

Tennessee Valley Authority experiment, and the emergence of ambivalence in the 1960s. Studying this sequence can help to reveal ways in which American attitudes have changed drastically in this century. This investigation is of particular interest now, as we embark on several ambitious and expensive new dam projects in America. This time, however, instead of creating new impoundments, we will dismantle existing ones, in an attempt to restore the landscape to its original pristine condition. Whether this is a rational response to overdevelopment or a futile attempt to resurrect the wilderness we struggled so valiantly to subdue, remains to be seen.

In the TVA hydroelectric projects from the 1930's and 1940's we see an expression of great positivism and enthusiasm for the beneficial features of dams. A (somewhat naïve) utopian vision of European futurism suffuses the architectural and landscape features of the TVA projects, as if Tony Garnier's vision of a perfect society, fueled solely by clean, renewable hydroelectric power, had been reinterpreted for the Appalachian wilderness. Architectural effect was a priority for the planners who first imagined the vast network of dams, locks, power plants and associated structures that was to be superimposed on the rural landscape of the Southeast United States. Each dam in the system includes a lavishly designed visitor's center, dramatically sited amidst lush parklands to encourage patriotic reveries by tourists. TVA was widely admired and applauded both here and around the world for apparently solving the environmental challenges facing poor farm families trying to maintain agriculturally based lifestyles in the South. Not much later, public perception of dams would change in America.

Built in the early 60's, the Glen Canyon project inspired large-scale public protest about an American dam for the first time. At Glen Canyon, as in the earlier TVA dams, tourists stream to the Visitor Center; but here, respect for American can-do spirit is tempered by a palpable ambivalence about the appropriateness and necessity of sacrificing the powerfully flowing river and its canyon to create the electricity and water resources that sustain sprawling cities and suburbs in the desert. In *The Monkey Wrench Gang*, the environmentalist



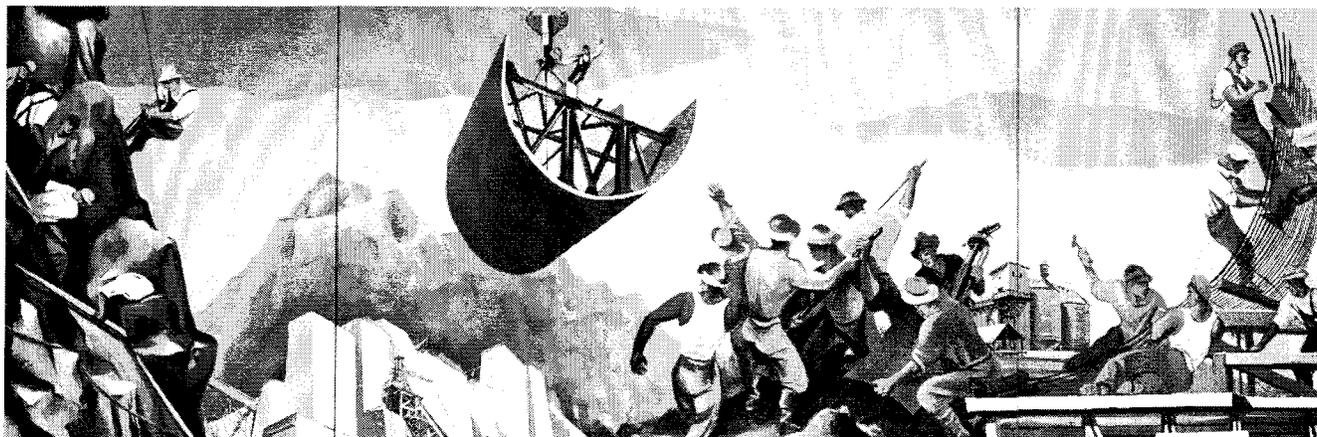
2. *Glen Canyon Dam* by Norman Rockwell

author Edward Abbey expresses his contempt for the new "promised land" in his description of the view from the bridge at Glen Canyon Dam:

"...Seven hundred feet below streamed what was left of the original river, the greenish waters that emerged, through intake, penstock, turbine and tunnel, from the powerhouse at the base of the dam. Thickets of power cables, each strand as big around as a man's arm climbed the canyon walls on steel towers, merged in a maze of transformer stations, then splayed out toward the south and west—toward Albuquerque, Babylon, Phoenix, Gomorrah, Los Angeles, Sodom, Las Vegas, Ninevah, Tucson, the cities of the plain." (2)

Indeed, it is difficult not to sympathize with Abbey's disdain for what he sees as the desecration of sacred places. The hordes of beer drinking jet skiers and motor boaters that swarm Lake Powell, the surreal inland sea that is backed up by the dam, seem blissfully ignorant of the majestic lost Canyon lying submerged, several hundred feet below their bobbing watercraft. Yet even Abbey grudgingly admires the spectacular feat and the stunning visual presence of the dam.

Comparing William Gropper's WPA mural entitled *Con-*



3. *Construction of the Dam* by William Gropper

struction of the Dam from 1937 (fig. 2), and Norman Rockwell's *Glen Canyon Dam* from 1972 (fig. 3), we can trace the trajectory of popular responses to dams in North America. The heroic, future-looking figures in the Gropper mural display unshakeable confidence in the righteousness of the American mission to harness the power of free-flowing rivers in projects like those of the Tennessee Valley Authority. Only forty years later, Rockwell's portrait of an Indian family's bewilderment (and their dog's cringing) at the sight of the big dam expresses the painter's serious misgivings in the face of American hubris.

Today, we read about new efforts to eliminate existing functional hydro facilities all around America. In Utah, serious voices are calling for the removal of Glen Canyon Dam and the draining of Lake Powell. On the Olympic Peninsula in Washington, \$110 million has been committed by Congress for dismantling the Elwha River Dams. Here, the penstocks for carrying pressurized water from the dam to the power turbines have been permanently shut, and water is allowed to overflow the dam crest like an artificial waterfall. Nature has begun to reclaim this once wild place; the mark of our culture is being erased, as we reevaluate our appropriate role in what was not long ago a brand new continent.

SOVIET DAMS

In the former USSR, dams were used as evidence of the collectivist state's industrial and technological prowess. V. I. Lenin was keenly focused on the role of hydroelectric power generation and distribution in releasing the rural population from the bonds of manual labor. Dnieprostroi was the centerpiece of the first Five Year Plan, and it was the world's largest dam for a short time after its completion in 1931.

The connection between the heroic dam and the promise of communism to deliver a clean and bright egalitarian future through electrification is a potent reminder of the role dams have played as expressions of cultural and political vision throughout this century. The Soviets were influenced by American precedents like TVA; but at Dnieprostroi, modernist architectural motifs are eliminated. These projects do not celebrate the dam as a streamlined machine in the garden, but rather as means to an end. In his preface to Margaret Bourke White's book of photographs of industrial topics, *Eyes on Russia*, Maurice Hindus writes in 1931:

"It is because of her love of the machine that her Russian photographs are so impressive, for the Russians too love the machine and venerate it even more. They differ from Miss Bourke-White in their approach. They love the machine more from what it does than for what it is. They view it as a social benefaction, as an instrument of a great deliverance, and they espouse it with a faith and a zeal with which in an earlier day men espoused their religion..." (3)

In the Soviet example, the great mass of industrial workers, and not the individual farmer, is the implied beneficiary of the hydro dam. These divergent messages are clearly a product

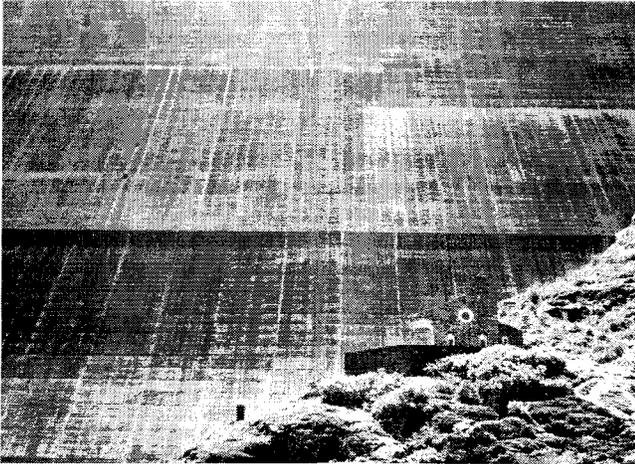


4. Soviet Poster by Gustav Klucis



5. Still from closing credits of film *Dr. Zhivago*

of the difference between the Soviet and American systems, and it can be documented in propaganda posters (fig. 4), films and even government-sponsored folk songs from both sides. Even in Hollywood, the idea of the dam as a representation of the promise of Communism's future was understood, as is seen in the closing credits for the film, *Doctor Zhivago* (fig. 5).



6. Grande Dixence Dam, Valais, Switzerland, with small stone church (photo by author)

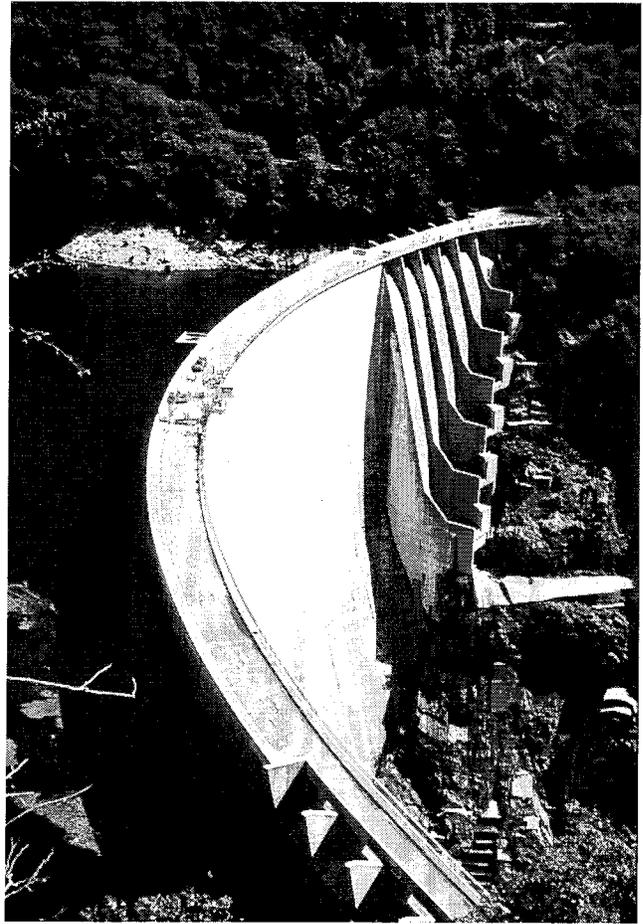
EUROPEAN DAMS

In Western Europe, dam building has developed quite differently as compared to the previous examples. Swiss and Italian Alpine dams are expressive of elegant Modernist structural solutions instead of the land reclamation ethic in America or displays of collectivist industrial might as in the Soviet Union.

Grande Dixence (fig. 6) and Contra (fig. 7) dams are products of characteristic Swiss precisionism. They are devoid of ornament and have the appearance of Minimalist sculptures, great smooth walls that slice through the landscape. In the Swiss examples, the American notion of setting up an opposition between the natural and man-made worlds is exchanged for a more seamless insertion of the machined object into picturesque settings. These are places that have been occupied for thousands of years, and Europeans appear to be comfortable with the notion that natural places are thoroughly inhabited and controlled, permanently altered from their natural condition, but done so in a sensitive and respectful way.

In rare cases, the enormous forces created by water impoundments has not been successfully restrained, and the European willingness to live in the shadow of the world's tallest dams has resulted in great tragedy. In 1963, near Belluno in the Italian Dolomite range, the top of a mountain slid into the reservoir behind Vaiont Dam. In the middle of the night, a 500-foot tidal wave poured over the crest of the dam, washing away the village of Langarone below; 2,600 people drowned. Remarkably, the thin arch structure did not fail; the landslide, however, was probably the consequence of negligence on the part of the design engineers.

Vaiont dam remains today, an 859-foot tall curving concrete wall, backing up nothing but dirt and rocks. In the rebuilt town, Giovanni Michelucci, architect of the Florence railway terminal, has erected an expressive cast-in-place concrete church, dedicated to the memory of the lost souls. The form of the church echoes the double curvature of the wall of the



7. Contra Dam, Lugano, Switzerland (photo by author)

concrete dam in a thoughtful and complex response to the disaster. The design of the church provokes questions as to the virtue of altering nature so drastically in the midst of inhabited places.

CHINA

In China, dam-building has been as concentrated as anywhere on Earth in the last fifty years, and while the basic technical, social and environmental issues are the same as in other places, China's experiences have been very different, in ways that can be traced to that country's unique history and culture. In Simon Winchester's essay about his trip up the Yangtze, *The River at the Center of the World*, we read,

"About 2,500 years ago a pair of distinct and entrenched schools of thought arose, reflecting the different views of the ruling theocracies: one was advanced by the Taoists, the other by the Confucianists. It may seem odd to westerners that religion had any impact at all on hydraulics: but it is a measure of the peculiar importance of the country's waterways—as well as a reminder of the delicious strangeness of China—that its priests and philosophers did take so seriously the question of exerting control over them." (4)



8. Chinese Mural, Baidicheng

Today, the world's largest hydroelectric installation is being realized on the Yangtze River at the Three Gorges. This project was first dreamed of by the father of modern China, Sun Yat Sen, and was later championed by the Great Helmsman, Mao Zedong, who presaged the dam in the poem he claimed to have composed while swimming across the Yangtze:

"Great plans are afoot...

Walls of stone will stand upstream to the west

To hold back Wushan's clouds and rain

Till a smooth lake rises in the narrow gorges.

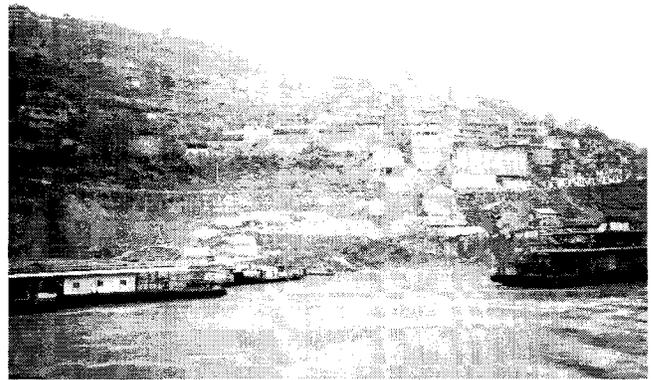
The mountain Goddess, if she is still there,

Will marvel at a world so changed."⁽⁵⁾

The Dam is made possible through importation of Western technology; yet it would be a mistake to infer that the motivation to build and planning and design decisions are not deeply connected to traditional Chinese ideas. One of the most helpful textual sources for trying to penetrate the thinking behind the Three Gorges Dam is found in Franz Kafka's story, *The Great Wall of China*, which describes the importance of an earlier continent-scaled landscape intervention to the many thousands of Chinese people who devoted their lives to it:

"...never before had they seen how great and rich and beautiful and worthy of love their country was. Every fellow countryman was a brother for whom one was building a wall of protection, and who would return lifelong thanks for it with all he had and did. Unity! Unity! Shoulder to shoulder, a ring of brothers, a current of blood no longer confined within the narrow circulation of one body, but sweetly rolling and yet ever returning throughout the endless leagues of China."⁽⁶⁾

Strangely, the Great Wall of China was built discontinuously, and was never completed; it actually provided little defensive benefit. In the West, we are mystified by this. Similarly, Western observers are puzzled by the decision to



9. Abandoned City along the Yangtze (photo by author)

build one great dam instead of a number of lesser ones, since the technical and social problems associated with building on such a vast scale are greatly increased. Here again we are faced with powerful evidence that dams, more than other engineered objects, are products of culture, and not purely objective solutions to physical problems. The same tools must be brought to bear on the analysis of their ultimate form and purpose that we apply to artforms in general.

In pondering the Chinese motives behind the Three Gorges Project, it is helpful to compare a photograph of one of the mid-sized towns upstream from the damsite that is slated for inundation (fig. 8), with an anonymous mural showing an idea of what the same area could look like once the reservoir has filled (fig. 9). The artist has created a dream of a new metropolis, complete with suspension bridge and skyscrapers, that looks like Hong Kong, or even Manhattan, nestled along the shoreline of the reservoir amid the exaggerated soaring landscape of the Three Gorges. Compared to the decrepit existing city, whose fate is unsentimentally marked by depth placards set up along the hillside, this naïve future vision reminds us of the spirit of Gropper's 1937 mural. But instead of a characteristically American portrait that focuses on the individual construction worker/hero, the Chinese image is inspired by traditional Yangtze River landscape painting, in which human interventions appears as tiny and peripheral, surrounded and dominated by their natural setting.

CONCLUSION

The purpose of this study is to begin to decipher the meanings embedded in dams as a way of informing current thinking. At the same moment that American misgivings about dams have overtaken our enthusiasm for them, the Three Gorges Project is going ahead full-steam, in spite of a massive International outcry. Passions are ferocious on both sides of the debate. But what has been missing in this controversy is an acknowledgement that these structures are more than massive industrial enterprises; they are also reflections of ourselves.

American dams of the TVA promoted a Jeffersonian vision of the landscape filled with thousands of small farms; the Soviets used dams as symbols of Communism's promising future; Europeans take delight in dams as expressions of structural elegance; and the Chinese see their new dam as a collectivist experiment in social improvement that also connects them to their ancient history. Clearly, these artifacts of our impulse to build and sculpt the environment have something to tell us. They represent the singular opposition of our heroic and beneficial impulse to control nature against our rapacity, and our endless ingenuity against its sometimes cataclysmic result.

NOTES

- (1) John Brinkerhoff Jackson. *A Sense of Place a Sense of Time*. Yale University Press, New Haven. 1994. . p. vii
- (2) Edward Abbey, *The Monkey Wrench Gang*. Avon Books, New York. 1975. p. 27
- (3) Margaret Bourke-White. *Eyes on Russia*. Simon and Schuster, New York. 1931. Preface.
- (4) Simon Winchester. *The River at the Center of the World*. Henry Holt and Company, New York. 1996. p. 216
- (5) Jerome Chen. *Mao and the Chinese Revolution, with 37 Poems by Mao Tse-Tung Translated from the Chinese*. Oxford University Press, New York. 1965.
- (6) Franz Kafka. *The Great Wall of China*. Schocken Books, New York. 1936. p. 86