

POPULATION AND WATER IN CALIFORNIA

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Abstract: The California State Water Plan is discussed as the latest example of anti-ecological use of water. The basic issue of this scheme is whether Los Angeles should continue to increase at the expense of the rest of California. There are indications, as Mary Austin predicted 40 years ago, that the land is beginning to speak against Los Angeles. Unfortunately, the people in charge of programs of such potentially great ecological damage as the State Water Plan lack the necessary background to understand what they are doing, and they would benefit from expert advice from professional societies as well as individuals.

Although I was not born in this part of California, my earliest memories are of Whiskey Creek near North Fork, a few miles to the east of Fresno, and our family's old homestead is now beneath the waters of Lake Millerton, one of those farm areas withdrawn from agriculture by "non-agricultural" uses. Thus, I feel that I have had a life long concern for water problems in California and can establish myself as an expert witness on these matters from an early age. We were a family of staunch Methodists, many of them preachers, and while I am from the black sheep strain I think it appropriate to offer a text from the 24th and 34th chapters of Isaiah:

The earth also is defiled under the inhabitants thereof;
 because they have transgressed the laws, changed
 the ordinance,
 broken the everlasting covenant.

Therefore hath the curse devoured the earth,
 and they that dwell therein are desolate:
 therefore the inhabitats of the earth are burned,
 and few men left.

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 And the streams thereof shall be turned into pitch,
 and the dust thereof into brimstone,
 and the land thereof shall become burning pitch.

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From generation to generation it shall lie waste:
 none shall pass through it for ever and ever.

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But the cormorant and the bittern shall possess it;
 the owl also and the raven shall dwell in it;

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And it shall be a habitation of dragons,
 and a court for owls.

The California State Water Plan, which was denounced by the previous speaker, A. Starker Leopold, as making no ecological sense, is only the latest in a series of controversial approaches to the use of water in California. First it was the hydraulic mining controversy; hydraulic mining debris, brought down upon the fields by streams, was our first great pollution problem. It had to be stopped because it threatened the existence of agriculture. The most dramatic episode in California's many water fights, at least so far, was the fight between the people of the Owens Valley and the City of Los Angeles, which involved dynamiting aqueducts and the dire prophecy of Mary Austin that no good would come to Los Angeles from this denial of ecological verities. Most of these matters have been adequately reviewed in Ray Dasmann's The Destruction of California.

Now we have the State Water Plan, which seems to have been designed without any clear idea of the needs or value of San Francisco Bay as an aquatic system, or of the Delta which lies in the center of California's system of waters. The tradition of minimizing or ignoring the effects upon fish life and the ecological balance of our waters is long standing. It dates back to the first planning for alleviating the effects of salinity invasion in the Delta. Shortly after the dry years of 1919-20, during which marine borers moved upstream past Antioch, an imposing plan to prevent salinity incursion into the delta by an actual barrier was drawn up. This was reported in Bulletin 22 of the California Division on Water Resources, two volumes of thickset type and numerous diagrams, published in 1929. Exactly six printed lines are devoted to fish: a reassuring statement that there will be a fish ladder, and if it doesn't work, the fish can always go through the locks with the ships. In Bulletin 28 of the same agency, published in 1931 and titled "Economic Aspects of a Salt Water Barrier", some 13 lines in the text are given over to the fish problem, with the admission that "a barrier might prove to be a serious detriment to the fishing industry." In the appendix, however, there is a report from the Division of Fish and Game which concludes:

A salt water barrier would seriously interfere with the free migration and propagation of the anadromous species of fish--salmon, shad, and striped bass-- which enter the bays and river channels to spawn. It also would materially change the brackish areas of the

shallow waters over the flats and in the sloughs of the upper bay and possibly eliminate the minute marine life which furnishes the basic food supply required by the young salmon and by both young and adult shad and striped bass. Therefore, it is concluded that a salt water barrier would have a detrimental effect upon the fishing industry in upper San Francisco Bay and the lower channels of the Sacramento and San Joaquin Rivers.

It was probably this position as much as anything else that resulted in the shelving of the Salt Water Barrier. It must be said that the conclusion is equally true for any serious alteration in the natural patterns of water flow in the San Francisco Bay Delta system. Throughout the development of our use of water there has been very little attention to ecological implications by engineers and politicians. Time and again the pattern of Shasta Dam has been repeated: First the plans are made, the project funded and begun, before the need to study, and make adjustments for, the natural renewable resources represented by fisheries, were even considered. In the Delta it has been possible to proceed with even less concern for the environment by installing the big pumps at Tracy, pulling water out of the Delta before anyone clearly understood the implications of this procedure. Now, so much harm has been wrought by reversed flows and diversions of water that it seems to some that the only possible way to remedy all this is to by-pass the delta entirely with some such structure as the Peripheral Canal. It might possibly work - if controlled by biologists concerned for maintaining the ecological balance in the Delta, but all indications of the history of water use suggest otherwise, that those concerned with the environment will have a minor role in the operation of the water works. Furthermore, we do not at this time have the knowledge to operate this system, especially with the additional complications of the San Luis Drain and the vast sewage works for the Bay and Central Valley region proposed by the Kaiser Engineers. This veritable plumber's apocalypse assumes that the chief function of the waters of the Bay and Delta region will be the dilution of "wastewaters." In this scheme it is implicit that wastewaters will be discharged directly into the delta and the bay, while the more desirable water will be diverted through the Peripheral Canal to serve the greater good of the greater good of the greater population of Los Angeles and the second class soils of the western San Joaquin valley. The salt bearing water from the irrigated fields would be recycled northward into the San Francisco Bay system, to be added to the loads of sewage, chemicals and increased heat from power plants. It is obvious, however, that the sanitary engineer's motto "The solution to pollution is dilution" is an unacceptable philosophy to apply to the complicated ecological system of Bay and Estuary and nearshore ocean, (some of the major outfalls would be in the ocean along the San Mateo County coast). I have heard it said that the concept of evaluating wastewater effects by use of ecological indexes as advocated by the engineers who have studied San Francisco Bay instead of relying upon tests for concentration of some single or few organisms is a great conceptual step forward, and it may well be, but if the end result is to treat all waters not being diverted out of the system as a vast toilet bowl, the concept serves a sad end.

What may be "acceptable" to the waters in terms of engineers' indices may still be "unacceptable" to many natural systems, and the proposal to use the ocean's alleged inexhaustible sink is made without any sound oceanographic information for the areas that would be affected.

This system we are tampering with is a series of three large basins, San Francisco Bay, San Pablo Bay and Suisun Bay, in which the waters of the streams of the Central Valley, draining an area of more than 30,000 square miles, mix with the oceanic waters of the Golden Gate. Before they enter the basins, the fresh waters pass through a deltaic system of channels and marshes which provide, as in all delta systems at the interface between fresh and salt waters, a rich environment for wildlife and fishes. It must have been an extraordinarily wonderful environment before civilized man descended upon it, but we have no great naturalist's record of what it was really like. Two hundred years ago, before it was altered with levees and marshland filling, this system of bays and marshlands occupied an area of more than 1300 square miles. The marshlands alone were more than 840 square miles, of which 500 consisted of delta marshlands. The surface area of the bays and channels was about 460 square miles at half tide. The average amount of bay water moved across the marshes by tidal action (exclusive of the delta) was more than three billion cubic feet. Salmon, native perch and various minnows abounded in the water and the air was filled with waterfowl. The delta was a vast area of channels, tules and patches of higher ground inhabited by scattered Indian villages, while along the shores of the bay, then as now, the main population was concentrated. The Indians of the bay lived by food gathering and crude fishing and carried on a lively export of mussels to the people of the delta and its adjacent higher grounds. No one is certain, but the native population was perhaps between 12,000 - 20,000 Indians. This was the original human carrying capacity of this area, and this primitive culture had been flourishing for perhaps 3,000 years, to judge from the size and contents of the shell mounds of San Francisco Bay.

The Indians were the first to go, overwhelmed by that most anti-ecological of all cultures, that of Renaissance Spain. But the newly indigenous culture of eastern North America was no better, as far as the environment was concerned, except that in our own time it shows signs of realizing (as that of South America is yet to do) that we cannot live contrary to our environment. In any event, in the two hundred years since European civilization has been in San Francisco Bay, the delta lands have been diked off so that the area subject to tidal flooding has been greatly reduced, and a large part of the area of San Francisco Bay has been reduced by diking of salt marshes and filling. The present surface area of San Francisco is said to be about 425 square miles, but this must refer to the original mean high water level. We are always encountering these somewhat different figures, on shifting bases. In any event, there has been a great deal of change, including the shoaling of Suisun and San Pablo Bays from hydraulic mining debris. All these changes have undoubtedly reduced the productivity of the system, along with the changing of water quality by altering streams and adding substances, both inhibitive and stimulative. How much, we cannot say, but perhaps the greatest effect on the system has been that of diversion of water from it. To these physical or chemical changes we have added biological changes. Many of

them perhaps yet to be ascertained.

The most spectacular of these was the addition of striped bass, shad centrarchids and catfish to the fauna. These were conscious additions (along with carp, a sort of half-witted addition, it might be said), but we have also added the asiatic clam Corbicula and the estuarine shrimp Palaemon macrodactylus and the small eastern crab Rhithropanopeus harrisi.

The most significant changes in the environment, however, have been those associated with the development of agriculture in the delta area. How much this development of the rich soils of the delta, with the levees, drainages and restriction of open water have affected the primitive productivity of the waters of the system can never be estimated. There may even have been enhancement, and certainly the great potential of this region for recreation, both fishing and boating, may be even more important than agriculture in terms of turnover of funds and the incalculable returns to the human spirit. We have plenty of areas like Los Angeles, but only one delta in California. When plans were first promulgated to change the environment of the delta, one of the benefits no one questioned was "improvement of navigation." This was not easy to measure directly, just as recreation is not easy to evaluate, but navigation was a sacred cow. As far as inland California is concerned, that sacred cow was run over by the trucking industry and is now a minor consideration in our planning. But the value of an open, reasonably unaltered environment is becoming a major consideration.

There has as yet been no really adequate study of all this, because there has been too much demand on limited resources to study the more obvious things that may be affected by further changes in the system. There are no uniform standards of research or procedure, even within a single agency. The Kaiser Engineers shifted base from year to year so that they cannot make valid comparison of changes or estimate trends. Somewhere along the line the elusive concept of TDS - total dissolved solids - was introduced, and measured in one part of the Delta by resistance and in another by hydrometer. Whatever TDS may really be, such procedure, if demonstrated with molasses in a hearing room with a salinometer and a hydrometer, would utterly confuse the lawyers and hearing officers.

It would seem that this whole complex system is being entrusted to (or appropriated by) people who have as little understanding of what it is about and how it operates as I have of managing a bank, and what banker would allow me, an automatic transposer, to occupy a teller's cage? How can we have a sensible state policy for one of the most complicated water systems on earth when we would treat its key component, the Delta, as a sort of inconvenience that interferes with orderly transfer of water, a needlessly leaky part of the Los Angeles aqueduct?

(An interesting alternative to all this has been proposed by Frank Stead, in the Winter 1969/70 issue of Cry California. Perhaps it will be given serious study, and there is some hope that we may make the decision for fish versus

people in the light of the announcement on February 8 that the Sespe Creek project has been suspended because of its potential danger to the last of the California Condors. So, perhaps, a few birds are indeed more important than water is to people in Ventura County.)

The basic issue of the State Water Plan, aside from the complications of pollution control in the San Francisco Bay area, is whether or not Los Angeles should continue to flourish at the expense of the rest of California, and ultimately, of the entire continent. It is, as Ray Dasmann has put it, "difficult to find any really good reason why the city of Los Angeles should have come into existence." However, it is there, and its ultimate fate was clearly predicted by Mary Austin from her bitter experience in the Owens Valley controversy, and restated by her many years later:

Twenty years ago, when the city of Los Angeles began to divert the water of Owens River, I made two prophecies. One of them has, within a few months, been fulfilled by the dynamiting of the aqueduct by the Owens Valley farmers, and the forced arbitration over that wholly illegal act forced on the city by the profounder moral right of the farmers, so profound that even Los Angeles dare not publicly ignore it. The other prophecy, made at that time, was that it is not in human society to resist the deep-seated factors of cultural evolution. The prophecy was to the effect that if the city evaded the rights of the farmers, presently the land itself would speak. This is not poetry. It is not even prophecy in the sense that it proceeds from any supernormal or hifalutin faculty. It is a plain deduction from known facts and measured forces . . . which enables me to say with reasonable confidence that if the Boulder Dam project is hurried through on its present basis, it will eventually be found that it will all have to be remade in less than a hundred years, made again in conformity with realities not taken into account by the present projectors.

(The New Republic, April 8, 1925, p. 186)

It would be interesting to have Mary Austin's comments on the dying pine trees of the mountains around Los Angeles, the departure of 10,000 people a year on doctor's orders, and the whole vast cancerous growth (twenty five percent of it beneath pavement) that is modern Los Angeles. She was indeed correct. The land is speaking against Los Angeles. But Mary Austin was not taken very seriously on this subject then. Now, of course we are questioning the divine right of Los Angeles to all it can get. We shall have to reverse that belief and the pattern of water use set in 1927 by the Colorado River Conference, which is still inadequately understood in many parts of the northwest, where Los Angeles plans to go next for water, although Mary Austin was alert to the danger: "There is probably no one at that conference who does not fully realize the national reach of the problem and its almost fatalistic relation to the American future. The one thing most needed to aid them in coming to decisions

which will have the good of the country in full regard, is that the country itself should awake to a proper share of its own interest." (The Nation, November 9, 1927, p. 512). The only thing that has changed is that we now know that such metropolitan agglomerations as Los Angeles in water deficient regions are not in the best interests of man's survival on earth. This has become obvious; the prophecies of Isaiah and Mary Austin (she would not have been dismayed to be included with Isaiah) are approaching fulfillment as all but members of the L. A. Metropolitan Water Board and the Colorado River Association may clearly see.

So the question is whether we need a vast project which will make it possible for Los Angeles to grow larger, or whether we should not consider the alternatives of dispersed population and, of course, setting limits to our population. If we do not, we will in time find out what it means to exceed the carrying capacity of our environment: the issue will be our survival as a species. This is an issue in which we are all involved.

Mr. Arnett of the Department of Fish and Game has stated that he does not think that professional societies should take active part in controversies, even when related to their professional field of competence. In this matter of the State Water Plan, however, we have a confrontation between the policy of state agencies and ecological concerns that may affect all of us. Starker Leopold has made this plain in his remarks about the State Water Plan. It is up to you what you want to do about this as individuals, but as the President of the Western Society of Naturalists I can assure you that we as a Society have taken and will take public stands on issues germane to the intent and purpose of our Society. For example, we are concerned, as a society consisting primarily of academic biologists, about the danger to the fauna of desert springs posed by plans to develop irrigation in the Amargosa Desert. We will take a position in favor of preservation of endangered species. In these controversies we need all the help we can get and we would hope that all of you will follow your conscience. Another aspect of this problem that you should remember is that your professional education has cost a lot of taxpayers' money and they have a right to expect more from you than silence, where knowledge and policy disagree. (I might also have said that a professional society should be able to decide its own business without advice from an official whose primary concern is policy, but perhaps I made it obvious at the time. It should also have been obvious that he did not want any professional society to go on record against such a controversial matter as the State Water Plan. However, it may now be difficult not to take sides in view of the increased tempo of the controversy, engendered in part by the full page advertisements by Mr. Alvin Duskin in the San Francisco Chronicle and Los Angeles Times of February 2 (Figure 1), just three days after the Fresno meeting. The issue, California or Los Angeles, is now clearly before the public.)

As for San Francisco Bay and all its tributary waters, it seems certain they cannot survive three thousand years of our exploitive culture as they did the unobtrusive, ecological use by the Indians. It is by no means certain that this system can withstand even another hundred years of our usage. The meaning of our times is that we realize that the earth cannot support indefinitely human

Figure 1. Several thousand coupons from this advertisement were mailed to the Governor and other state officials indicated. A similar advertisement, differing in detail, appeared in the Los Angeles Times.

Alcatraz, The Bay, Water And The Imminent Death of California

FOUR MONTHS AGO, being personally outraged over the plans for a mindless commercialization of Alcatraz, I placed an ad in these pages.

To my amazement, it produced a tremendous public outcry and we were all treated to the spectacle of officials trampling each other in a race to deny that they had ever voted the way they had in fact voted.

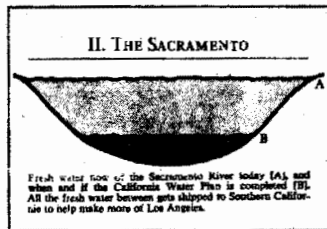
The Hunt Plan for Alcatraz is dead, and now it seems that the island will either become a park (which almost all of the 8,000 respondents wanted it to be) or else it may be given to the Indians.

Both solutions are acceptable as far as I am personally concerned, the more so because my own preference—a bird sanctuary—has begun to seem to me inadequate. Recent terrifying facts have made me realize that the birds may soon have nothing to eat from bay waters (dead fish) and when the situation for birds, and trees, and by the way for people is reaching the point where we are all as nearly extinct as the brown pelican.

In order to save Alcatraz for wildlife, it is necessary to keep life in the Bay, and if any of you think that struggle has been won by the Save the Bay people then you haven't heard of a creation called The California Water Plan. Listen to this:

1. The idea is to take water which is presently in ample supply in Northern California and move it south, via one of the most complex (and expensive) series of canals, dams, pipelines and tunnels ever accomplished in the world (see map). The result will be terrible destruction to scenic areas, but that's the least of it.
2. The water is to be used to encourage new industry and more population on the presently undeveloped outskirts of Los Angeles. In other words, to make more Los Angeles.
3. The water will produce profits for (a) real estate developers eager to turn the countryside into suburbs (b) industry, which wants the water for development, and (c) some mechanized agriculture, principally subsidized cotton.
4. On the other hand, the accelerated development

up here. After the water is diverted, the fresh water outflow of the Sacramento River will be reduced from 18 million acre feet per year to 2 million. (See Box II.)



6. With less fresh water flowing through the rivers and delta, the pesticides, nitrates and industrial chemicals that wash into it will have much greater destructive power than even now. They are likely to kill off millions of fish (as happened recently in Germany), species which eat the fish, plantlife along the shores, birds which need the plantlife, and finally, the marine plankton along California's continental shelf, which produce 70% of the oxygen we breathe.

It's a chain reaction. Everything needs the next thing, you see; that is the miracle of nature. We are busily destroying the chain, forgetting that if it is disrupted, so are we. A few too many chemicals in the plankton, or the fish and birds we eat, and we can forget Alcatraz forever.

7. These same chemicals flow into San Francisco Bay and eventually we will have a bay as dead as Lake Erie. Which is why what happens to the birds on Alcatraz starts with what happens to the California Water Plan in Sacramento. But there's one other little point, Poison Lake.

8. As it heads south some water will be used for irrigation. Eventually this water will be leached from the land into a giant ditch (San Joaquin Drain) because it will be so filled with nitrates and pesticides that it could begin to poison the soil.

9. Originally, the plan was to take this poisoned water and, by a marvel of engineering creativity, dump it back into San Francisco Bay. This technological advance has since been discredited, but as nobody can figure just what can be done with such a deadly water supply, the solution that's been devised is this one: collect it all in what the engineers call Kesterton Reservoir, but I call "Poison Lake," and then leave it there until someone figures out how to clean it all up. That's the solution!

10. Now all this imaginative thinking is not free. You and I voted in 1960 (during the administration of Governor Brown) to pass the \$1.75 billion Water Bonds Act to execute this wonderful thing. What did we know? But this water is not for drinking, it turns out, and the real cost is more nearly \$3 billion and guess who is going to foot the bill for the difference? You know the answer. (See Box III.)

11. There's a lot more to this, of course, than I can possibly tell you on this page, and I'm not the expert anyway. If any of you want the full

technical story, please check the appropriate box above, and I'll tell you where to find reports which all discuss alternative less expensive and less destructive ways of getting water where and when it is really needed, and which also contain reports by scientists who are experts and who will scare you more than I have.

It should be obvious that the time for placing prime importance on commercial development of anything in this state has long since passed. We have already reached the point where life in California is hardly the pleasant experience it used to be. What's the use of a nice house in the countryside when there's damn little countryside anymore? Where do you go to escape people or traffic or aircraft noise? Or to find unpoisoned air, or food that's not killing you slowly as you eat it?

In Los Angeles, things are so bad that mothers are keeping their children indoors to keep them from breathing the air. (In Tokyo, by the way, they have vending machines which provide a few minutes worth of oxygen. Put in a coin, out drops a face mask. That's what it's come to there.)

Industrial growth may have been a good idea when California was an underdeveloped state, but now it's an overdeveloped state. We cannot afford any longer to give commerce and industry

first say-so over the environment, not if we once get it in our heads that we are also wildlife; we are only one strand of the web of life on this planet and in order to survive we have got to save everything else.



The California Water Plan will accelerate development at a time when we're choking from what we already have. Just because, in our naivete, we supported it ten years ago, does not change that it's a disaster in today's world and should be scrapped.

A critical element of the project—The Peripheral Canal—is now on Gov. Reagan's desk. Hailed by the State as a "compromise," this canal would divert water from above the Delta instead of from the Delta itself which makes it about as much of a compromise as one bullet in the heart instead of two. The entire plan is out of date and all work on it must be stopped, if we want a livable California.

Please join me in trying to halt this project, by mailing the coupons above and encouraging others to do likewise. Thank you.

Alvin Duskin, 510 3rd St., San Francisco 94107



I. THE POLLUTION "BODY COUNT"

THE BROWN PELICAN THE BAY CRAB THE BAY SHRIMP THE PINE FORESTS

Here you have some lovely pictures of living things which are on the way to extinction. Well, Ponderosa Pines are not going to be extinct, very soon, but 1,000,000 of them in the San Bernardino National Forest may soon be dead from smog. The figure is a little more definite for the peregrine falcon and the brown pelican. They will be extinct when the current generation dies. The pelicans have eaten enough fish contaminated with pesticides that as a result, when they lay eggs, the shell is not thick enough to support its own weight. It cracks open and all the offspring die. No new generation. We don't know what happens to the human reproductive process from digesting these same fish, but it isn't good, that much we know.

opment will dramatically increase smog, traffic, people and poisonous chemicals. It will encourage everything bad about Los Angeles. While helping some business it will do so at the expense of 99% of the population. 5. So much for L.A. Here is what will happen

civilization as we have developed it in North America, and that we must revise our values if we want to continue to live on earth as a species. We will, or should now be, asking such questions as shall we try to keep the Condors at the expense of curbing our own numbers, and shall we read with candles rather than kilowatts?