resources and schedule of accounts receivable present fairly the operations of the Ohio River Valley Water Sanitation Commission on a receipts and disbursements basis for the fiscal year ended June 30, 1958, and its financial condition on June 30, 1958.

Wm. H. Mers & Co., Certified Public Accountants

COMMISSION PUBLICATIONS

FIRST ANNUAL REPORT—Nov. 1949

Background leading to establishment of Commission; plans and goals; reproduction of the compact.

PREVENTING STREAM POLLUTION FROM OIL PIPELINE BREAKS

Sept. 1950—A guidebook of recommended practice.

SECOND ANNUAL REPORT—Nov. 1950

An accounting of activities and projects; status of municipal sewage-treatment programs; development and work of industry-action committees.

WABASH RIVER POLLUTION-ABATEMENT NEEDS

Aug. 1950—Recommendations, analysis and data for water conservation by pollution control between Terre Haute, Ind., and Mt. Carmel, Ill. (Out of print)

BACTERIAL-QUALITY OBJECTIVES FOR THE OHIO RIVER

June 1951—A guide for the evaluation of sanitary condition of waters used for potable supplies and recreational uses.

PHENOL WASTES TREATMENT BY CHEMICAL OXIDATION

June 1951—Report of a cooperative research project which shows how phenols can be destroyed by three methods of chemical oxidation—using chlorine, ozone and chlorine dioxide. (Out of print)

POLLUTION PATTERNS IN THE OHIO RIVER—1950

June 1951—Water-quality conditions and changes revealed by a simultaneous sampling of the 963-mile stretch from Pittsburgh to Cairo. (Out of print)

PLATING-ROOM CONTROLS FOR POLLUTION ABATEMENT

July 1951—A guidebook of principles and practice for curbing losses of solutions and metals that otherwise might find their way into water courses. (Price 50c)

BRINE CONTAMINATION IN THE MUSKINGUM RIVER

Aug. 1951—Determination of the nature and magnitude of brine-waste discharges from salt processing operations and their effect on water quality. (Out of print)

CLEAN STREAMS FOR THE OHIO VALLEY

Sept. 1951—A non-technical public education booklet which outlines the water pollution problem and its solution through treatment plants. (Out of print)

THIRD ANNUAL REPORT—Nov. 1951

Outline of program activities, including details of technical studies, river investigations and educational campaign.

OHIO RIVER POLLUTION-ABATEMENT NEEDS—HUNTINGTON TO CINCINNATI STRETCH

Feb. 1952—Findings on treatment requirements for maintaining oxygen and bacterial-quality objectives used as the basis for Treatment Standard No. 2. (Limited supply)

PLANNING AND MAKING INDUSTRIAL WASTE SURVEYS

April 1952 (44pp., 27 illus.)—Detailed instructions for measuring volume of flow, obtaining representative samples and calculating waste load. (Price $1.00)

HOW TO GET SEWAGE TREATMENT WORKS IN OHIO

June 1952 (40pp.)—A guide describing recommended step-by-step engineering and financial procedures for cities or villages undertaking a sewage works project.

DISPOSAL OF SPENT SULFATE PICKLING SOLUTIONS

Oct. 1952 (76pp., 17 illus.)—An analysis of methods for treating spent solutions resulting from sulfuric acid pickling to reduce stream pollution. Compiled by the Steel Industry Action Committee. (Out of print)

FOURTH ANNUAL REPORT—Nov. 1952

Graphic presentation of inter-relationships of varied groups and activities that comprise program. Depicts goals and accomplishments.

METHODS FOR TREATING METAL-FINISHING WASTES

Jan. 1953 (72pp., 16 drawings) An evaluation of various disposal methods and their applicability to specific waste control conditions. Compiled by Metal-Finishing Industry Action Committee. (Price $2.00)

REDUCING PHENOL WASTES FROM COKE PLANTS

Jan. 1953 (36pp., drawings and tables)—The sources, volumes and concentrations of phenolic wastes and methods for reduction by process changes or treatment. (Price $1.00)

MULTIPLE-PURPOSE RESERVOIRS AND POLLUTION CONTROL BENEFITS

Jan. 1953—Description and status of the 80-unit reservoir program of the U. S. Corps of Engineers in the Ohio River Basin with reference to its present and anticipated effects on pollution abatement. (Limited supply)

OHIO RIVER POLLUTION-ABATEMENT NEEDS—PITTSBURGH TO HUNTINGTON STRETCH

March 1953—Findings on treatment requirements for maintaining oxygen and bacterial-quality objectives used as the basis for Treatment Standards No. 3 and No. 4. (Limited supply)

OHIO RIVER POLLUTION-ABATEMENT NEEDS—CINCINNATI TO CAIRO STRETCH

Nov. 1953—Findings on treatment requirements for maintaining oxygen and bacterial-quality objectives for use at public hearing.

FIFTH ANNUAL REPORT—Nov. 1953

A detailing of action during the first five years. The record shows the transformation that has occurred: new pollution curbed, existing pollution decreased and the trend of half a century reversed.

PROCEDURES FOR ANALYZING METAL-FINISHING WASTES

Aug. 1954 (102pp.)—Methods designed to screen out interfering substances and selected for accuracy and reproducibility of results. (Price $1.00)

SIXTH ANNUAL REPORT—Nov. 1954

Compliance status of cities along the Ohio River. Sewage-treatment standards 5, 6 and 7 and a map of Ohio River showing sections where treatment standards apply. Includes a chart depicting five and ten-year drought-flow values.

SEVENTH ANNUAL REPORT—Nov. 1955

Comparative population and pollution-abatement status in signatory states. Text of industrial-waste control policy and procedure, also minimum requirements. Location map of water-quality monitor stations, showing analyses made at each station.

PROCEDURES FOR INVESTIGATION OF FISH-KILLS

March 1956 (24 pp., 9 illus.) A practical outline of what to do and how to do it, designed for the agency or individual charged with responsibility for investigating a fish-kill. Contains bibliography on bioassays and toxicity; also on biological indicators of pollution. (Price 50c)

EIGHTH ANNUAL REPORT—Nov. 1956

Sewage-treatment facilities being completed to serve three-quarters of population. Appraisal of industrial-waste control. Quantitative data on various uses of the Ohio River. Development and scope of a six-year inquiry on the physiological aspects of water quality.

WATER-QUALITY AND FLOW VARIATIONS IN THE OHIO RIVER—1951-55

March 1957 (112 pp.) A compilation of chemical and bacteriological analyses coupled with flow-discharge records from a network of monitor stations. Includes a hydrographic study of the flow variability pattern, particularly with regard to minimum flows. (Price $2.00) (Limited supply)

NINTH ANNUAL REPORT—Nov. 1957

Graphic presentations showing progress in sewage and industrial waste control, public and industrial water demands, and river quality and quantity variations. Location map of radioactivity monitor stations in Ohio Valley; an inspiring message from President Eisenhower as Commission enters its tenth year.

DUST RECOVERY PRACTICE AT BLAST FURNACES

Jan. 1958 (36 pp., drawings and tables) An evaluation of settleable solids formation and recovery at mills in the Ohio Valley and a suggested procedure for defining performance of waste-water clarifiers. (Price $1.00)

COMMITTEE REPORTS RELEASED FOR PUBLICATION

AQUATIC-LIFE ADVISORY COMMITTEE

"Aquatic-Life Water-Quality Criteria"—First and second progress reports, *Sewage and Industrial Wastes*, March 1955, p. 321 and May 1956, p. 678, respectively. First report defines meaning of water quality suitable for fish life and sets forth recommendations for dissolved oxygen, evaluation effect of hydrogen-ion concentration and outlines bioassay criteria. Second report contains conclusions with regard to temperature, dissolved solids, settleable solids, color, chloride and fluoride ions.

CHEMICAL INDUSTRY ADVISORY COMMITTEE

"Detergents in Sewage and Surface Water"—*Industrial Wastes*, July-Aug. 1956, p. 212. A report on development of analytical procedures and research activities.

"Site Selection for Chemical Industry Plants"—*Industrial Wastes*, Jan.-Feb. 1957, p. 24. Orginally titled "Operation and Design Practice as Related to Pollution Control in the Chemical Industry", this report deals specifically with treatment and disposal of water-borne wastes.

"Current Practices in Municipal Treatment of Industrial Wastes"—*Sewage and Industrial Wastes*, June 1957, p. 672. A survey of 100 sewage-treatment plants analyzed with respect to their handling of industrial wastes.

"Selecting Sites for Chemical Plants"—*Industrial Wastes*, March-April 1958, p. 46. Waste disposal considerations as they relate to the location of new processing facilities.

OIL REFINING INDUSTRY ACTION COMMITTEE

"Foul Condensate Treatment and Disposal"—*Sewage and Industrial Wastes*, Feb. 1958, p. 185. Experiences and operating data relating to the treatment, disposal and re-use of foul-condensate waters.

ARTICLES OF REFERENCE INTEREST

"Rebirth of a Great River"—by Karl S. Dixon, *Saturday Evening Post*, Dec. 24, 1955, p. 19. An account of half a century of river abuse by pollution and the manner in which the Ohio Valley was aroused to unite for action in safeguarding its water resources.

"Ohio River Water Quality and Flow"—by Edward J. Cleary and David A. Robertson, Jr., *American Water Works Ass'n Journal*, March 1958, p. 399. Experiences of the Ohio River Valley Water Sanitation Commission in pioneering the establishment of a river-quality monitor program. Methods of operation, evaluation of data and costs are discussed.

"Acid Drainage Controls Coming—Handwriting on the Wall"—by W. A. Raleigh, Jr., *Coal Age*, June 1958, p. 72. An appraisal of the problem with suggestions to the coal industry for initiating an action program. Specific emphasis is given to the activities of the Ohio River Valley Water Sanitation Commission and its coal-industry advisory committee.

"Big Cleanup on the Ohio"—by George Laycock, *Field and Stream*, Nov. 1958, p. 47. A sportsman's view of what has transpired in the Ohio Valley crusade for clean streams. Discusses findings from the aquatic-life studies underway by the Commission.

REGULATORY AGENCIES OF THE SIGNATORY STATES

Operations of the Ohio River Valley Water Sanitation Commission are designed to promote and coordinate pollution control on a regional basis. Guided by the principle that no sewage or industrial-waste discharge originating within a signatory state shall injuriously affect the uses of interstate waters, the Commission makes determinations regarding control measures.

Securing compliance with these measures then becomes an obligation of each state. The Commission does not deal directly with any municipality or industry regarding compliance. Whenever, however, in the opinion of the Commission, satisfactory compliance is not being or cannot be obtained through the effort of state agencies, enforcement procedures prescribed in Article IX of the compact may be employed.

Listed on this page are the names and addresses of the regulatory agencies in the signatory states. Questions concerning compliance with water-pollution control requirements should be addressed to the agency in the state in which a municipality or industrial plant is located. The state agency will arrange for such contact or consultation with the Commission as may be necessary or requested.

ILLINOIS	Technical Secretary State Sanitary Water Board Springfield, Illinois
INDIANA	Technical Secretary Indiana Stream Pollution Control Board 1330 West Michigan Street Indianapolis 7, Indiana
KENTUCKY	Executive Director Kentucky Water Pollution Control Commission 620 South Third Street Louisville 1, Kentucky
NEW YORK	Executive Secretary New York State Water Pollution Control Board New York State Dept. of Health Albany 1, New York
OHIO	Engineer in Charge Sewage and Industrial Wastes Unit Division of Sanitary Engineering Ohio Department of Health Columbus 15, Ohio
PENNSYLVANIA	Sanitary Water Board Box No. 90 Harrisburg, Pennsylvania
VIRGINIA	Executive Secretary State Water Control Board 415 West Franklin Street Richmond 20, Virginia
WEST VIRGINIA	Executive Secretary State Water Commission 1709 Washington Street, East Charleston, West Virginia