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Los Alamos: Coming Down from the Hill of Certainty

E.A. MARES

The story of Los Alamos is well-known in terms of the scientific and technological advances and applications related to nuclear physics and other sciences that have been investigated and developed in its laboratories. As a scientific community, Los Alamos was founded during World War II for the very practical purpose of designing and assembling the final model of the atomic bomb. After the surrender of Nazi Germany, only a few skeptics such as the Hungarian-born physicist, Leo Szilard, questioned the necessity of using the atomic bomb.¹ Most of those who supported the Manhattan Project were certain about its necessity and the atomic bomb's ultimate use at Hiroshima and Nagasaki. Debra Rosenthal, among others, has captured this sense of certainty on "The Hill": "The war years in Los Alamos were remarkable, full of purpose, energy, camaraderie, and creativity born of necessity, but the war is long over. The old excitement has been replaced by comfortable routine."²

More than fifty years later, the "Impact Los Alamos oral history project marks, in my opinion, an important step in coming down from the hill of certainty—the hill of intellectual smugness—in order to wrestle constructively with the many and complex issues swirling around Los Alamos. These issues are of vital importance not only to Los Alamos and its surrounding communities, but also to the world—at-large.

The story of the founding of the enigmatic city on The Hill and the aura of secrecy within which the scientists, engineers, technicians, working crews, and their families lived for many years is also fairly well-known. Less well-known, however, is the story of Los Alamos in terms of how silence and secrecy impacted the lives and fortunes of these families, especially in terms of the psychological effects and social consequences for individuals and families involved. There is still much to be done in terms of social and historical research in this area in relation

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to the lives of those individuals, and their families from the towns, villages, and farming and ranching communities of northern New Mexico who went to work on The Hill. In terms of culture and history, were these people ever able to "return home" again? And what did "home" mean? This is the story that is of particular concern for the Impact Los Alamos Oral History Project.

What I will attempt to do is provide an historical and philosophical overview for this oral history project. My concerns are primarily social, cultural, and historical, and I would like to establish from the outset that I have no bias against science and technology. I am an associate member of Sigma Xi (the national science honorary society), and I have done some research and writing in the area of the history of science in New Mexico. I was a co-author of "Science in New Mexico: Origins and History" with Joseph A. Schufle and McAllister H. Hull, Jr., the first chapter of *From Sundaggers to Space Exploration: Significant Scientific Contributions to Science and Technology in New Mexico* (1986).³ In 1985, on the occasion of the fortieth anniversary of the first atomic detonation at the Trinity Site, I wrote a brief overview of the philosophical trail that led from medieval scholastic disputes to the Manhattan Project. This appeared in the *Albuquerque Journal's Impact Magazine*.⁴

I do not question the validity of the Western scientific tradition, but rather the impact it has had on cultures and communities that were, and are, non-Western. Specifically, I have reservations about how Los Alamos National Laboratory (LANL) has historically related to its surrounding communities in northern New Mexico. These are primarily, although not entirely, Pueblo Indian or Hispanic communities.

Finally, I intend to provide a historical overview and cultural context for discussion of the findings and issues raised and presented by the Impact Los Alamos Oral History Project. In short, I would like to be very clear that I do not see the story of Los Alamos as one in which there are "good guys" pitted against "bad guys." Our individual and collective lives and histories are far too complicated and complex to reduce them to simplistic soap operas. What first strikes me when I reflect on Los Alamos are the historical ironies associated with this community. After centuries, possibly millennia of slow change, Los Alamos suddenly experienced an explosive rate of political, social, and economic change after 1943.

From primordial times until the coming of the Spaniards in 1546, the life patterns of the indigenous Pueblo and nomadic Indian tribes were governed by the seasons and the vagaries of weather. Change was very slow. Built into the indigenous communities, so to speak, were patterns of intimate relationship to all aspects of nature. There was, in fact, a striving for and an awareness of the need for harmony in such a cosmos. I tried to capture this sense of wholeness and harmony in my poem "Once a Man Knew His Name." This poem reflects my homage to Popé, an unsung hero of New Mexico. Popé was the leader of the Pueblo Revolt in 1680 that expelled the occupying Europeans. I would like to share a few stanzas with you:

All is sacred in our world:
Shimmering Mountain to the north.
Obsidian Covered Mountain to the west.
Turtle Mountain to the south.
Stone Man Mountain to the east.

All the hills are sacred.
All the shrines are sacred.
All the plazas are sacred.
All the dances are sacred.
All the directions and their colors
Are sacred for the pueblo
The Spaniards called San Juan.⁵

Though the coming of the Spaniards in 1546 interrupted native patterns, the rate of change, nevertheless, remained fairly slow. The Spaniards introduced many new animals, plants, and agricultural tools and technologies. The Pueblo Indians incorporated these changes into their world view probably because the Spaniards themselves were not caught up in the major European currents that would lead to the Scientific Revolution, the Enlightenment, and the rise of the idea of progress.⁶ Also, because Spaniards recognized, understood, and legally allowed communal patterns of living, such as those encountered among the Pueblo Indians, changes introduced by the Spaniards were gradually incorporated into the native world view.

After the opening of the Santa Fe Trail in 1821, a more accelerated pace of change was introduced into the Southwest by the United States. The Southwest had been the far northern frontier of the Spanish Empire and then Mexico.⁷ Even though an abundance of goods came down the Santa Fe Trail, transportation was slow and problematic for a number of reasons. The Apaches, Comanches, and other indigenous cultures also resisted this new and aggressive intrusion into their historic domain, combined with the conflicts of the American Civil War. The net effect was a delayed impact of the industrial revolution on the older cultures of the Southwest. In any case, the rate of technological change was still slow enough to allow Indians and Mexicans (called "Spanish" or Mexican Americans after 1846) to make reasonable adaptations.⁸

After the war of aggression against Mexico in 1846 and its conclusion with the Treaty of Guadalupe Hidalgo, honored more in the breaking rather than the keeping, and after the "trail of broken treaties" with Native Americans, the "old social order" in the Southwest was upset. The Native Americans became, at best, noble savages while the Mexicans, now citizens of the United States, remained by and large unwanted ignoble savages in the new order. Technological change and social uprootedness continued to proceed at a slow rate for a few more years in northern New Mexico.⁹

Life for the Pueblo Indians and the Hispanic population in the Los Alamos area went on much as it had before the United States imposed its political, social, and economic institutions upon their societies, only now the locals were economically dispossessed and their agrarian way of life became confined to ever narrower domains as permitted by the new Anglo-American order. Despite all the upheavals, change was still relatively slow until the coming of the railroad in 1879.¹⁰

The impact of the railroad on New Mexico and the Southwest was enormous. Curiously enough, however, the railroad had a peculiar effect on northern New Mexico. The route that railroad developers chose swung down from Raton Pass to Las Vegas and then bypassed Santa Fe in favor of a route through Lamy and Albuquerque. It thus transformed a large quadrant of northern New Mexico into an economic backwater. The economic center of the state shifted south to Albuquerque. Santa Fe, Los Alamos, and all of Rio Arriba counties remained isolated and rural for Mexican and Indian inhabitants, but became something of a romantic hideaway for Americans ill at ease with some of the social, economic, and aesthetic consequences of the industrial revolution. Taos and Santa Fe became havens for artists, and the inhabitants of the Los Alamos area continued to live in a kind of splendid isolation. The modern world with all its stresses was just over the horizon to the east and to the south, but it was comfortably removed and would remain so until 1942.¹¹

All this changed when J. Robert Oppenheimer and General Leslie R. Groves paid a fateful visit to Los Alamos in October 1942. From the war years and until the present, Los Alamos has experienced a half century of incredible change. An area that changed only slowly over a long period suddenly experienced sweeping transformation in what is historically a very short time. The Western individualistic and analytic world view was suddenly and dramatically imposed upon Los Alamos. Los Alamos had the Indian and Hispanic cultures still intermingled with their own communal values and traditions, as opposed to this Western world view.

In my mind, I keep returning to that journey up the Jemez River Valley undertaken by General Groves, the director of the Manhattan Engineering District (the atomic bomb project), and Oppenheimer, the brilliant, enigmatic, and charismatic theoretical physicist who was the director of Project Y (the code name for the bomb research and assembly part of the Manhattan Engineering District). Oppenheimer, familiar with New Mexico since his youth, had spent much time in the state. His family owned property near Pecos, and he thought that the Jemez area would be suitable for a project that might involve hundreds of scientists, as he then expected.¹² I have often wondered if Groves had the awareness of Oppenheimer, or to what extent either of them really cared as they drove north that they were following the path of a sacred river. They were crossing a territory populated by people of ancient cultures who possessed an utterly different world view. Here, where sacred rituals were performed throughout the year to harmonize the relationship between humans and the cosmos, the general and the scientist drove

along old U.S. 85 through rich farmlands and orchards along the east bank of the Jemez River. No one spoke to the locals about what was planned. No one consulted them. No one was interested in what they had to say. No one saw any need whatsoever to consider their input on the momentous decisions underway. For all practical purposes, the dwellers of this land were mere local color. They were, in effect, part of the landscape.

From Bernalillo, Groves and Oppenheimer proceeded along State Route 44 to San Ysidro and on to Jemez Springs. They found the narrow Jemez canyon too confining so they continued their drive into the high country toward Valle Grande. Oppenheimer had long admired the land around Los Alamos, and he wanted the general to consider it as a possible site. As they continued north, the atomic fuse lit by modern physics under the pressure of the modern nation-state was slowly burning its way to Los Alamos. Since 1942, nothing has ever been the same. Not for Los Alamos, the United States, or for planet earth. I think that Los Alamos in its broadest context has forced us, and continues to force us, to try to comprehend the profoundly disturbing irony of how people and communities can be entirely left out of the decision-making processes that forever alter their relationship to land, their families, their cultures, and the entire human ecology.

The existence and demands of LANL have radically skewed all of the social, educational, and economic indices of northern New Mexico's counties. Some of these counties were among the poorest in the nation when the labs opened up. These same counties remain among the poorest in the nation while Los Alamos county has one of the highest standards of living in the world.¹³

I am not pointing a finger here at any individual or group. What I am doing is raising a serious issue. Los Alamos has had two types of consequences: intended and unintended. The intended consequences involved the creation of immensely destructive weapon systems. The irony here is that atomic weapons development occurred in a spectacularly beautiful and peaceful part of this planet, where the older cultures had at long last learned to live together in relative, although certainly not perfect, harmony. We are now most concerned with the unintended consequences of Los Alamos. Surely one of these was the creation of a vast area of northern New Mexico economically characterized by gross differences in living standards that created a two-tiered welfare system. On the one hand, federal welfare existed for the bright, educated, and outstanding scientists and their coteries who were useful tools for furthering the goals of the nation-state during World War II and the cold war. Great wealth in the form of significant federal infusions of money was brought to northern New Mexico for immensely destructive purposes, even though these purposes were cast in terms of the noblest of intentions. On the other hand, the welfare programs of the New Deal and the Fair Deal were meant to help those who were historically present in the area, for those who were not so useful, and for those who, to put it succinctly, were in the way and had to be at least minimally placated.

As I see it, the three major ironies of Los Alamos are: rapid change introduced to an area where very slow historical evolution had occurred; the sudden imposition of a Western analytic and scientific tradition in a shroud of secrecy upon cultures of the area which had their own unique cultural orientations; and the unintended creation of a large island of social, economic, and educational inequality in the heart of northern New Mexico. These ironies raise questions that need answering.

Los Alamos merits the most serious concern because it is, in a sense, a metaphor for the world-at-large. The problems of Los Alamos are symbolic of the problems of Third World countries in their interactions with the West. To view these problems as opportunities for solutions is to indicate that we have not given up on the dynamics of history and change. Nothing is ever static. We are not necessarily forever frozen into old attitudes and postures but rather we can use our imaginations and intelligence to find solutions to our problems.

For the moment, I want to apply the concept of metaphor to the cultures we are considering here. Let LANL stand for everything we associate with the West, the Tewa world as a representative for New Mexico's indigenous cultures, and the Mexican-American world as a representative for the Hispanic communities in the Southwest. In this reduced frame of reference, several things become clear. Geographically, LANL, the Tewa world, and the Mexican-American world exist in close proximity in northern New Mexico. These worlds overlap in a complex web of personal, social, economic, political, and cultural interactions. Each of these worlds has its own cosmology—its own highly effective and satisfactory explanatory devices for relating the human condition to the ecology of this planet and to the cosmos as a whole. Each of these worlds needs to protect its sacred precincts—laboratories, kivas, and moradas, respectively—from excessive intrusion by outsiders. Each of these worlds needs to interact with each other (and with all other human communities) in ways that amplify human potential everywhere.

Some useful concepts come to mind here. Murray Gell-Mann, *The Quark and the Jaguar* (1994), has suggested that it is possible to view a human being as what he calls an information gathering and utilizing system, or IGUS.¹⁴ George Johnson, *Fire in the Mind* (1995), comments on this notion of an IGUS:

At the deepest level we are all information gatherers—Iguses, in Gell-Mann's term. Dig deep enough through the layers of the mind and surely you will reach rock bottom, an impenetrable floor: the architecture of the brain as it was molded by evolution to find patterns, even if they are not always there. . . . We all share this belief in symmetries, and finding ourselves in a world where the symmetries have broken, we imagine a time before the fall from perfection, whether we call it Eden, the underworld, or the big bang.¹⁵

Take this concept to a higher level and think of an entire culture, any human community, as an IGUS. If a culture is envisioned as an information gathering and utilizing system, then it might be possible to more clearly describe and develop the most effective means and mechanisms for cross-cultural communication. An expanded and more accurate flow of information might help bring about more equitable political, economic, and social relations. This might realize, in effect, more equitable power relationships.

Recent attempts by Tomás Atencio and his associates in the Rio Grande Institute to develop a computerized communications net—La Resolana Electronica, as it is called—to link rural areas of northern New Mexico on the Internet with some urban areas may be the first significant and sophisticated approach to some of the paradoxes raised by the Los Alamos story as I have discussed here. A recent article by Atencio in *Quantum* reinforces the idea of a culture or a community as an IGUS:

[Places like Taos, Embudo, Dixon, Mora, Abiquiu and Santa Clara Pueblo] were missed by the industrial society at the production end. . . . We never had factories; we never had a working class. We remain peasants tied to the land and it is important that we not lose the energy that makes our ties to the land remain strong. We were missed by the Industrial Age, but we can't afford to be missed by the Information Age. Technology will bring people together.¹⁶

I would like now to raise some questions. First, we need to identify the issues of power and responsibility for what has happened and what is happening with relation to Los Alamos and the communities it impacts. In other words, what are the institutions and who are the persons who exercise power and authority in the Los Alamos area? Is that authority being exercised responsibly and for whose benefit? This question of power is serious and it needs to be addressed. We also need to address to what extent, if any, the communal values of the Indian pueblos and the Hispanic villages can be brought to bear on the future of Los Alamos. What should the roles be of the local communities in determining their own futures? If, as Gell-Mann argues, there is a central theme that connects the simple and complex, "the theme that connects the quark, the jaguar, and humanity," then what role do the communities have in helping to shape this theme and not merely react to it?¹⁷

A fourth question is whether any significant dialogue has been established between the various traditional, village-based communities and other communities in the Los Alamos area. Who is talking to whom and is anyone listening? A fifth question, in a broad sense, would be what values are at stake for both individuals and the communities? What I am concerned about are not the stated values that we easily pay lip service to, but rather the operational values such as those that we actually demonstrate through our deeds and actions. Sixth, I would ask what

has been and continues to be the environmental impact of LANL? I am thinking of the environment in a larger, social sense as well as the natural. Seventh, what kinds of political, social, and economic interactions must we now consider for the future of Los Alamos? In other words, if a transfer of power needs to occur for the future of Los Alamos, how should that transfer occur? Who should exercise that power? In a sense, we are talking about boundaries. My eighth question would be what sort of boundaries, if any, make sense in the emerging internationalized world where ecological zones are more important than national boundaries? My ninth question would be who is going to make the new boundaries? I am looking beyond the boundaries of the ephemeral nation-state because I think that human cultures and communities are older, more profound, more enduring, and ultimately wiser and more likely to continue, despite their undeniable shortcomings. My last question involves the old way of looking at Los Alamos, national security, hierarchical national values focused on wartime needs, and an imposed scientific community distinct from and much better off economically than the surrounding communities. Is this old way good enough for a world of dubious national boundaries, worldwide communications, and growing ethnic and tribal concerns?

I would urge everyone, but particularly those in the scientific community, to look into their own philosophic and cultural roots for possible solutions to these problems. What wonderful opportunities they present! I would also remind the scientific community, if it needs reminding, that there is a deeply compassionate and humane tradition running through modern physics from Max Planck to Leo Szilard, Richard Feynman and others. In a little-known work of Planck's, *The Philosophy of Physics* (1936), he argues that the scientist, like the rest of us, must make a leap of faith when engaged in the dialogue with nature to understand the world:

Anyone who has taken part in the building up of a branch of science is well aware from personal experience that every endeavor in this direction is guided by an unpretentious but essential principle. This principle is faith—a faith which looks ahead. . . . associations of ideas are not the work of the understanding but the offspring of the investigator's imagination—activity which may be described as faith, or, more cautiously, as a working hypothesis. The essential point is that its content in one way or another goes beyond the data of experience. The chaos of individual masses cannot be wrought into a cosmos without some harmonizing force and, similarly, the disjointed data of experience can never furnish a veritable science without the intelligent interference of a spirit actuated by faith.¹⁸

I would, then, remind the scientific community and everyone else that a harmonizing force has been present in New Mexico for a long time. Perhaps it is time to recognize the power of that force, its deep roots in alternative cultures and visions of the cosmos, its close association with communication and information, and to grant it the privilege of status, empowerment, and dialogue for the benefit of all of us. I think this harmonizing force appeals to what is best in all of us. I think we should pay it some heed while there is still time.

NOTES

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3. McAllister H. Hull, Jr., Joseph A. Schufle, and E.A. Mares, "Science in New Mexico: Origins and History," in *From Sundaggers To Space Exploration: Significant Contributions to Science and Technology in New Mexico*, a special issue of the *New Mexico Journal of Science*, ed. David Hsi and Janda Panitz. Published jointly by the New Mexico Academy of Science and the New Mexico Sigma Xi Chapters and Clubs. 26 (February 1986), 1-24.
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10. D.W. Meinig, *Southwest: Three Peoples in Geographical Change 1600-1970* (New York: Oxford University Press, 1971), 38-52.
11. *Ibid.*, 46-47; George Johnson, *Fire in the Mind: Science, Faith, and the Search for Order* (New York: Alfred A. Knopf, 1995), 11-17.
12. Ferenc Morton Szasz, *The Day the Sun Rose Twice: The Story of the Trinity Site Nuclear Explosion, July 16, 1945* (Albuquerque: University of New Mexico Press, 1984), 16.
13. See United States Census data for 1940, 1950, 1960, 1970, 1980, and 1990 on population, economics, employment, education, and housing for Los Alamos, Rio Arriba, Santa Fe, Taos, Mora, and San Miguel Counties in the state of New Mexico.

14. Murray Gell-Mann, *The Quark and the Jaguar: Adventures in the Simple and Complex* (New York: W.H. Freeman and Company, 1994), 155.
15. George Johnson, *Fire in the Mind*, 198.
16. Frank D. Martinez, "Sunny Side: One Project Shows That The Cultural Ties That Bind Can Be Electronic," *Quantum* 13 (Spring 1996), 25.
17. Gell-Mann, *The Quark and the Jaguar*, 367.
18. Max Planck, *The Philosophy of Physics* (New York: W.W. Norton, 1936), 121-22.