

Miracles of Modernization:

The Green Revolution and the Apotheosis of Technology*

Waving his hand toward a patch of willowy, pale green rice stalks, Benigno Aquino showed an American reporter what the Green Revolution meant to the Philippines in the fall of 1966. “Here is the bullock cart. Here is the nineteenth century,” he said. Then, pointing across the road to a paddy of stubby, dark shoots planted in orderly rows, “here is the jumbo jet! The twentieth century.”¹ Over the next ten years, Green Revolutionaries took credit for saving the world from a Malthusian catastrophe. India, Pakistan, the Philippines, Malaysia, and Indonesia declared self-sufficiency in food, and agricultural technology received praise for reversing the economic fortunes of one of the world’s poorest regions. But what most impressed Aquino, the *New York Times*, the scientists at the International Rice Research Institute (IRRI), and the institute’s patrons in Washington and New York, was how the rice looked. “It’s something you can see,” Ford Foundation vice president Forrest Hill explained, “You can say, ‘well, go out and look at it.’ It did happen.”²

In the vast international undertaking known as development, a project that engrossed much of the world during the final half of the twentieth century, what “did happen” was configured as much by image and imagination as by the statistics accumulated by social scientists. In development lore only the Marshall Plan rivals the Green Revolution’s achievement. The agricultural miracle has been celebrated with a Nobel Peace Prize, but it has also been criticized—by Prince Charles and Al Gore, among others—for ravaging the environment, impoverishing peasants, and filling Asian cities with exploitable laborers.³ It is cited today as a precedent for the coming revolution in genetically modified (GM) foods. But the continuing debate seldom touches on the ingredient that made “miracle rice” a success even before the first crops were harvested and that guaranteed its triumph could not be repeated: the use of seeds to symbolize the arrival of modernity.

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1. Joseph Lelyveld, “Philippines Tries New Rice Strain,” *New York Times*, 18 December 1966.

2. F. F. Hill Oral History, 20 April 1973, Ford Foundation Archives, New York.

3. Al Gore, *Earth in the Balance* (London, 1992), 321–22; Charles Windsor, “A Royal View on Sustainable Development,” Reith Lecture, April 2000, http://news.bbc.co.uk/1/hi/english/static/events/reith_2000/lecture6.stm.

The new rice partitioned the landscape, drawing a boundary between traditional and modern agriculture clear enough to be seen through the chin bubbles of helicopter gunships.⁴ To diplomats, transnational scientists, and Southeast Asian technocrats, grain became a living symbol of abundance, an apparition capable of inducing mass conversions to modernity. In the modernization discourse, “technology transfer” denotes a moment when gifts of science change hands and economies are forever transfigured. The Green Revolution plotted this moment spatially, marking the ground with a line separating the bullock cart from the jumbo jet. Where the dark green rice stopped, that was the edge of the modern. Along this advancing frontier was a space rich with opportunity, where scientific rationality beatified itself in wonders and signs.⁵ IRRI’s “modern varieties” inspired developmental fantasies with political motifs: modernizing nationalists basked in the breakthrough’s technological aura, while the United States looked for ways to translate social disruptions caused by the new seeds into strategic influence.

The story of the transformation of Asian agriculture in the 1960s lies at an important intersection Walter LaFeber identified between the historiographies of technology and U.S. foreign relations.⁶ The extensive literature on the Green Revolution acknowledges its geopolitical agenda and describes the varied professional, commercial, and strategic interests behind scientific agriculture. Foundations and scientists fulfilled institutional and professional ambitions by supplanting local knowledge and praxis with international (Western) expertise.⁷ For Monsanto, Union Carbide, and multinational oil companies, the Green Revolution furnished a means to penetrate and discipline markets.⁸ John H. Perkins has described a politics of population and national security shared by State Department planners and foundation executives who saw demographic pressures propelling leftist insurgencies.⁹ Green Revolutionaries, in this view,

4. Vietnam veteran Thomas R. Hargrove claimed IR-8 could be easily seen from choppers “because it looked like a crew cut.” Hargrove, *A Dragon Lives Forever* (New York, 1994), 13.

5. Gyan Prakash, *Another Reason: Science and the Imagination of Modern India* (Princeton, NJ, 1999), 47.

6. LaFeber, “Presidential Address: Technology and U.S. Foreign Relations,” *Diplomatic History* 24 (Winter 2000): 1–19. See also Odd Anne Westad, “The International History of the Cold War,” *Diplomatic History* 24 (Fall 2000): 551–65.

7. Stephen A. Marglin, “Farmers, Seedsmen, and Scientists: Systems of Agriculture and Systems of Knowledge,” in *Decolonizing Knowledge: From Development to Dialogue*, eds. Frederique Appel-Marglin and Stephen Marglin (Oxford, 1996), 185–248; Gustavo Esteva, “Hosting the Otherness of the Other: The Case of the Green Revolution,” in *ibid.*, 249–278; Robert S. Anderson, Edwin Levy, and Barrie M. Morrison, *Rice Science and Development Politics: Research Strategies and IRRI’s Technologies Confront Asian Diversity* (Oxford, 1991); Edmund K. Oasa, “The International Rice Research Institute and the Green Revolution: A Case Study on the Politics of Agricultural Research” (Ph.D. diss., University of Hawaii, 1981).

8. See especially Jack Kloppenberg, *First the Seed: The Political Economy of Plant Biotechnology, 1492–2000* (Cambridge, 1988); Angus Wright, *The Death of Ramón González: The Modern Agricultural Dilemma* (Austin, TX, 1990).

9. John H. Perkins, *Geopolitics and the Green Revolution: Wheat, Genes, and the Cold War* (New York, 1997).

were “buying time” for the West to contain the population explosion. Whether sympathetic or critical, narratives of the Green Revolution follow a structure conventional to histories of technology, beginning with the inspiration of scientists, climaxing in the defeat of tradition, and unfolding in tables of statistics measuring harvests, revenues, and social disturbance. In this context, politics is a kind of original sin, bred into the seeds and carried with them to Asian fields. This essay suggests an alternate approach to understanding relationships between technology and the exercise of influence.

Technological artifacts may be seen as tools at the service of preexisting interests or strategies, but technologies also impose demands on resources, time, and information, and so shape the way interests are perceived and strategies devised. Technology, as the second of its Greek roots implies, is a type of rhetoric, an argument in the form of an object. We are familiar with the ways in which the conceptual systems built around computer technology (is there any sustainable argument *against* a hardware upgrade?) focus and constrain thought.¹⁰ In a foreign policy context, nuclear weapons and petroleum are not simply—or even principally—regarded as tools, but as markers of status and restraints on behavior. Those who develop, distribute, and theorize new discoveries frame them in ways that determine what intelligence, resources, and results are privileged, and therefore what goals and futures can be imagined. For this reason, an emphasis on hidden agendas and interests may actually understate the extent to which technology shapes foreign relations, and vice versa. The political effects of a technology derive not primarily from the motivations behind its inception but from the way the artifact is used to reveal and circumscribe the universe of priorities and possibilities, a blinkering effect that has been called *technicity*.¹¹

This essay examines a particular technicity: the use of a technology—such as rice—to visualize a boundary between tradition and modernity. In the late 1960s, IR-8 was deployed throughout Southeast Asia as a symbolic divider marking the onset of a new political and economic dispensation. The present essay focuses, somewhat arbitrarily, on the Philippines and Vietnam. They were the first countries to cultivate IR-8 extensively, and they illustrate how rice technology could be employed for pacification and to consolidate client regimes, but more importantly they exemplify the element of spectacle that made the introduction of dwarf rice and wheat a pivotal event in Indonesia, Sri Lanka, and India as well. “Here is an opportunity where irrigation, fertilizer, and peasant education can produce miracles in the sight of the beholder,” Robert

10. For a full elaboration, see Paul N. Edwards, *The Closed World: Computers and the Politics of Discourse in Cold War America* (Cambridge, 1996).

11. The term is used by Foucault and others but is generally attributed to Martin Heidegger. See *The Question Concerning Technology and Other Essays* (New York, 1977), 14–35; Reiner Schürmann, “Technicity, Topology, Tragedy: Heidegger on ‘That Which Saves’ in the Global Reach,” in *Technology in the Western Political Tradition*, ed. Arthur M. Melzer, Jerry Weinberger, and M. Richard Zinman (Ithaca, NY, 1993), 190–213.

McNamara observed.¹² IR-8's power to make modernity visible was what excited wealthy landlords, postcolonial politicians, aid officials, and foundation grant-slingers. The new seeds had "an element of drama, an element of excitement—some sex appeal, if you will," William S. Gaud, director of the U.S. Agency for International Development (USAID) explained. "Development . . . suddenly came down to a very simple proposition: one man seeing his neighbor doing better than he was doing."¹³

Development experts in the 1960s recognized a connection between sight, technology, and the modern state that scholars have recently begun to analyze. Foreign assistance, as Daniel Lerner explained in 1968, was in essence a process of creating and consuming images: "Every nation that regards itself as more developed now transmits pictures of itself to those less developed societies that figure in its own policy planning," while the nation receiving the images "decides, as a matter of high priority for its own policy planning, which of them constitutes the preferred picture of its own future."¹⁴ A variety of critical literatures identify a characteristically modern "hegemony of vision" manifest in architecture, popular culture, and modes of governance. The imperial "gaze" preoccupies postcolonial and gender studies, and international relations theorists James Der Derian and James Scott have extended the analysis to describe how the state strives to draw its subjects into its own way of seeing, and thus to conform their aspirations to the technicity of the state.¹⁵ Following this thread, the present essay will contend that scientists, military officials, and modernizing regimes valued IR-8 because they believed it possessed an unusual capacity to induce peasants, voters, and governments to see their situation differently, and to recalculate their interests and allegiances accordingly. Like McNamara, observers resorted to religious terminology to describe such conversions, appropriately perhaps, for development has been described as a "global faith," a belief—in the face of contrary evidence—in the redemptive power of science and economic growth.¹⁶ As the Viet Cong, Ferdinand Marcos, USAID and others recognized, however, the denomination of that faith was up for grabs. The emphasis in standard narratives of the Green Revolution on conflict between innovation and tradition conceals a more consequential struggle for representational authority, to decide what metaphors, campaign slogans, war

12. "Text of Address by Robert McNamara, World Bank's New President," *New York Times*, 1 October 1968.

13. House Subcommittee on National Security Policy and Scientific Developments, *The Green Revolution: Symposium on Science and Foreign Policy*, 91st Cong., 1st sess., 1969, 30.

14. Daniel Lerner, "Modernization," in *International Encyclopedia of the Social Sciences*, ed. David L. Sills (New York: Crowell, Collier, and MacMillan, 1968), 10: 387.

15. David Michael Levin, ed., *Modernity and the Hegemony of Vision* (Berkeley, CA, 1993); James C. Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven, CT, 1998); James Der Derian, *Antidiplomacy: Spies, Terror, Speed and War* (Cambridge, 1992).

16. Gilbert Rist, *The History of Development: From Western Origins to Global Faith* (London, 1999).

aims, or geopolitical agendas would be associated with the spectacle of the miracle harvest. Tradition may have been foredoomed, but a contingent, unpredictable contest over technicity ultimately determined the meaning of the Green Revolution in history and memory.

Throughout the Cold War, United States officials considered their ability to display the fruits of modernity to be a powerful weapon against communism. Client states served as “showcases of democracy” and aircraft carriers as floating icons of futuristic technology. “I want to show you this kitchen,” Vice President Richard Nixon told Nikita Khrushchev at the 1959 American National Exhibition in Moscow. The refrigerators and dishwashers, Nixon explained, symbolized a freedom of choice “that’s the spice of life.”¹⁷ But placing visions of abundance before millions of Asian peasants proved difficult. In 1957, the head of the U.S. Chamber of Commerce suggested that Ho Chi Minh would lose appeal if the Vietnamese could see a Sears Roebuck catalog, and the Kennedy administration later consulted, unfruitfully, with Sears executives about putting the plan into effect.¹⁸ Walt Whitman Rostow, a leading modernization theorist and national security adviser to Lyndon Johnson, wanted to put “television sets in the thatch hutches of the world” to defeat both tradition and communism with the spectacle of consumption.¹⁹

Showcasing had become a standard feature of foreign aid and development projects by the mid-1950s. Rural experiment stations and model villages presented miniaturized futures for people to visit and emulate. The nature of this display changed in the 1960s, as the Johnson administration escalated the war in Vietnam. Executives of the Ford and Rockefeller foundations—along with Ferdinand Marcos’s “technocrats” and counterinsurgency warriors in Vietnam—used technology to draw a more visible dividing line between stagnation and progress, across which Asian peasants would “begin to sense, however dimly, what an affluent society could mean for them and their children.”²⁰ They wanted to sharpen the edge of the modern, to force a decision between old ways of life and the new. IRRI’s agricultural revolution spearheaded this effort.

The Ford Foundation funded IRRI after its other rural development programs failed to generate sufficiently dramatic results. Since 1951, the foundation and the Indian government had backed a concept called community or

17. Harrison E. Salisbury, “Nixon and Khrushchev Argue in Public as U.S. Exhibit Opens,” *New York Times*, 25 July 1959.

18. House Special Subcommittee to Study the Foreign Aid Program, *Southeast Asia: Report on United States Foreign Assistance Programs*, 85th Cong., 1st sess., 1957, 6; Fowler Hamilton to Walt W. Rostow, “Back to the Sears Roebuck Catalog,” 13 August 1962, State Department Policy Planning Council files, Lot 69D121, box 211, NARA. The Sears Roebuck idea was first suggested by salesman-evangelist-congressman Bruce Barton in 1920 as a cure for Bolshevism. Warren I. Sussman, *Culture as History* (New York, 1984), 128.

19. David Halberstam, *The Best and the Brightest* (New York, 1972), 123.

20. Ford Foundation, *A Richer Harvest* (New York, 1967), 3.

village development. Beginning at the experimental hamlet of Etawah, Uttar Pradesh, and eventually spreading to seven demonstration provinces, the program created Taylorized model villages.²¹ Agronomists and social scientists identified and classified the functions of rural life, introduced improvements, and dispatched young trainees to transmit knowledge to distant villages. Bulletin boards, photographs, and carefully staged comparisons displayed the advantages of new techniques, but progress was slow, especially by the statistical yardstick of development economics.²² After eight years and \$10 million, Indian farms had grown no more productive and Henry Heald, the foundation's new director, pulled the plug. "After you give a lot of young Indians a six months course in village development," Heald complained, "you really haven't got much."²³ Amid forecasts of impending famine, the State Department and the CIA urged the foundation to take action.²⁴ Heald hired a Cornell agronomist, Forrest F. Hill, to reorganize the international development program. Hill pushed the concept of a joint Ford/Rockefeller initiative on rice in Asia.

Hill made no predictions that a rice institute would abruptly enlarge the world's food supply or avert a famine in Asia. IRRIs selling points were that it represented a new scientific approach and a new institutional arrangement.²⁵ The Ford Foundation promoted "project-oriented research," a scientific work culture that originated in the Office of Scientific Research and Development during World War II and reached its fullest elaboration in James Webb's NASA.²⁶ Project-oriented research had proven itself in the Rockefeller Foundation's wheat improvement program in Mexico. It was the United States' answer to the threat of totalitarian science in the shadow of Sputnik. Instead of

21. Albert Mayer, *Pilot Project, India: The Story of Rural Development at Etawah, Uttar Pradesh* (Berkeley, CA, 1958). Horace Holmes, an Etawah pioneer, recalled a trajectory that the Green Revolution would repeat: "there was too much publicity. It was even called a 'miracle' by some. It wasn't. There were numerous efforts in many other countries along somewhat similar lines. Some have been quite successful. Others ignored the necessity for building an agricultural base, and unfortunately became large welfare projects." Horace Holmes, "Etawah Revisited," October 30, 1967, AGR 10 INDIA, State Department Subject Numeric File, box 420, NARA.

22. Jonathan B. Bingham, *Shirt Sleeve Diplomacy: Point 4 in Action* (New York, 1954), 45.

23. Heald oral history, 7 January 1972, Ford Foundation archives; F. F. Hill, "Notes on Economic Development," 10 December 1958, Report 010459, FF archives.

24. H. Rowan Gaither, "Interview with Mr. Allen Dulles," 15 April 1955, Report 005611, FF archives.

25. F. F. Hill, "Notes on Economic Development," December 1958, 010459, Hill Papers, FF archives; Hill, "Purposes of the Proposed Rice Research Foundation," 1959, Hill papers, box 14564, FF archives.

26. The team concept was enshrined in the Ford Foundation's seminal document, the Gaither Report, and became one of IRRIs main exports. "Report of the Business Division," October 1949, Gaither Report: Supporting Documents, Vol. II, 21, FF archives; A. Colin McClung, "Accelerated Rice Research Program for E. Pakistan in Cooperation with the IRRIs," May 1965, report 001616, FF archives.

solitary inventors or a hierarchical science establishment, scientists would work in egalitarian, interdisciplinary teams on projects determined by the national interest.²⁷ Foundations also believed in “institutionalizing” change, and that foundations were an especially useful type of institution. Ford and Rockefeller pledged seven million dollars to create IRRI, and Hill began negotiations in 1959 to establish it as the first tax-exempt research foundation in the Philippines.²⁸ In line with the latest social science theories of modernization, Hill felt development required new institutions, attitudes (e.g. the team approach), and technology.²⁹ IRRI would bundle all three in one package. It marked a transition in the Ford Foundation’s philosophy of development. Instead of incrementally improving practices and technologies already in the developing world, it would introduce something completely different, a Manhattan Project for food.³⁰

Hill and Robert Chandler, the former president of the University of New Hampshire and IRRI’s first director, viewed scientific research as a kind of moral instruction, a solvent for national and elite prejudice. Chandler incorporated this ethic in everything IRRI did, starting with the buildings laid out on a site adjacent to the University of the Philippines campus at Los Baños. Foundation officials selected an internationally known architect, Ralph T. Walker—a modernist famous for his designs of American military bases, suburban research campuses (Bell Labs, General Electric), and industrial pavilions at the 1939 World’s Fair—to supervise a team of Filipino architects preparing plans for one of the largest construction projects ever undertaken in the Philippines.³¹ Walker’s design made no concessions to either climate or local conventions. There was “no true Philippine style,” he assured foundation officials; nationalistic styles had given way to the modern idiom. Constructed completely of imported materials, the sprawling one-story aluminum and glass structures featured modular walls to encourage an egalitarian office culture. Air conditioning, tiles, plumbing, and upholstery conveyed “the power and richness of American life,” and also a sense of permanence. Walker felt his buildings

27. Walter A. McDougall, *The Heavens and the Earth: A Political History of the Space Age* (Baltimore, MD, 1997).

28. Robert F. Chandler, “On Rice Research,” July 1960, Chandler speech file, IRRI archives, Los Baños, Philippines. The new institutional form caught on, and soon even the president was sequestering assets in the “Ferdinand E. Marcos Foundation.” James Hamilton-Paterson, *America’s Boy* (New York, 1999), 222.

29. Forrest F. Hill, “The Human Factor in Economic Development,” 14 October 1957, Hill papers, 003698, FF Archives.

30. On the origins of IRRI, see Robert S. Anderson, “The Origins of the International Rice Research Institute,” *Minerva* 29 (Spring 1991): 61–89; Robert F. Chandler, Jr., *An Adventure in Applied Science: A History of the International Rice Research Institute* (Manila, 1992).

31. J. G. Harrar to F. F. Hill, 23 December 1959, FF grant files, 06000178; Walker to J. G. Harrar, January 26, 1961, FF grant files, 06000178; Chandler to Harrar, 17 February 1960, FF grant files, 06000178.

emblemized “a new type of imperialism” based on “specialized knowledge generously given to backward peoples.”³²

Chandler came under attack for extravagance, but he defended the design as necessary for IRRI’s mission. Other grantees especially resented the housing compound, which, they felt, failed to display a proper pioneering spirit. The ranch-style homes (4 br, 2 ba, air, W/D, tennis, pool, lake vu.) cost \$60,000 apiece in 1961. Each came equipped with a generator, a luxury that astonished visitors from neighboring Ford Foundation village development projects. “What this seems to say,” a grantee laboring in a village in Marawi noted, “is that IRRI residents should never be without electricity and water. There are none of us in that enviable situation.”³³ Chandler replied that the homes were not for Americans, but for Asians, who would for the first time enjoy the amenities of life in the developed world. From their air-conditioned offices and living rooms, trainees from Karachi or Saigon would view the problem of underdevelopment from the vantage of modernity.³⁴

Chandler was especially concerned with training scientists to negotiate the passage across the edge of the modern, and IRRI’s landscape and work routines guaranteed trainees would practice that journey daily. Facing the laboratory buildings was an eighty hectare experimental farm laced with underground pipes to allow individual plots to replicate the rainfall and drainage patterns of any part of the tropical zone. Soil imported from Java, the Mekong Delta, and the Plain of Jars was laid out in separate national paddies, making the farm a miniature Asia, an agricultural war room where scenarios could be gamed out in virtual space. Care was taken to assure that scientists approached this microcosm in a spirit of humility and self-reliance. Visiting scientists were required to “take off their shoes and wade right in” and run experiments themselves.³⁵ “We always start trainees behind a carabao, out in the fields,” an IRRI official chuckled. “It’s good for their character. About once every three days they are likely to come in and say, ‘Why are we here?’ but after a month or so, they get right enthusiastic.”³⁶ Specialists were encouraged to base their knowledge on experience, rather than on published studies. Each day’s routine—leaving the office to tend and inspect plantings, and then returning to write up the

32. Ralph T. Walker, *Ralph T. Walker, Architect of Voorbees, Gmelin, and Walker* (New York, 1957), 225; Ron Robin, *Enclaves of America: The Rhetoric of American Political Architecture Abroad, 1900–1965* (Princeton, NJ, 1992), 151.

33. Harry L. Case to George F. Gant, “International Rice Research Institute Budget,” 12 October 1966, FF grant files, PA06500055.

34. Robert F. Chandler, Jr., “The Rockefeller Foundation and the International Agricultural Research Centers,” undated, International Rice Research Institute Library, Los Baños; Chandler, “Case History of IRRI’s Research Management During the Period From 1960 to 1972,” undated, IRRI Library; Chandler, *Adventure in Applied Science*, 94.

35. Oral History interview with Robert F. Chandler, 1967, IRRI archives, Los Baños, 26.

36. Paul Deutschman, “IRRI Fills Empty Rice Bowls,” *Saturday Review*, 6 August 1966,

results—symbolically enacted science’s obligations to the underdeveloped world.

IRRI was founded in the salad days of development economics when “the prospect of leading the Third World into the twentieth century,” according to Kennedy adviser George Ball, “offered almost unlimited scope . . . to sociologists, psychologists, city planners, agronomists, political scientists and experts in chicken diseases.”³⁷ The presumption that Asian scientists could learn the dignity of toil from their American mentors indicates the influence of modernization theories just then coming into vogue among policymakers and academics. In 1957, with IRRI still on the drawing board, Hill anticipated problems with the Asian “plant breeder who sits in his office and sends his untutored field hand to make crosses.”³⁸ His concern drew on recent behavioral theories emphasizing the importance of steering the restless energies of the “transitional personalities” on whom modernization depended. In a seminal 1956 article, Zbigniew Brzezinski complained that Western-trained third world intellectuals were “on the whole elitists, despite their protestations.” Contemptuous of their countrymen and envious of the colonial powers’ technology, they rejected “slow and chiefly self-directed economic development” in favor of communism’s quick solutions.³⁹ Lucian Pye coined the term “expectation gap” to describe the psychological chasm separating young Asians from the “peasant standards and values” that surrounded them. Frustrated young men risked becoming “victims of their own impatience” unless nation building could give them a “sense of belonging” in both the village and the modern world.⁴⁰ Cold warriors recognized the subversive potential of these unfulfilled yearnings. An Indian student told Ambassador Chester Bowles that his generation lived “with one leg in the world of the ancients and the other in the rational scientific world of the modern, with the feeling that both of these worlds are breaking to pieces under our feet.”⁴¹

IRRI aimed to outfit its trainees with a stable *hybrid* professional identity they could carry back into Asia’s fractured culture. Removed from the debilitating atmosphere of colonial bureaucracies and caste-conscious schools, trainees found their native abilities with a suddenness that surprised Chandler.⁴² IRRI’s routines banished politics and privilege. Indian and Pakistani agronomists lived and worked together. Habits formed by colonial education were systematically

37. George W. Ball, *The Past Has Another Pattern* (New York, 1982), 183.

38. Hill, “The Human Factor,” 8.

39. Zbigniew Brzezinski, “The Politics of Underdevelopment,” *World Politics* 9 (October 1956): 57–59.

40. Lucian W. Pye, *Guerilla Communism in Malaya: Its Social and Political Meaning* (Princeton, NJ, 1956), 344–346; See also Daniel Lerner, *The Passing of Traditional Society* (New York, 1958).

41. Chester Bowles, *Ambassador’s Report* (New York, 1954), 90.

42. “The Indians are just as productive [at IRRI] as anybody,” he marveled. “I remember, Dr. Pathak wasn’t there thirty days, and Dr. Tanaka too, before he had the first field experiment *planted*.” R. F. Chandler oral history, 29 July 1966, Rockefeller Foundation Archive Tarrytown, NY.

discouraged, and specialists were rewarded for eschewing the comforts IRRI took pains to provide. No standing was given to academic rank; no degrees offered. Research aimed at visible results in the field that would overwhelm the scorn of bureaucrats and peasants back home. Trainees were told to expect such resistance, but also to face it with the support of their international team. The institute's "first-class" facilities were instructional, inculcating the oppositions—modernity/tradition, practice/theory, science/politics—that defined both the institute and the agronomist.

To Filipinos, the structures signified a different opposition, between luxury and poverty. In a country where *palabas*, or showiness, governs political and economic life, IRRI went over the top. The *Manila Chronicle* likened it to a hotel lounge, and Filipino officials called it "Hollywood on Los Baños."⁴³ The latter name actually predated IRRI's first use as a film set. In 1966, director Cornel Wilde, taking advantage of the institute's ability to furnish "Asian" and "state-side" locations, used it as backdrop for *Beach Red*, in which Rip Torn consoled Jean Wallace on a divan—Chandler's divan—in the IRRI lounge while Marines assaulted the experimental rice fields outside.⁴⁴ Aside from the U.S. military bases, the IRRI residential compound was the Philippines' first gated suburb. Land reform expert Wolf Ladejinsky toured the Philippines in 1963 and found conversations about IRRI invariably turned to the subject of the gate guard, "a symbol of exclusiveness."⁴⁵ Chandler considered the criticism unfair, since the surrounding poverty made a place as "modern and well equipped as the IRRI complex an obvious attraction to burglars."⁴⁶ Green Revolutionaries gradually grew accustomed to having their intentions misconstrued. It was easier to create contrasts than to control the meanings people attached to them.

Looking like an Ohio consolidated high school perched on a volcano, IRRI appears misplaced even today. In the 1960s, the effect was startling. "The entire installation is so different from the ramshackle construction characteristic of much of Filipino life at home," a *New Yorker* reporter observed, that it "attracted a good many sightseers."⁴⁷ Once IRRI was dedicated in 1962, buses from Manila brought a thousand tourists a week to Los Baños for a glimpse of the future. IRRI opened a welcome center and conducted guided tours, offering visitors education and a sense of time-travel, much like Colonial Williamsburg, another Rockefeller-sponsored theme park. Williamsburg, according to its guidebook, was "more than a bricks and mortar reconstruction," it was a "symbol of democracy in the troubled world today."⁴⁸ IRRI reached for the same symbolism, reas-

43. E. J. Kahn, "Rice, Rice, Rice," *New Yorker*, 23 October 1965, 172.

44. Cornel Wilde (director), *Beach Red* (1967); Robert F. Chandler oral history, 25 January 1967, RF Archives, 88.

45. Ladejinsky to Walter A. Rudlin, 17 January 1963, Ladejinsky papers, FF archives, 006102.

46. Chandler, *Adventure in Applied Science*, 86.

47. *Ibid.*, 166.

48. Richard Handler and Eric Gable, *The New History in an Old Museum* (Durham, NC, 1997), 64.

suring visitors that science would ease the passage between tradition and modernity. An eleven-minute film introduced Filipinos to themselves, as they were seen by outsiders. Depicting tasks many in the audience had performed that day, it observed that these “primitive methods” of cultivation were “inefficient, wasteful of human energy,” and posed the essential question: “Can modern science help these people grow more rice? Two American foundations think that it can.”⁴⁹

Los Baños was a destination for pilgrims even before IRRI. Visitors came for its healing baths and to visit Makiling National Park, which adjoined the institute’s grounds.⁵⁰ The proximity to Mount Makiling, a sacred spot since pre-Christian times, cast a spiritual aura over IRRI that the discovery of miracle rice only confirmed. The rainforest-cloaked volcano is named for Mariang Makiling, a *dirwata*, a light-skinned place-goddess whose profile can be discerned in the mountain’s slope. In pre-Spanish times, Makiling visited local people (as the Virgin Mary has since) in response to appeals for help. One well known legend tells of her taking pity on a poor farmer to whom she gave a *bilao* full of ginger. Disappointed, he carried the basket home, whereupon the coarse tubers turned to gold.⁵¹ In the last century the mountain’s dense forests have given refuge to political utopians—*Katipuneros* and the Maoist New People’s Army—and to syncretic sects whose Christ, the nationalist leader Jose Rizal, revealed that the mountain contained an underground paradise, “a garden of flowers and fruit trees.”⁵² Chandler never invoked Makiling’s legends, but an echo of these associations may be heard in the vernacular names the Philippine press attached to IRRI’s first high-yielding varieties, IR-8 (“miracle rice”) and IR-5 (the “more miraculous rice”), and the name the Marcos administration gave IR-8: Rizal Seed No. 1.⁵³ The apotheosis of rice technology, which proceeded in earnest after 1966, began in a commingling of legends, American and Filipino, placing IRRI at the source of earthly abundance and asserting its guardianship of nature’s secrets.

IRRI’s scientists set out to “change the architecture of the rice plant”—to make it shorter, greener, with fewer leaves and more panicles—their mission dictated as much by a need for institutional distinction as by the requirements

49. International Rice Research Institute (film), 1965, RF archive.

50. Alfonso J. Aluit, *Galleon Guide to Manila and the Philippines* (Manila, 1968), 135–6.

51. A *bilao* is the shallow basket used to thresh rice. Resil B. Mojares, “Waiting for Mariang Makiling: History and Folklore,” *St. Louis University (Baguio City) Research Journal* 19 (December 1988): 205–215; Jose Rizal, “Mariang Makiling,” in *Rizal’s Prose* (Manila, 1990), 86–92.

52. Reynaldo Clemeña Iletto, *Pasyon and Revolution* (Quezon City, 1989), 206, 210. It is widely believed in central Luzon that a tunnel connects the mountain to Mt. Arayat, fifty miles away. At IRRI’s grand opening, President Diosdado Macapagal indicated that IRRI would protect the Philippines against subversion of another kind, as a “potent weapon in the struggle against poverty and communism.” “Rice Research Institute Opened,” *Manila Chronicle*, 8 February 1962.

53. Zacarias Saran, “FM Reaps Miracle Cereal,” *Manila Chronicle*, 16 November 1966; Edward R. Kiunisala, “The More Miraculous Rice,” *Philippines Free Press*, 11 October 1969.



Figure 1: IRRI displayed the contrast it wanted to create throughout Asia. Its modern glass and aluminum laboratories faced an experimental farm where rice was grown in “traditional” ways. Scientist trainees were expected to “wade right in.” (Source: Rockefeller Archive Center).

of Asian agriculture. Modernization schemes, like dissertations, must stand by their claims to novelty, a problem Chandler felt acutely as he struggled to establish his program’s preeminence in a region thick with colonial, national, and United Nations centers devoted to improving rice. Rice breeding, once an artisanal skill of farmers, became a state function in colonial Asia, and in the late 1940s the UN Food and Agriculture Organization (FAO) considered it one of the few aspects of Asian production that had been adequately modernized.⁵⁴ The Philippines, like most countries, had national and provincial research stations, including one located in Los Baños. The FAO set up an international rice center in Bangkok in 1962.⁵⁵ In this crowded field, Chandler needed to display the merits of his project-oriented approach with sufficient splash to justify Ford’s and Rockefeller’s massive investment. From the beginning, therefore, he

54. FAO, *Report of the Rice Study Group, Trivandrum, Travancore State, India* (Washington, 1947), 20–21.

55. Kathleen McLaughlin, “UN to Establish Rice Research Center in Thailand,” *New York Times*, 27 July 1962; Hill to Chandler, 2 October 1962, Hill Papers, box 14564, FF archives.



Figure 2: IRRI scientists Henry Beachell, Peter Jennings, and Robert Chandler (clockwise from bottom) introduce Marcos and Johnson to dwarf rice in 1996. Rice of “traditional” height can be seen on LBJ’s left. LBJ wanted to use the new rice to “escalate the war on hunger.” Source: IRRI

elected to avoid incremental improvements in rice varieties and go for “the big jump.”⁵⁶

Once an international staff was assembled, Chandler asked it to produce specifications for an “ideal plant type,” a variety that would most efficiently convert sunlight, water, and chemical inputs, particularly nitrogen, into food. The scientists settled on eight characteristics of this Platonist ideotype, known at IRRI as “the target”: The rice would be short, to avoid wasting materials on stalk; dark green, to absorb sunlight better; and rigid, to allow for machine harvesting. It should grow anywhere in tropical Asia, and have resistance to pests and diseases.⁵⁷ Breeders rejected or modified strains that met only some of these

56. Edmund K. Oasa, “The International Rice Research Institute and the Green Revolution: A Case Study in the Politics of Agricultural Research” (Ph.D. dissertation, U. of Hawaii, 1981), 201.

57. “Breeders Determine Desired Plant Characteristics,” *IRRI Reporter* 1 (January 1965): 2; IRRI, *Annual Report for 1961–1962* (Los Baños, 1962), 13. Henry M. Beachell, an agronomist at the U.S. Department of Agriculture rice experiment station at Beaumont, Texas, had already written about an ideal plant type “adapted to combine harvesting in the southern United States.” Beachell became IRRI’s chief rice breeder. H. M. Beachell and J. E. Scott, “Breeding Rice for Desired Plant Type,” *Proceedings of the Rice Technical Working Group* (Houston, TX, 1962), 15–16.

criteria. Chandler wanted to take plant genetics to its limits, to “show the world that higher yields were possible.”⁵⁸

Philippine agronomists tried unsuccessfully to discourage the Big Jump strategy. Dioscoro Umali, dean of the University of the Philippines College of Agriculture, attended IRRIs Thursday seminars in 1963 and 1964. The target variety, he pointed out, would require expensive inputs: not just fertilizer, but also herbicides to prevent shading by taller weeds. Shallow-rooted dwarf plants needed more precise hydraulic control than most peasant farmers could manage. Farmers would have to discard nearly all of their practices and adopt new techniques for planting, weeding, irrigation, harvesting, and threshing.⁵⁹ New chemicals and equipment would require credit and distribution networks that the region did not have. If adopted, the target variety would radically disrupt the social environment in which rice was grown. His criticisms hit upon an unstated objective of the Big Jump strategy: to induce social change by displacing the culture and economy of rice cultivation. Umali was the first but not the last scientist to try to rescue the straightforward objective of increasing rice yields from the ballooning expectations that clustered around the project. Among agronomists, his view would prevail in the end, but not until after the Green Revolution had been defined by modernizers who regarded rice as an instrument for social engineering.

The dream of using food to reform Asia originated in the Rockefeller Foundation amid concern about the political consequences of runaway population growth.⁶⁰ Foundation demographers believed only modernization across a broad front—involving urbanization, the spread of literacy, consumerism, and external contact—could appreciably reduce birth rates and forestall a crisis. The best hope lay in stimulating an “industrial revolution of agriculture, whereby agricultural personnel are taken off the land and put to work in factories.”⁶¹ President John F. Kennedy expanded on this vision in the June 1963 speech to the World Food Congress that formally launched the Green Revolution. He called for an agricultural revolution “which may well rival, in its social consequences, the industrial revolution,” and lead to “the building of new institutions, the training of a new generation of young people,” and a liberation of “the talents and the creative abilities of half of mankind.”⁶²

Paradoxically, development economists expected a single technology to propel this sweeping change. A massive Ford Foundation/Social Science Research Council inquiry into the sources of economic development begun

58. Oasa, “International Rice,” 183.

59. Oasa, “International Rice,” 194–197. These warnings proved correct. See, Anderson, *Rice Science*, 177.

60. Perkins, *Geopolitics and the Green Revolution*, 119–120.

61. Frank Lorimer to Warren Weaver, “WFL Notes on ‘World Population and World Food Supplies,’” 22 November 1949, RF papers, RG 3, series 915, box 3.

62. Kennedy, “Statement at the Opening Ceremony of the World Food Congress,” 4 June 1963, *John F. Kennedy Office Files*, Part 1, reel 11, frame 1018.

in 1955 postulated that “epochal innovations” (the steam engine, internal combustion) drove historical and economic transformation.⁶³ But Albert O. Hirschman, writing in 1958, suggested that the technological trigger could also be something as ordinary as a rice seed. Rejecting the orthodoxy of “balanced” development, which required simultaneous economic, social, and scientific advances to generate a “big push” toward modernity, he argued that a disruptive technology, an “inducement mechanism,” could stir unused talent and capital into activity. Like an atomic pile, underdeveloped societies would undergo a “chain of disequilibria” as energy was released from the breaking of traditional bonds.⁶⁴ John P. Lewis, former head of the India USAID mission, told Congress in 1969 that Hirschman had written the history of the Green Revolution in advance. “He taught many of us to realize that this is the way you expect successful development to happen. When it succeeds, you get a thrust, one sector moves ahead, and it begins to create effective pulls on the laggards.”⁶⁵ Lester Brown, a Department of Agriculture economist, explained that farmers who discarded customary practices would assert control of their environment in other ways, demanding schools, roads, birth control, and new political arrangements. Change would percolate upward from the riceroots, until “peasant farmers are drawn into the mainstream of modern economic life.”⁶⁶ The inducement mechanism’s psychological influence was thus more important than its economic effect. Much ink would be spilled in the 1970s debating the rationality of peasants, but IRRI’s project proceeded from the assumption that peasants were *not yet* rational.⁶⁷ Their awakening to modernity would begin with the decision to plant IRRI’s seeds.⁶⁸

IRRI defined its target in January 1965, during the pause between the Tonkin Gulf Incident and the onset of Rolling Thunder, the bombing of North Vietnam. At that moment, ocean and air currents were shifting in a pattern now known as El Niño, pushing monsoon clouds away from the Asian land mass and deep into the Pacific Ocean. As Mike Davis points out, El Niño oscillations subsided between the 1920s and the 1970s, granting tropical Asia a reprieve from climate-induced (but not war- or politics-induced) famine, but in 1966

63. Simon Kuznets, *Modern Economic Growth: Rate, Structure, and Spread* (New Haven, CT, 1966), 2.

64. Albert O. Hirschman, *The Strategy of Economic Development* (New Haven, CT, 1958).

65. House Committee on Foreign Affairs, *The Green Revolution*, 91st Cong., 1st sess., 5 December 1969, 63.

66. Lester R. Brown, *Seeds of Change: The Green Revolution and Development in the 1970s* (New York, 1970), 10; Nils Gilman, “Paving the World With Good Intentions: The Genesis of Modernization Theory, 1945–1965” (Ph.D. diss., University of California, Berkeley, 2000).

67. Pierre Brocheaux, “Moral Economy or Political Economy? The Peasants are Always Rational,” *Journal of East Asian Studies* 42 (August 1983): 791–803; James C. Scott, “Everyday Forms of Peasant Resistance,” *Journal of Peasant Studies* 13 (1986): 5–35.

68. “Rice planting is more than an economic activity,” Bernard Fall observed. “It is a way of life, a whole Weltanschauung in itself.” Fall, “A Grain of Rice is Worth a Drop of Blood,” *New York Times Magazine*, 12 July 1964, 10.

the monsoon never came.⁶⁹ The break in the weather cleared skies over North Vietnamese targets and accelerated the Pathet Lao's dry season offensive, but U.S. concern focused on India.⁷⁰ An Asian drought would severely test the U.S. administration's often repeated claim that free men ate better.⁷¹ Rostow noted that Johnson tracked "the fall of rain in India and Pakistan as closely as he did along the Pedernales."⁷² Typical of El Niño years, the 1965 drought coincided with a cool, wet summer, as well as a record number of tornadoes, in the U.S. Midwest and Great Plains. American meteorologists noted strange "shifts in planetary wind currents" but failed to draw the connection to the Indian drought that was obvious to Johnson's advisers on food aid.⁷³ Large harvests in North America furnished the United States with both means and opportunity to rescue India. The Perkins Committee, a special presidential advisory group on foreign aid that included Gaud, Dwayne Andreas of Archer Daniels Midland, and David Rockefeller, urged that this momentary leverage should be used "to force India to increase her agricultural productivity." The force had to be subtle, however. "Any such use of our power must be done cautiously," the committee warned. "Such a policy has hazards and the powerful and rich cannot do this sort of thing too publicly."⁷⁴

The changed climate refocused IRRI's mission from reforming institutions and attitudes to averting famine. "We have now reached a point," J. George Harrar, IRRI's board chairman, told the National Academy of Sciences, "that the combination of annual deficits in world food supplies and the onrushing population increase could spell disaster for the attainment of world peace and prosperity."⁷⁵ IRRI took on the mood of Los Alamos as crops withered in India and Pakistan in the fall of 1965. Scientists spoke of a "race against time" as they monitored the results of more than 570 crosses on the experimental farm. "We

69. Mike Davis, *Late Victorian Holocausts: El Niño Famines and the Making of the Third World* (London, 2001), 245–248.

70. Central Intelligence Agency, "Communist Troop Movements in Laos," 13 January 1965, *Declassified Documents Reference System*, 1976–17F. See Johnson's comparison of the two problems in "Notes of a Meeting," 24 February 1966, *Foreign Relations of the United States, 1964–1968* (Washington, 1998), 4: 256.

71. See for instance John M. Cabot, "Wise Distribution of U.S. Food Surpluses in Latin America," *Department of State Bulletin* 60 no. 1036 (1 April 1959): 636; Douglas Dillon, "Building Growth in Freedom," *Department of State Bulletin* 41 no. 1068 (14 December 1959): 856; Dean Rusk, "The Tragedy of Cuba," *Vital Speeches of the Day* 28 (15 February 1962), 9: 259.

72. Walt W. Rostow, *The Diffusion of Power* (New York, 1972), 422.

73. "What's Happening to the Weather?" *US News and World Report*, 30 August 1965, 49–50; "Drought in East, Floods in West—Why the Strange Weather?" *US News and World Report*, 27 December 1965, 48–50; Davis notes that "American grain production . . . is typically in meteorological anti-phase with El Niño droughts and crop failures in India. . . . Herbert Hoover showed how it could be elaborated into full-scale foreign policy of famine relief and food aid." Davis, *Late Victorian Holocausts*, 261.

74. Perkins Committee, "Minutes of Meeting with McGeorge Bundy," 12 October 1965, *Foreign Relations of the United States, 1964–1968* (Washington, 1997), 9: 117.

75. National Academy of the Sciences, *Prospects of the World Food Supply: Proceedings of a Symposium* (Washington, DC, 1966), 2.

keep telling them what responsibility they have to produce,” Chandler observed, “because of all the money that’s been invested, and the whole world is looking at us, and all that.”⁷⁶ By 1966, plant breeders had narrowed the field to three: IR-8, IR-9, and IR-5, each derived by cross breeding short-stemmed varieties with Peta, a hardy Indonesian strain.⁷⁷ Each variety needed to be monitored for several generations more, but the Philippine government had already chosen a winner. The Nacionalista ticket headed by Ferdinand E. Marcos had won election in 1965 on the slogan “Progress Is a Grain of Rice.” Seasonal rice shortages, a lingering byproduct of colonial trade patterns, had grown intolerable to electorates in the Philippines and across South Asia. Marcos’s Harvard-trained technocrats, some of whom sat on IRRI’s board, determined to press the institute for a solution. In early 1966, before the scientists were ready, Chandler approved and USAID funded Project SPREAD, large-scale multiplication and field trials of IR-8.⁷⁸ Concerned about disease susceptibility, the breeders urged caution, but the Philippine press proclaimed a breakthrough had already been achieved.

As the August harvest came in, the Philippines was gripped by a modern tulipomania. IR-8 was sold in the lobbies of banks and fashionable department stores, and harvested grain was too costly to eat. Newspapers promised a tenfold increase in yield. “Miracle Rice—Instant Increase,” proclaimed the *Philippines Free Press*, assuring readers that spectacular yields were automatic, “lodged in the grain itself—a built in productivity.”⁷⁹ That this was decidedly not true was what made IR-8 attractive to the technocrats and to the American aid officials who jumped on the miracle rice bandwagon. USAID began distributing IR-8 in a package with Atlas and Esso farm chemicals while another leading manufacturer, Caltex, built a nationwide distribution network.⁸⁰ Green Revolutionaries took criticism, then and since, for enabling U.S. multinationals to penetrate third world agriculture, but this analysis actually understates the ambition of IR-8’s modernizing project.⁸¹ The technocrats knew reliance on manufactured “inputs” afforded opportunities to impose a solution to the rice crisis by extending government control over this unregulated sector of the economy. Marcos set up a coordinating council directed by Rafael Salas to direct the supply of seed, chemicals, loans, and machinery, enabling the government

76. Chandler oral history, 1967, IRRI, 26.

77. IRRI, *Annual Report for 1965* (Los Baños, 1966), 15.

78. USAID Philippines, *The Philippine Story of IR-8 The Miracle Rice* (Manila, 1967), 3.

79. Napoleon G. Rama, “Miracle Rice—Instant Increase,” *Philippines Free Press*, 6 August 1966.

80. Wesley C. Haraldson, “The World Food Situation and Philippine Rice Production,” *Journal of the American Chamber of Commerce (Philippines)*, February 1966, 59; USAID Philippines, *The Philippine Story of IR-8 The Miracle Rice* (Manila, 1967).

81. Harry M. Cleaver, Jr., “The Contradictions of the Green Revolution,” *Monthly Review* 24 (June 1972): 80–111; Claude Alvares, “The Great Gene Robbery,” *The Illustrated Weekly of India*, 23 March 1986, 6–17; “CGIAR: Agricultural Research for Whom?” *The Ecologist* 26 (Nov./Dec. 1996): 259–289.

to control prices and supply at every step of cultivation. Agriculture and marketing, already enmeshed in international commercial networks, came under a new centralized discipline. "Even if it wasn't such a spectacular producer," Salas believed, "one would advocate pushing miracle rice culture if only to train the Filipino farmer into thinking in terms of techniques, machines, fertilizers, schedules, and experiments."⁸² An American USAID official affirmed that creating "an American time pressure culture" was essential to the program. "If people do not accept discipline," he observed, "we cannot progress."⁸³

The race against time had reached the wire in 1966. In January, the Central Intelligence Agency forecast "widespread starvation" in India.⁸⁴ The pope appealed to the world for help as students rioted in Bengal and Communist unions paralyzed Calcutta with a general strike.⁸⁵ In October 1966, President Johnson toured the Philippines and Vietnam, his only trip to the region as president. Johnson wanted to signal the permanence of America's commitment to Asia, Eric Sevareid told CBS viewers, to construct "a cause with a capital C, a new manifest destiny, a new Americanized, modernized, version of Kipling's white man's burden."⁸⁶ IRRI served as a convenient backdrop. Striding onto the experimental rice field beside Ferdinand and Imelda Marcos, Johnson crouched and sampled the soil with his fingers. "Drawing on your experiments, your new rice strains, the technical training you are giving," he told IRRI's staff and a global television audience, "we can escalate the war on hunger. That is the only war in which we seek escalation."⁸⁷

The following month at a press conference at the Manila Hotel, IRRI formally "named" IR-8, announcing that it produced five to eight metric tons per hectare—double the average—"under careful management."⁸⁸ The institute advertised IR-8 as a cosmopolitan rice, able to produce high yields throughout tropical Asia. "IR-8 was to tropical rices what the Model T Ford was to automobiles," a pamphlet later explained, "a rugged variety that could go almost anywhere."⁸⁹ But at the time of release the only thorough testing had been under IRRI's tightly controlled conditions, and it had been barely tested outside the

82. Quijano de Manila, "New Rice Bowls?" *Philippines Free Press*, 29 April 1967, 47.

83. Quoted in Victoria Arcega, "Technocrats as Middlemen and their Networks in the Philippine Rice Project: The Case of the Masagana 99" (PhD diss., Michigan State, 1976), 237.

84. CIA, "India's New Prime Minister," 20 January 1966, *Declassified Documents Reference System* (Bethesda, MD, 1977), fiche 1977-270A.

85. Alan Berg, "Famine Contained: Notes and Lessons from the Bihar Experience," in *Famine: A Symposium Dealing With Nutrition and Relief Operations in Times of Disaster* (Uppsala, 1971), 113-129.

86. Bureau of Public Affairs, "Public Comment on Manila Conference and President's Trip," 19 October 1966, Dept of State, Office of Public Opinion Studies, RG 59, NARA, box 44.

87. Pedrino O. Ramos, "LBJ Country Hops," *Manila Chronicle*, 27 October 1966, 1.

88. IRRI, "Institution Names New Rice Variety," 28 November 1966, Hill papers, FF archives, box 14564.

89. IRRI, *IR8 & Beyond* (Los Baños, 1977), 1.

Philippines at all. IR-8's breakthrough lay mainly in the sensation it created and its close resemblance to the ideal architecture IRRI had set out to achieve.

IR-8 appeared to solve the rice crisis, and for the Marcos administration, the appearance of success was sufficient. The new variety covered a million acres in the Philippines in 1968 according to IRRI (750,000 according to the CIA).⁹⁰ U.S. intelligence reports noted that the gap between production and consumption of rice was about 10 percent, roughly what it had been before miracle rice was introduced, but that the technocrats had produced a bountiful harvest through fraud.⁹¹ The Marcos administration, which first claimed self-sufficiency in 1968, maintained the illusion well into the 1970s through the simple device of exporting small quantities amid great fanfare while secretly importing tons of rice from Hong Kong and faking the figures.⁹² Marcos's reputation as a modernizing, technocratic leader—as well as his victory in the 1969 election—rested on the feigned achievement of his Green Revolution.⁹³ Marcos's publicity agents wrote the early drafts of the Green Revolution legend: “Coming at the precise moment in history when the Philippines' growing population was forcing the country steadily and surely into a maelstrom of hunger,” a spokesman elaborated, “the development of miracle rice marks a turning point which may not only arrest this possibility, but makes possible a complete reversal toward self-sufficiency.”⁹⁴

Dwarf rice and dwarf wheat furnished the flagship program for a new generation of populist leaders whose slogans emphasized developmentalist, rather than redistributionist, goals: Marcos (“Rice, Roads, and Schools”), Indira Gandhi of India (“Remove Poverty”), Ayub Khan of Pakistan (“Together Let Us Build”), Suharto of Indonesia (“Father of Development”), and Dudley Senanayake of Ceylon (“Grow More Food”). As Akhil Gupta explains, developmentalist rhetoric and the promise of scientific solutions to poverty allowed these regimes to neutralize class antagonisms within their coalitions, appeal to supposedly universal demands for increased consumption and national strength, and identify the opponents of progress.⁹⁵ The modernization idiom of American social scientists proved astonishingly successful at mobilizing Asian electorates. With the help of USAID and the J. Walker Thompson advertising agency, Marcos presented IR-8 as answering “the promise of a better

90. International Rice Research Institute, *Annual Report for 1968* (Los Baños, 1968), 13.

91. Central Intelligence Agency, “Intelligence Memorandum: Philippine Economic Problems,” August 1968, *Declassified Documents Reference System*, fiche 1987-164: 2690.

92. Philip Bowring, “Rice: Manila's Facts and Fantasy,” *Far Eastern Economic Review* 87 (28 March 1975): 43-45.

93. Despite debunking, the Philippine success is still accepted within the Green Revolution literature. See Gordon Conway, *The Doubly Green Revolution* (Ithaca, NY, 1997), 53-55.

94. Col. Osmundo Mondoñedo, “The Rise of the Miracle Men,” *The Sunday (Manila) Times Magazine*, 1 October 1967.

95. Akhil Gupta, *Postcolonial Developments: Agriculture in the Making of Modern India* (Durham, NC, 1998), 59-71; see also Sunil Khilnani, *The Idea of India* (New York, 1999), 90-91.

life."⁹⁶ The achievement of self-sufficiency in 1968 allowed Marcos to sweep to victory in 1969, making him the first (and only) Philippine president to win reelection. Developmental populists couched the goal of self-sufficiency in nationalist terms, as an attribute of a progressive, independent nation. Rice imports, once justified by the older economic logic of comparative advantage, were now regarded as a national embarrassment.⁹⁷

U.S. officials preferred this brand of nationalism over the chauvinistic style of the first postindependence leaders or the "radical nationalism" of a younger generation that "resent[ed] any overtones of American domination—political, economic, or cultural."⁹⁸ The United States encouraged developmentalist regimes to assert an independent identity and strategic posture. Since the 1950s, think tanks and social science journals had theorized the emergence of leaders of a new type, democrats or dictators who would seek legitimacy "through modernizing achievement" and possess the ability to "reinterpret traditional beliefs, adapt them to modern needs and translate them into a modern idiom."⁹⁹ The task before these leaders would be to close the "aspiration gap" between the stubbornly traditional peasantry and the impatient millions seeking a better life in the cities.¹⁰⁰ Like IR-8 itself, the developmental regimes that introduced the rice appeared in fulfillment of scripture. Rostow had written in *Stages* that nationalism would pass through two phases. The first generation of nationalists, "weighted too heavily with interests and attitudes from the traditional past" to achieve breakthrough, would give way to a "generation of men who were not merely anxious to assert national independence but were prepared to create an urban-based modern society." These charismatic leaders would promote "radical changes in the productivity of agriculture" as "a precondition for take-off."¹⁰¹

96. USAID Philippines, *The Philippine Story of IR-8 The Miracle Rice* (Manila, 1967), 5; Rolando B. Modina and A. R. Ridao, *IRRI Rice: The Miracle that Never Was* (Quezon City, 1987), 19. The Thompson agency provided "radio skits, musical jingles, posters, cartoons, and newspaper and magazine articles."

97. This was particularly evident in Indonesia's "mass guidance" rice intensification effort. See Greg Acciaoli, "What's in a Name? Appropriating Idioms in the South Sulawesi Rice Intensification Program," in *Imagining Indonesia: Cultural Politics and Political Culture*, ed. Jim Schiller and Barbara Martin-Schiller (Athens, OH, 1977), 288–320; John Bresnan, *Managing Indonesia: The Modern Political Economy* (New York, 1993), 112–134.

98. quote from Central Intelligence Agency, "Philippine President Marcos' Problems at Midterm," December 7, 1967, *Foreign Relations of the United States, 1964–1968* (Washington, 2001), 26: 805; see also Rostow to Johnson, "Indonesia," 8 June 1966, *Foreign Relations of the United States, 1964–1968* (Washington, 2001), 26: 436–437.

99. Edward Shils, "Political Development in the New States: II," *Comparative Studies in Society and History* 2 (July 1960): 409.

100. Lucian W. Pye, *Guerrilla Communism in Malaya: Its Social and Political Meaning* (Princeton, NJ, 1956), 345; Mutual Security Program, "Operations of the MSP, January 1–July 30, 1959," *Department of State Bulletin* 42 (1 February 1960) 1975: 160.

101. W. W. Rostow, *The Stages of Economic Growth: A Non-Communist Manifesto* (Cambridge, 1960), 30–31.

IRRI's press release noted that IR-8 was sometimes called "miracle rice." Chandler had mixed feelings about selling science as superstition, and IRRI soon renounced the name.¹⁰² Nonetheless, it was taken up by IR-8's promoters. News accounts played on biblical metaphors and the occult uses of rice in Eastern tradition.¹⁰³ Given scriptural images invoked by the multiplication of food, the sacralization of IRRI's achievement was perhaps inevitable, but USAID's translation of IR-8's miraculousness into other languages and other faiths reveals something else: an impulse to hold up modern marvels before astonished natives. Gilbert Rist observes that belief in development "needs signs everyone can see; and economic 'miracles' and technological 'wonders' play their part to perfection."¹⁰⁴ But the miracle contained a paradox. IR-8 was designed to symbolize and enforce modern rationality, but it fulfilled a yearning for magic. Into the wide space between IR-8's tested abilities and its miraculous claims flowed the ambitions of the United States.

After 1967, the Green Revolution became an instrument of U.S. policy in Asia. USAID replaced the foundations as IRRI's chief funding source. Responding to the Indian famine, Johnson dispatched one fifth of the U.S. grain harvest to Calcutta in the largest flotilla "since the allied forces crossed the English Channel on D-Day."¹⁰⁵ He disregarded the Perkins Committee's qualms and used PL480 food aid, doled out in monthly increments, to place a "short tether" on India and other countries, compelling them to divert national resources into the agricultural sector and adopt Green Revolution protocols.¹⁰⁶ Miracle seeds promised a long-term solution to the problem of famine, but U.S. officials also hoped for political windfalls from the disruptions their sudden arrival would cause. The shock of the new would create a moment of possibility in which governments could be converted and wars won.

At an earlier stage of the Vietnam conflict, American policymakers and journalists commonly argued that the war was a struggle for the control of rice,

102. The IRRI information office tried to deemphasize the miracle after 1968. Chandler later insisted that "we never called it that." Anderson, *Rice Science*, 124; "Director Scoffs at Miracle Rice Criticism," *Bangkok Post*, 13 May 1969.

103. "Rice of the Gods," *Time*, 14 June 1968, 69; "Breakthrough against Hunger: Miracle Rice for Far East," *US News*, 4 December 1967, 68–9; Kahn, "Rice, Rice, Rice," 160. Stories on rice and IRRI continue to be written in this vein; see Peter T. White, "Rice, the Essential Harvest," *National Geographic*, May 1994, 48–79.

104. Rist, *The History of Development*, 45.

105. Rostow, *Diffusion of Power*, 422.

106. James Warner Bjorkman, "Public Law 480 and the Policies of Self-Help and Short-Tether: Indo American Relations, 1965–68," in *The Regional Imperative: The Administration of U.S. Foreign Policy towards South Asian States under Presidents Johnson and Nixon*, eds. Lloyd I. Rudolph and Susanne H. Rudolph (Atlantic Highlands, NJ, 1980), 201–262; Carolyn Castore, "The United States and India: The Use of Food to Apply Economic Pressure, 1965–67," in *Economic Coercion and U.S. Foreign Policy: Implications of Case Studies from the Johnson Administration*, ed. Sidney Weintraub (Boulder, CO, 1982), 129–153; Shivaji Ganguly, *U.S. Policy toward South Asia* (Boulder, CO, 1990), 177–184; Chester Bowles, *Promises to Keep* (New York, 1971), 523–536.

the food supply of Asia.¹⁰⁷ Other issues eclipsed that claim by 1967, but rice remained significant as an indicator of progress (or deterioration) in the vaguely defined but critical mission of pacification. Military and civilian advisers agreed that progress on the military and diplomatic fronts hinged on Saigon's ability to demonstrate confidence and extend its authority in rural Vietnam. They envisioned pacification as a process of rural modernization: civil programs in health, agriculture, education, and security would win the allegiance of distant villages and expand the influence and presence of the central government. Even as bombing and ground combat escalated, the dwindling supply of rice in urban markets revealed Saigon's weakening hold on the countryside. In 1965, Prime Minister Nguyen Cao Ky threatened to shoot a merchant a day until the rice shortage disappeared, but by the following year the capital, isolated within one of the largest rice producing areas in Asia, lived on grain imported from the United States.¹⁰⁸

At high-level war summits at Honolulu, Manila, and Guam in 1966 and 1967, Johnson directed energy and resources into pacification and placed it on the same level of priority with combat operations. Gen. Robert Komer, the chief of Civil Operations and Revolutionary Development Support (CORDS), the pacification command, advertised the new policy with the slogan "rice is as important as bullets."¹⁰⁹ In weekly progress reports, known as Komergrams, a summary of rice prices and supply served as pacification's stock ticker. The pressure for measurable results steadily increased. Only visible demonstrations of Saigon's viability, Johnson believed, would bring Hanoi to the table and sustain domestic support for the war. Johnson pressed Komer to "search urgently for occasions to present sound evidence of progress in Vietnam."¹¹⁰ Rather than new programs or techniques, Komer's "new model" pacification program, initiated in mid-1967, emphasized "a series of new measurement systems," including a computerized Hamlet Evaluation System (HES) that tracked government influence over villages by security and developmental criteria, a CORDS Evaluation Branch to document progress, and provincial tracking polls to monitor

107. See, for example, Bowles, *Ambassador's Report*, 247–248; Bernard B. Fall, "A Grain of Rice Is Worth a Drop of Blood," *New York Times Magazine*, 12 July 1954, 10.

108. Paul Dean, "Viet's 'David' Adored in Goliath's World," *Indianapolis Star*, 19 September 1965; Embassy of Vietnam, *Vietnamese Agriculture: A Progress Report* (Washington, 1972), 5.

109. R. W. Komer to Johnson, "Second Komer Trip to Vietnam, 23–29 June 1966," 1 July 1966, Department of State, *Foreign Relations of the United States, 1964–1968* (Washington, 1998), 4: 480.

110. Johnson quoted in Richard A. Hunt, *Pacification: The American Struggle for Vietnam's Hearts and Minds* (Boulder, CO, 1995), 134. On the goals of pacification, see Jefferson P. Marquis, "The Other Warriors: American Social Science and Nation Building in South Vietnam," *Diplomatic History* 24 (Winter 2000) 90–91; Michael E. Latham, *Modernization as Ideology: American Social Science and Nation Building in the Kennedy Era* (Chapel Hill, NC, 2000), 154–155; *The Pentagon Papers: The Defense Department History of United States Decisionmaking in Vietnam*, Sen. Gravel Edition (Boston, MA, 1971–1972), 2: 596.

attitudes among the rural population.¹¹¹ Komer directed resources at villages in the middle range of the HES scale, to consolidate rather than enlarge the government's zone of influence and allow the pacified area to appear clearly marked on briefing maps sent to Washington.

IR-8 arrived in Vietnam as pacifiers were searching for methods to mark the separation between enemy and friendly areas on the landscape. Until 1967, pacification had proceeded on the principle that the benefits of modernization, generally distributed, would win hearts and minds and ease rural disaffection, creating conditions for expanded government influence. Modernization was thus a temporal movement; villagers proceeded through developmental stages to reach a level where they were no longer susceptible to persuasion by the Viet Cong. Dissenting counterinsurgency theorists, however, argued for a more focussed rural pacification effort in which "material benefits should be so distributed as to create a marked difference in the quality of life between the areas controlled by the GVN [Saigon] and those contested with the VC." The boundaries of modernization could be drawn by increasing rice production "in GVN controlled areas only, by subsidizing provision of inputs such as fertilizers and credit."¹¹² In a series of seminars in McLean, Virginia, in 1966, U.S. Army planners endorsed this spatial reorientation. Pacification should seek to bring "tradition bound village dwellers into more frequent and more intimate contact with modern elements of the society through the matrix of a town-village economic complex" by stimulating "a farm surplus to be traded by the peasant for a higher level of consumer and investment goods." By the time Jose Ona, a Philippine rice specialist, brought the first seeds from IRRI, planning on both policy and theoretical levels anticipated the introduction of an ingredient that would dramatically increase crop yields and depend on continual inputs of fertilizer and credit. IR-8 arrived right on schedule.

Branding it *Thân Nông*, after the agriculture god and divine progenitor of the Vietnamese, the U.S. aid mission launched a "Madison Avenue-style campaign" to sell Vietnamese farmers "on the glories of IR-8."¹¹³ In October 1967, with the speed and efficiency of a military operation, USAID dispatched fifty tons of IR-8 to Vo Dat, sixty miles northeast of Saigon, an area thought to be secure. Army units escorted the seed from IRRI to the Manila docks. On arrival in Saigon it was airlifted by Air America planes and army Chinook helicopters to a landing zone at Vo Dat, where it was offloaded by fifteen Chieu Hoi (Viet Cong defectors) and parcelled out to waiting villagers and agricultural

111. Robert W. Komer, *Bureaucracy at War: U.S. Performance in the Vietnam Conflict* (Boulder, CO, 1986), 120-121.

112. C. J. Zwick, C. A. Cooper, H. Heymann, Jr., and R. H. Moorsteen, *U.S. Economic Assistance in Vietnam: A Proposed Reorientation*, July 1964, RAND Corporation report for USAID, R-430-AID, *Declassified Documents Reference System*, fiche, 1997-164.

113. Peter R. Kann, "Miracle in Vietnam: New Rice May be Key to Economic Stability after War Ends in Land," *Wall Street Journal*, 18 December 1968.

experts.¹¹⁴ Twelve hectares were to be cultivated by professional American and Philippine agronomists and another 778 by nearly one thousand Vietnamese families who were given free seed, chemicals, and water pumps but “told nothing authoritatively” about the nature of the rice or the project they were involved in. U.S. agricultural adviser C. F. van Haeften expected to produce test data and enough seed to plant twenty thousand hectares the following spring, when it would be deployed throughout South Vietnam.¹¹⁵

As the project geared up, one pacification expert tried unsuccessfully to slow the pace and separate IR-8’s utility from the hype. George L. McColm, director of the strategic hamlet program, had been a military adviser on agrarian reform in occupied Japan, Korea, and now Vietnam. Echoing Umali’s arguments, he observed that IR-8 would require “an entirely new approach to rice production” and might open a one-time opportunity to push subsistence farmers into commercial agriculture. In two widely distributed memos in late 1967, he cautioned against “wild and irresponsible promotion of IR8” and urged that distribution and trials take place only “under strict technical supervision” to avoid building expectations that could not be met.¹¹⁶ McColm aimed to salvage some economic benefit from what was becoming a psychological operation, a “high impact” program to penetrate the closed world of the Vietnamese village. He was unable to dampen optimistic forecasts that IR-8 would induce a social catharsis, stirring individuals to act in their own interests rather than for the village or the Viet Cong. American officials blamed South Vietnamese corruption for the failure of earlier efforts to deliver a modernizing stimulus through land reform or strategic hamlets, and they needed a mechanism that could work without bureaucratic volition or interference.¹¹⁷ With its dependence on imported inputs, they believed, IR-8 would widen the arc of influence unaided by bloody or soiled hands, automatically linking remote villages to chains of supply and distribution radiating from Saigon.

As combat activity tapered off in weeks before the 1968 Tet holiday, Ambassador Ellsworth Bunker announced Operation TAKEOFF, combining a stepped-up Phoenix Program (assassinations and terror directed at the Viet Cong “infrastructure”) with extensive demonstrations of IR-8 to be held the following summer.¹¹⁸ The seeds were expected to stir up a South Vietnamese

114. James P. Grant to Orville Freeman, “Silver Lining to Disaster or How IR-8 Came to Vietnam in a Big Way,” 17 November 1967, in *The Johnson Administration and Pacification in Vietnam: The Robert Komer-William Leonhart Files, 1966-1968*, ed. Robert E. Lester (Bethesda, MD, 1993 [microfilm]), reel 1, frame 37.

115. J. W. Holmes to Department of State, “Rice Policy Committee,” 6 January 1968, State Department Subject-Numeric files, INCO RICE VIETS, NARA, box 1142.

116. George L. McColm, “IR-8 and the Rice Revolution in Vietnam,” 6 November 1967; “Cultural Requirements for IR-8 Rice,” 20 December 1967, McColm Papers, U.S. Army Military History Institute, Carlisle Barracks, Pennsylvania.

117. Rusk to Bunker, “Land Reform Step Up,” 19 October 1968, 1995-228: 2747.

118. Bunker to LBJ, “36th Weekly Message,” 24 January 1968, *Declassified Documents Reference System* (Bethesda, MD [microfiche], 1985), fiche, 1985-205: 2928.

cultural revolution, turning young, innovative peasants against their tradition-bound ancestors. Once the yields of IR-8 were demonstrated, young farmers would begin dreaming of the motorbikes, radios, and sewing machines such a harvest could buy. A visiting agribusinessman found U.S. and Vietnamese officials in Saigon “running around waving IR-8 pamphlets like Red Guards with the Mao books.”¹¹⁹ Johnson had demanded “coonskins on the wall,” dramatic, visible evidence that pacification was succeeding.¹²⁰ IR-8 would soon supply the first coonskin. “Things really looked great,” an agricultural adviser noted in April 1968, “until the Tet Offensive came along.”¹²¹

The surprise attack on garrisons, provincial capitals, and Saigon itself in January 1968 thwarted the planned rice revolution. North Vietnamese and Viet Cong troops severed the main truck routes, cutting the experimental fields off from the vital supplies of fertilizer. For the next three months, van Haeften’s team waited in Saigon, the fate of the dwarf shoots unknown. USAID Director William Gaud had planned to feature the agriculture/consumer revolution in his March Senate testimony on Vietnam aid. Instead, he had to acknowledge that “this was all before January 30. What the situation will be in the future is pretty hard to tell.”¹²² When agricultural advisers returned to the countryside, they found the crop stunted by neglect but still bearing seed. The rice infrastructure fared less well; throughout Vietnam dikes and paddies showed damage from mortar and bomb craters, tank tracks, and defoliant.¹²³ Johnson’s announcement of a bombing halt in March and the initiation of the Paris peace talks undercut the rationale for Operation Takeoff.

After Tet, IR-8 became part of a reorganized pacification effort designed to foster an image of South Vietnam as a self-supporting state capable of surviving a peace settlement.¹²⁴ William Colby, Komer’s successor, set 1969 targets for reducing Viet Cong strength by 33,000 through Phoenix activities and raising rice production by one million tons with IR-8. As with Takeoff, agricultural and military actions were coordinated so that “the spread of miracle rice,” Colby noted, “would occur in the communities where new local territorial forces were assigned and self-defense groups organized.” He considered it “the best organized and conceived operation since Ngo Dinh Nhu’s strategic hamlet program.”¹²⁵ Miracle rice became the visible mark of a pacified land-

119. Kann, “Miracle in Vietnam,” 26.

120. *Pentagon Papers*, 2: 552.

121. Gene Roberts, “Lack of Security Upsets South Vietnam Rice Plan,” *New York Times*, 10 April 1968.

122. Senate Committee on Foreign Relations, *Foreign Assistance Act of 1968*, part 2, 90th Cong., 2nd sess., 13 March 1968, 332.

123. University of Hawaii/AID, Asia Training Center, *Debrief of an Agricultural Adviser, Quang Tri, Vietnam, 1967-68*, 1968, [typescript], Hamilton Library, University of Hawaii, Manoa, 13-15.

124. Bunker to AID, “New Pacification Concepts,” 26 September 1968, *Declassified Documents Reference System* (Bethesda, MD[microfiche], 1995), fiche, 1995-88: 1003.

125. William Colby, *Lost Victory: A Firsthand Account of America’s Sixteen-Year Involvement in Vietnam* (Chicago, IL, 1989), 266.

scape. "As the percentage of A, B, and C [pacified] hamlets kept rising on HES charts in staff offices," South Vietnam's pacification chief noted, "the refreshing green surface of rice seedlings gradually expanded everywhere."¹²⁶ Fertilizer and seed subsidies allowed the Commercial Import Program to bring Saigon's consumer culture to the countryside, and IR-8 came to be known as "honda rice" after the motorbikes that were acquired with the proceeds.¹²⁷ Advisers announced that South Vietnam would be self-sufficient in rice by 1973, but as in the Philippines, statistical yields were harvested on paper. An American official observed that Vietnamese "service chiefs were ordered, often somewhat arbitrarily, to revise yield figures, lower consumption figures, or decrease estimates of drought damage" to ensure the program's success.¹²⁸ American planes leafletted North Vietnam with photographs of dwarf rice fields captioned "IR-8, South Vietnam's Miracle Rice. All Vietnamese can enjoy this rice when peace comes."¹²⁹

In the waning months of the Johnson administration, U.S. negotiator W. Averell Harriman held forth IR-8 as the technological edge that might yet win the war. At Paris, Harriman and North Vietnamese representative Xuan Thuy deadlocked over the shape of the table and conditions for the cessation of bombing, but found room for agreement on IR-8. On October 17, 1968, after a difficult morning haggling over representation for South Vietnam, the two delegations adjourned for tea and plunged into conversation about miracle rice.¹³⁰ Harriman returned to Washington convinced that IRRI's technology might provide the basis for a settlement. "Miracle rice is one of the most important things to them," he told reporters. Hanoi was anxious to break its food dependence on China. "If they could get miracle rice and the techniques of growing it from us, I think they would hope to be independent of China."¹³¹ Ford Foundation officials congratulated themselves and voted an increase in IRRI's funding. "It now appears that 'miracle rice' is going to play a major role in concluding the war in Vietnam," Hill observed.¹³²

The Nixon administration's negotiator, Henry Kissinger, failed to pursue the IR-8 opening, but by mid-1969 it may already have closed. Viet Cong propagandists initially sought to discourage plantings of IR-8 by spreading rumors that the rice caused impotence and leprosy, but in mid-1969 the National Lib-

126. Maj. Gen. Nguyen Duy Hinh, *Vietnamization and Cease Fire* (Washington, 1980), 88.

127. "A Rice Goal in Sight," *Vietnam Magazine* 2, no. 5 (1969): 17.

128. Berger to SecState, "Rice," 25 January 1969, Department of State Subject-Numeric File, INCO RICE 17 VIET US, NARA, box 1142.

129. Robert W. Chandler, *War of Ideas: The U.S. Propaganda Campaign in Vietnam* (Boulder, CO, 1981), 108-109.

130. Harriman to SecState, 17 October 1968, *Declassified Documents Reference System* (Bethesda, MD [microfiche], 1993), fiche, 1993-287: 3399.

131. Hedrick Smith, "Harriman Suggests A Way Out of Vietnam," *New York Times Magazine*, 24 August 1969, 74.

132. Hill to W. M. Myers, "RF and FF Financial Support for IRRI," 4 March 1969, FF archives, PA06500055.

eration Front reversed course, urging its members to cultivate the new seeds in liberated areas. In September 1969, when U.S. troops came upon well-tended fields of IR-8 growing deep in enemy territory beyond the reach of Hondas or subsidies, it was as if they had discovered a Viet Cong helicopter factory. The story was reported around the world, and Congress expressed concern about seeds making their way to China or Cuba.¹³³ North Vietnam did acquire IR-8, either via the Ho Chi Minh Trail, through trade with Pakistan or Sri Lanka, or through independent development. As early as July 1968, North Vietnamese agronomists had disseminated “Southern dwarf” seeds to farmers in the Red River delta.¹³⁴ North Vietnam was embarking on its own agricultural revolution to divert labor from rice farming into industry and the military in preparation for the final stages of the war. In 1972, the CIA confirmed that a fifth of North Vietnam’s paddies were planted with IR-8.¹³⁵ The edge of the modern had advanced beyond the horizons of American power.

Until a helicopter evacuated the last IRRRI adviser from a Saigon rooftop, IR-8 continued to supply imaginary victories. Despite repeated ignition failures, it never lost its reputation among war managers as an engine of change. Instead, it adopted new transformative powers (cultural solvent, bargaining chip, economic stabilizer) to suit new desired futures. The sheltering discourse of modernization protected it from the imputation or the memory of failure. “Our achievements were not tremendous because the fighting interfered with our work,” Chandler later recalled.¹³⁶ His memory reveals how achievement was defined, for the Green Revolution, as an alternative to red revolution, could not “happen” in Communist Vietnam, although of course it did. Two years after the fall of Saigon, Vietnam made IR-8 the centerpiece of a brutal program of rural reconstruction. Gen. Vo Nguyen Giap, architect of the military victory, argued that scientific agriculture would restore discipline and reverse “the outmoded working and thinking habits of centuries” of capitalist agriculture.¹³⁷ Vietnam is one of the few places where IR-8 is still grown.¹³⁸

On a recent episode of the television drama *The West Wing*, the White House is visited by President Nimbala of the Republic of Equatorial Kuhndu, on a foraging mission for affordable AIDS drugs. At a press conference on the lawn, a reporter asks Nimbala what he is looking for. “A miracle,” he answers. “There

133. Hargrove, *Dragon Lives Forever*, 162; “Reds May Be Growing Miracle Rice,” *Bangkok Post*, 22 December 1969, 2; House Committee on Foreign Affairs, *The Green Revolution*, 37.

134. Buy Huy Dap, *Khoa Hoc Ky Thuat Nong Nghiep*, July 1968, Joint Publication Research Service, Translations on North Vietnam 47179, 3 January 1969.

135. CIA, “National Intelligence Survey: North Vietnam,” January 1972, 1989-198: 3241.

136. Chandler to Thomas R. Hargrove, 12 October 1989, Chandler personnel file, IRRRI archives.

137. Vo Nguyen Giap, *Essential Tasks of the Scientific and Technological Revolution in Agriculture* (Hanoi, 1979), 21-2.

138. Interview with Dat Van Tran, International Rice Commission, 8 May 2000, Rome, Italy.

are people who make miracles in the world. One of them lives right here in the U.S.” President Martin Sheen then steps forward to explain that Nimbala was referring to Norman Borlaug, who saved India from famine with seeds of dwarf wheat.¹³⁹ This image of the Green Revolution has proven unusually durable. No history of Asia or the world in the twentieth century would be complete without reference to it, even though economists have discredited its essential prologue, the “race” between population and food supply.¹⁴⁰ On the historical map, the Green Revolution occurred along the great crescent of South and Southeast Asia, the focal point of the late Cold War. Dwarf wheat and rice came into widespread use in the developed world, too, and IRRI’s greatest impact was arguably on one of the world’s largest rice exporters, the United States, but the Green Revolution did not happen in U.S. history. The current agricultural revolution follows the same narrative. Large-scale production of genetically modified crops is confined chiefly to North America, but in the ubiquitous public service advertisements of the Council for Biotechnology Information, it is Asian women and children who look into the camera with grateful eyes.

Development is a visual language of blueprints, charts, and allegories. Within its limited vocabulary, the Green Revolution furnished a visual representation—and now a memory—of what happens when modernization comes to the countryside. In the 1960s, the idea of a rural modernity was a conceptual innovation. Rostovian theorists reified modernization as an expansion of the city; the village was by definition primitive, stagnant, just as for Gandhian anti-modernists it was the seat of human values undiminished by the machine. Modernizers and their critics both envisioned rural development as an imitation of urban habits and forms. IR-8’s real achievement was literary. It took diffuse processes unfolding over decades—the spread of irrigation and market arrangements, new political relations between farmers and the state, and the rise and fall of developmental regimes—and illustrated them in a parable of seeds.

139. “In This White House,” *The West Wing*, Season 2, Episode 4, 25 October 2000, teleplay by Aaron Sorkin.

140. See for instance, David Reynolds, *One World Divisible: A Global History Since 1945* (New York, 2000), 139; Richard W. Bulliet, ed., *The Columbia History of the Twentieth Century* (New York, 1998), 359–361; J. M. Roberts, *Twentieth Century: The History of the World, 1901–2000* (New York, 1999), 118; Paul Kennedy, *The Rise and Fall of the Great Powers* (New York, 1987), 440; Eric Hobsbawm, *The Age of Extremes: A History of the World, 1914–1991* (New York, 1991), 292, 366; J. R. McNeill, *Something New Under the Sun: An Environmental History of the Twentieth Century World* (New York, 2000), 219–227; Nicholas Tarling, ed., *Cambridge History of Southeast Asia* (Cambridge, 1992), 2: 531. Amartya Sen, the Nobel prizewinning economist, is generally credited with disproving the purported connection between famine, food supply, and population. See Amartya Sen and Jean Drèze, *Hunger and Public Action* (Oxford, 1989), 49; Amartya Sen, *Poverty and Famines: An Essay on Entitlement and Deprivation* (New York, 1981); Sen, *Development as Freedom* (New York, 1999), 160–188.