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Protection of the Chesapeake Bay: Environmentally Legal, Eminently Uninhabitable?

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PROTECTION OF THE CHESAPEAKE BAY: ENVIRONMENTALLY LEGAL, EMINENTLY UNINHABITABLE?

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This article considers the question of how far we have progressed in our efforts to protect the Chesapeake Bay. The short answer is: better than ever, but not nearly well enough. Some will view this response as a hedge against almost any eventuality, as a safe assessment that metes out praise on the one hand, while taking the hard-to-assail position that we can always do better. Nevertheless, fifteen years of reporting on and living in the Chesapeake Bay region leads me to conclude that we face the distinct possibility of ensuring an environment that is legally sufficient but increasingly less pleasant in which to live.

Our goal must be to consider water quality and land use in concert. In the last decade an entire body of pollution control law and strategy has evolved from the concept of nonpoint source pollution, which refers to all the chemicals and silt that wash or leak into our waters from farms, forests cut for development, industrial landfills, and the like. Because of all our efforts at pollution control, I can confidently assert that we are doing better than before in cleaning up the Chesapeake Bay.

But it is not enough. The land is more than just a pollution source to be regulated; it is extremely important to our environmental well-being. Even the most dedicated of Bay enthusiasts pass the great bulk of their existence on the land. Although we are making progress toward fulfilling most of our pollution control goals, we are also developing far too much of the watershed too rapidly and wastefully, and with shameful insensitivity. Suburban development is popping up at such a pace that Maryland may soon become known as "The Suburb State."

This article is based upon the radical assumption that we can and will meet all water quality standards that the scientists and the computer modelers say are needed to restore the aquatic systems of the Bay. Furthermore, it assumes that every Chesapeake Bay environmental goal currently in existence will be met, and met in timely

* Environmental Reporter, The Baltimore Sun (1975-1987). B.A., Johns Hopkins University, 1968.

fashion. I am not making these assumptions merely for the sake of argument. I am fairly confident that we *can* meet these goals if we mobilize the expertise and the resources available to us. I realize, however, that this will not be an easy task.

For example, one victim of the continuing degradation of the Chesapeake area is the rockfish. In assessing the quality of life for the rockfish one should note that fish, like quotes, must always be placed in context if they are to be understood. Rockfish thrive more than most species in the habitats that are most attractive to humans, namely in the fringes of marsh that ring the Chesapeake and in the crashing surf of Atlantic beaches. Also, the rockfish's life cycle is dependent on spawning waters that exist in the same places we put our sewage plants, power plants, towns, and marinas. The rockfish presents a wonderfully visible symbol that should inspire us to responsibly coexist with nature.

Another example are the netters who for three hundred years have plied their trade on our Bay rivers and creeks, tied to the annual migrations of the rock, totally dependent on nature's ways. The point is that through environmental degradation we not only lose a species of fish, we also lose a far richer and more extensive context of human association with nature than anything that can be quantified in pounds or dollars.

The rockfish story is applicable to the efforts to clean up the Chesapeake Bay waters. We cannot realistically assess what is happening and determine whether there is "progress," unless we consider the Bay irrevocably embedded in, and tied to, what is happening on the land that surrounds it and which drains fresh water into it. Geographically, this encompasses a watershed extending from Cooperstown, New York, to approximately the North Carolina border. As the following example of the Blue Plains treatment plant illustrates, our efforts to save the water will not be enough to keep the watershed pleasant.

The Blue Plains Regional Wastewater Treatment Plant, serving the District of Columbia and large portions of the Maryland and Virginia suburbs, is arguably the apotheosis of our attempts to clean up water without noticeable interruption in the development of the surrounding land. This sewage plant serves the capital of a world power and safeguards the health of the Nation's river, the Potomac, into which it discharges. No other sewage plant on earth combines the size and sophistication of Blue Plains. This is the Apollo mission of water pollution control, our thoroughbred champion in the high stakes race to reclaim our waters.

There are two things nature lovers generally revile as the answers to environmental concerns: bigness and technological fixes. Both tend to ignore natural limits to growth, and both are all too capable of creating problems as bad as the ones they solve. Both reach perhaps their ultimate synthesis in Blue Plains on the Potomac. If there is one place where society's pursuit of progress at the peril of natural systems should clash against the limits of big, high technological solutions resulting in disaster, it ought to be at Blue Plains.

There is no evidence of this clash, however, in the definitive report of the United States Environmental Protection Agency (EPA) on the state of the Chesapeake Bay and its tributaries. This report was issued in 1983 after a six-year study of the region's most pressing water quality problems.[1] Almost lost in the EPA's report on the region's decline was a particular finding that parts of the Potomac River were currently exhibiting improving water quality.[2] The Potomac's condition was a clear testament that better sewage treatment, undertaken after pollution turned a national river into a national embarrassment, can work.

Blue Plains seems to suggest that with enough money we *can* have rapid development and at the same time maintain our healthy rivers. There is a possible flaw, however, in such comforting assumptions, but environmentalists who hope to expose it by waiting for Blue Plains to reach its limits do not understand the nature and history of how our society controls its pollution. Blue Plains offers a shining example.

Blue Plains collects sewage from an area as large as the drainage basins of many Bay rivers. Wastes that enter its arteries on a Tuesday evening from Leesburg, Virginia, or from Damascus, Maryland, for example, may not receive final processing at the main plant until the weekend. Sewage moves through Blue Plains at the rate of a third of a billion gallons a day, a capacity that virtually equals all the other sewage plants in Maryland combined.[3] Of the nearly 13 million people who live in the 5-state watershed of the Chesapeake Bay, around 15 percent of them are hooked into the Blue Plains

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1. *See* CHESAPEAKE BAY PROGRAM, U.S. ENVIRONMENTAL PROTECTION AGENCY, CHESAPEAKE BAY: A FRAMEWORK FOR ACTION (Sept. 1983) [hereinafter CHESAPEAKE BAY: A FRAMEWORK FOR ACTION].

2. *See id.* at 16.

3. Telephone interview with Walter Bailey, Chief of the Wastewater Div. of the District of Columbia's Treatment Plant at Blue Plains, Washington, D.C. (Feb. 8, 1988).

system.[4]

The plant's beginnings in 1938[5] did not bespeak the current high level of faith in technology to overcome any sewage problem that might arise. Its location on the Potomac's east shore was chosen for the simple reason that it could cast its effluent downstream beyond the ability of the tides to bring it back into sniffing distance of the District.[6] In the early years Blue Plains was nothing more than a few small buildings and treatment tanks. It only removed about 40 percent of the gross pollutants in the sewage.[7]

Today the plant, approaching its fiftieth anniversary, has become a small city, with its own newsletter.[8] Almost the entire 154-acre site is devoted to processing the pollution brought in by the unrelenting river hurtling down upon Blue Plains from its 725-square-mile catchment area. Rail spurs shuttle in tons of chemicals that Blue Plains uses to purify its sewage, and a continuous stream of trucks flows in and out of the grounds to cart off the three million pounds of solid residues, or sludge, extracted every day from the wastewater.[9]

Blue Plains' state of the art manipulation of sewage begins with twin pipes that feed the plant through a set of "bar screens," mammoth grates of steel with inch-square openings. These extract the largest matter—tennis shoes, beer cans, small trees—from the raw sewage. Past the bar screens, the sewage races turbulently through deep, concrete header channels where grit, sand, and gravel settle out. At this point, the water has a dense, slatey, grey-green color. After emerging into the sunlight, the sewage lingers in a series of placid, circular ponds, a hundred feet in diameter, where further settling of solid matter occurs. Then a mechanical grease skimmer revolves around the surface of each pond.[10] Frequently, a seagull will hover and pluck something from the water. The ponds and the seagulls comprise the final stages in the physical cleansing processes known as primary sewage treatment, which Blue Plains has been en-

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4. *Id.*

5. *Id.* Construction was completed in 1938 on a parcel of land originally called *Blew Playne.*

6. *Id.*

7. *Id.*

8. *Id.*

9. *Id.* The sizeable technocracy required to maintain the quality of the effluent that enters the Potomac is housed in a soaring, pyramid-shaped headquarters building, elegantly sheathed in bronze-gold reflecting glass. This fact, along with the plant's near billion-dollar price tag, has earned Blue Plains the sobriquet in national sewer circles of the "craphouse Taj Mahal."

10. *Id.*

gaged in since 1938. By comparison, Baltimore's Patapsco Treatment Plant did not achieve primary sewage treatment until 1983.

Next, biology and chemistry are unleashed on the sewage, which by this point looks slightly more translucent than it did when it was at the primary stage. Giant aerating pumps bring it to a rolling boil in dozens of long, narrow channels that cover several acres. Workers then introduce microbes into the sewage to feed on oxygen and waste and to attack the subtler stuff like coffee and other dissolved solids that remain after primary treatment. It sounds simpler than it is. Much care and thought is devoted at this stage to the proper feeding of these microbes. The idea is to keep them hungry, but not starve them. It is also important to ensure that heavy rainstorms entering the plant do not wash the microbes away.

While the microbes are feeding on the sewage, two chemicals, ferric chloride and waste pickle liquor, are added to precipitate out whatever escaped the microbes.[11] Blue Plains then adds chlorine, a disinfectant, to this treatment, in quantities that consume a rail car of the chemical every week. At this point, the sewage has been detoxified to a degree equalling, and usually exceeding, almost any large treatment plant in the world. But this is just the beginning. Next, the wastewater flows into a section of the plant where it undergoes "nitrification."[12] Nitrification converts elements of the waste to more stable chemical forms, so that they will remain essentially inert and harmless to water quality after entering the Potomac.

The sewage is led through a dozen concrete ponds, each nearly the length of a football field, divided into fifty-nine separate stages for treatment. To provide sufficient aeration, which enables the nitrifying bacteria to work, the plant is underlain by tunnels containing miles of piping, six feet in diameter. These pipes carry oxygen pushed by five blowers of 4,000 horsepower each.[13] These blowers control the precise amount of oxygen; lime, which is necessary to maintain the proper pH level; and numerous other factors to ensure proper nitrification.[14]

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11. *Id.* Blue Plain's use of pickle liquor represents a happy partnership between the treatment plant and Bethlehem Steel's giant Sparrows Point Works in Baltimore. Blue Plains, whose growing needs at one point were straining DuPont's entire national production capability for flocculating agents, was more than happy to take the mill's excess pickle liquor off Bethlehem's hands, and out of the steel company's polluted discharges to Baltimore's outer harbor.

12. *Id.* "Nitrification" is a process where the sewage is treated by combining it with nitrogen which oxidizes compounds such as ammonia.

13. *Id.* It takes $500 of electricity to click one blower on and off.

14. *Id.* Blue Plains maintains a water quality laboratory on a concrete island amid the

After spending hours amid the churning of sewage and howling of blower pumps, the sewage enters the cool serenity of the multimedia filtration building, where it is treated for the last time before it enters the river. At this point, the wastewater looks as clear as tapwater, even before it enters its final filtering stage. The water is forced through massive filters of two-foot thick crushed anthracite, a foot of fine sand, and a layer of almanite. After each quantity of wastewater has been filtered, the filters are backwashed, and clouds of the purest, black mud erupt from their every square inch. The water discharged from Blue Plains adds approximately 4 percent to the Potomac's average flow at this point. In the very driest of times, however, Blue Plains might account for almost half of all the fresh water coming down from the river's nine-million-acre drainage basin.[15]

Through the gray-tinted glass of the filtration building, there is a fine view of Blue Plains, and one can appreciate what the water quality engineers mean when they explain their "linear approach" to problem solving. They proceed stepwise—solving the major or most pressing problem, then turning their attention to the problems that may arise from the solution, and so on down the line. Looking back over the bar screens, grit chambers, grease skimmers, microbe tanks, "flocc" tanks, nitrification, filtration—one realizes that for all its sophistication, Blue Plains arose from no grand design or vision, but from decades of adding on, usually in response to a crisis in the river. It is a testament to linear problem solving.

If it seems there is never a problem Blue Plains cannot solve, then there also never seems to be a time without a problem that needs a solution. For example, the chlorine that is not consumed in disinfection may have untoward effects on spring spawning runs of fish. In response, Blue Plains is adding another chemical process to dechlorinate its discharge. To take care of possibly undesirable by-products of dechlorination, the engineers may add yet another chemical—sulfur dioxide. Then there is the space reserved at the plant for denitrification, which is necessary when nitrification is no

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acres of treatment ponds that would be the envy of many state environmental health departments. Nitrification takes up about half the space of all the treatment that has preceded it, and costs more to operate than both primary and secondary treatment.

15. *Id.* Officials at the Environmental Protection Agency sometimes get heated calls about the quality of the plant's discharge from congressmen flying back into National Airport, just upstream and across the river. They call to report what looks like an oil slick emerging from the plant. There is nothing that can be done, they are informed. The Potomac's waters will always form a turbid contrast to the glassy, clear stuff coming out of Blue Plains.

longer sufficient to maintain river quality. Some people are not sure denitrification is necessary on the Potomac, but it is generally agreed it would cost several hundred million dollars to attempt it.[16] Ironically, while nitrogen is not a problem in the Potomac River around Blue Plains, there is mounting evidence that suggests that it acts as a major pollutant when it reaches the different chemistry of the Bay salt water at the river's mouth.[17]

If there is a single accomplishment of which the engineers at Blue Plains are justifiably proud, it is the plant's supreme efficiency at removing phosphorus—the "candy" in sewage on which thrive the noxious algae that can choke the river's other life. Blue Plains removes phosphorus at an efficiency that often approaches fifty times that of conventional modern plants. Thus, in the summer of 1983 the engineers were shocked when a massive algal bloom, reminiscent of the 1960s, covered portions of the river.[18] Scientists after two years of study hypothesized that somehow Blue Plains may have altered the pH of the river enough to liberate extra phosphorus that had been locked up on the sediments of the Potomac's bottom.[19] The likely answer will be to add another step in the treatment process to increase the alkalinity of the wastewater.

Blue Plains plans to embark on another expansion, which will increase its capacity to the point of sending an additional sixty-four million gallons daily into the Potomac. Whether the plant can substantially increase its capacity yet maintain the quality of the treated sewage that goes into the river is a question to which Blue Plains' engineers think they have the answer. If the money—an estimated third of a billion dollars—is available, the technology will not be found wanting in the foreseeable future. This is another example of the benefits of the linear approach to solving pollution problems.

Before anyone praises it too much, however, one should consider the possible consequences of an extra sixty-four million gallons of sewage and its effect on a certain point in a river. First, the added capacity for Blue Plains means that it can accommodate the increased development necessary to house an additional half million people, mostly in the Maryland suburbs around its service area. This adds an additional 10 percent to the state's population, which in turn translates to a number of effects that spread across the whole watershed like ripples from a stone thrown into the water.

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16. *Id.*
17. *Id.*
18. *Id.*
19. *Id.*

A 10 percent population increase could add about 13,000 boats to traffic on the Bay each summer weekend; about 30,000 persons to the peak crowds that throng Ocean City's beach; an extra 300,000 automobiles to state highways (traveling an extra 2 billion miles annually); an extra 90,000 fishermen competing for catches on the Bay on an extra 218,000 fishing trips; and an extra 155,000 new dwelling units. There will be great pressure to build a third Bay bridge from rural Southern Maryland to the Eastern Shore. In addition, much of Central Maryland's remaining open space is likely to be encircled by a new "Outer Beltway" to relieve the traffic problems of the Washington, D.C. region. The ripples would not stop there, of course. The extra housing would boost the state's utilization of forest and farmland approximately three-quarters of a square mile annually for several years. Because a population increase will mean more air conditioning demand, it will greatly increase the likelihood of needing another massive power plant somewhere around the Bay's edge where it can draw cooling water.

Driving home from Blue Plains, I have often thought how the rapid growth of the Washington, D.C. region has already begun to affect the people who live downstream from the plant. One such person, Jimmy Hancock, has lived his entire life approximately twenty-five miles downstream on a little capillary of the Potomac system called Mattawoman Creek. Once while Jimmy and I were on a canoe trip, he showed me his childhood swimming hole where the current scooped out a place near the bank, the same swimming hole where Jim's father swam when he was a child. Jim also took me to the sand-bottomed slough where he brought his wife when they were younger to catch snapping turtles sunning in the clear shallows.

Jimmy, a cobbler in Charles County, had gotten so frustrated with local efforts to develop the land around the creek that he earned a law degree in order to fight for preserving the Mattawoman. He got his degree, fought the system, and won. The State of Maryland is acquiring much of the land for a natural environment area. Recently, Jimmy remarked that the place had changed so much that he does not go down to the creek as often as before. Ever since they began building new marinas up the Potomac, throngs of large power boats have plagued the creek. They have churned up the shallow bottom, muddied the clear waters, and killed off the aquatic grasses. The place did not seem to belong anymore to quiet canoers and sniffers of delicate marsh flowers.

There is a vast difference between keeping Maryland pollution

free and keeping it lovely and unique, between keeping it environmentally legal and keeping it eminently liveable. This is becoming more apparent as Maryland and its neighbor states continue to grow at such a rate that in the next several decades twice as many people will be living on the land in the Bay's watershed. This will add up to twice as many people desiring to enjoy its waters and its shorelines, natural areas, and aquatic resources.

The linear approach of the sanitary engineer—which is to add on a solution wherever a problem is spotted—is in fact the way we still approach a wide range of environmental problems. Not even the most sophisticated equipment can redress the loss of a paved-over forest. No chemical process can take the power boats off Mattawoman Creek, or make Bay watermen competitive for fish and for dock space with hundreds of thousands of well-heeled sports-fishermen and sailboaters. Because we focus so much on the pollution we generate, we tend to use it as the gauge of our success or failure in protecting our environment. Some say that as our limited ability to clean up our environment becomes evident, our abiding faith in big, high-tech solutions to the problems inherent in continued growth will be destroyed. Others, looking at the marvels already wrought by the engineers at Blue Plains, say that such faith is justified: Both sides should realize we might be enjoying clean water in the Potomac long after the ripple effects of an expanding and well-sewered population have degraded natural systems and supplanted traditional cultures.

People say change is unstoppable, change is inevitable, change is necessary. Of course, they are right. But our thinking about change should not end there. It is absolutely vital to keeping the Chesapeake environment habitable as well as legal that we learn how better to accommodate change.

When we begin to talk about our need to accommodate change, a concept surfaces that seems almost anathema to many Americans. That concept is limits. Rather than accept our limits, we tend to want the best of both worlds in deciding our current use of the Chesapeake Bay regions. Our true desire is to have our own unspoiled patch of countryside. Admittedly, this desire is qualified by one's need to explore the wilderness. It is also tempered by reality. The epitome of appreciating Maryland's geography is a return each evening to a first class hotel, or a sweeping, unspoiled view of ocean coast in its entirety from the deck of a condominium.

People want the best of both worlds. This seems to imply an unalloyed good. There is, however, a balance to be struck, and

there are limits to our encroachment on the natural world of the Chesapeake region. If we avoid this reality, we risk destroying the "Save the Bay" movement that bids to become our environmental drumbeat through the remainder of this century. No one doubts that we *want* to save the Bay. It is, after all, what makes this region the best of both worlds. Acknowledging this, however, and having celebrated the unrivaled progress in environmental cleanup made since the historic EPA Bay Conference in 1983, we might be sobered by recalling that two other conferences to save the Bay preceded it in 1968 and in 1977.[20] Like the third conference, the first two ended on hopeful and enthusiastic notes. Indeed, the years following the first of those conferences witnessed the greatest wave of both federal and state antipollution legislation and spending in history, accompanied by the dramatic rise of the modern environmental movement.

During those years Bill Hargis, a longtime Bay scientist, stated that we were making famous progress in fighting pollution. We were moving upstream, so to speak, with tremendous effort at about three knots, but the current continued to run downstream against us at five knots. Hargis' point was that our efforts to save the Bay do not occur in the laboratory where all the variables are under our precise control. We are not in a game where the forces of pollution take time out while we huddle to decide on countermeasures. This is why, finally, I warn those who hope to save the Bay that its epitaph has already been written, if not chiseled in stone.

There are a number of ways in which that proleptic epitaph can be stated, but I think it was particularly fitting the way it came from the mouth of a real estate agent from the boom-growth Bayshore county of Anne Arundel. She was testifying against controversial new state legislation designed to limit the amount and the types of development of the most environmentally sensitive waterfront areas of the Bay and its rivers. The realtor feared the proposed legislation would affect her livelihood, but she also wanted the lawmakers to understand why a healthy Chesapeake Bay was as much in her interest as anyone's.

"*We need the Bay to stay clean and beautiful, so that people will continue to move here to enjoy it,*" *she explained.*

In her own way, she had defined the best of both worlds for the

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20. *See* CHESAPEAKE RESEARCH CONSORTIUM, INC., PROCEEDINGS OF THE BI-STATE CONFERENCE ON THE CHESAPEAKE BAY (1977) [hereinafter PROCEEDINGS OF THE BI-STATE CONFERENCE]; PROCEEDINGS OF THE GOVERNOR'S CONFERENCE ON THE CHESAPEAKE BAY (1968) [hereinafter PROCEEDINGS OF THE GOVERNOR'S CONFERENCE].

Chesapeake region—*i.e.*, a world with adequate natural resources to accommodate all who wish to enjoy them. It is the Blue Plains dilemma—clear water amid a ruined habitat—but broader.

The term "ruined habitat" encompasses more than aesthetics and quality of life. I cannot attempt to adequately describe it, because it is nebulous and incapable of objective definition. But I can say that even with the most technologically advanced and zealously enforced pollution controls, we are nowhere near the point where each additional resident does not constitute a quantifiable net drain on the finite natural resources of the Chesapeake Bay and its surroundings. We can influence the degree of withdrawal from our natural resource bank accounts, but not the direction of the cash flow.

In the meantime, the people keep coming. The many uses and seductions of the shore, where land meets water, are so alluring to people that nearly half the planet's population has settled on the 5 percent of land mass that is adjacent to the coastlines. In our own country, fully three-quarters of us will soon live within fifty miles of an ocean or great lakes coast. The bay with perhaps the greatest amount of shoreline edge for its size anywhere on earth is our own Chesapeake. Compare the ratio of our Bay's shoreline to its length with almost any similar coastal water body in the world. Commonly, others will show an edge that is two, three, or four times their greatest length or width; on the Chesapeake, the ratio is approximately twenty-five to one.[21]

Population in the Bay's sprawling watershed, which took 350 years of European settlement to reach 8 million, has swelled to about 12 million in the last 30 years (8 percent of our total time here) with more people moving closer to the water's edge.[22] The problem is not just more of us, but more of us each expecting more. Consider the impact on the Bay watershed in the context of the American home. In the decade 1970-1980, the number of people in Maryland increased by about 8 percent, while the amount of undeveloped land used for residential purposes almost doubled,[23] reflecting an increasing demand for a rural or suburban home with a large lot. The more affluent the new Bay-dwellers were, the more they consumed the watershed countryside. Nearly two-thirds of all the land that changed from undeveloped to developed went to

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21. *See* CHESAPEAKE BAY: A FRAMEWORK FOR ACTION, *supra* note 1, at 3, 6 (Sept. 1983).

22. *See id.* at 11.

23. D. BOGUE, THE POPULATION OF THE UNITED STATES 72 (1985).

house a mere one-fifth of the newer population. Most of this development took place on land outside of areas with planned water and sewer facilities, thus mocking the elegant, "comprehensive land use plans" that county governments like to trot out as evidence of "controlled growth." Adding people to the watershed requires a rebalancing of the developed with the natural. Each time the balance is struck anew, we seem to be left with a little more concrete and a little less nature. Where does it all end?

I am optimistic that, with a little luck, we will soon see some payoffs in the form of more fish and cleaner waters from the massive and technologically sophisticated "Save the Bay" campaign. Admittedly, this is short-term optimism. The scientists whose research has laid the foundation for the next wave of pollution controls will tell you that it will not take long before population trends and lifestyle demands will once again outstrip past progress. They do believe, however, that by the time that happens science will be able to respond with the necessary degree of Bay-saving techniques.

Indeed, that is not an unworthy approach to many ongoing concerns, such as regulating the Nation's money supply, or maintaining its road system. We operate that way so often that a Yale economist, Charles Lindblom, gave it the formal name of "muddling through" in a famous article published in the 1950s.[24] At its best, "muddling through" recognizes that we humans are not very good at divining long-term, comprehensive solutions—there are too many variables and imponderables involved. Instead, we make admittedly incomplete, imperfect decisions, followed by almost constant, incremental mid-stream corrections. Despite our talk about long-range planning, this is essentially how we run the country. If we really want to stop the further degradation (and instead want restoration) of the environment in the Bay region, we must consider the flaws in "muddling through."

First, we must recognize that it is natural in an estuarine environment for the plants and animals living there to routinely undergo dramatic declines and rebounds from year to year, as the changing environmental conditions first favor one form of life and then another. Only after we carefully observe these swings over a period of years are we able to detect a true environmental problem. For example, the virtual disappearance, between 1969 and 1972, of the Bay's submerged aquatic grasses, one of the estuary's major life

24. *See* Lindblom, *The Science of "Muddling Through,"* 19 PUB. AD. 79 (1959).

support systems,[25] was not correctly distinguished from these natural ups and downs until the late 1970s. In a conversation I had with Walt Boynton, a University of Maryland Bay scientist, I asked Mr. Boynton what he thought had happened to the grasses. Walt hypothesized that it was probably too much shift and too much dirt, but that it would be four or five more years before scientists could prove that conclusively enough to get someone to do something.

The killer indeed turned out to be a combination of chemicals in the treated sewage, and those same chemicals in the soil washing off millions of acres of farms in the watershed. It was not until 1983 that Maryland, Virginia, and Pennsylvania were convinced to make major commitments to control the problem. Depending on which state one is talking about, it will be anywhere from 1988 to the end of this century before major reductions begin to occur in the pollutants that have been killing the Bay's grasses. Thus, major changes in the way we use the land and water across the 64,000-square-mile watershed can take a generation or more. During that time the causes of the problem will continue. This is one reason we end up "progressing" at Dr. Hargis' three knots against that unrelenting five-knot current.

Second, as we increasingly turn the watershed to human use, we permanently foreclose valuable options for reversing pollution. On the Patuxent River, at 100 miles the longest waterway wholly contained in Maryland, it was determined a few years ago that in dry summers, treated sewage from booming upstream growth centers soon will account for approximately two-thirds of all the water flowing down the river.[26] This will create serious problems for the rich seafood harvesting areas of the lower Patuxent. Upstream sewage authorities made a bold commitment to quit using the river as a waste sink. They decided to spray the sewage after treatment on the land, and to allow the soil to filter out the final traces of harmful pollution. Environmentalists cheered. But it never came to pass. The region had already developed to the point where the considerable acreage required for spraying the sewage simply could not be found.[27]

Finally, we have always put a good deal of faith in the Bay's resilience—its ability, given half a chance, to recover from an envi-

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25. *See* PROCEEDINGS OF THE BI-STATE CONFERENCE, *supra* note 21 at 47.

26. Telephone interview with Ken Shanks, Natural Resources Planner, Md. Dep't of the Environment, Baltimore, Maryland (Feb. 23, 1988).

27. MD. OFFICE OF THE ENVIRONMENT PROGRAM, WATER QUALITY MANAGEMENT PLAN FOR THE PATUXENT RIVER BASIN § 208 (1982).

ronmental insult.[28] Our faith is not without justification. Many times in recorded history, one species or another has been negatively affected by natural, manmade, or unknown events, only to rebound to record levels. With all that we have destroyed in the Bay's environment, one wonders at how much still survives.

Yet, if we compare the Bay's natural defenses of a century or two ago with today's, we must recognize that our modern Chesapeake has forever lost the ability to take a punch like it once could. In late June of 1972, tropical storm Agnes caused the worst flooding to hit the huge watershed in perhaps two centuries. The huge flood filled the estuary for days on end with incredible volumes of choking silt, farm chemicals, sewage from ruptured lines, and fresh water—the latter being a deadly pollutant to salt-loving aquatic species. Agnes would have been a rude shock to the Chesapeake's system in any age, but coming in modern times, it was far more devastating.

The forest that once covered nearly 100 percent of the watershed, unsurpassed in filtering pollutants and absorbing the runoff from storms before it reached the Bay, had been reduced by nearly a third when Agnes hit. Similarly, the Bay's vast stocks of oysters had been reduced to perhaps 5 percent of their former glory. The great reaches of underwater grasses, already highly stressed by pollution, were destroyed when Agnes hit. These grasses, which had existed continuously in the Bay for at least a thousand years, never bounced back. With them went their ability to absorb several sewage-plants-worth of nitrogen and phosphorus, two chemicals that have increasingly plagued the Bay ever since.[29]

For fifteen years people have blamed Agnes for most of the Bay's problems. The truth is, however, that we cannot blame one hurricane for all the Bay's problems. Shorn of its biological filters and buffers, already destabilized and stressed to the limit, the Bay simply lost its ability to handle the assault launched by Agnes.

There are also some concrete examples of this loss of resilience. In the last century the Bay has lost hundreds of miles of prime spawning rivers to big dams, notably on the Susquehanna, where rockfish once mounted as far as the Juniata, and shad and herring ran all the way past Binghamton, New York. As a result, the fish simply have fewer windows at which to place their bets for a successful hatch. In addition to the known major dams, experts estimate

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28. When the Chesapeake Bay Foundation was making a movie about the Bay recently, there was an office joke that they could not decide whether to call it "fragile paradise" or "sturdy sewer."

29. *See* PROCEEDINGS OF THE BI-STATE CONFERENCE, *supra* note 21, at 46-47.

there are just under 900 blockages—small dams, culverts, and the like—closing innumerable miles of small spawning streams all over the Bay region.[30]

The Bay also suffered a serious set-back in court. In 1971 the Maryland Court of Appeals, in *Bruce v. Director, Department of Chesapeake Bay Affairs*,[31] struck down a state regulation restricting Maryland watermen from tonging oysters and crabbing outside their own county waters. As a result of this decision, a more mobile fishing force was created, with larger, Bay-ranging boats that now exert tremendous fishing pressure within a matter of hours on any new "hot spot" where the beleaguered shellfish struggle for survival. This too has seriously hurt the Bay's chances to rebound.

Our demands on the Bay have not only led to the loss of resilience, but also to a loss of freedom. This is the inevitable price a civilized society exacts as it tries to infinitely expand the use of finite resources. As one environmental permit writer for the State of Maryland pointed out, in order to compensate for all the uses we make of the Bay, rivers, and the land, we must regulate and restrict those uses. Thus, we now need a license to fish in the Bay and half a dozen stamps and permits to hunt. We have rules that tell us in what kind of detergent we can wash our clothes (non-phosphate ones), and how much we must pay for boat registration. There is also serious talk of requiring licensing for boaters and creel limits on certain species of Bay fish.

Will we save the Bay? Restoring it to the level of quality that existed before the late 1950s seems unimaginable. Even if it could be done, the sacrifices would be too great; the expectations of today's public would be satisfied before that point. Most scientists I talk to think we merely can maintain most of what we still have left, and many feel all we can do is slow the current rate of decline. If we can save just half of what the Chesapeake Bay is all about during the next several generations, we will still have more than most regions of the world.

This kind of speculation strikes the politicians and the bureaucrats as pessimistic, and it smacks of criticism of their ability to carry out the public mandate, which clearly is to save the Bay. They miss the point, however, on two counts. First, the environmental quality of the Bay and its surrounding lands should not be separate priori-

30. Telephone interview with Howard King, Program Chief for Recreational and Commercial Fisheries, Dep't of Natural Resources (Mar. 8, 1988).

31. 261 Md. 585, 276 A.2d 200 (1971).

ties. Second, most of the Chesapeake Bay's problems simply remain beyond the current or envisioned political-legal system's ability to solve them. Those who are still optimistic about our ability to save the Bay should read the final report of the first modern Bay conference held in 1968.[32] It posed five basic policy questions which, had they been clearly answered, might have made it unnecessary to gather fifteen years later to plan one of history's largest environmental salvage operations. The questions were:

(1) how many people do we wish to house on the shores?;

(2) how many tons of food do we wish to harvest, and what kinds?;

(3) how big a ship do we wish to accommodate (implications for dredging and dredge spoil disposal)?;

(4) how many pleasure boats will we be operating?; and

(5) how many acres of wetlands should we preserve?[33]

With the exception of wetlands, soon after protected by law,[34] we have not yet begun to answer any of those questions. In fact, we are only beginning to recognize them as legitimate. How big? How many? How much? These questions seem almost to paralyze us, because they suggest limits to our pursuit of the best of both worlds. They confront a faith in perpetual progress reinforced by nearly two millennia of a Judeo-Christian tradition that sees the earth as planned for the benefit of humankind.

Will we save the Bay? We will keep trying, but "saving the Bay" can become almost a state of grace, like tithing, allowing us to proceed comfortably with business as usual in the rest of our lives. We must broaden our definitions of environmental quality to include far more than the standards set forth in Clean Water and Clean Air Acts. We must fundamentally re-examine our striving for the best of both worlds, for numbers without limit.

Where do we start? What follows are some guidelines, which should be seen as subjects for serious debate, rather than finished concepts. We need to agree that our current framework for protecting the Chesapeake Bay environment is inadequate. We are at risk of winning the battles, *i.e.*, meeting pollution laws, but still losing the war, *i.e.*, creating an uninhabitable environment. Similarly, environmentalists and environmental managers need to be honest with the public about the limits of our Bay-saving capability. We need to

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32. PROCEEDINGS OF THE GOVERNOR'S CONFERENCE, *supra* note 21.

33. *Id.* at I-6.

34. *See* MD. NAT. RES. CODE ANN. §§ 9-101 to -105 (1983 & Supp. 1986).

accept the fact that we are inevitably going to continue to change our natural surroundings. We must, therefore, concentrate on instilling the highest quality environment into the changed landscape rather than vigorously opposing change and protecting wilderness.

Even with this in mind, it still seems crazy to lavish environmental protection funds on the Bay waters around Kent Island, where people boat occasionally, while allowing the most rampant type of unaesthetic development to occur all along the highways of Kent Island, where the population spends most of its time. It would make just as much sense to spend Maryland's open space monies (approximately $30 million a year) on a project to make the land lining Route 50 more aesthetic, than it would to spend the monies on the acquisition of a remote mountainside in Allegheny County. Instead of trying to decide which idea is better, we should try to adopt both.

Having only lately learned to look at the Bay's environment in the context of its entire five-state watershed, we now need to superimpose on that watershed map the lines that divide it into more than a hundred independent decisionmaking units—the counties. For the public good, regulation of water over the watershed has been delegated to the state and federal governments. Land use decisions, however, remain the province of town and county governments. While none of these local governmental bodies wants its water to end up like the Baltimore Harbor, none of them are willing to give up the power to use their land just as intensively as the state's largest city.

Along with the knowledge of how intimately and extensively land use affects water quality comes the almost agonizing recognition of a fundamental irony of public environmental policy. We hold the waters and their denizens as a public trust, to be held in stewardship for future generations; meanwhile, we allow the surrounding land, 64,000 square miles of watershed, to remain a free-market commodity, whose highest and best use is largely determined by the short-term economics of individual gain.

This reminds me of the current proposal of a developer to build a hundred luxury condominiums on little Smith Island, an internationally known and loved watermen's village in the middle of the Chesapeake Bay. Smith Island is, of course, changing, and it will continue to do so as young people leave and erosion encroaches. But with a little creative effort by local and state governments, we will probably find uses for the land profitable to both the developer and the island. Currently, there is no mechanism to attempt such efforts, and that is a pity. There are many areas of the Bay region

just like Smith Island that have developed environments so unique they are worth preserving. State subsidy and intervention, if necessary, should protect such areas from dramatic departures from their traditional lifestyles.

One example of Maryland's efforts to preserve such areas is the Maryland Critical Area Law,[35] the most far-reaching piece of state legislation to emerge from the 1983 Bay Conference. This law has upset the land development community in Maryland, perhaps in part because, in contradistinction to feats of engineering like Blue Plains, it is a decidedly nonlinear approach to safeguarding the environment. The State has designated a one-thousand-foot strip around the edges of the Bay and its tidal tributaries as a "critical area."[36] Within this area, in all the remaining undeveloped areas of the shorefront, the legislation provides for severe restrictions on developmental activities. These restrictions apply even to those areas that are not yet plagued with environmental problems, so that problems never develop there.

The Critical Area Law is very controversial and the next decade will undoubtedly see many attempts to repeal or chip away at the concept. On the other hand, many people are convinced it is a concept that must be expanded to the whole state, not limited to a thin fringe nearest the water, because our progress is expanding to the bursting point behind that fringe.

It is rather ironic that the Critical Area legislation has to justify its dramatic rezoning of 10 percent of Maryland's land surface solely in terms of helping water quality and preserving wildlife habitat. All the law's sponsors agreed it would have been infinitely more difficult to pass it in the name of enhancing human enjoyment of the shoreline. But almost everyone I have spoken to who supported the law has first and foremost waxed enthusiastic about how much it will mean to the people, now and in the future, to enjoy an undeveloped waterfront. There is a lesson to be learned. It reminds me of the comparison an American Indian chief once made between the way his people and the white race regarded the environment. The former considered it with their hearts, and the latter with their heads.

I fully realize the difficulty in letting our hearts rule our heads in the formulation of modern day law and policy. But before we begin to make decisions about our environment, maybe we should first take a good one-or-two-day drive through Maryland, paying particu-

35. *Id.* §§ 8-1808.1 to -1808.3 (Supp. 1986).
36. *Id.* § 8-1807(a)(2).

lar attention to what is happening to our countryside. We should look around and ask ourselves where our environment is heading. It might make us feel a little heartsick. Then maybe we will agree that we need to think of the *whole state* as a "critical area."