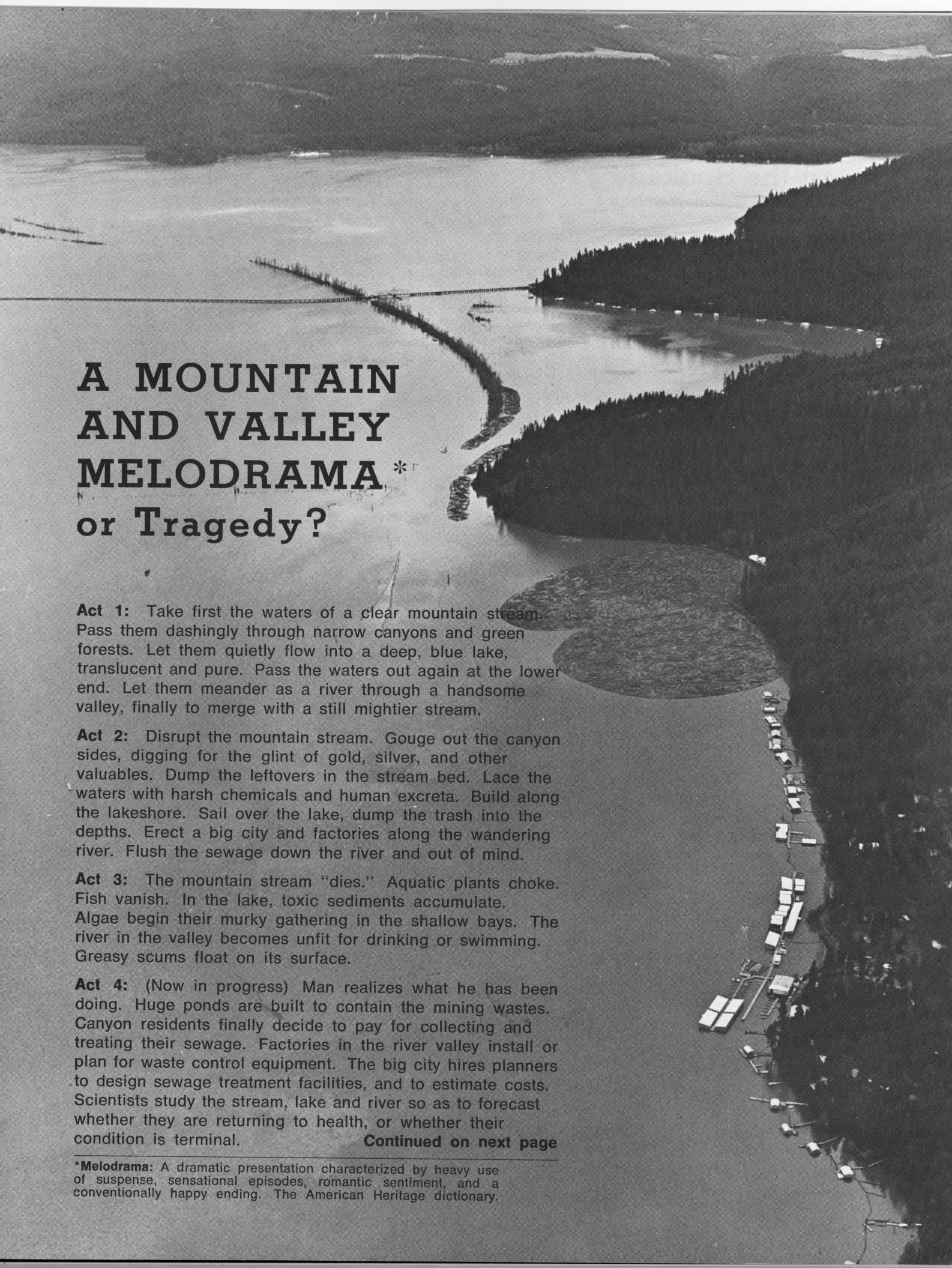


A MOUNTAIN AND VALLEY MELODRAMA* or Tragedy?

Act 1: Take first the waters of a clear mountain stream. Pass them dashingly through narrow canyons and green forests. Let them quietly flow into a deep, blue lake, translucent and pure. Pass the waters out again at the lower end. Let them meander as a river through a handsome valley, finally to merge with a still mightier stream.

Act 2: Disrupt the mountain stream. Gouge out the canyon sides, digging for the glint of gold, silver, and other valuables. Dump the leftovers in the stream bed. Lace the waters with harsh chemicals and human excreta. Build along the lakeshore. Sail over the lake, dump the trash into the depths. Erect a big city and factories along the wandering river. Flush the sewage down the river and out of mind.

Act 3: The mountain stream "dies." Aquatic plants choke. Fish vanish. In the lake, toxic sediments accumulate. Algae begin their murky gathering in the shallow bays. The river in the valley becomes unfit for drinking or swimming. Greasy scums float on its surface.

Act 4: (Now in progress) Man realizes what he has been doing. Huge ponds are built to contain the mining wastes. Canyon residents finally decide to pay for collecting and treating their sewage. Factories in the river valley install or plan for waste control equipment. The big city hires planners to design sewage treatment facilities, and to estimate costs. Scientists study the stream, lake and river so as to forecast whether they are returning to health, or whether their condition is terminal.

Continued on next page

*__Melodrama:__ A dramatic presentation characterized by heavy use of suspense, sensational episodes, romantic sentiment, and a conventionally happy ending. The American Heritage dictionary.

THE COEUR D'ALENES and the Spokane River

As most eastern Washington and northern Idaho residents will recognize, the four-act "play" described on the previous page, is the unfinished drama of the South Fork of the Coeur d'Alene River, Coeur d'Alene Lake, and the Spokane River.

How this "play" will turn out is still unknown. It may be several years before we will know if the performance will turn out to have been a melodrama with a happy ending or a tragedy clear to the end.

The region's current pollution problems all started many years ago with the shine of placer gold in Eagle and Pritchard Creeks. A little later, the weight of some "stones" which Noah S. Kellogg threw at his obstinate jackass also contributed. It if were not for these two factors, today's pollution difficulties of the Coeur d' Alene-Spokane region would be vastly different in nature and intensity.

Nearly one hundred years ago, prospector Andrew J. Pritchard found, at the bottom of his crude sluice box, yellow gold. Since the conclusion of his service in the Civil War, Pritchard had been searching for this elusive metal. His trek had taken him through the hot canyons of the Southwest's Superstitions and Panamints, as well as the steep slopes of California's Sierra Nevadas. His quest had been fruitless, however, until he came to rock-filled Eagle Creek in the Bitterroots of the Territory of North Idaho.

Historical accounts differ as to the precise year of Andy Pritchard's discovery. There also is some dispute over whether he or some other prospectors working in the area actually were the first to find the gold. But it seems to be established fact that in 1883, Pritchard and rough mountain man Bill Keeler rode out of the Coeur d'Alene Mountains into the thriving village of Spokane Falls. When they arrived, their buckskin "pokes" were heavy with gold.

. . . dreams of scooping up gold by the shovelful

The stampede to Pritchard and Eagle Creeks soon followed. One account relates that thousands and thousands of persons converged on Spokane Falls. From there, the fortune-hunters pushed on east to the "diggins," where all hoped to realize their dreams of scooping up gold by the shovelful.

The photograph on the previous page is of the southern end of Coeur d'Alene Lake.

The gold was there, all right, though many of the El Dorado seekers were not to share in it. Two roistering mining camps soon sprung up to house the thousands who struggled through the deep winter snows to the strike. Eagle City was hastily erected, near where the creek of the same name emptied into Pritchard Creek. More than twenty saloons, dance halls, and casinos lined the one long street of this camp in the wilderness.

The second town to be built was Murrayville (later shortened to Murray), some five miles up Pritchard Creek from Eagle City. By the fall of 1884, ten thousand people were living in the two towns and on the surrounding slopes. Placer gold was being washed out of the gravel of the creeks by the thousands of dollars worth each day, according to one historical account.

However, within a few short months, the gravel yielded the last of its flakes and nuggets. The boom went out of Eagle City and Murrayville. But by then, thousands of dollars had been pumped into the economy of Spokane Falls. The small village was beginning its own boom.

Back in the Coeur d'Alenes, the hiatus was brief. In the fall of 1885, Noah S. Kellogg made the find that was to totally eclipse the Eagle and Pritchard Creek bonanzas. In the years to come, many different legends were to be told about how Kellogg came to make his fateful discovery. It is commonly accepted, however, that Noah had been little more than a hanger-on and roustabout in the mining camps of Eagle City and Murrayville. Already well past the prime of life, Kellogg was grubstaked to do some prospecting by two of Murrayville's more substantial citizens. Dr. J. T. Cooper and building contractor O. O. Peck chipped in ten dollars each. This small sum bought the old man a six-week supply of "sowbelly, beans, flour, and tools." The grubstaking of Kellogg was done more to keep the old fellow from pestering Connor and Peck, than out of any hope that Noah would find gold-bearing strata.

Following Cooper's and Peck's admonition to get out of town, Kellogg spent a number of weeks laboriously climbing over the steep ridges south of Murrayville. Carrying his supplies was an ancient and decrepit jackass. Noah panned several creeks, chipped at some outcroppings with his pick, but found nothing he recognized as gold-bearing quartz. By now he had worked his way across the canyon of the South Fork of the Coeur d'Alene River and had climbed a large ridge on the other side which runs east and west.

Tired, his supplies nearly gone, Noah de-

The valley of the South Fork of the Coeur d'Alene River today. In 1885, amateur prospector Noah S. Kellogg discovered a rich lead and silver outcropping in a gulch located to the right of the tailings pond shown at the top of the picture. Kellogg's find led to the development of the Coeur d'Alenes as one of the world's most productive mining districts. Before construction of the tailings ponds, waste materials were dumped directly into the river bed. Metals still are leaching into the river, making it uninhabitable for fish and other aquatic life.

cided to return to Murrayville. But his stubborn "mountain canary" had strayed a little ways from their rough camp, located in a little canyon leading up from the South Fork. Noah called it Milo Gulch, after a distant relative. Pursuing the little jackass, Kellogg picked up some rocks to toss at it, hoping to herd it down the slope.

These stones seemed strangely heavy. The old man tossed several at the pack animal, then reflected that these rocks, from a nearby outcropping, might contain iron ore. Since he had nothing else to show his grubstakers back in Murrayville, Noah put several in his pack.

But for all the reaction these heavy stones elicited from Connor and Peck upon his return to the mining town, Noah might as well have left them to age on the slopes of the South Fork. The doctor and the contractor berated Kellogg for bringing back "worthless rocks," and declared they were done grubstaking him. Disconsolate, Noah sought sympathy and refreshments in a nearby Murrayville saloon. Here he met a previous acquaintance, Phil O'Rourke. Described as an "irresponsible, irrepressible, happy-go-lucky Irishman," O'Rourke, who spent most of his time gambling, displayed more knowledge of precious metals than Connor and Peck. Breaking the heavy rocks in two with Noah's pick, O'Rourke declared them to be rich samples of galena, a mixture of silver and lead.

The Irish gambler quietly assembled three close friends and five pack horses. Accompanied by Noah, the fortune hunters crept out of Murrayville in the middle of the night. Retracing the old prospector's steps, the group arrived back at the rock outcropping in Milo Gulch where Noah had tossed the stones at his jackass. The eager wealth seekers put up notices to two claims, one on each side of Milo Gulch. One claim was named the Bunker Hill, and the other, the Sullivan. Noah, O'Rourke, and the rest stayed for several days, collecting samples of the galena outcropping. Then, on September 10, 1885, their heavily laden pack string arrived back in Murrayville, accompanied by the elated group. The stampede from Murrayville to the South Fork followed. Later, bonanza-hunters poured in from Spokane Falls, and eventually from throughout the world.

. . . one of the richest mineralized areas of the world

What happened is now enshrined in mining history. A number of other rich mineral outcroppings and veins were found along the South Fork. Additional mines were brought into being. The Coeur d'Alene mining district was soon recognized as one of the richest mineralized areas of the world. Many miners and prospectors, including old Noah S. Kellogg, became wealthy beyond their most fanciful dreams.

Murrayville dwindled away as the exodus continued to the new bonanzas on the South Fork. New communities soon were sawn and hammered into being up and down the canyon bottoms from Milo Gulch. The camps of what are now Wardner, Kellogg, Osburn and Wallace grew into lusty towns. Ore crushing mills and massive smelters were constructed to extract the valuable metals from the useless "gangue" or carrier rock. The leftover "tailings" were deposited in about the only feasible spot, the bottom of the South Fork canyon. The waste waters from the smeltering operations also were discharged down the river.

Meanwhile, back in the Territory of Washington, Spokane Falls was rapidly outgrowing its village ways. A number of the new millionaire miners began to invest their wealth in Spokane real estate and buildings. Coeur d'Alene Lake, too, began to develop a reputation as an attractive vacation spot.

This development of the Coeur d'Alene-Spokane region has continued up to the present. There has been some economic oscillations, but the overall pattern has been one of steady growth. Vast quantities of precious metals have been brought out of the mines along the South Fork. One estimate puts the value at more than two billion dollars. Another measure of the activity that has taken place is the great amount of tunneling which has been done below the surface of the Coeur d'Alene Mountains in search of the ore-laden veins. It has been estimated that if all the mine shafts and tunnels were placed end to end, they would more than reach from San Francisco to Los Angeles.

As far as the village of Spokane Falls is concerned, its name has been shortened, but its population has grown to many thousands. The natural trading center for much of eastern Washington as well as northern Idaho, Spokane can boast of modern stores, tall buildings and many big-city activities. During World War Two, the availability of low-cost hydroelectric power from nearby Grand Coulee Dam led to Spokane becoming a major aluminum processing center.

The shores of Coeur d'Alene Lake have had their share of increased activity, particularly in the past few years. The city of Coeur d'Alene, located at the north end of the lake, now has some 16,000 permanent residents. Summer va-

The Coeur d'Alene River flows into Coeur d'Alene Lake near Harrison, Idaho—shown at the extreme left of the picture. Analysis of the bottom muds found in the river's delta show high concentrations of metals.

cationers from throughout the West swell this total by a large number.

This activity is not confined to the north end of this handsome body of water. An aerial flight around the edges of the lake reveals many weekender cabins clustered along many of the shores and slopes. During the summer, houseboats, cabin cruisers, and sailboats dot its waters.

growth . . . has not been without its environmental penalties

This economic and recreational growth of the Coeur d'Alene-Spokane region has not been without its environmental penalties. In a report prepared twenty years ago by the U.S. Public Health Service, it was stated: "The major sources of pollution in the Spokane River Basin are the discharge of raw sewage from 174,000 people, treated sewage from 15,000 people, wastes from a sulphite pulp and paper mill and a variety of other industrial plants, and the tailings from ore concentration mills. The total known organic waste load presently being discharged to the watercourses of the basin has a population equivalent of 400,000, ninety-five percent of which is discharged to the Spokane River in the vicinity of Spokane, Washington. Four industries discharge organic wastes of undetermined strength and 31 others inorganic wastes with polluting characteristics. Approximately 500,000 tons of tailings are discharged annually into the South Fork of the Coeur d'Alene River by ore concentration mills. . . Erosion is particularly serious in the Palouse soils of the southwestern part of the basin and in the burned and cutover forest lands along the South Fork of Coeur d'Alene River."

In another part of the report, it is stated that: "All fish life has been destroyed in the South Fork of Coeur d'Alene River below Mul-

lan, Idaho. In July, 1932, this stretch of river from shortly above Wallace, Idaho was found to be practically devoid of fish, bottom fauna, or plankton organisms. The effect of mining wastes on fishlife in Coeur d'Alene Lake has not been determined.

"Sludge deposits have been reported in Nine Mile Reservoir below Spokane and the formation of gas during periods of low flow indicates septic decomposition in this area."

The present environmental situation of the Coeur d'Alene-Spokane region is somewhat better than it was twenty years ago. Still it could be said that the South Fork is nearly dead, the future of Coeur d'Alene Lake is clouded, and the Spokane River is filthy, especially downstream from Spokane. However, there are some grounds for hope, but recovery will neither be easy nor automatic.

One of the bright spots in the Spokane Basin environmental picture has been the pollution control work already being done by the mines of the Coeur d'Alenes. Industry usually is selected to be the chief recipient of environmental finger-pointing, but in this instance, industry's record is better than the towns and citizens of the mining region.

The mines have constructed huge tailing ponds to hold their mining left-overs. Between 1966 and 1970, an estimated $1.2 million dollars was spent to build such facilities. The ponds, however, will not provide a complete cure. Cadmium, lead, mercury, and zinc—none of which in very large quantities is regarded as healthy for aquatic life or humans—are draining from the smelters, old tailing piles, and shutdown mines into the South Fork. These metals are passing down the South Fork into Coeur d'Alene Lake. From there, small but measurable quantities are going into the Spokane River. Some extensive studies are now being made by scientists from Washington State University and the University of Idaho on the biological impact of these metals in the Spokane drainage system. Details of their investigation, headed up by Dr. William H. Funk, WSU Research Division Sanitary Engineering Section; Dr. Royston H. Filby, WSU Nuclear Radiation Center; and Dr. Fred W. Rabe, University of Idaho Zoology Department, are given on page 18.

Another corrective measure instituted in recent years by the mines is to return the waste tailings back to the mine tunnels, instead of dumping them in the canyon, once the valuable ore has been extracted. One estimate places the amount of tailings being placed in the mine stopes and tunnels at sixty percent of the total tailings being created.

The third time was the charm for the residents of the South Fork canyon to collectively decide to do their part toward cleaning up the river. On January 11 of this year, the citizens voted—66% favorable required—to approve a sewer bond issue. Proposals for similar bonds were defeated in 1968 and in 1969. The funds will provide for a sewage collection and secondary treatment system. (Sewage for Kellogg already is being treated along with mine wastes in the Bunker Hill tailings pond.)

It will take several years for the new sewage collection system to be designed and built. Until then, the raw sewage, including wastes from homes and a hospital, will be swirling down the waters of the South Fork.

Steps also have been taken to reduce pollution in Coeur d'Alene Lake, proper. Residents of the city of Coeur d'Alene passed a bond issue in September of 1971 by an 87 percent majority. Funds obtained from the sale of these bonds will be used to expand the city's secondary sewage treatment plant.

A point of environmental concern, however, is the houseboats and the increasing numbers of motorboats which are on the lake during the summer. Idaho law does prohibit the discharge of sewage into lakes, but this practice is hard to police. Idaho state senator Art Manley, a resident of Coeur d'Alene, has been quoted as saying that the growing number of motorboats and houseboats on Coeur d'Alene Lake and an upsurge in construction of summer cabins on deeded lands along the shore are contributing to a "massive pollution problem."

The algae growth problem in Coeur d'Alene Lake has not reached a critical stage as yet

Even though the vacation and permanent homes around the pine-girt shores of Coeur d'Alene Lake have septic tanks, they still may be contributing to the long-range pollution of the lake. Unfortunately, the liquid effluent from septic tanks is rich in nitrates and phosphates. These, as any farmer or home gardener will recognize, are fertilizing materials which make plants grow. Still more unfortunately, the tiny specimens of algae, which inhabit most lakes, are plants, and they respond to nitrates and phosphates in a dramatic way. Under the right conditions of sunlight, water temperature and nitrate/phosphate and other nutrient availability, they take off on a population explosion. Within a week or so, these tiny plants can turn a shin-

ing lake into a mass of smelly, matted growths, particularly if the lake is shallow.

The algae growth problem in Coeur d'Alene Lake has not reached a critical stage as yet, according to Professors Funk and Rabe, who are studying the South Fork, Coeur d'Alene Lake and the Spokane River. They believe Coeur d'Alene Lake is still in relatively good shape algae-wise, except for some of its shallower parts during the late summer.

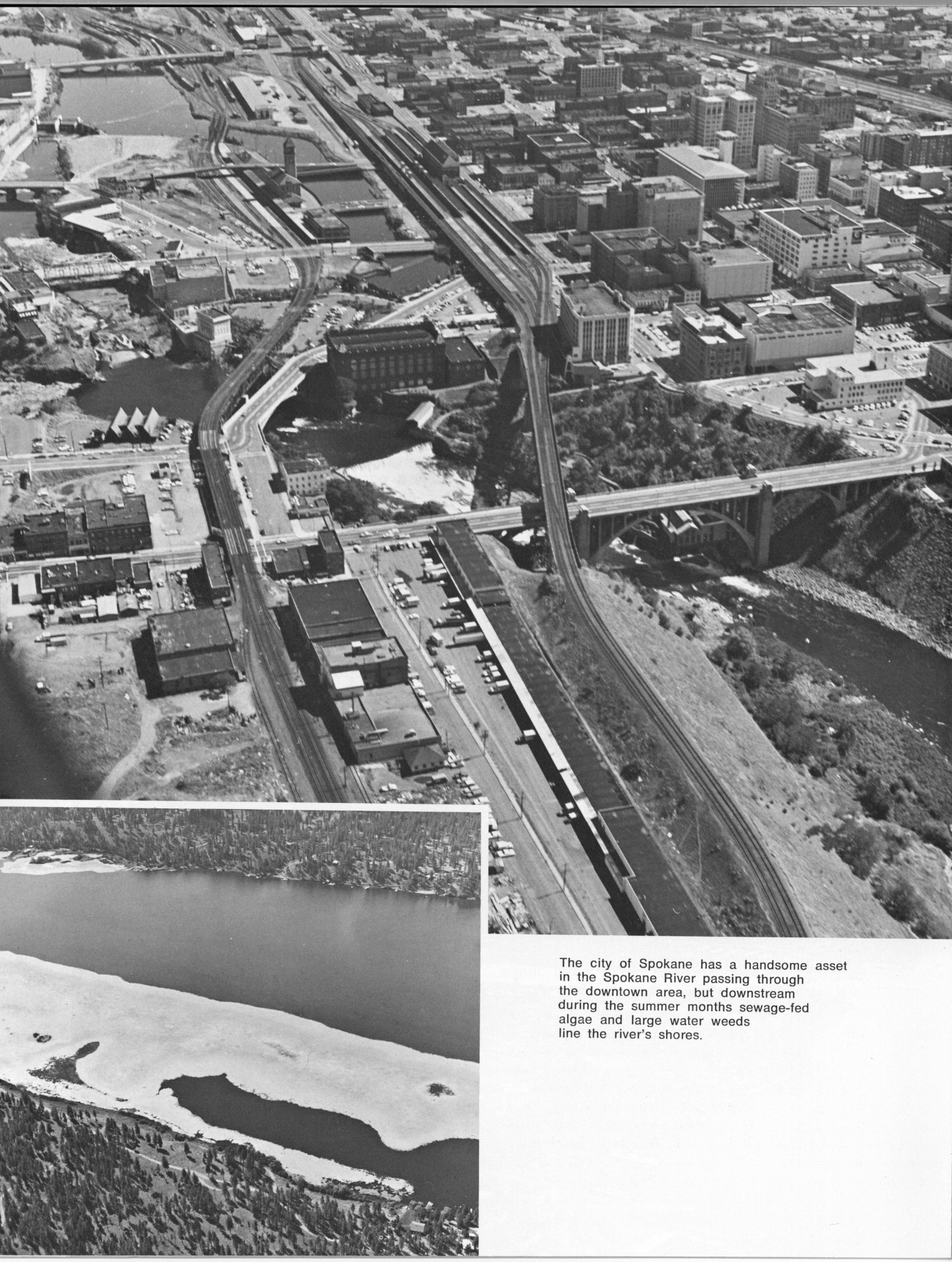
But as far as the long-range health of the lake is concerned, some means eventually may have to be devised to prevent the septic tank effluents from cabins from reaching the lake waters. One option might be an extensive system of collection sewers and a centralized treatment facility somewhere around the lake. However, many of the water-level summer cabins are located at the bottom of steep slopes. The sewage in these instances would have to be pumped uphill.

Funk relates that as a stop-gap remedy, cabin owners in a fairly densely settled area might be able to cooperatively construct or finance a small system where the sewage from the individual cabins would be collected and pumped up to a storage lagoon where treatment could take place. "The effluent from the lagoon could be channeled or piped to where trees or other vegetation could use up the nutrients in the effluent," Funk says.

Rabe reports that the amount of carbonates present in the lake is relatively low, but available carbon for photosynthesis is not limiting. He also calls attention to the fact that the southern end of the lake, from Harrison to Rocky Point, appears to be greatly different, biologically, than the northern portion, which extends from Harrison to the city of Coeur d'Alene. The amounts of nitrates and phosphates are considerably higher in the southern sector, a higher biomass occurs there, and 14C studies have indicated higher biological productivity taking place. The green and blue-green algae dominate the southern end, while diatoms make up the major part of the population of the northern sector.

It is generally conceded that Chatcolet Lake (really a portion of Coeur d'Alene Lake) is in poor shape. Chatcolet Lake was formed by flooding which occurred when a dam was added at the north end of Coeur d'Alene Lake. The Chatcolet sector is not near as deep as the rest of the lake. Being shallow, it is susceptible to algae and other water weed growths. One of the major sources of this plant growth

The Spokane River begins its existence at the northern end of Coeur d'Alene Lake, then meanders down the Spokane Valley to the left of the picture.



The city of Spokane has a handsome asset in the Spokane River passing through the downtown area, but downstream during the summer months sewage-fed algae and large water weeds line the river's shores.

is the nutrient-rich material coming into the lake from Plummer Creek and other adjacent streams.

The city of Spokane's major pollution problems are a result of primary sewage treatment only, combined sewage and storm sewers, and bad algae growths downstream from the city. Spokane's record on waste treatment is not too lustrous. According to Thomas Haggarty, eastern Washington regional manager for the Washington State Department of Ecology, until 1955 Spokane discharged the sewage from its homes, stores, hospitals, etc., directly into the Spokane River without any treatment. By this time, the population of the city was more than 160,000.

In 1955, primary treatment of the city's sewage was instituted. This treatment has been described by one sanitary engineer as "only picking out the big pieces." The rest—the small "pieces," the liquid waste, the infectious bacteria—are passed right on through to the receiving water body. The bacteria can be eliminated with heavy chlorination but the liquid waste containing high amounts of nitrogenous and carbonaceous materials enriched with phosphorus are passed on to the hungry algae in Long Lake.

Another pollution-related problem which confronts the officials and citizens of Spokane is the city's combined storm and sanitary sewers. When this system originally was constructed, the street drains for storm runoff were connected into the sanitary sewers which ran under the streets to the Spokane River. Such an arrangement saved the cost of separate installations.

The storm drainage and raw sewage then goes directly into the river

But as the city grew, it was realized this was not an adequate set-up. In the 50's, a system of interceptor sewers was added. These new pipes, for the most part, were laid along the banks of the Spokane River where they "intercepted" the flow coming down the combined storm and sanitary sewers. This flow was then piped to the primary treatment plant.

This was an improvement, but as Haggarty says: "The hydraulic capacity of this system cannot take all of the sewage and stormwater that is generated at one given time. . . . There are 44 points in the sewer system where there are natural overflow or bypass arrangements to the Spokane River. Unfortunately, it does not take very much rain to cause some of these overflows to work. The storm drainage and raw sewage then goes directly into the river."

Planning is underway, according to Haggarty, to develop a construction program to remedy this situation. He feels that it may be ten years before the major portions of a corrective system can be planned, financed, and constructed.

The Department of Ecology engineer also points out that Spokane is slated in the near future to hire an engineer to begin design of a new treatment plant for the city. Hope has been expressed that this new facility could be in operation by the time Expo 74 opens. Haggarty believes this may be wishful thinking in view of the time needed to design and construct such an installation.

. . . this stretch of the Spokane River contains many algae . . .

Because of the primary-only treatment given to Spokane's sewage, and the relatively slow-moving waters in the power dam impoundments downstream from Spokane, this stretch of the Spokane River contains many algae and other water weeds. This is unfortunate, for the valley terrain is handsome. Conifer-clad mountainsides slope down to the river. Here and there clumps of aspen add their greens and yellows, depending upon the season. Many cities would dearly love to have a similarly attractive region to serve as a recreational area. But until the river is cleaned up, the lower Spokane River Valley will have only a great future, not a great present.

According to Funk, Spokane will have to go to tertiary sewage treatment before there will be much hope of reducing the algal infestation of Long Lake and the rest of the lower Spokane. Secondary treatment will not remove the nitrates and the phosphates which fertilize the algae.

Hopefully, the stimulus of Expo 74, to be held in Spokane, will do much to advance environmental cleanup in the Spokane Basin. The theme of the world exposition is to be Progress without Pollution. In October, 1970, a plan to clean up the entire Spokane-Coeur d'Alene drainage system was proposed by a group of Washington and Idaho business leaders and endorsed by the governors of the two states. The environmental improvement plan is to be an integral part of the exposition, expected to attract five million visitors to Spokane.—D.C.F.