SCIENCE AND PUBLIC POLICY:

THE TWAIN MUST MEET

The Wolfle Lecture - University of Washington

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May 16, 2002

People think and complain a lot about government, but practically no one complains or thinks much about science, even though arguably science has more impact on our lives, for good or ill, than does government. Maybe it's because science seems to be an aspect of nature itself, like mountains and seas. No one gets exercised about mountains being high or seas being wet. Or maybe it's because government casts an unflattering light on the human condition; government is us, and we often don't like what we see. The historian, Barbara Tuchman once observed that as you look through the long course of history, at all the civilizations that have come and gone, you find that despite their great differences in culture and achievement, whatever different things they did best, they did the same thing worst, and that was government. You look at an historic culture that's perfectly competent in

art, in commerce, in architecture, and if you were to ask them, how they govern themselves, you would get something like, "we give absolute power to a dimwit because he's the oldest son of the homicidal maniac who used to be in charge."

Things are somewhat better nowadays, of course, since it's generally agreed that choosing leaders democratically is superior to relying on a genetic lottery, but there is still something to many people deeply dissatisfying about government, especially about remote national government, and especially about the way that national government deals with natural resource and environmental protection issues. How can this be? Despite what people think, we are not in general ruled by dimwits anymore. We are the most advanced scientific nation in the world. Thousands of highly skilled and dedicated people are struggling with these environment and natural resource issues every day. Why can't we do better?
Well, I think we probably can, but in order to do so we are going have to change the way science and public policy are brought together to address these problems, and that's mainly what I want to talk about this afternoon.

Let's start with how we got here. Originally, it was some authority – a Caesar, a monarch, a noble - that determined what was good and what was

true. Then came the period we refer to as the Enlightenment. Science arose to determine what was true, and when people wanted to pursue the good collectively, they came to accept that democratic forms of government were worth a try. Modern science and modern democracy are both children of the Enlightenment, but there's always been something of a sibling rivalry in their relationship. That's because among the good things it produced, the Enlightenment also brought forth one of the most toxic ideas in human intellectual history, that being the notion that a bunch of smart people could figure out a political system that could answer every human need, a system that had the authority of science behind it. Naturally, when people came to realize how really wonderful such systems were, they would democratically choose them, but in the meantime, they could legitimately be imposed on the people, by force. After all, who can argue with scientific truth? As we know, the monstrous political systems that convulsed the century just past were one result. As we also know, democracy is a perilous game, and its' occasional failure is no surprise. In fact, in the opinion of practically every political thinker in the western tradition, from Plato on down, democracy leads inevitably to anarchy and anarchy to despotism.

We were more fortunate in our own country, largely because the democratic instinct is so strong here and because our society is so solidly grounded in the rule of law. In turn, the law is grounded in the assumption that ordinary people can make the often complex judgments necessary to an ordered state. Thus we have juries, and legislatures. But law is also presumed by some to be based on reason. Oliver Wendall Holmes said, "it was based on experience." Blackstone before Holmes said, "if the law is not rational, it is not the law." Now, science is the epitome of reason. As the decisions that a democracy must make become more complex than deciding whether the guy robbed the bank or who should pay taxes and how much, science increasingly comes into the house of law, into the house of democracy, and starts throwing her weight around. This has to be somewhat uncomfortable, because science is not democratic. Scientific issues are not decided by vote. If all the scientists in the world believe one thing to be true, and a single scientist demonstrates that it's not true according to the protocols of the scientific method, then all those scientists have got to change their minds. This has actually happened from time to time in the history of science, and the people who have shown all their peers to be wrong are hailed as heroes. Everybody thought the planets had to move in circles, and Kepler showed their orbits were ellipses. Everybody thought

time and space were absolute, until Einstein showed they were relative. Everybody thought that the genetic material had to be a protein, but Oswald Avery demonstrated that it was really DNA.

This has been going on for a while, so that democratic policy-makers have become used to turning to scientists for answers, often, it has to a be said, in a grudging way. They want the scientists to come in, give them a simple answer, and leave. But it doesn't work that way. To understand why, we have to take a closer look at the nature of science and what scientists actually do.

Science works primarily by analysis, the breaking down of complex problems into smaller ones. The goal is to develop a problem that's susceptible to an experiment or an observational regime involving a relatively small number of variables. If the variables are controlled or easily determined, the scientist can be accurate and precise. We know very exactly where the planet Mercury will be twenty-five years and a day from now, and what happens when we mix two chemicals together under specified temperature and pressure.

Science is also statistical. That is, scientists typically don't say that something is true, but only that something is true subject to specified levels of uncertainty. For experimental data, scientists like the uncertainty to be down around the one per cent level, which means that you'd expect to see your data resulting from chance alone only one in a hundred times. It is important to understand that this is not what policy-makers usually mean by uncertainty. Policy makers are paid to make decisions on scant data, and often they are in circumstances where a decision simply must be made. In those situations an eighty-five per cent chance of being right may look pretty good. But they are not going to get that kind of estimate from a scientist as science. Scientists are paid to say this is what we know under the statistical rules governing science and this is what we don't know. They're not really supposed to guess**.** If they do, their opinions are no more valuable than those of any informed and educated citizen.

What separates actual science from the opinions of people who happen to be scientists is an elaborate process of peer review and publication. Science is literally that which is published in peer-reviewed journals. Unfortunately for the policy-maker, this is always a moving target. Dr. Smith publishes a result, and Dr. Jones publishes a conflicting result.

Smith replies with a letter to the journal and additional data. Then Dr. Brown weighs in with a paper that demonstrates that both Smith and Jones are right in some respects and wrong in others. Over time, the truth comes out, Yes, the planets really do revolve around the sun in elliptical orbits, and everything really is made of atoms. But time is just what the policy-maker often does not have. They need answers today, or in any case before Smith, Jones & Brown, can work things out.

So policy-makers are often in the position of asking scientists to be un-scientific, thus obviating any logic to be found in consulting scientists at all. They do this for two reasons. First, because science has a reputation for the pursuit of truth without fear or favor. In contentious policy wrangles they may be seen as neutral referees. Second, nothing in our intellectual culture matches the prestige of science. Scientists sent men to the moon, scientists have cured some of the worst plagues of humanity--surely they can tell us whether or not to build this little dam.

But often they cannot, and especially not when things like dams are involved. There is no policy area more fraught with problems involving the inclusion of science than environmental protection and resource

management. And it's easy to see why this is the case. We saw that science is most precise when variables are few and well controlled. But the environment has a vast number of variables, and they are nearly impossible to control. That means that environmental questions are very hard to answer through controlled experiments. We can collect data and do computer simulations, of course, but these are subject to criticism by political groups offended by their results. It's always possible to claim that something crucial was left out, because something crucial is so often left out. Yes, it is possible to develop a consensus about a particular scientific issue—global warming for example—but this consensus is never going to be as convincing as the consensus that the planets rotate around the sun. The environment is just too complex, and moreover, in environmental science we start to push up against the limits of what can be known about the world. Complexity at a certain level introduces us to the universe of chaos: we know pretty much what causes lightning, for example, but we will never be able to predict where it will strike.

And environmental science is particularly hard-pressed to answer questions of just the type that policy-makers most want to ask, questions like "what will happen to some endangered animal if we do thus and so?" Or

"what is the safe level of a certain pollutant?" To these and similar questions, science can only give uncertain answers. But saying that answer must be uncertain is not the same as professing total ignorance. We know a lot, and that knowledge should be used to enlighten decisions. Unfortunately, we have historically lacked an institutional theater in which science and policy-making can come together efficiently, and produce more light than heat.

In order to understand why this is so, we now must take a look at the origins of the legal institutions that we've devised to protect the environment and manage natural resources. There are three distinct streams of development in our legal institutional history. The first of these is the common law and the tort process. It was an early discovery that airborne pollution causes damage to life and property. People so damaged naturally sought relief in the courts, and here judges discovered a problem. A polluting factory is not a mere nuisance; it is the source of economic livelihood for its community, and judges have to live in communities, too. So beginning in the 1950s, some courts began turning to formal science advisory boards to determine whether there was a level of pollution below which damage could not be found. One of the first of these cases was

decided here in the Pacific Northwest, when a farmer sued smelter and refinery operators for crop damage. In that case and in many others, courts and their science advisors found that there was a safe level of pollution, below which damage claims would not be entertained by the courts. The farmer lost. It's often forgotten, especially by dedicated government bashers, that the first environmental standards established by courts were a blessing to industry, or at least the lesser of evils, the idea being that putting in pollution controls is cheaper and more predictable than losing a lawsuit.

Standards were also being established through the second stream of development, which was public health, by far the oldest source of environmental law. Governments have been legislating to protect the public health since antiquity, and until the middle of the last century such controls had been local in origin and impact. But air and water pollution which respect no geographic or political boundaries required national standards, and these were established, together with the administrative apparatus for issuing detailed regulations and enforcing them. Eventually, almost all of these programs were combined into the Environmental Protection Agency. The EPA has appointed various science advisory boards, which have labored mightily over the past thirty years to develop a sound scientific basis for

federal regulations. It has not been easy. The federal regulatory process is painfully slow, and its products are invariably challenged, most often for the science on which they're based. The affected parties can hire scientists, too, whereupon we are treated to the unedifying spectacle of scientists duking it out in a courtroom, any pretence to neutrality quite abandoned.

Finally, we have the vast system of governmental control and ownership that is designed to protect the American landscape and conserve our natural resources. This was largely a late 19th Century development, stirred by the observation that if things were left entirely to private interests, the national resources would be despoiled and wasted and its priceless scenery ruined. In short order came the national park system, the national forests, the bureau of land management, the federal water projects, and decades later the endangered species act. The political philosophy behind all of these programs was that national resources belonged to all the people of the nation, not just the people who happened to live in the vicinity and might derive their livings from them; and further, that the people living near them—largely westerners—could not be trusted to manage the resources. That was the job of scientifically-trained experts, who had no economic stake in the resources and could therefore be trusted to manage them for the

good of all Americans, present and future. This arrangement was, and remains, profoundly undemocratic. If scientists are considered natural philosophers, which is what they were once called, then the natural resource regime in the western United States is very close to the philosopher kingdom prescribed by Plato, and yearned after ever since by people for whom democracy is too messy and prone to corruption. Thomas Jefferson had their number when he wrote to the effect that if you think the people not enlightened enough to use their powers wisely, the solution is not to remove or restrict those powers, but to enlighten the people.

This we have not done. When I said just now that we have no efficient theater in which science and policy making can come together, I really meant that we have no regular means of popular enlightenment, a place where democratic powers can be exercised <u>in concert with</u> the application of the best scientific understanding. What we have instead are the courts, with their dueling experts and sometimes confused judges; the legislatures, with those same dueling experts and contending interest groups; and the press. The press is where if 300 of the world greatest scientists swear that black is black, some enterprising reporter in search of "balance" will locate the lone scholar willing to testify that black is white. I

exaggerate, of course, because these questions are hardly ever simple, and there is legitimate disagreement in the halls of science. But there has to be a better way. What we're doing now is not working. We are still losing too much of our environment. We are not effectively managing our resources. Everyone is angry with the federal government and discounts its scientific expertise. Why is this so hard?

When we confront a seemingly intractable problem in human affairs, it's well to look toward basic human frailty for an origin, and here we find what I believe is the psychological basis for our situation, what we might call the mutual corruption of science and policymaking. Let's look at the policymaker first. Occasionally, we have a situation in which the policy maker has already made the decision for political or ideological reasons and is simply using science as a fig leaf. That's typically when you get claims that my science is good science and your science is bad. Everyone is for good science. (So far I have met no one who favors bad science.) More commonly, the policymaker genuinely doesn't know what to do, but has to make the decision and wants a little cover. Policymakers don't like to get people mad at them if they can help it. Making a tough decision based on your values is probably the hardest thing to do in public life. Half the people

think your values are cockeyed, and most of the other half thinks that you made the decision because some interest group or others got to you. That leaves your family and a few personal friends to testify how noble you really are, which is not a lot of solace or votes. How much easier and safer it is to declare that science has made the decision! Our science advisory board has told us that green frogs will rain from the sky unless we replace the dam, and while I am personally much more in favor of a tax break or free ice cream, we will have to follow the dictates of reason.

Now, because avoiding direct responsibility for such decisions is so pleasant, policymakers will often chivvy scientists into stepping outside the legitimate bounds of science and ask questions that science cannot answer, either because the data and the theoretical understanding are insufficient, or because the question is not scientific at all. A question like 'what should the ABC Valley look like?' is not a scientific question. Science can tell us what the valley looked like 500 years ago, and can suggest what it will look like in 50 years if current uses continue, but science doesn't do 'shoulds.' To get around this, policymakers often erect general concepts like 'pristine,' 'sustainable,' 'natural,' and 'wilderness.' Then scientists find themselves, knowingly or not, trying to establish measurable indicators of such policy-

based concepts. There is nothing wrong with this per se, but it's an error to think that it's scientific, or value-free. Finally, science is useful to policymakers who would rather not make a controversial decision at all. 'We're studying the problem' is a fine old perennial.

The analog of the policymaker who uses science to disguise or delay a values-based decision is the scientist who departs from science and starts dabbling in policymaking. Scientists are citizens like everyone else, and have the right to weigh in on environmental or any other issues. The problems start when scientists are brought in to render specific scientific assistance, and instead give what amounts to policy advice. I recall some years ago an occasion where I was supposed to introduce a panel of distinguished scientists to the President of the United States to tell him what was known about acid rain. The evening before the meeting I got together with the scientists over dinner and explained that they were only supposed to talk about the facts and not try to tell the President what to do. And they all said they understood and agreed. The next day, of course, no sooner had they sat down in the Roosevelt Room of the White House than they were pouring out advice about how to run everything from controlling acid raid (the <u>policy</u> issue involved) to restoring damaged statuary in Rome. It's the

truth. All to President Reagan's complete and understandable befuddlement. Because of their performance, the control of acid rain (what they wanted) was postponed for about six years. Why, is too long a story for this speech, but that is the truth too.

Their conduct was only human, but it was not helpful. Government agencies therefore spend a lot of time and effort trying to keep science advice in the strict sense separate from policy-making. At EPA we made a lot out of the difference between risk assessment and risk management. Risk assessment was supposed to be a scientific activity that presented a pure estimate of how much risk was posed to health or the environment by the use of some chemical or the generation of some pollutant. Then the scientists were supposed to drop this on the desk of the policymaker and slip away, and the policymaker was supposed to balance this risk against other social concerns, like economic costs or impacts on employment or agency priorities, and make a balanced decision. In practice, it's not so easy to separate the assessment from the management side—there's no Chinese wall, because the assumptions you make in conditions of high scientific uncertainty are going to influence the outcome of the study and the levels of risk you describe. These assumptions can and will be challenged as

improper intrusions of management concerns into the supposedly "pure" scientific study.

The end result of this inter-corruption is that science is de-legitimized in the public eye. Anyone who does not like the policy implications of a scientific study can decry it as bad or junk science. Rationality tends to drain from the system, to be replaced by raw politics based in part on demonization: the pointy-headed Washington bureaucrats or the irresponsible, land-grabbing despoilers or the granola worshipping tree huggers. Science, which is in its essence a program for reaching agreement about the nature of the world, then becomes a mere adjunct to politics. Contending groups review the same literature and by selective interpretation announce that "science shows" whatever suits their chosen policy. In this process the extremes tend to dominate, and so we see a face-off between environmentalists claiming the planet is on its last legs and cornucopian economists who think everything is just fine, or would be if those environmentalists would just shut up.

At the same time, lacking a basis in good information, policymaking is paralyzed. Among the technical agencies, we observe the growth of

what's been called the "conspiracy of optimism." That's when the US Forest Service, for example, promises to each of its constituencies the fullest realization of its values: to the timber interests as much wood as you want, to the recreation interests as much fishing and hunting as you want, to the conservationists as many trees as you want, and to Congress a program that makes money doing all those things. What you end up with, however, is an agency that pleases no one and loses money at the same time.

Well, it's easy to throw up our hands at this point, and say that science is science and politics is politics and never the twain shall meet. But the twain must meet in some more productive and creative way or else we will continue to fail in resource management, particularly here in the west. The consequences of failure are not good, and not just for America. If we cannot, with all our knowledge and political stability and wealth, figure out how to manage our own natural resources for the present and for future generations, how can we expect people in the rest of the world to do it? We need our solutions to serve as a democratic example – and that is still the best way to lead. Otherwise, we are going to lose huge swathes of the natural world.

How could we do it better? First, we have to admit that we side with Jefferson and against Plato. It should never happen that an elite body of experts is going to be allowed to make natural resource decisions in this country. In the end these are always going to be democratic decisions; the real question is how to make them the best possible democratic decisions, and include as much rational analysis and technical expertise as we can.

Given that, we have no option but to devise ways of enlightening democratic processes directly, with the contributions of scientists - Is this really possible, when we read studies that say 40% of Americans don't believe in evolution, and interviews that suggest the many of our fellow citizens have ideas about the natural world more characteristic of the first millenium than the second or the third? It gives one pause. On the other hand, my own experience tells me that when ordinary people and policy makers from a particular locality get together to make decisions about resources in their place, they can come up with solutions that the experts haven't thought of. Given the right stimulus, and with the stakes high enough, people can learn enough to make good and technically competent decisions

I think three things are required for this to happen. First, the scientific analysis has to be transparent. By that I mean that the decision makers have to understand the origins of the scientific advice and what assumptions have gone into generating the results. Everyone has to understand what part of the decision is based on data, and what part on values. It is usually recommended that the science part of the process be formally separate from the policymaking part, so that the scientists drop their findings on the policymaker's desk as if they were delivering a pizza. I'm not sure this is workable for reasons I've already discussed. We should always strive to know what's science and what isn't, but the best way to do that is through continual feedback between the scientists and the people who need to make decisions based on the scientists work. What we don't want, is the familiar complaint from policymakers that the scientists have produced useless studies, and from the scientists that the policymakers are misusing their science.

Next, I think there has to be a frank admission of uncertainty and a commitment on the part of policymakers not to use uncertainty as an excuse for inaction. Natural resource and environmental decisions are always going to be made under conditions of uncertainty, and that will throw the values of

the policymakers into high relief. In an uncertain world do you want to err on the side of public health protection? On the side of endangered species? On the side of self-sufficient energy generation? On the side of present prosperity? On the side of posterity? Each of these is reasonable, and science has nothing to say about which to choose. Policymakers need to make the decision and make it clear on what basis it is made and don't blame the uncertainty.

Finally, I think we have to address how the question of scale affects how science integrates with policymaking on natural resource decisions. The political context for such integration is not a hopeful one. For generations, experts lodged in federal resource management agencies have tried to impose resource decisions on localities, justifying such actions on two counts: first, that the resources belonged to all Americans, not just those who happened to live in those regions, and second that they were the experts. Who can argue with expertise? The late Scott Matheson, when he was the Governor of Utah, summed up this situation by saying that the feds considered that since the west was virtually uninhabited, the people who lived there constituted a new class of citizen, the virtual uninhabitants, who did not have a full set of democratic rights. The anger that this attitude

provoked made it easy for western politicians to run against the federal government, with the result that the states containing most of the resources under federal authority came to be represented by a solid phalanx of politicians whose primary political character was resistance to federal authority.

Of course, in politics as in physics any reaction provokes a reaction that is equal and opposite, and so there developed powerful national lobbies supporting federal authority. Environmental and conservation interests deplored the western resistance as land grabbing exploiters dependent on federal largesse but ungratefully unwilling to abide by the rules devised to protect resources on behalf of all Americans. The westerners, they claimed, had but one hypocritical cry, which was, "get out, but give us more money."

This is a recipe for political gridlock. The western conservatives win all the elections but can't govern in their own back yard, and the conservationists having won many early battles, such as the Clean Air Act and the Clean Water Act, can now block any major adjustments in Congress. What has emerged from this wasteland and the frustration it spawned, remarkably enough, is a new process called resolution by collaboration. These processes arise when interest groups and government agencies at all

levels with a stake in some local issue come together to solve problems that no single one of them could solve alone. Donald Snow of the Northern Lights Institute in Montana described these groupings as "coalitions of the unalike." They typically include all stakeholders—farmers, ranchers, federal, state, tribal and local officials, business and environmental representatives—bringing together people who rarely meet regularly across a table, and might not choose to do so if there were any alternative. Essentially, people in the west have found that if you set out to solve problems on a local scale—a watershed, say, or a river basin—you can achieve concrete solutions to problems that would be intractable if you had to depend only on a national regulatory program.

Scientific or technical analysis is critical to the success of such groups, and it has an effect that it typically does not have when it tries to address enormous problems that are national in scope. Something really interesting happens when you get analytic information fed directly into a group that has both an intimate understanding of a particular landscape and a keen interest in what happens to it. Nothing does a scientist more good than having to explain things from first principles, without the typical jargon of the trade. Nothing does a group of citizens with disparate backgrounds and

conflicting interests more good than coming together around an analytic technically accurate picture of their home place. This has to be what Jefferson meant when he talked about enlightening the people. Over and over again we have seen real change occur in these groups. Trust grows, as does confidence in the creative powers of ordinary people. In short, I think that this is probably the only way that we are going to bring our twain together.

Let me close by talking about a collaborative process taking place here in our own backyard, and aimed at preserving the wild salmon runs of Puget Sound. Now, in the Pacific Northwest, as I need hardly remind you, salmon gets everybody's vote. There may be some people who think that if you want fish, go to the supermarket, but that's not a respectable view around here, besides which we are obliged, under the terms of the Endangered Species Act, to preserve our wild salmon. Two Puget Sound species of salmon, Chinook and Hood Canal Summer Chum have been listed as threatened or endangered under the Act. So with salmon, we have democratic and legal support for preservation.

But there are two general problems arising from this public commitment. First there are a lot of players. It sometimes seems that there are more organizations trying to save the salmon than there are salmon. A short list would include the National Marine Fisheries Service, the National Fish and Wildlife Service, the U.S. Forest Service, the Washington State Departments of Natural Resources, Ecology and Fish & Wildlife, the King County Department of Natural Resources, the Northwest Indian Fisheries Commission and some 23 native American tribes, commercial and sport salmon fishing groups and a number of environmental organizations, industry groups and landowners. The play itself is even more confusing than the player roster: virtually everything that people do in the Puget Sound region has some effect on the survival of salmon, including building, timbering, farming, boating, using electricity, taking a shower, and, of course, fishing. Because of this snarl, the technical and scientific basis for recovery of the fish is also going to be extremely complex. What we don't want to happen in a situation like this is for the various groups to be working at cross-purposes, producing redundant or conflicting plans for salmon recovery. We don't want a solution being imposed by a federal authority without the cooperation of state, local, and tribal interests, because such

impositions typically don't work very well. Most important, we definitely don't want dueling scientific assessments of what needs to be done.

A little over two years ago all of the parties I just mentioned – some 250 of them - convened at Port Ludlow, Washington, to see if they could form a collaborative approach to the salmon problem. After several more meetings and 16 months, they were able to come up with the idea of a shared strategy for salmon recovery. The objectives of this strategy were to improve the health of the Puget Sound ecosystem so as to achieve self-sustaining wild populations of salmon at harvestable levels. That means that the four H's—harvest, hatcheries, habitat and hydropower—will somehow have to be managed in an integrated manner throughout the Sound. The first step was to generate a recovery plan, in which all of the various activities taking place at both the regional and watershed levels will be brought into harmony. The recovery plan will result from scientifically based fish goals having been chosen by inclusive watershed citizen groups – goals that can be translated into specific commitments from those citizens to restore salmon habitat in their watersheds. These watershed commitments will then roll up to adequate numbers of fish over space and time to allow the National Marine Fisheries Service to delist. And there will be adequate

fish to meet treaty obligations to the Puget Sound tribes. While that's going on, the scientific activities that are being carried out in support of the different organization will have to be brought under a single umbrella and coordinated. Currently, this technical work is being carried out by the National Marine Fishery Service's Technical Recovery Team, in coordination with scientists from the fish treaty tribes and the Washington Department of Fish & Wildlife.

The critical question here is how to get the scientific information developed by this group into the hands of people who need it to respond to fish and human needs. While some distinction must be made between what is science and what is management, it makes little sense to completely separate the two. If you do that, as I've said, the managers and affected public will complain that the technical staff is not providing the answers it needs and the scientists will complain that the managers are misusing the science. Also, we're in this for the long haul: saving the salmon is going to have to be a continuing and adaptive effort. We are trying to do something that I don't believe has ever been done before, which is maintaining what amounts to a subsistence economy in the heart of a burgeoning high-technology industrial and residential region. Science is a process and

management is a process and both are going to have to be woven together into a fabric of intelligent, informed actions that will accomplish our goals. Constant feedback between the two is the key. The science effort has to focus more closely on the specific needs of managers at different levels, from the region to particular watersheds. The managers have to absorb new information on the run, and learn by this to ask more intelligent questions - questions posed in forms that the scientists can actually try to answer. This is the Jeffersonian and not the Platonic model.

Success stills lies in the future, but it strikes me that we are well-begun. We have all the players in the same room. We have agreements on the shared strategy forged. Money seems to be flowing in a coordinated way. So I am hopeful that we have the basis for a new American institution, one that builds on the technical and democratic strengths of our nation and region. It's significant that collaborative processes such as this are native to the American west. And let me close with this, as the author Wallace Stegner wrote: "Angry as one may be at what heedless men have done to a noble habitat, one cannot be pessimistic about the west. This is the native home of hope. When it fully learns that cooperation, not rugged individualism, is the quality that most characterizes and preserves it, then it

will have achieved itself and outlived its origins. Then it has a chance to create a society to match its scenery."