Culture, Science, Nature ...and the Beringian Connection

William E. Brown

Route 14, Box 233
Santa Fe, NM 87505

(Formerly: Denali National Park, Denali Park, AK)

Panel Presentation at the George Wright Society meeting in Tucson—November 1988

I start with a premise succinctly stated by Ruth Hubbard, Professor of Biology, Harvard University:

«The nature that the sciences – which means scientists – tell us about is a nature scientists invent so as to provide the kinds of explanations of it, and uses of it, that the society requires. Societal intentions toward nature are what shape scientific descriptions of it; the descriptions, if you will, are intention-laden.....What I am getting at is that science and the conceptualizations of nature that scientists explain by means of it are no less cultural products and social productions than are economics, political science, and philosophy.»

...*The Nation*, 24 October 1988...

In historical perspective, science is a product of cumulative cultural knowledge. And scientific theory is generally applied only in a context of cultural readiness, which is of two kinds: technological or tool kit; ideological or acceptance.

Two recent books, Hawking, *A Brief History of Time*, and Rhodes, *The Making of the Atomic Bomb*, trace the accumulation of cultural knowledge through necessary stages over hundreds of years leading to the two dominant revolutions in physical science in the 20th Century: the special and general theories of relativity and quantum mechanics, which gave access to understanding of both the macro and micro universes.

Now, two examples that illustrate cultural readiness, or the

lack thereof:

First, technological or tool kit—Leonardo designed a flying machine, based on observations of the flight of birds, that could have served, almost, as a working drawing for the Wright Brothers 400 years later. Lacking motive power, Leonardo's plan languished as a notebook curiosity.

Second, ideological or acceptance—A Century after Leonardo, Galileo, using the recently invented telescope (that's tool kit), validated the Copernican heliocentric theory, thus challenging Catholic dogma, which placed the Earth at the center of the universe. Galileo had to recant, and his ideas only slowly percolated into a new world view.

Now let's take these themes into the modern world. As model I use the Manhattan Project, which produced the atomic bomb—not because bombs are my object, but because that project, instrument of social purposes of the most compelling kind, illustrates in its original impulse and intent the complete welding of culture, science, and nature. An urgent societal need—beating the Nazis to the bomb—met the exiled European scientists who had created the theoretical basis for exploiting the ultimate energy of the universe. When President Franklin Roosevelt endorsed the proposal of Albert Einstein and his colleagues he fused accumulated knowledge and cultural readiness to produce the bomb and shape world history. The mixed applications and results, with us to this day and into the future so long as half lives keep halving, are not the subject of this discourse. But the model of mobilized social and natural energy bears on this discourse, as we shall see.

Conclusion: We need not strain to see the connections, the total integration of culture, science, and nature. We see also that culture and science, in a kind of shell game of chicken and egg, synergize to drive each other. In the modern homogenizing world, the major fields of science, arrayed in their sub-disciplines, come together to further the objectives and rightly or wrongly validate prevailing, culturally determined world views. Science as the interpreter and manipulator of nature is a powerful cultural phenomenon.

Now let's move toward Beringia

The immediate context is the rising public awareness and concern over global trends—those hints and harms resulting from biospheric changes caused by the accumulating by-products of 200 years of industrialized human society, a society growing in numbers and per capita consumptive potency with each passing hour.

For example, the global warming trend—among many possibilities: ozone, acid rain, toxic wastes, you name it.

The Union of Concerned Scientists in its Fall 1988 *Nucleus* describes the nature of the greenhouse effect and some of its predictable results over the next century. Some highlights:

- Five of the hottest years of the past century have occurred in the 1980s.
- The Earth is 0.5 degrees C. warmer than 100 years ago.
- Measurements taken in Alaska

permafrost imply that temperature in polar regions has gone up 2 to 4 degrees C. in the same period.

- Air trapped in fossil arctic ice indicates that carbon dioxide levels have risen 25 percent since pre-industrial times.
- Climate models predict that greenhouse gases, to date, have committed the Earth to a general warming of 1 to 2.5 degrees C., and more in polar regions.
- The trendline in Alaska has persuaded many formerly skeptical climatologists that the greenhouse effect is now upon us.
- Lacking concrete steps and controls by governments worldwide, the average temperature will rise 5 degrees C. by mid-21st Century, vs. 1 degree with stringent controls; polar region changes will be two to three times as great as the average, or, worst case, 15 degrees of change in polar regions, with a potential rise in world sea level of 6 or 7 meters.

For historical perspective, the Ice Ages of the Pleistocene resulted from changes of only 2 to 4 degrees C. from previous averages.

The list of imponderables and synergisms resulting from such wrenchings of world climate has led some people to counsel no action—"It's beyond us," they say. But the logic of self-preservation argues that monitoring and measuring such changes, controlling the sources of potentially greater changes, and planning for adaptation to those changes that are already inevitable may well become the most urgent business of the world's governments in the future—setting us apart, it is hoped, from the dinosaurs.

It is not only the Union of Concerned Scientists ringing the warning bells. We daily see articles clustered in our newspapers; every week studies and alarming predictions from normally conservative institutions are reported. Public awareness and political response *are* coming into focus. *Cultural readiness is building.*

This brings us to the National Park System in Alaska and elsewhere. From the founding vision of pleasuring grounds—places for esthetic, intellectual, and physical inspiration and adventure—the national parks have evolved into the Nation's premier universities and laboratories for understanding and propagation of the environmental ethic. This has been a two-fold but completely integrated adaptation of our mission: on the one hand to broadcast to the public at large, for general societal purposes, the saving message of the ethic; on the other to influence general environmental health, which in the long run determines the fate of the parks. Both of these concerns, in the light of recent indicators, are more urgent than ever before.

In these circumstances the historic decision to set aside parklands for the benefit of the people has created a pragmatic treasure of the utmost current significance. The parks have held in trust relatively unaltered ecosystems in which, belatedly, we can attempt to discover the workings of this world, in which we can measure environmental and cultural changes that threaten the environmental solvency and sanity of this world.

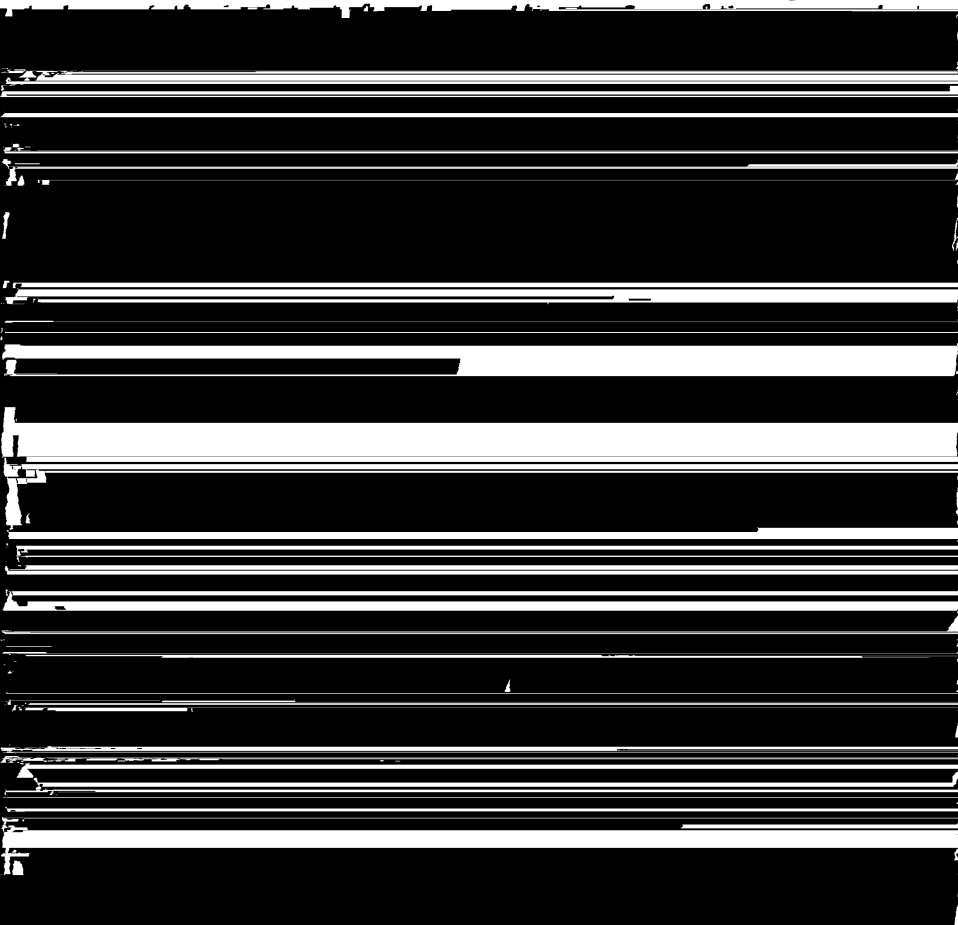
From such studies in the parks can come the communications—scientific and popularized reports, lectures, campfire and school programs, films—that can inform decision and move the public at large to those reforms of social and individual behaviour that may yet save us and the parks that give us inspiration.

By serendipitous congressional mandate the national parks today are positioned for transcendent contribution to this society and the larger world. The very conservatism of the National Park Service, its being a kind of model of cultural lag, finding solace in the past, has fortuitously been its greatest strength. Because of it the System stands

ations gained from parkland experiences—along with scientific knowledge derived from parkland study zones—can help guide the larger decisions and reforms that our society must make in the coming decades.

Now, finally, to Beringia

In the past 2 years the United States and the Soviet Union have loosened the grip of the Cold War and entered upon a new era of cooperation. The joint effort, ranging from arms control to technical and cultural exchanges, has incidentally breathed new life into a bilateral environmental protection agreement signed in 1972 during an earlier



concerns. It was recognized that the ancient land-bridge connection that made Alaska a peninsula of Asia endures to this day in the fields of physical, biological, and anthropological sciences.

With similar environments, shared migratory resources, and intertwined human histories from earliest times, the U.S. and Soviet segments of Beringia form an intellectual, esthetic, and utilitarian entity. Recognizing these joint interests the Beringian Heritage project would open the way for joint scientific research, actively sponsored by the benefitting nations. From that science would come knowledge for cooperative preservation and enlightened utilization of the region's many treasures. And from this model could come larger visions of mutually respectful unity and interdependence.

A proposal for an international heritage park has been endorsed in principle by both sides. The frame would be: designation of separate but proximate protected areas established under the laws of procedures of each national authority. The park would have potential as proving ground for broader fields of cooperation throughout the Beringian region and beyond. It would offer a concrete project and a physical locale where scientists, technicians, and managers from U.S.-Soviet agencies, ministries, and academic institutions could perfect working networks and procedures to carry on good work. Given different historical experience and emphasis in protected-area mission and management, the two nations could here mesh their respective strengths in new syntheses for mutual benefit.

Let me now review and conclude

1. There is growing public and political awareness of the need for international biospheric science to measure and help reverse potentially catastrophic global trends.

2. Arctic regions show particular sensitivity to those trends, hence are valuable as monitoring stations.

3. The National Park Service manages a vast and diverse landbase in Alaska of international scientific value.

4. The U.S.-Soviet Beringian Heritage project—envisioned as an international park supported by neighboring Biosphere Reserves, such as Noatak and Denali in the U.S. side and similar units on the Soviet side—provides a starting point for comparative studies that could and should become circumpolar in scope.

In broader perspective, the National Park System comprehends a spectrum of natural and cultural areas reaching from the tropics to the high arctic, from Maine to the Marianas. Unless the global trends warnings we have so far received prove unreal—an unlikely event—it is inevitable that our government, in concert with others, will be forced to mount Manhattan Project equivalents to stem the rising waters, control energy emissions, curb the poisons that Nature has finally refused to absorb. In pursuit of these massive tasks, key sites

within our National Park System and allied conservation units, and in equivalent reserves of other nations, surely will function as monitoring, research, and experimental centers. They will record levels and changes, pinpoint sources, and provide the scientific knowledge that can translate into reform and restructuring of current destructive practices. In this international mosaic of sites, the national parks of the United States will be critical benchmarks, standards by which deviations from or recovery toward healthy environments can be measured. As steward of these natural laboratories and data bases, the National Park Service must begin now to prepare itself for a key leadership role in scientific and social affairs, nationally and internationally, based on the geographies of hope that it is privileged to manage.

Given all this, and with regret that grim necessity is its cause, I yet believe that this institution may be on the brink of resuscitation. Lord knows we need it. We need a cause that will restore and requite the bruised idealism of this honorable Service. We need to be valued again in our own society. We've always measured that value by the service we could render. I believe we'll have the opportunity to render more service than we've ever rendered before.