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Emperor Joseph's Roots

On a May morning in 1957, ten thousand fish floated on the eastern edge of San Francisco Bay, their pale, upturned bellies bobbing on the surface of the dark water. The crowd of carcasses described an arc that stretched along the shore from Richmond's harbor south to Point Isabel. Many striped bass, a prized game fish, were among the dead.

Seth Gordon, director of California Department of Fish and Game (DFG), fielded complaints from anglers outraged by the fish kill. The Public Health Committee of the State Assembly passed a resolution admonishing DFG for its failure to enforce pollution control laws. Gordon told the committee members off. "We want to stop pollution," he said, "but the law as it stands puts our Department in the position of a boxer going into the ring with one hand tied behind his back."[1] The ability to set and enforce pollution standards rested with California's nine regional water pollution control boards. To effect any change, Gordon's department had to prove to the boards' satisfaction that pollution allowed by existing standards was harmful to fish, a challenge that had so far proved impossible. Responding to questions about the East Bay fish kill, he said, "We still don't know what caused the die-off, or where it came from."

David Joseph was then starting out as a DFG biologist, armed with a doctorate in marine biology from the University of California at Los Angeles. Born in Connecticut, on a cooperative farm where his parents raised dairy cows and shade-grown tobacco with other immigrant Russian Jews, he'd grown up in Inglewood, in southern California, when the place was still a bucolic town and he could ride his horse to the beach. He'd met his wife, Marion, when they were both students at UCLA. "He was an outdoor guy," she remembers. "He wasn't a fisherman, he just loved the sea, loved the land. His work was always going to have something to do with protecting the environment."

In 1957, Joseph was an oddity—at the time, few, if any, DFG staffers held graduate degrees. In the aftermath of the East Bay fish kill, he pushed his colleagues to nail down the cause of the disaster, using careful scientific detective work.

At Joseph's urging, DFG staff tallied the numbers of dead fish, brought some of the victims back for study, and collected samples of the water for analysis. The crowd of fish carcasses had centered around the Stauffer chemical plant in

Richmond. Analyses of both bay water and the dead fish found significant levels of toxins released in Stauffer's effluent. DFG biologists checked the chemical content of discharges from other nearby plants, and concluded the deadly chemical could have come only from Stauffer. The gills of the dead fish had been eroded away, causing them to suffocate. Laboratory tests found that fish exposed to the effluent from the Stauffer plant died. Their gills were destroyed, just as the gills of the fish in the East Bay kill had been; under the microscope, the same pattern of damage was clear.

Fed up with the determined inaction of the San Francisco Water Pollution Control Board, Joseph suggested a new tactic: The state could sue Stauffer for damages. It took time to gather evidence and to convince his superiors the lawsuit was a valid idea. In March 1958, the state attorney general (Edmund G. "Pat" Brown, soon to win his first term as California governor) filed a civil lawsuit against Stauffer, seeking $13,000 in damages, the price tag DFG put on the more than two thousand striped bass that had died.

Newspaper reports described the suit as "unprecedented." Stauffer's attorney branded the suit "ridiculous" and announced that Stauffer's effluent was "incapable of destroying fish." By the time the trial was under way, Stauffer had hired a new lawyer, who acknowledged that the company discharged twenty-five tons of acid to the bay each month. He argued that the fish kill could not be Stauffer's fault, because no self-respecting fish would swim into water as befouled as that near the Stauffer outfall. Joseph testified as an expert witness and made sure that the jury saw photomicrographs of the eroded gills in affected fish. In December 1959, a jury awarded the state more than $15,000 in damages from Stauffer—funds that would go to the DFG. Today that amount seems puny, but at the time California industrialists found it outrageous, and feared that it set an ominous new standard for environmental protection.

The Stauffer case marked the start of a long career in which Joseph would use a combination of scientific rigor, personal charm, and sheer stubbornness to shake up inert regulatory agencies, to subvert the "politics as usual" that allowed ongoing water pollution. One colleague described Joseph's strategy as "poking the bear." Others saw him as a David battling the Goliath of industrial pollution.

Arcata's activists thought of Joseph as an arrogant scion of the state bureaucracy. Irked by his refusal to take them or their arguments seriously, they called him "Emperor Joseph." Yet many of those who knew him well viewed Joseph as a groundbreaking environmental hero. Perhaps he was both: a clean-water revolutionary who came to resist innovative, but in his view unproven, solutions.

Joseph began working for the state in an era when industry and city governments assumed that dumping wastes in rivers, bays, and the ocean was their right, and the regulatory boards charged with protecting California's waters agreed. In 1949, the California Legislature had passed the Dickey Water Act, setting up nine regional water pollution control boards. Board members represented agriculture, industry, cities, and counties. They shared an interest in maintaining their right to pollute.[2]

"The use of the State's waters for waste disposal in order to provide a better economic position for a municipality or an industry has become a guiding philosophy in the application of the Dickey Act," Gordon testified at a 1957 legislative hearing.[3] Under the law, he noted, pollution did not legally exist until it reached a level determined to be "unreasonable." While anglers and biologists saw unreason in tainted waters all around the state, the regional water pollution control boards saw an orderly use of resources, with certain stretches of water designated as official industrial or municipal cesspools. Gordon suggested some changes in state law that were, at the time, radical. No public waters should be completely set aside for waste disposal. Penalties for pollution should be made so high that no plant on shore could afford to dump raw effluent into California's bays.

At the start of his DFG career, Joseph's office was at San Pedro, close enough to the intensely polluted Los Angeles–Long Beach harbor that he could smell the rotten-egg stink that rose from the water. The harbor received effluent from fish canneries, oil refineries, chemical plants, vegetable oil plants, metalworking shops, shipyards, and city sewage outfalls.[4] In dry summers, Dominguez Channel, a concrete-lined canal that ran into the harbor from the north, carried no liquid aside from the waste discharges of industries along its banks.[5]

The dense kelp beds that had once flourished in open waters outside the harbor's mouth thinned out, and then vanished—as they did outside of polluted San Diego Bay, and for miles near a major urban sewage outfall at White's Point on the southern California coast, where discharge rates had risen from 20 million gallons a day in 1940 to more than 200 million gallons a day in 1957.[6] The abalone and other creatures that relied on kelp for food or shelter also dwindled. On beaches near major sewage outfalls, kids played with the rubber rings from decayed condoms, which washed up in the thousands.

Inside Los Angeles harbor, biologists were just beginning to explore the impacts of the intense pollution. Using a bucket equipped with retractable flaps that could scoop up samples of the bay floor, Donald Reish, a graduate student in marine biology at the University of Southern California, found that the creatures living on the harbor floor—the benthos—were profoundly affected by contaminants. Reish focused his study on polychaetes, segmented marine worms that were among the most common creatures found in the harbor. He identified six kinds of benthic communities, defined by the level of dissolved oxygen in the water and the diversity of polychaete species. (Pollution with organic wastes and petroleum tends to deplete dissolved oxygen [DO], suffocating marine life.) Mapping the harbor from a worm's point of view, Reish defined areas that ranged from a healthy bottom, with a diverse array of polychaetes and a normal DO level of about 7 parts per million (ppm), to a polluted bottom in waters where the DO was 3.5 ppm, about half the normal level, and the community was dominated by a single hardy species of worm, *Capitella capitata*. In areas he dubbed "very polluted," the bottom was covered with a layer of toxic sludge in which nothing could survive. Brought to the surface, this black muck stank of sulfur and petroleum.[7]

Fish captured in or near the harbor showed signs of serious health problems. Halibut were underweight and listless; white seabass and spotfin croaker had

exophthalmia, an abnormal protrusion of the eyes, leading to blindness and death; a variety of fish had mysterious lesions and tumors. In an experiment, DFG biologists put wild killifish into effluent collected from Dominguez Channel and diluted with seawater. The fish developed lesions within twelve days, and all of them died, even those that were moved into clean water.[8]

Engineers at the Los Angeles Harbor Department preferred foul water. In clean conditions, marine worms burrowed into the thousands of wooden pilings in the harbor, and hundreds of the weakened pilings had to be replaced each year. Carrol Wakeman, one of the harbor engineers, sang the praises of pollution, telling a legislative committee:

> The more pollution we have in the harbor, the fewer pilings need to be replaced. It also saves money for boat owners; where there is pollution they don't have to paint their boats as often, because barnacles and other fouling mechanisms are nonexistent. This is very important to us . . . We don't want objectionable floating matter but we do want the type of pollution which limits oxygen content in harbor waters.

Wakeman said he'd be happy if the entire inner harbor had oxygen levels of about 2 ppm, because the waters would be conveniently dead. When a stunned assemblyman commented that Wakeman was the first person he'd ever encountered who liked pollution, Wakeman replied, "It's a matter of dollars and cents—economics."[9]

The waters of San Diego Bay were tinted a brownish red, the result of intense blooms of algae fueled by mass discharges of raw or minimally treated sewage. The tiny, floating marine plants would take up the nutrients in the sewage and reproduce like mad; at night, when photosynthesis was impossible, the algae would respire, breathing in oxygen just as mammals do. As masses of phytoplankton died off, they sank to the bottom, where bacteria used up more oxygen in the process of decomposing them. As a result, the bay's waters were drained of oxygen, suffocating fish and marine invertebrates. The polluted southern arm of San Francisco Bay likewise went anoxic every summer, the result of discharges of fish cannery wastes and poorly treated city sewage.[10]

The Los Angeles Regional Water Pollution Control board designated disposal of industrial wastes and sewage as a "beneficial use" of the Los Angeles harbor, along with the provision of docking facilities for ships. Habitat for marine life didn't make the list. Joseph came on the scene just as citizen's groups and his own new employer, DFG, were taking up the fight against rampant pollution. He would soon prove his ability to think—and to fight—outside the box. Jack Fraser, director of water projects for DFG, created a new position for Joseph, who in the late 1950s became California's first full-time water quality specialist. Joseph moved, with his wife and young kids, to Sacramento, and began to tackle water pollution issues statewide.

He would spend the next few years in pitched battle with the regional water pollution control boards. Board members were appointed by the governor, and as prescribed by the Dickey Act, were linked to industry, agribusiness, and city gov-

ernments, all of which had a need to dump effluents containing everything from human sewage to caustic solvents and toxic waste from oil refining and the manufacture of DDT. The regional boards focused on making life easy for polluters, and stubbornly ignored protests from DFG staff, conservationists, and fishermen.

While DFG Director Gordon and his successor, Walt Shannon, continued to advocate for change in the Dickey Act, Joseph searched for ways to move ahead under existing law. By 1961 Joseph had helped to push through another legal case, in which Shell Oil was charged with criminal pollution of Dominguez Channel. While the Shell case was pending in municipal court in Compton, Joseph and his colleagues moved to gather evidence on the dire biological state of Dominguez Channel and the inner harbor. Frequent kills occurred when schools of fish from the cleaner outer harbor blundered into the inner harbor and suffocated. Joseph hoped to do an end-run around the inert Los Angeles Regional Board and use the courts to enjoin polluters from discharging untreated waste. The strategy relied on language in the DFG Code section 5650, which seemed to give the DFG the power to act independently of the regional boards. DFG enlisted the help of Ralph Scott, the assistant attorney general who'd prosecuted the case against Stauffer. Scott thought the agency had solid grounds to seek injunctions against the industrial plants that lined Dominguez Channel.

In July 1961, Joseph went into high gear, gathering evidence on fish kills, assigning his staff to conduct bioassays of industrial effluent and necropsies on killed fish in the harbor. He studied the work of Don Reish, who'd identified a series of dead zones on the floor of the Los Angeles harbor in 1954. He was hard at work building a case against the Dominguez Channel polluters when, in November, the judge in Compton dealt DFG a stunning blow, dismissing the agency's case against Shell before it could be decided by a jury. The judge said that Dominguez Channel did not constitute "waters of the state of California" because in the dry months it carried nothing but the effluent flowing from dischargers. He refused to allow expert testimony on the toxicity of inner harbor waters to fish, or to recognize DFG's right to act independently of the regional board. In the aftermath of this defeat, DFG Director Walt Shannon wrote to Ralph Scott asking him to move ahead with case-by-case injunctions against industrial polluters.

Scott replied that any hope for the DFG cases in Dominguez Channel rested on the outcome of an appeal then pending on a case concerning pollution in Calaveras County, on the Mokelumne River. Months later, the appeals court ruled that injunctive relief in pollution cases was the exclusive province of the regional water pollution boards. DFG's legal maneuvers had failed.

The Los Angeles Regional Board stood by its decision to do nothing. The board had declined to set discharge requirements for individual polluters; instead it set a water quality objective that DO in inner harbor waters should not fall below 0.5 ppm, a peculiar goal since most forms of marine life can't survive in water that oxygen-poor. In 1956, DFG Director Seth Gordon sent a complaint to the regional board, noting that pollution levels in the inner harbor had risen, with obvious effects on fish. When the waste flow from the Richfield Oil plant was diverted

from the Los Angeles County sewer system back to Dominguez Slough, hundreds of gulls mobbed the harbor, gobbling up dying anchovies. A valuable species of bait fish that was once abundant in the harbor, anchovies go to the surface and show obvious signs of distress when DO levels drop below 3 ppm.[11]

In the fall of 1963, the same kind of disaster played out again on a larger scale: Millions of anchovies died in a kill that attracted an estimated 20,000 gulls. The dying anchovies made such easy prey that the gulls ate until they were too heavy to fly. DFG Captain Walter Putnam pointed out that this kind of thing had been happening in the Los Angeles harbor for years.[12] More than half of the bait fish taken each year in California were anchovies captured in the outer harbor. He worried that the outer harbor would one day be as polluted as the inner harbor, a catastrophe that he speculated could put an end to sport fishing in southern California, because it would destroy the principal source of bait. In places the water turned a pearlescent white, an effect created when sulfates discharged from oil refineries fed blooms of anaerobic bacteria. White masses of colloidal sulfur were left behind. Putnam regularly tracked oil spills in the harbor, sometimes several in a single day, and watched as a cannery discharge bubbled a brown slop of fish bones and guts into the water.

The fight for the Los Angeles harbor dragged on for years. In late 1958, during the closing weeks of his last term as governor, Pat Brown appointed Ellen Stern Harris, a dedicated conservationist, as the public's representative on the Los Angeles Regional Board. Harris questioned every move her fellow board members made, drawing public attention and slowing down the board's normal rubber-stamping of pollution permits. Long-time board members snapped at her, asking her with varying degrees of rudeness to shut up and get out of the way. Thomas Gaines, a public relations officer at one of the Dominguez Channel oil refineries, found her particularly annoying. In 1967, when officials with the Federal Water Pollution Control Administration admonished the Los Angeles Regional Board for failing to monitor and regulate DO levels in the harbor and to acknowledge fish life as a beneficial use, Harris urged her fellow board members to change their standards. By then, Harris's resistance had drawn activists to the regional board's meetings, and other conservationists were on hand to back her up. Gaines described the push for higher water quality standards as "an exercise in futility."[13] The board voted to change nothing. The majority shared Gaines' conviction that California water quality was none of the Feds' business.

Conservationists, along with DFG, kept pushing. Demonstrators took a flotilla of small boats into the harbor and dropped black wreaths into the water in protest. Angry editorials ran in the *Los Angeles Times* and other local papers. By late 1968 DFG had a new case in court, involving pollution of Dominguez Channel by Union Oil Company. Two appellate courts had found against the company's contention that DFG could not enforce its code because it had been superseded by the power of the regional boards; a third appeal by Union Oil was pending.

The clash between industry and conservationists played out at a hearing held by the Los Angeles Regional Board in April 1969. A Sierra Club representative read historical accounts that proved the now-sterile harbor had once been rich in

marine life, and urged the board to adopt fish and wildlife habitat as a beneficial use of the harbor. John Easthagen, a chemical engineer and spokesman for the Western Oil and Gas Association, replied that the idea of bringing life back to the harbor was "an irrational, emotional and unscientific approach."[14] The harbor and Dominguez Channel, he argued, were manmade structures, and not intended for marine life.

Easthagen was right, in a way, about the history of the Los Angeles harbor. Until the early twentieth century, the shoreline of southern Los Angeles County was covered in salt marsh and mudflat. Dominguez Slough was a mucky, meandering channel that flowed in from the north to meet the mouth of the Los Angeles River. In the early 1900s the marshes were drained, the Los Angeles River was diverted away, and wharves and a breakwater were built to allow deep draft ships into the harbor. By the 1950s, Dominguez Channel was a concrete canal running through a paved landscape, fed by manmade storm drains that carried runoff from 110 square miles of southern Los Angeles County, including Dave Joseph's childhood home of Inglewood.

Bringing these urbanized, industrial waters back to life, Easthagen claimed, would be "very costly, of doubtful value . . . unreasonable, arbitrary and capricious." Ellen Stern Harris told him that the harbor area belonged to the public, and the people now wanted to reclaim it. "I don't think you can go back to the time before the Indian," Easthagen answered.

The majority of the Los Angeles Regional Board agreed with Easthagen, and held to their traditional stance of doing nothing to regulate industrial discharges. But change was coming, whether the regional board liked it or not. At a September hearing, conservation-minded members of the State Water Resources Control Board raked the Los Angeles Regional Board over the coals for its inaction. Kerry Mulligan, the state board's new chairman, told them the day might come when all discharges into the inner harbor and Dominguez Channel would be banned. At the end of the meeting, Lester Louden, the long-time chair of the regional board, went up to Jerome Gilbert, the state board's executive officer. He suggested that Gilbert change his name to "Ellen Stern Gilbert," a mocking reference to activist Ellen Stern Harris. A few days later, Louden succumbed to pressure from the state board and resigned his chairmanship. The regional board grudgingly agreed to list marine life as a beneficial use of the harbor.

In October 1969, the state board ordered an end to all waste dumping in Dominguez Channel and the inner harbor, a change that was to be completed by 1973. Industrial effluents would have to be treated and discharged to the ocean rather than the inner harbor. It was a seismic shift in policy, brought on by years of struggle. And it worked: by November 1970, inner harbor waters had gained back some oxygen—2 ppm—and fish appeared in the murk. By February 1971, schools of anchovy and bonita had returned, and so had the barnacles and wood-boring polychaete worms that clung to the wooden pilings in the Los Angeles harbor. A professional diver who'd worked in the harbor for years, feeling his way in water so turbid he couldn't spot his hand in front of his face, reported that he could see where he was going in the depths of the harbor for the first time ever.

The decade between the dismissed case against Shell Oil and the rebirth of the Los Angeles harbor had been a busy one for Dave Joseph. He'd ended up in a position of power that no one, not even his closest allies, had thought he could achieve. Joseph's unexpected rise was tied to a long fight over pollution from pulp mills, then a new industry in California.

In the spring of 1960, the North Coast Regional Water Pollution Control Board was poised to approve the release of effluent from a pulp mill that the Simpson Timber Company planned to build at Fairhaven, on the Samoa Peninsula, west of Humboldt Bay—the first pulp mill proposed on the California coast. Simpson planned to discharge its effluent, containing a heavy load of organic waste and caustic chemicals, directly onto the beach on the Pacific Ocean side of the peninsula. This strategy had already proved disastrous at a Georgia-Pacific pulp mill on the Oregon coast, near Newport, where effluent released onto the beach had created a foul-smelling wall of foam that triggered a wave of outraged protest from local people.

In the 1960s, as many lumber mills shut down, the wood pulp industry held the promise of new jobs in hungry logging towns like Arcata and Eureka. (The Humboldt Chamber of Commerce recorded 262 working sawmills in the county in 1951 but only fifty-five by 1962.) But the economic boost came at a price. To create a smooth pulp that yields strong paper, wood chips are cooked in an alkaline soup, under pressure. The process produces large volumes of waste that can be deadly to aquatic life. Loaded with wood fibers and lignin, a component of plant cell walls that gives wood its structural strength, the effluent has a high biochemical oxygen demand—that is, in the process of decomposing, it sucks dissolved oxygen out of the water. It also contains mercaptans (carbon-based sulfur compounds), acids, and sulfides, all of which can irritate the gill surfaces of fish and impair the growth of oysters. High doses of methyl mercaptans can kill fish by paralyzing the nerves of their gill muscles.[15] (Mercaptans cause the infamous stench associated with pulp mills. During the boom years of pulp production in Humboldt County, prevailing winds carried the stink inland from the Samoa Peninsula to Eureka, causing the whole city to hold its collective nose.)

The North Coast Regional Board was as reluctant to demand expensive environmental protections from industry as its Los Angeles counterpart. William Shackleton, the regional board's executive officer, sent Simpson a list of wastewater "requirements" that were so general as to be meaningless. Joseph protested. DFG and other agencies were supposed to comment on the board's standards, but they'd been given no time to study the issue and no information beyond a map showing the location of the mill site and the fact that Simpson expected to release 30 million gallons of liquid waste every day. Shackleton blandly ignored pleas for a delay from Joseph, and from the Departments of Public Health and Water Resources.

In July, DFG hosted a meeting in Eureka to discuss pollution from Simpson's proposed mill. They invited representatives from all the involved state agencies, local fishermen's and conservation groups, and Simpson. Shackleton responded

to his invitation with a letter announcing that no representative of the regional board would attend as the agency had nothing to contribute.

During the meeting, several people objected to the notion of releasing effluent onto the beach. George Allen, a fisheries professor at Humboldt State, worried that noxious effluent would affect surf fishing, and that wastewater discharged to the ocean might make its way into Humboldt Bay on the incoming tide. Joseph found other allies at the meeting. One was Edward Eldridge, a scientist with the US Department of Public Health based in Oregon, which had been grappling with pulp mill discharges for decades. Eldridge agreed it was obvious an outfall pipe should be built to carry the discharge well away from the shore. He mentioned the foam-drowned beach at Newport.

Roland Sultze, the Simpson rep, said one of the major draws of the Fairhaven site on the Samoa Peninsula was the ability to discharge directly to the ocean. Discharging to rivers was just too much trouble—decades of experience had shown how devastating the effluent could be to fish and to the look and smell of natural waters. Sultze admitted to Joseph that the regional board's vague regulations would make it difficult to plan and engineer the mill. His closing comment was that if pulp mills could not dispose of wastes in the Pacific Ocean, they wouldn't be built in California at all.

In November 1960, Joseph traveled north with a group of regulators and industrialists involved in plans for a pulp mill on the Sacramento River. They visited a series of mills in Oregon and Washington, all of which, Joseph observed, had serious pollution problems in their early years. "Improvements came about," he wrote, "only after a considerable amount of public indignation." In Oregon, as in California and everywhere else, industry would only go as far as it was pushed in terms of investing cash in waste disposal systems. On the Willamette River, where it ran through Portland, areas with low DO levels created by sewage discharges and mill wastes at times formed barriers to migrating salmon; to continue upstream meant suffocation.

At the Crown-Zellerbach mill on the north bank of the Columbia River, he learned the details of the company's struggle with mats of pollution-fed algae building up in the river. These clumps of "slime" fouled fishing gear and brought complaints from local people. Rather than treating its effluent, Crown-Zellerbach built holding ponds so that its discharge could be released gradually, avoiding intense algal blooms. The Crown-Zellerbach mill smelled awful, an inevitable part of industrial wood pulping. Joseph mused that the healthiest attitude toward a new mill was a balance of resignation and vigilance. Economic forces meant the mills would come; the resulting changes would be sad, even if regulators did the best they could.

Dale Snow of the Oregon Fisheries Commission led Joseph on a tour of the Georgia-Pacific mill that had become infamous for discharging onto the beach at Newport. The history of the mill's effluent had a familiar ring. Before the plant was built, Georgia-Pacific planned to dump its waste into Yaquina Bay, the home of an extensive oyster farming industry. Oregon regulators refused to allow this, and a battle went on for more than a year while the company tried to avoid the

added expense of piping its effluent past the bay and out to sea. At last Georgia-Pacific built an eight-mile-long pipe that carried its effluent onto the beach in front of the town of Newport. There it gurgled onto the sand, creating a bank of foam that stank to high heaven. After many months of complaint from the citizens of Newport, Georgia-Pacific had extended its discharge pipe 250 feet into the ocean, and the worst of the foam and odor problems subsided. Snow was tracking impacts on nearshore fish and invertebrates, and had so far found none.

Joseph returned from Oregon convinced that a mill can do anything that's required to prevent water pollution, if the owner is made to invest the money. A scientist at the Crown-Zellerbach mill had pointed out that pulp mill wastes could be treated in the same way as domestic sewage, and that this was already being done at four US mills. "They will do whatever they are forced to do," Joseph wrote. "DFG and the Water Pollution Control Board will force the company to do whatever is necessary."

At Oregon State College's pollution lab, which was studying the effects of pulp waste on salmon, he'd met Bob Lewis, a young scientist who soon after came to work for DFG as a pollution analyst. "Dave was one of the first to grapple with the hierarchy to try to get more protection for fish and wildlife," remembers Lewis. "He had a great sense of humor, bright as a new dollar, very compassionate about other people. We called him Little Giant, but not to his face. On the north coast he was known as Dr. Clean; the dischargers came up with that name."

Based on information from existing mills and advice from Erman Pearson, a University of California professor recognized as an expert on pulp mill waste disposal, Joseph put together recommended regulations for the Simpson mill. Half a century later, his work still looks impressive. His guidelines addressed subtleties that were then often ignored. Impacts on fish were (and often still are) measured by exposing fish in a laboratory to varying dilutions of effluent for a few days and finding the amount that caused half the population to die, a metric known as $TL_{m,}$ for Threshold Limit, median. By the 1960s, biologists had begun to point out the obvious flaws in using this live-or-die standard. For wild fish populations to thrive, they need conditions in which all life stages, from eggs to adults, can stay healthy. At the time, little was known about the toxic effects of the many ingredients of pulp waste. Joseph tried to err on the side of safety by stating that the concentration of effluent in the receiving waters must not exceed a tenth of the TL_m value as measured on a free-swimming stage of a resident salmonid.

He also addressed problems with oxygen depletion, required holding ponds to control excess effluent, and demanded a monitoring program to track impacts on marine life—a request considered radical at the time. All this, including a mathematical formula for determining effluent concentrations in the ocean, fit neatly on a single page. The recommendations were submitted to the regional board in February 1961. Then came the painful process of waiting and watching while the regional board found ways to bury them.

At the board's meeting in March, Humboldt Bay fishermen and oyster farmers showed up to read letters of support for Joseph's regulations. "It appeared as though the Board felt our case had merit," Joseph wrote. Shackleton, the executive officer, who had a long-established habit of brushing

off DFG's concerns, suggested that the board wait until Simpson had a chance to study the proposal, so no action was taken.

Over the next few weeks, Joseph and his boss, Jack Fraser, tried to convince the regional board's engineer, Wendell Candland, to read their recommendations. Candland ignored them. ("Wendell was annoyed when DFG hired its own pollution analysts," remembers Lewis. "He spent most of his time visiting wineries, supposedly to investigate them for pollution. He was a double jerk.") On May 18, Shackleton sent a letter informing them that nothing would change, because Simpson, unsure if and when it would break ground on the mill, did not wish to discuss the matter.

Joseph asked that the board cancel its vague regulations for Simpson's proposed mill and wait until Simpson could provide specific plans. He reminded the board that the original regulations were set hurriedly because of Simpson's supposed need for speed. "This suggestion," Joseph remarked, "aroused something less than wild enthusiasm in Shackleton."

Later in June the *San Francisco Chronicle* reported that Georgia-Pacific planned to build a pulp mill on the Samoa Peninsula, adjacent to Simpson's land. Worried by the vision of multiple unregulated pulp mills belching waste onto the beach, Joseph began to think of taking the issue up the chain of bureaucratic command to the State Water Pollution Control Board.

At the regional board's September meeting, the two women members (known to history only as Mrs. Gordon Hadley and Miss Childs) staged a small rebellion. They refused to second a motion to continue the original regulations for Simpson. Mrs. Hadley pointed out that the board had never had an analysis of DFG's suggested requirements from their engineer. Candland replied that he had not taken the time since he knew that the board had no intention of altering its original regulations. He suggested that an analysis of DFG's recommendations by an impartial engineer would take a year and cost at least $1,500. The board members ordered him to prepare an analysis for their next meeting, three months off.

To Joseph, Candland's declaration that he'd done nothing about the Simpson issue over the past eight months was "an unprecedented admission of incompetence." He was sure the only intelligent critique Candland could produce would have to come via Simpson's own engineers, and he expected the regional board to do nothing over the following three months but find ways to avoid the substance of his objections to unregulated pulp mill discharge.

"Back in the 50s and early 60s, this sort of thing was common," says Lewis. "The argument for letting Simpson dump waste on the beach was that the mill might smell bad but it was the smell of prosperity."

The regional board duly rejected DFG's recommendations in December 1961. In January 1962, Walt Shannon, the director of DFG, lodged a formal complaint with the state board. "We do not believe that the sanctioning of a 30 million gallon per day discharge of waste directly onto the beach in the Eureka area will promote the orderly development of the pulp industry," he told board members. He pointed out that the Kimberley-Clark mill on the Sacramento River had accepted

strict discharge regulations, and that Georgia-Pacific had announced they would voluntarily install an extended pipeline to carry discharges from their Samoa mill out into the ocean.

In March 1962 eleven state board members traveled to a hearing in Eureka where Joseph and his allies had a chance to speak their minds. Joseph explained why the regional board's approach was too vague, and how destructive a discharge onto the beach would be. The Humboldt Bay Fisheries Association, which had been formed in 1961 as a response to the issue of Simpson's proposed pulp discharge, sent a representative to protest the regional board's refusal to set meaningful pollution limits. The cards had clearly been stacked in Simpson's favor, he argued, long before anyone who understood the environmental impacts had weighed in.

After that meeting, the paper trail on the Simpson mill controversy vanishes—for two years, no newspaper articles, no memos from Joseph to his superiors. There's no record that the state board ever made a decision on DFG's appeal. Perhaps the bureaucracy let the issue go because Simpson had no clear plans as to when it would start construction. Then, in June 1964, the *Eureka Humboldt Standard* ran a front-page story: Crown-Zellerbach Corporation was partnering with Simpson to build a $45 million pulp mill at Fairhaven. Combined with Georgia-Pacific's mill, already under construction, this would mean thousands of new jobs for Humboldt County. Governor Brown made a statement congratulating the people of Humboldt.

By the time the pollution controversy reappeared in the local newspapers, in the late autumn of 1966, the players had changed in surprising ways. Dave Joseph was no longer the DFG biologist petitioning to protect marine creatures: He'd been appointed executive director of the regional board, ending Shackleton's long and industry-friendly reign.

"The whole game started to change," recalls Lewis. "Dave was the first non-engineer to become a regional board executive officer—a real shock at the time."

"It was astonishing that they appointed a biologist," agrees Don Reish.

Joseph could now call the shots. His longtime ally in the fight over Simpson's pulp mill, Frank Douglas of the Coast Oyster Company, held a seat on the board. The notion of discharging onto the beach was quickly discarded. Under Joseph's leadership, the regional board required a discharge pipe that would extend two thousand feet into the ocean, and a monitoring program to track effects on marine life.

The long, unwieldy pipe was damaged when Simpson workers tried to install it. Attempts to repair the line failed, so the company had to wait for delivery of new pipe and favorable weather and tides that would allow its placement. The mill was ready to start up, at least on a limited basis, to test the equipment. The mill manager, P.M. Schnabel, announced the start of the mill's operations to the press—but he neglected to ask the regional board's permission to discharge through a foreshortened pipe that would release effluent near shore.

Joseph warned the company that its plan to release effluent through the broken outfall pipe was a violation of state regulations. A Crown-Zellerbach executive

named Lowell Clucas flew to Humboldt to meet with Joseph and the Humboldt County district attorney. He made no comment on whether the mill would follow the regulations.

On Thanksgiving Day, 1966, the Simpson pulp mill started up, and effluent flowed into the Pacific near the shore. Joseph called an emergency meeting of the regional board on December 1. Ray Welsh, a board member and commercial fisherman, confronted mill manager Schnabel. “For four lousy days, you guys had to start up and couldn’t wait,” he growled. Still, the board agreed to let Simpson keep running with its broken discharge pipe until January 15, or until the new pipe was installed, whichever came first. Even Jack Fraser, Joseph’s former boss at DFG, agreed with the plan, though he emphasized the need for Simpson to get its new discharge pipe in as soon as possible.

On a night two weeks later, a batch of black liquor—the chemical broth in which wood chips were cooked to yield pulp—escaped into the effluent pipe instead of being drawn back into the mill to reclaim its contents. (Pulp mill engineers had created ways to reuse the sulfur and salt in black liquor for economic reasons, long before environmental laws came into play. Black liquor is normally boiled down, leaving many of the useful chemicals behind and reducing the amount of wastewater.) Dawn revealed a bank of foam on the beach, five feet high, stretching for more than half a mile north and south of the discharge point. Douglas, the oyster farmer and regional board member, waded into the bank of waste and took in the strange view. The temporary permit the board had issued Simpson at its emergency meeting had specified that no foam was allowed. The power to make rules, even when you’ve won it, is not always enough.

In his Santa Rosa office, two hundred miles from the mess on Samoa’s beach, Joseph told the press that the incident showed the problems inherent in discharging pulp waste near the shore. If Simpson had been able to meet its original schedule in placing the offshore effluent pipe, this incident wouldn’t have happened—and once a new pipe was installed, it should not happen again.

Everyone who knew Joseph well remembers his wry sense of humor. Maybe, on that frustrating day, less than a year into his tenure as executive of the regional board, he smiled and appreciated the irony of the situation. One thing that’s certain is that he wouldn’t have had much time to dwell on it. Time and pollution moved on.

In the long stretch of northern California for which Joseph’s board was responsible, water pollution problems were diverse. The city of Santa Rosa was releasing a growing volume of wastewater into the Russian River, which had gone from a pristine salmon stream to a flowing sewer, with clumps of toilet paper and urban debris on its banks. Smaller cities, including Arcata and Eureka, had ongoing problems with failing sewage treatment systems. The lumber industry was building a sprawling network of logging roads and clear-cuts, which sent loads of dirt tumbling into waterways. The silt destroyed habitat for salmon and trout. Since the California Board of Forestry ignored these impacts, Joseph tackled them.

“Dave started to regulate logging from the standpoint of water pollution,” remembers Craig Johnson, an engineer who worked at the regional board in the

1970s and 1980s. "We were telling people to do things above and beyond what the Board of Forestry required."

As had long been the case for the regional water pollution boards, the Board of Forestry was controlled by representatives of the industry it was supposedly meant to regulate. In 1971, a California appellate court ruled that the existing Forest Practice Act was unconstitutional—because it gave power over the environmental impacts of logging to those who profited from the industry.[16] For a year after the court decision, while the state legislature scrambled to build a new forestry law, the lumber industry was essentially unregulated—except on the north coast.

"Dave and his board were the only law in town," remembers his wife, Marion. "For a year, they held the lumber industry at bay based on its pollution of water."

Joseph's job involved a complex mix of science and politics. Regional board members were political appointees, and were known to include ranchers, loggers, or industrialists whom Joseph had cited for violation of water quality standards. At times, his own board seemed as unwilling to act as Shackleton's had been in the bad old days. In 1972, during Ronald Reagan's first term as governor, Joseph let off some steam by writing a sardonic letter to himself signed by an imaginary outraged citizen:

> Why is your board still screwing around, when months ago more than enough evidence was presented to make its responsibility crystal clear? "Would you please pass on to your incompetent, impotent and/or self-seeking Board and its senile, Neanderthal chairman my plea that they either get off their butts and do their jobs, or admit to the puzzled world that they are really the lackeys of timber and other industrial interests?

By the mid-1970s, Joseph was taking on the timber industry's common practice of spraying herbicides from small planes. The intent was to knock back the growth of unwanted plants that would compete for sunlight with redwood and Douglas-fir seedlings sprouting in clear-cuts. The label directions on the two most commonly used herbicides, dichlorophenoxyacetic acid (2,4-D) and 2,4,5-trichlorophenoxyacetic acid (2,4,5-T), warned users not to get the spray into waterways.

Industry claimed that they had the spray planes fly on still days, so that the poison never wafted into streams. Monitoring for traces of pesticide was impractical, but they assured the board there was nothing to worry about.

Sampling for chlorophenoxy herbicides was time-consuming and expensive, but Joseph and his staff came up with a quick, affordable way of proving that aerial spraying did leave herbicide in streams. They used fluorescent dyes, a routine means of tracking leaks from sewer pipes.

"The timber companies used a tank to mix herbicides with water," explains Johnson. "We just took a tank and mixed the dye into the water in the same proportion as herbicide, and had a plane spray that. Using a fluorometer, you can detect very small amounts of dye, at levels you can't see." The new technique proved that aerial spraying did indeed put pesticides into streams, tainting

drinking water sources and potentially affecting aquatic life. Armed with this new evidence, Joseph required timber companies on the north coast to add fluorescent dye to their herbicide mixtures and to set up instream fluorometers to detect contamination. He set a limit of 10 parts per billion (ppb) on the amount of herbicide allowed in waterways.

This logical response became a political hot potato. If herbicide spraying was curtailed on timber lands, the same thing might happen in the vast farm fields of California's Central Valley. Agribusiness, one of the most powerful players in California's economy, worried that Joseph's board might trigger a movement to limit statewide use of pesticides.

"We were regularly getting calls from the governor's staff, and from the Department of Food and Agriculture," remembers Johnson. "Dave was under tremendous pressure, but as always he stuck to his guns."

Eventually, Joseph banned aerial spraying of phenoxy herbicides within his jurisdiction. The US Environmental Protection Agency (EPA) soon followed suit, banning aerial spraying of 2,4-D and 2,4,5-T nationwide.

In his free time, Joseph relaxed by taking long drives on back roads with his wife, in his cherished BMW. "He knew every bit of his board's territory," Marion says. "All of the North Coast was Dave's natural habitat." He also loved to putter on the small farm in Marin County where he and Marion raised their three kids. He'd rest in the shade of the barn to savor his cigarettes: Marion refused to let him smoke in the house, because she figured the trips to the barn slowed his smoking down. He didn't kick his tobacco habit until near the end of his life, when he was already sick.

In 1985, after serving as executive of the regional board for twenty years, Joseph retired. That same year, 2,4,5-T, one of the pesticides he'd stopped timber companies from dropping out of the sky, was banned in the US. The manufacture of 2,4,5-T creates dioxin, a carcinogenic compound that accumulates in the tissues of fish, wildlife, and people and persists in the environment for years. Every batch of 2,4,5-T is contaminated with dioxin to some extent.

Around the time of Joseph's retirement, a startling link between pulp mills and dioxin pollution was becoming clear. In 1983, EPA scientists found high levels of dioxin contamination in fish downstream from several pulp mills in Wisconsin. This was the first sign that pulp mills produced dioxins; later studies found that toxic organochlorine compounds, including dioxins and furans, were formed during the process of bleaching pulp with elemental chlorine. The agency had not expected this result, and proceeded to hush it up.

Dioxins can suppress immune responses and cause liver damage, rashes, cancer, and reproductive disorders.[17] In 1979, EPA ordered an emergency halt to the use of 2,4,5-T. This decision triggered years of legal and political battles with pesticide manufacturers, led by Dow Chemical.

Starting in 1981, under the Reagan administration, EPA officials began to gag agency scientists studying dioxin contamination and to focus on managing public opinion of dioxin rather than the chemical's health risks.[18] In early 1983, EPA Administrator Anne Gorsuch resigned and her colleague Rita Lavelle was

dismissed amid Congressional investigations of their handling of Superfund hazardous waste sites. One of the most controversial examples was the severe dioxin contamination at Times Beach, Missouri, which eventually led to the town's permanent evacuation by order of the Centers for Disease Control. Gorsuch's aide and successor, John Hernandez, also resigned when Congressional hearings revealed that he'd allowed Dow Chemical to edit a report on dioxin contamination caused by its plant in Midland, Michigan.[19]

The link between pulp mills and dioxin pollution first became public when Greenpeace activists published a report called *No Margin of Safety*, in August 1987.[20] In September 1990, EPA issued an advisory against eating fish caught near 20 US pulp mills. Dioxin was accumulating in the tissues of fish, reaching levels that would create a significant risk of cancer and liver damage in people who ate them. EPA's list of the nation's worst pulp mill polluters included the Simpson mill at Fairhaven.[21]

Meanwhile, scientists had begun long-term studies of wild fish living near Canadian pulp mills. One especially revealing example was a mill that discharged effluent into Jackfish Bay on Lake Superior. Researchers found impacts on fish there that paralleled the toxic effects of dioxins on mammals, including humans. The white sucker, a native Great Lakes species, showed damage to its reproductive system, including an increased age to sexual maturity, failure of gonads to develop, and a drop in circulating reproductive hormones. The fish also had enlarged livers, and blood tests showed they were producing cytochrome P450 enzymes, proteins produced by the liver in response to toxic insult. These symptoms of toxicity were much less extreme in fish living near pulp mills that did not use the chlorine bleaching process, which implied that dioxins and furans played a role. When the Jackfish Bay mill was shut down for eight months, all the fishes' symptoms vanished, but some of the reproductive problems returned after the mill started back up with more sophisticated wastewater treatment. Pulp and paper mill effluents can contain over 250 known chemicals: Some of the toxins in pulp mill effluent remain unidentified.[22]

Thirty years after Joseph had first fought to control pollution from the Simpson mill, it and the neighboring Louisiana-Pacific mill were dumping a combined total of 40 million gallons of untreated waste into the Pacific every day. In 1987, the two companies had finagled a waiver from Congress, exempting them from the requirement for secondary wastewater treatment that had by then been imposed on most other polluters dumping into ocean waters off the US coast. The pulp mill outfalls emptied near the North Jetty at the entrance to Humboldt Bay, a popular surfing spot. The waves there turned black from mill waste. Surfers were getting sick, suffering from nausea, sinus infections, headaches, sore throats, and skin rashes. Dioxins and furans were detected in fish and crabs collected near the outfalls, and in the mills' smokestack emissions.

Fed-up Humboldt locals brought their complaints to the Surfrider Foundation, an environmental nonprofit started in the mid-1980s by surfers concerned with the ongoing pollution of California beaches. The group delved into records for the two Samoa mills and discovered that waste discharges routinely violated EPA

standards. Surfrider filed suit against the mills in 1989. The EPA, which had for years been trying to get the mills to clean up their effluent, later joined the suit.[23] In September 1991, Simpson and Louisiana-Pacific settled, agreeing to invest more than $50 million in improving their waste treatment. Simpson would use an alternative, chlorine-free bleaching process to prevent formation of dioxins and furans. The mills would be required to regularly test their effluent for toxicity to abalone, sea urchins, sand dollars, and kelp. It was, at the time, the second-largest financial settlement made under the Clean Water Act, and a sweet victory for anyone who cared about protecting the ocean.

"The case proves," said Surfrider attorney Mark Massara, "that the 167 million people who annually use California's beaches can take back our shoreline."

David Joseph would surely have cheered, but by then he was gone. He died of cancer in May 1991, at the age of 64. The people who worked most closely with Joseph remember him as a great man.

"He was fundamental in moving water quality protection forward in California," says Susan Warner, who worked for Joseph at the regional board and eventually succeeded him as executive director. "He was a driven environmentalist. He didn't suffer fools gladly, or tolerate claims unsupported by evidence. Industry saw him as the big heavy."

John Hannum, an engineer who was hired by Joseph to work for the regional board, remembers him with fondness. "Dave was a consummate biologist and a hugely capable motivator," he says. "He knew how fish lived and how water politics played, and he had a healthy skepticism about engineers and their notions. He'd keep us mindful that we were protecting a public resource with public money."

Wes Chesbro was a member of the Arcata city council that battled Joseph in the 1970s. In 2014, when term limits ended his tenure as an elected member of the California Assembly, he noted that his view of Joseph had transformed with time. "I've spent 35 years learning to see things from the other guy's point of view. That's part of being successful in politics," he said. "The regional board was used to dealing with recalcitrant entities that just didn't want to fix things. Arcata was completely outside the box. I have plenty of respect for Joseph's body of work, but we wanted to do something that was untested and experimental. That was too much a challenge to his regulatory regime for him to take it seriously."

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