that because of its commitment to large-scale projects along the river has generally shown little concern for pollution alleviation. The new district of Wuqiao in Wanxian is a good example. No environmental plan for the district exists, and only those facilities which can afford to move have been relocated. Then there is the case of the Eastern Sichuan Chemical Company, which has received ¥2 billion from the government for construction of a new plant that will employ 20,000 relocatees. But the plant will produce 60,000 tons of caustic soda, 100,000 tons of formaldehyde, and 100,000 tons of polyvinyl chloride annually. Clearly, the construction of this plant will only add to the pollution problem in the reservoir, not solve it.

Conclusion

The Three Gorges dam will exacerbate an already serious pollution problem in the Yangtze River. By severing the mighty river and slowing the flow of its water, the dam will cause pollution from industrial, residential, and township-level sources to concentrate in the river rather than be flushed out to sea. The result, for the 400 million Chinese who live in the Yangtze River Basin, will be a poisoned river.

Chapter Twelve

Military Perspectives on the Three Gorges Project

Da Bing

There have always been strong links between key economic projects and national defense. This is the case with the Three Gorges dam. Dam supporters argue that the project will increase the supply of electricity and promote economic development, thereby strengthening the country’s defenses. But because the dam will be built in central China, it will assume immense strategic importance. If it were destroyed by military attack, the consequences for the military, and for the entire nation, would be disastrous.

Although the world is becoming a more peaceful place, the threat of an attack on the Three Gorges dam cannot be dismissed.* Large cities, nuclear power plants, and hydro projects are routinely considered prime military targets. Examples abound: The British bombed Germany’s Mohne and Eder dams during World War II, the United States bombed North Korean dams during the Korean War and Vietnamese dams and dikes during the Vietnam War, and in 1938 Chiang Kai-shek ordered his troops to blow up the Yellow River dikes to stem the Japanese Army’s advance.

Based on available materials, it appears that the Leading Group for the Assessment of the Three Gorges Project (which issued its report in 1987) did consider how to protect the dam itself; however, if the dam were to come under attack it would most likely be part of broader multitarget assault. The enemy would not only target the Three Gorges dam but would also seek to destroy all the surrounding facilities, including the Gezhouba dam and the Zhi River Railway bridge. Therefore, any assessment of the

*China’s perspectives on current international relations are examined in Robert Ross, ed., East Asia in Transition: Toward a New Regional Order (Armonk, N.Y.: M.E. Sharpe, Inc. 1995).
military threat to the Three Gorges dam must not be limited to an evaluation of the threat posed by a single strike against the dam, but instead must include comprehensive defense planning for the entire region, which has not yet been done.

China’s defense system is weak and unable to defend against attacks by modern weapons. *

Based on assessments so far (such as a twenty-year-old Chinese Air Force report on the poor defensibility of the dam which, at the time, led the People’s Liberation Army [PLA] to oppose the project), ** our primary defense is to lower the water level in the reservoir in a crisis situation in order to reduce the threat of disastrous floods in the lower reaches if the dam were to be destroyed. While we might receive advance warning of an attack, it is by no means certain. Therefore, strengthening and improving our defenses must be seriously considered.

The effects of a military attack on the Three Gorges dam would be serious and widespread. But most experts limit their analysis to the impacts of a single attack on the dam and the floods that would result. And indeed, the floods caused by even a single strike would be disastrous—the entire area from the dam site at Sandouping to just above Shashi City would be flooded by a wall of water rushing forth at 400,000 cubic yards per second. A minimum 130,000 to 208,000 people on the southern bank of the river would be affected. However, the limited, single strike analysis concludes that the dam burst would not seriously affect the Jin River dikes, Shashi City, and the area around Wulan. Its impact, they conclude, would be primarily local.

But as we mentioned earlier, any complete assessment of risk should focus not just on the destruction of the dam and resulting floods, but also on other potential impacts; for instance, the destruction of shipping routes, the loss of electricity generation, and possible contamination from nuclear or biological weapons. A military attack on the Three Gorges dam would clearly not just have local impacts.

If, along with the Three Gorges dam, the Gezhouba dam, the Jin River dike, and the Shashi City area, the Wulan area, and the area around the dikes is attacked, the impact would be significant and widespread. The destruction of the Three Gorges dam would have serious consequences for the entire region.

* For a recent assessment of China’s military capabilities, see New York Times, December 3, 1996.

**Yang Ling, "High Dam: The Sword of Damocles," in Dai Qing, Yangtze! Yangtze!, pp. 229–241, and Winchester, The River at the Center of the World, p. 236. The current involvement of many PLA-run companies in the dam’s construction may have helped swing elements of the military to support the project.

dikes, and the Zhij River bridge were also attacked, the destructive impact would increase exponentially. In addition to the local flooding mentioned above, the flood waters would reach the Han River plains, destroying railway lines and directly threatening the Wulan area. Tens of millions of people and over 300,000 square kilometers in the plains would be threatened. Railways, roads, and navigation routes (especially the Beijing-Canton and Jiao-Lu rail lines) would be destroyed, making it very difficult to move supplies and personnel north or south. * The navigation route between Wuhan and Chongqing would also be destroyed, creating similar difficulties for the movement of troops and supplies between the east and west. The resulting immobility of troops would seriously compromise China’s ability to sustain front-line forces in any coastal conflicts. The destruction of the Three Gorges and Gezhouba dams would also cause blackouts in several provinces in central and east China and would halt military movements and production in western Henan, eastern Sichuan, and western Hunan. Finally, the use of nuclear or biochemical weapons would create immense amounts of contamination and pollution throughout central China.

During World War II, British attacks on dams in the Ruhr Valley had a paralyzing effect on German industry and were particularly devastating to the German war effort. The U.S. bombing of dams during the Korean War had the same effect: In summer 1952, the United States bombed four power stations—the Fushan, Jiashan, Changji, and Shuifeng power stations, which together comprised 13 separate power plants with a total capacity of 1.524 million kilowatts. ** Of the 13 plants, 12 were completely destroyed, causing a two-week blackout throughout North Korea and a 50 percent reduction in industrial production in and around Pyongyang and the Yalu River. The impact of the bombing was also felt in northeast China where, even with the supplementary electricity provided by a series of small-scale dams and power stations, electrical supply was cut by 90 percent. Later, in June 1953, another five North Korean dams were bombed by the United States. The damage severed the water supply to 75 percent of North Korea’s rice paddies, seriously disrupted

* The major Yangtze River flood in 1954 cut off the Beijing-Canton line for 100 days, causing widespread industrial and commercial havoc.

**Power plants in Baghdad were also destroyed by Allied forces in the recent Persian Gulf war.
transportation, and caused enormous psychological stress amongst the population. An earth and rockfill dam 32 kilometers north of Pyongyang was also bombed (flooding 43 kilometers of land and cutting major railway and transportation routes) as were the Guicheng and Deshang dams which were situated near key transportation routes into northeast China.

The severity of the destruction caused by a military strike against a dam is not directly proportional to the size of the dam and reservoir; it also depends on the location of the facility and the extent of preventive measures taken before an attack. The Soviet Union, France, Austria, and the United States have all conducted studies and taken various measures to mitigate the effects of military strikes against their key hydro installations.

But the advent of nuclear weapons and precision-guided cruise missiles have made it increasingly difficult to guard against attack. Many analysts have therefore argued that any plan to construct large-scale reservoirs must include, as a priority, the consideration of military risk. Why then did the experts who carried out the assessment of the Three Gorges dam pay so little attention to this issue? And, how could they believe that as long as a warning system was available for releasing water in the midst of a crisis, losses could be minimized? What if the warnings were inaccurate? And what effects would releasing water have on electricity generation, especially during a time of war? Would navigation by 10,000-ton vessels still be possible with a lower reservoir? And if the enemy were to destroy the Three Gorges and Gezhouba dams, the Jin River dikes, and the Zhi River bridge all at once, what would the total damage be?

Since the real purpose behind the assessment of the Three Gorges dam was to promote an early launch to the project, it is obvious that the experts simply decided to avoid the issue of war altogether since the questions mentioned here are very difficult to answer. The Yangtze Valley Planning Office’s assurances that “appropriate engineering and managerial measures would limit the flood damage caused by conventional or nuclear attack” result not from an honest assessment of this problem, but from a concerted effort to sweep the problem under the rug.

The assessment’s cursory review was not the last word on the issue, however. An article entitled “War and Its Impact on the Three Gorges,” published in Qiyejia (Entrepreneur) magazine, raised the eyebrows of many and finally brought the issue to the forefront. According to the article:

Yin Zhishu, a defense expert from the PLA General Staff, has recalled that as early as 1959 Premier Zhou Enlai placed Zhang Aiping, then deputy director of the General Staff and chairman of the National Defense Science Commission, in charge of tests of air defense for the proposed Three Gorges project. Zhang Aiping, Qian Zhengying, Lin Yishan, and 60 other scientists and experts from various military, scientific, and hydro-planning organizations were gathered together to carry out the evaluation.

Yin Zhishu claims that in the course of these tests, explosions and simulated direct attacks were conducted. The findings recommended lowering the water level during a crisis, diverting water into the lower reaches, reinforcing the coffer constructions in front of the dam, and building air defense facilities. To deal with a direct attack on the dam, the tests called for the design of a large-scale concrete structure and the piling of rocks. . . . After the research was completed, General Zhang delivered his report to Premier Zhou and later it was passed on to experts during the 1987 Assessment.

During the 1960s, the engineer corps, the Yangtze River Planning Office, and the Hydro Research Institute participated in nuclear weapons testing in China’s remote Xinjiang Province. More than ten tests were conducted. . . . The Hydro Research Institute conducted seven tests on four dams, including air and land attack scenarios and the emptying of the reservoir. The Electric Research Institute focused on testing the effects of war on electricity transmission and electrical equipment.

Because of the size of the Three Gorges dam, it has a certain capacity to resist heavy bombs. Zhang Aiping proposed that studies on the possible destruction of the dam by atomic and hydrogen bombs be made a priority. The basic air defense policy was to walk on both legs, that is, to adopt active and passive air defenses at the same time so as to be able to eliminate the enemy before it reaches the target and . . . to ensure that the destruction which does occur is minimized.

Despite once again raising the issue of a military defense of the Three Gorges, the article was filled with errors and angered General Zhang Aiping when he read it.

The true account, in Zhang Aiping’s own words, is as follows: “In August 1958, I followed Premier Zhou’s order and, along with Comrade Zhang Zhengman, went to Yichang to study the air defense system for the proposed Three Gorges dam at Sandouping. The results of our aerial surveys of the river and surrounding lands showed that defense against conventional aerial attack would be no problem. Studies by the Yangtze Valley Planning Office came to the same conclusion. But a nuclear attack was something completely different. If the dam were bombed in a nuclear attack, the water would rush all the way down to the city of Nanjing, which would suffer enormous damage, as would the Dongting and Poyang lakes. The only defense would be to release water from the reservoir ahead of time, but this is extremely risky, for there is no way to know when the enemy will attack. Moreover, the Three Gorges dam will bring
no benefits to Sichuan Province let alone to the greater southwestern part of China. And in the upper reaches the dam will cause Wanxian County to be submerged and threaten the area around Chongqing. The dam will not benefit navigation and will cause sedimentation to accumulate in the upper reaches of the Yangtze and increase the likelihood of flooding.

"We reported all of this to Premier Zhou. Zhou asked my personal opinion about the project and I said frankly, 'Let future generations decide this issue.'

"The article claims that 'As early as 1959 Premier Zhou Enlai placed Zhang Aiping . . . in charge of tests of air defense for the proposed Three Gorges project.'" But, in reality, the tests only used hand grenades and small bombs. The nuclear tests in Xinjiang were also limited and didn't really achieve the expected results.

"All in all, Three Gorges defense research after 1959 focused primarily on defense against nuclear attack. But since it comes so swiftly, and because we could never predict such an attack, we concentrated on passive defense methods such as reinforcing the dam base and releasing water before an attack. But we were not sure of the measures' effectiveness. As for the notion that we can predict when war will break out, I don't know what to say about that!"

As Zhang makes clear, there are no easy solutions to the problem of defending the Three Gorges dam, and research into the problem has been woefully insufficient. The 1987 Assessment dealt with the problem by simply assuming that no war would ever threaten the dam and unleash the destructive powers of the water which lies behind its wall.

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Epilogue

The New Golden Triangle of China

Richard Hayman

"Don't you understand? We can't guarantee your safety!" barked the gravel-voiced Public Security officer. The radio was crackling from headquarters: "How did they get there? They can't stay! Send them down!" I translated for my two friends who were having their first encounter with the rude officiousness of the Chinese police.

It was November 1995, and we had come to hike into the highland region known as Shennongjia, home to many prized rare plants and animals, including the legendary ye ren ("big foot") primate. These mountains, on the borders of Sichuan and Hubei provinces, rise to over 10,000 feet in sheer cliffs and steep ridges over rushing tributaries of the Yangtze River in the Three Gorges region. The cliffs are riddled with ancient caves of unknown depth, many of which will be flooded by the reservoir. We had met herbalists in the town of Dachang on the Daning River and examined many odd roots and fungi. Our guide, Old Zhu, offered to take us up into the highlands and introduce us to collectors. Little did he know how much trouble he would get us into.

We had been riding in the back of a local truck eating dust and diesel fumes for six hours. The steep mountains rolled past, climbing ever higher. The slopes are deforested and studded with gray boulders. Mud-walled houses nest in bamboo groves. Farmers hoe sweet potatoes and harvest chili peppers. At one turn in the road, majestic cedars stood above a government office. "They're only for scenery. The rest are gone," noted a truckmate. We got off the truck in Guanyang, a town of mud buildings with one street paved with large flagstones. There was an unusual hubbub on our arrival. A crowd of wide-eyed mountain people stared at us and examined our packs. The driver was worried because the police were calling over to us. They had never had foreigners here before.