

Technology in a Global World

Andrew Feenberg

Introduction

Japan has always been the test case for the universality of Western culture. The Japanese were the first non-Western people to modernize successfully. They built a powerful economy based on Western science and technology. Yet their society remains significantly different from the Western models it imitates. These differences are not merely superficial vestiges of a dying tradition, but show up in the very structure of Japanese science and technology. Is Japan different enough to qualify as an "alternative modernity?" Does it refute or confirm the claims of universalism? These are the questions Japan raises for us today. An early response to these questions comes from Japan itself. In the 1930s the founder of modern Japanese philosophy, Kitaro Nishida, proposed an innovative theory of multicultural modernity. In this chapter, I will consider the Japanese case and introduce Nishida's remarkable theory, one of the first attempts to grasp the philosophical implications of globalization.

I. Two Types of Technological Development

The department store was introduced into Japan in late Meiji by the Mitsui family. They called their store Mitsukoshi. The store was successful and expanded until it was as large as the Western department stores it imitated.¹

However, in one respect, the Japanese store was quite different from its models: Mitsukoshi had tatami mat floors. This made for some unique problems. Japanese consumers did not usually remove their shoes to enter the small traditional stores in which they were accustomed to shop. Instead, they walked on paving or platforms near the entrance and faced

counters behind which salesmen standing on tatami mats hawked their wares. One can still find a few such stores today. Although Mitsukoshi's tatami mat floors were also unsuitable for shoes, customers had to enter the store to shop. And enter they did, sometimes many thousands each day.

At the entrance a check room took charge of customers' shoes and handed them slippers to use on the fragile floors of the store. As the number of customers grew, so did the strain on this system. One day five hundred shoes were misplaced, and the historian of Tokyo, Edward Seidensticker, speculates that this disaster may have slowed acceptance of Western methods of distribution until after the earthquake of 1923 when wooden floors were finally introduced.

This story tells us something we should know by now about technology: it is not merely a means to an end, a neutral tool, but reflects culture, ideology, politics. In this case, two very different nationally specific techniques of flooring came into conflict as an apparently unrelated change occurred in shopping habits. Neither wooden nor tatami mat floors can be considered technically superior, but each does have implications for the understanding of "inside" and "outside" in every area of social life, including, of course, shopping. It eventually became clear at Mitsukoshi that Western methods of distribution required Western floors.

The conflict between these flooring techniques has long since been resolved in favor of Western methods in most public spaces in Japan except traditional restaurants, inns, and temples, where one still removes one's shoes before entering. Nevertheless, the tatami mat conserves a powerful symbolic charge for the Japanese, and many homes have both *washitsu*—Japanese style rooms, and *yoshitsu*—Western style rooms. This duality has come to seem emblematic of Japan's cultural eclecticism. Globalization there has largely meant conserving aspects of traditional Japanese technique, arts and crafts, and customs alongside an ever-growing mass of Western equivalents. At first it seemed that a Western branch had been grafted onto the Japanese tree. Today, one may well ask if it is not a Japanese branch surviving precariously on a tree imported from the West.

This Mitsukoshi story illustrates the idea of nationally specific branching development. Branching is a general feature of social and cultural development. Ideas, designs, and customs circulate easily, even among primitive societies, but they are realized in quite different ways as they travel. Although technical development is constrained to some extent by a causal logic, design in this domain, too, is underdetermined, and a variety of possibilities are explored at the inception of any given line of development. Each design corresponds to the interests or vision of a different group of actors.

In some cases the differences are quite considerable, and several competing designs coexist for an extended period. In modern times, however, the market, political regulations, or corporate dominance dictate a decision for one or another design. Once the decision is consolidated, the winning branch is "black-boxed" and placed beyond controversy and question.

It is precisely this last step which did not take place in the relations between national branches of design until quite recently. Poor communications and transport meant that national branches could coexist for centuries, even millennia, without much awareness of each other and without any possibility of decisive victory for one or another design. Globalization is the process of intensified interaction between national branches, leading to conflicts and decisions such as the one illustrated in the Mitsukoshi story.

However, conflict and decision is not the only consequence of a globalized world. Here is a second story that illustrates a different pattern I call "layered" development.²

Shortly after the opening of Japan to the world, the Satsuma domain hired a British bandmaster named William Fenton to train the first Japanese military band. Fenton noticed the lack of a Japanese national anthem and set about creating one. He identified a poem, which is still sung as the lyrics of the Japanese national anthem, and set it to music. This unofficial anthem had its debut in 1870, but it was nearly unsingable and quickly fell into disuse.

The need for an anthem was especially pressing in the Navy. Japanese officers were embarrassed by their inability to sing their own anthem at flag ceremonies at sea. The Navy therefore invited court musicians to train the Navy band in traditional Japanese music in hopes that among the performers a composer would be found. But the process was too slow, and the Navy finally asked the court musicians themselves to supply it with suitable compositions. The results were again disappointing. The court musicians came up with a piece in a traditional mode arranged for performance by a traditional ensemble, hardly the sort of thing one would have ready and waiting in a stateroom on a Navy ship!

Around this time, Fenton was replaced by a German bandmaster named Franz Eckert. Herr Eckert rose to the occasion. He arranged the anthem supplied by the court for a Western band, making suitable modifications for playability. In 1880, Japan finally had its current national anthem.

This story is quite different from the Mitsukoshi one. Like flooring, music had developed in Japan and the West along different branches; however, the Japanese national anthem is neither Japanese nor Western, but draws on both traditions. The relations between traditions in this case are

quite complex. The very idea of a national anthem is Western. An anthem is a self-affirmation that implies the existence of others before whom the national self is affirmed. But there were no others for Japan during its long 250 years of isolation in a world unto itself. With the opening of the country, self-affirmation became an issue, and an anthem was needed. But how could the anthem affirm Japan unless it reflected Japanese musical style? Hence the composition had to be Japanese. This was easier said than done since the anthem was to be performed by Western instruments at Western-inspired ceremonies. Thus, an original Japanese compositional layer had to be overlaid with a further Western layer in the final stage.

Here we do not have rooms of different styles side by side, but a true synthesis. The merging of traditions takes place in a layering process that is characteristic also of many types of social, cultural, and technological development. Often, several branches can be combined by layering the demands of different actors over a single basic design. In the process, what appeared to be conflicting conceptions turn out to be reconcilable after all. The anthem sounds Japanese played by a brass band. Similarly, modern Japanese politics, literature, painting, architecture, and philosophy emerged in Meiji out of a synthesis of native and Western techniques and visions.

Layering should not be conceived on the model of political compromise, although it does build alliances between groups with initially different, or even hostile, positions. Political compromise involves trade-offs in which each party gives up something to get something. In technological development, as in musical composition, indeed, wherever creative activities have a technical basis of some sort, alliances do not always require trade-offs. Ideally, clever innovations get around obstacles to combining functions and the layered product is better at everything it does, not compromised in its efficiency by trying to do too much. This is what the French philosopher of technology, Gilbert Simondon, calls "concretization."³ It is this layering process which gives rise to global technology, combining many national achievements in a single fund of world invention.

II. The Globalization of Development

Branching and layering are two fundamental developmental patterns. Their relations change as globalization proceeds. Elsewhere, I have described two styles of design corresponding to different stages in this process. What I call "mediation centered design" characterizes the earlier stage, in which each nation develops its technology relatively independently of the others.⁴ Of course, ideas do travel, but the overwhelming weight of par-

ticular national traditions ensures that they will be incorporated into devices differently in different contexts. These differences are owing in large part to nationally specific ethical and aesthetic mediations that shape design. Thus, each design "expresses" the national background against which it develops.

Globalization imposes a very different pattern, which I call "system centered design."⁵ The globalizing economy develops around an international capital goods market on which each nation finds the elements it requires to construct the technologies it needs. This market moves building blocks such as gears, axles, electric wires, computer chips, and so on. These can be assembled in many different patterns.⁶

The capital goods market is such a tremendous resource that, once interchange between nations intensifies, no one attempts to bypass it. But when design is based on the assembly of prefabricated parts, it can no longer so easily accommodate different national cultures. Instead of expressing a cultural context, products tend more and more to be designed to fit harmoniously into the preexisting system of parts and devices available on the capital goods market. Accommodation to national culture still occurs, of course, but it shares the field with a systematizing imperative that knows no national boundaries. Meanwhile, national culture expresses itself indirectly in the contribution it makes to innovation on the capital goods markets themselves. I would like to develop these two consequences of globalization.

The shift toward system-centered design has implications for the role of valuative mediations in the structure of modern, globalized technology. Traditional technologies generally fit well together. Japanese tatami mat floors, traditional architecture, eating and sleeping habits, shoes, all are of a piece. As such, they express a definite choice of way of life, a valuative framework rooted in Japanese culture. However, on purely technical terms, the links between the artifacts involved are relatively loose. It is true that houses need entryways in which to leave shoes, that futons must be spread on tatami mats, and so on, but adapting each of these artifacts to the others is not very constraining. The wide margin for choice makes it easy for cultural mediations to install themselves in technical design. Indeed, traditional crafts do not distinguish clearly between cultural and technical constraints. There is a "right way" to make things, and it conforms to both.

The globalization of technology changes all this. When design is system based, it must work with very tightly coupled systems of technical elements. Electric wires and sockets cannot be designed independently of the appliances that will use the electricity. Wheels, gears, pulleys, and so on,

come in sizes and types fixed by decisions made in their place of origin. A device using them must accommodate the results of those decisions.

System-centered design thus imposes many constraints at an early stage in the design process, constraints that originate in the core countries of the world system. These constraints are imposed on peripheral nations participating in the globalizing process without regard for their national cultures. Furthermore, the very availability of certain types of capital goods reflects the national technological evolution and priorities of the core countries, not those of later recipients. Thus, the effect of globalization is to push cultural constraints to the side, if not to eliminate them altogether. The products that result appear to be culturally "neutral" at first sight, although in fact they still embody cultural assumptions which become evident with wide use in peripheral contexts.

The computer is an obvious example. For us Westerners, the keyboard appears to be technically neutral. But had computers been invented and developed first in Japan, or any other country with an ideographic language, it is unlikely that keyboards would have been selected as an input device for a very long time. Just as the FAX machine prospered first in Japan, so computers would probably have been designed early with graphical or voice inputs of some sort. The arrival of Western computers in Japan was an alienating encounter with the West, a challenge to the national language. Considerable cleverness had to be invested in domesticating the keyboard to Japanese usages.

These observations indicate the weakness of national culture in a globalizing technological system. However, there is another side to the story. Countries far from the core, such as Japan was until quite recently, may not contribute as much as core countries, but they do contribute something. And these contributions will be marked by their national cultural background. In the case of Japan, the magnitude of these contributions has grown to the point where they are a significant factor for the original core countries. Global technology contains a Japanese layer, and so exhibits a true globalizing pattern, not simply core/periphery relations of dependence.

It is difficult to give examples of this feedback from national culture to capital goods' markets. A cultural impulse realized technically looks just like any other technical artifact. Still, a cultural hermeneutics ought to be able to find the cultural traces in the technical domain.

Perhaps miniaturization could be cited as a specific contribution reflecting Japanese culture. At least this is the argument of O-Young Lee, whose book *Smaller Is Better: Japan's Mastery of the Miniature*, argues that

the triumph of Japanese microelectronics is rooted in age-old cultural impulses.⁷ The impulse to miniaturize, evident in bonzai, haiku poetry, and other aspects of Japanese culture, appears in technical artifacts, too. Lee cites the early case of the folding fan. Flat fans invented in China arrived in Japan very early. The folding fan, which seems to have been invented in Japan in the middle ages, was exported from there to China, inaugurating a familiar pattern. The basic technology of the transistor radio and the videotape recorder both came from the United States, but the miniaturization of the devices, which was essential to their commercial success, took place in Japan, from which they were exported back to the United States.

Of course, once capital goods markets are flooded with miniaturized components, every country in the world can make small products without cultural afterthoughts. But if Lee is right, the origin of this trend would lie in a specific national culture. In a sense, aspects of that culture are communicated worldwide through the technical specifications of its products.

III. Nishida's Theory of the Global World

In the first part of this paper I have illustrated a thesis about the globalization of technology with stories about Japan. In the remainder I will try to draw out the implications of this thesis for the major contribution of Japanese philosophy to the understanding of globalization, Nishida's pre-War theory of the global world.

The context of Nishida's argument was the growing self-assertion of Japan in the early twentieth century. For many Japanese this was primarily a matter of national expansion, but for intellectuals like Nishida, the stakes were still higher—world cultural leadership. These two aspects of Japan's economic and military rise were connected but not identical. On the one hand, Japan had become powerful enough to conquer its neighbors. On the other hand, this very fact showed that Japan, an Asian nation, could participate fully in cultural modernity, assimilating Western achievements, and turning them to its own purpose. Nishida argued on this basis that Asia could finally take its place in the modern world as the cultural equal, or even superior, of the West.⁸

The link between Nishida's position and Japanese imperialism is thus complex and controversial. I have already contributed to that debate in several articles and will return briefly to this topic in the conclusion of this paper.⁹ However, my main interest here lies elsewhere, in the parallel I find between the structure of technological globalization as I have explained it above and Nishida's conception of a "global world (*sekaiteki sekai*)."¹⁰ I will

show that the contrast between branching and layering underlies this conception, although Nishida misses the technological implications of his approach.

Nishida argues that until modern times, the world had what he calls a "horizontal" structure, that is it consisted of nations lying side by side on a globe that separated, rather than united, them. The concept of "world" was necessarily abstract during the long period that preceded the modern age. By this Nishida means that "world" was a concept only, not an active force in the lives of nations. This condition was unusually prolonged in the case of Japan, which remained disconnected from growing world commerce and communication until the 1860s.

International commerce transformed this horizontal world by bringing all the nations into intense contact with each other. The result was the emergence of what Nishida calls a "vertical" world, a world in which nations struggle for preeminence. Every nation now participates actively in the life of its neighbors—even quite remote nations, through war, trade, and the movement of people and ideas. But there is no harmonious fusion here, but rather a hardening of identities that leads ultimately to war. In this context, nationalism emerges as a survival response to the threat of foreign domination.

Nishida has several other terminologies for this shift that sound rather odd to our contemporary ears, but which are ultimately suggestive. Perhaps the best way to understand his approach is as a dialectic of conceptual frameworks, each one inadequate by itself to describe social reality, but able to do so all together in a mutually correcting system of categories. The complexity of Nishida's argument is supposed, therefore, to correspond to the actual difficulty of thinking global sociality.

Nishida develops the contrast of horizontal and vertical worlds further in terms of the relation of the "many" to the "one" in space and time. The many nations dispersed in space enter into interaction in the modern world. Interaction in history implies more than the mechanical contact of externally related things. Each nation must "express" itself in the world in the sense of enacting the meanings carried in its culture. This can lead to conflict as nations attempt to impose their perspective on all the others. But interaction also requires commonality. Two completely alien entities cannot interact. At each stage in modern history a common framework is supplied by a dominant nation that defines itself as a unifying "world" for all the others. The unification involves the imposition of a general form on the struggle of the particular nations. Nishida gives the example of Great Britain's imposition of the world market on the nineteenth century

(Nishida 1991, 24). The many conflicting nations are thus bound together at a deeper level in one world.

The passage from the many to the one is also reflected in the relations of space and time. The dispersal of the nations in space, their "manyness," is complemented by the simultaneity of their coexistence in a unifying temporal dimension. The struggles of the nations have an outcome that is this unity. Thus in modern times, geography is subordinated to history. The unifying nation represents time for this world and, as such, loses itself in the process of unification it imposes. Britain is absorbed into the world market it creates and becomes the scene on which the world economy operates. The particularity of the nation, Britain, is transcended by the universal order it institutes and for which it stands.

The mechanical and the organic form is yet another terminological couple that Nishida explores. The mechanical world is made of externally related things dispersed in space. Mechanically related things can properly be called individual. Their multiplicity forms an "individual many" (*kobutsuteki ta*) (Nishida 1991, 29-31). The organic world consists of wholes oriented toward a *telos* in time. The whole is thus a subject of action, a "holistic one" (*zentaiteki ichi*) (Nishida 1991, 37-8). Society is not adequately described as mechanical because it forms a whole, and yet it is not organic because its members are fully independent individuals, not a herd. The undecidability of the mechanical and the organic gestures toward the originality of the social world, which cannot be represented by either concept because it embraces both.

Nishida introduces the concept of "place" (*basho*) in a final attempt to conceptualize this "self-contradictory" globalized world. Place, in Nishida's technical sense of the term, is the "third" element or medium "in" which interacting agents meet. Had they nothing in common, they could not meet and interact. But what is it that holds them together? A separate entity would itself require a place to interact with the actors. The *basho* is thus not something external to the interaction but a structure of the interaction itself. This structure arises as each actor "negates itself" to become the "world" for the other, that is, the place of the interaction (Nishida 1991, 30).

It is not easy to interpret this obscure formulation. It seems to mean that in acting, the self becomes an object for the other; it is encountered in the other's path. But the self is not just any object, but the environment to which the other must react in asserting itself as subject. As the other reacts, it defines itself anew, and so its identity depends on the action of the self. But the determination of the other by the self is only half the cycle; the action of the other has an equivalent impact on the self. Interaction is the

endless switching of these roles, a circulation of self-transforming realizations (*jikaku*) achieved through contact with an other self.¹²

Nishida has two ways of talking about the role of place in the modern world. Sometimes, he writes as though the globalizing nation serves as the "place" of interaction for the other nations of the world, the scene of interaction. This place can be imposed by domination or freely consented as cultural supremacy, the difference Nishida assumes between England in the past and Japan in the future (Nishida 1991, 99, 77; Nishida 1965c, 373, 349). At other times, he claims that the modern age is about the emergence of global place in the form of a world culture of national encounter.¹³ Nishida does not see any contradiction between these two discourses because he assumes that Japanese culture is a kind of "emptiness" capable of welcoming all cultures. But as we will see, this ambiguity turns out to be quite important.

On the basis of this analysis, Nishida asserts the importance of all modern cultures. Western dominance is only a passing phase, about to give way to an age of Asian self-assertion. The destiny of the human race is to fruitfully combine Western and Eastern culture in a "contradictory self-identity." This concept refers to a synthesis of (national) individuality and (global) totality in which the emerging world culture is supposed to consist.

There is a sense in which this global world constitutes a single being, which changes through an inner dynamic. Thus the world "determines itself." But the identities of the particular nations are not lost in this unified object. The resulting world culture will not replace national cultures. Something more subtle is involved. Nishida writes, "A true world culture will be formed only by various cultures preserving their own respective viewpoints, but simultaneously developing themselves through global mediation" (Nishida 1970, 254). World culture is a pure form, a "place" or field of interaction, and not a particularistic alternative to existing national cultures. They persist and are a continuing source of change and progress. The process of self-determination is thus free in the sense of being internally creative; it is not determined by extrinsic forces or atemporal laws. There is nothing "outside" the world that could influence or control it. Even the laws of natural science must be located inside the world as particular historically conditioned acts of thought (Nishida 1991, 36).

Here is a passage in which Nishida describes the global world as he envisages it: "Every nation/people is established on a historical foundation and possesses a world-historical mission, thereby having a historical life of its own. For nations/peoples to form a global world through self-realiza-

tion and self-transcendence, each must first of all form a particular world *in accordance with its own regional tradition*. These particular worlds, each based on a historical foundation, unite to form a global world. Each nation/people lives its own unique historical life and at the same time joins in a united global world through carrying out a world historical mission" (Nishida 1965a, 428; Arisaka 1996, 101-2).

However, this cosmopolitan argument culminates strangely in the claim that Japan is the center of the unifying tendency of global culture. Just as Britain unified the world through the world market in the spirit of utilitarian individualism, leading to endless competition and strife, so Japan will unify the world around its uniquely accommodating spiritual culture, leading to an age of peace. Japan will be the "place" on which the world will move beyond the limits of the West to become truly global. Japan can lead the world spiritually because its unique culture corresponds to the actual structure of the global world: "It is in discovering the very principles of the self-formation of the contradictory self-identical world at the heart of our historical development that we should offer our contribution to the world. This comes down to practicing the Imperial Way and is the true meaning of 'eight corners under one roof'" (*hakkoo ichiu*) (Nishida 1991, 70).

The vagueness of this conclusion is disturbing. Nishida explicitly condemns imperialism and argues that Japan cannot be the place of world unity if it acts as a "subject" in conflict with other nations. Instead, it must "negate itself" and become the "world" for all other nations (Nishida, 1991, 70, 77). Yet, he also recognizes the fatal inevitability of world conflict and seems to accept Japan's role within that context, as in this statement from his speech to the emperor: "When diverse peoples enter into such a world historical (*sekaishiteki*) relation, there may be conflicts among them such as we see today, but this is only natural. The most world historical (*sekaishiteki*) nation must then serve as a center to stabilize this turbulent period."¹⁴ And, as we see above, he employs ultranationalist slogans with abandon, apparently in the hope of being able to instill new meaning into them. The least that one can say is that his efforts were naive and lent backhanded support to an imperialistic system that conflicted fundamentally with his own philosophical premises.

But just as one can seriously question the depth of the connection between Nazism and Heidegger's thought, if not his actions, similar doubts arise around Nishida's nationalism. There is no clear logical connection between his claims about Japan and his conception of global unity. At least the British gave the world the world market around which to unify. What

does Japan have to offer? What mediation does it provide that qualifies it as the center of the new age?

So far as I can tell, Nishida was not bothered by this question, although he should have been. He claims that Japan is the *archetype* of global unity through its ability to assimilate both Eastern and Western culture, but while this is indeed admirable, it is not clear how it qualifies Japan as the *place* of global unity. For that one would think that Japan would have to do something more positive on the world stage than simply to exist as a model. Nishida does announce the world historical significance of the liberation of Asia from Western imperialism. Yet this is certainly not the equivalent of the world market as a unifying force. In the end, this question remains unanswered.¹⁵

IV. Technology and Place

Despite these problems, I do not think this should be the last word on Nishida's theory of globalization. Once its nationalistic excrescence is removed, the structure of the theory is truly interesting. Nishida's basic claim is that the world has moved from a horizontal to a vertical structure, from indifferent coexistence in space to mutual involvement in time in a conflictual but creative process of global unification. The emerging unity does not efface national differences but incorporates them into an evolving world culture that is best defined as a "place" of encounter and dialogue. A common underlying framework makes possible the communication of nations amidst their conflicts.

This claim precisely parallels the analysis of the passage from branching to layered development presented in the first part of this paper. The various branches of technology in a spatially dispersed world finally meet in the global world of modern times. There they assert themselves and come into conflict, but there they also inform each other with ideas and inventions drawn from diverse national traditions. The outcome, global technology, forms a sort of "place" in Nishida's sense, a scene on which the encounter between nations proceeds with global cultural consequences, but without eliminating the originality and difference of the constitutive national cultures. The layering process in which each culture expresses itself while at the same time contributing to a single fund of invention is thus precisely congruent with Nishida's conception of world culture.

Nishida comes close to making some such connection. He understands that historical action is inextricably intertwined with technical creation. He explains that "Culture includes technique" (Nishida 1991, 61). Technique is

an expression of a people's spirit as it interacts with the environment, and through that interaction forms itself (Nishida 1991, 57; Nishida 1965c, 328). "We create things through technique and in creating them we create ourselves" (Nishida 1991, 33; Nishida 1965c, 297). Although Nishida did not do so, one can build on these observations and carry them a step further by relating this social conception of technique to his notion of global cultural interaction in the twentieth century.

Nishida himself was witness to this process as it unfolded in Japan. He was surrounded by rapid social, cultural, and technological change, which he welcomed, and which he believed could become the medium for the expression of an authentic Japanese spirit. He rejected the ultranationalist insistence on keeping the Japanese branch pure in the age of global interaction and insisted that Japan should enter the world scene and move forward. In this he was the theorist of his moment in history, a moment in which Japan appeared to be successfully combining Eastern and Western styles in every domain of life. Nishida lived these events intensely. Perhaps he lost his shoes at Mitsukoshi. Surely, he sang the national anthem and was swept along with his generation by the syncretic modernization of Japan's government, cities, schools, and cultural production. I conjecture that this background underlay his conception of the global world and his confidence in the future. If only he had realized how small a role national politics would ultimately play in that world compared with the force of global technology!

Acknowledgments

I want to thank Yoko Arisaka and Mayuko Uehara for generous help with translations and interpretation of Nishida. They have corrected many misunderstandings; those that remain are my own.

Notes

1. The full account of this story is to be found in Edward Seidensticker, *Low City, High City* (New York: Knopf, 1983).
2. The account below is drawn from William Malm, "The Modern Music of Meiji Japan," in *Tradition and Modernization in Japanese Culture*, ed., Donald Shively (Princeton: Princeton University Press, 1971). For more on layering, see Andrew Feenberg, *Alternative Modernity*, (Los Angeles: University of California Press, 1995a), ch. 9; hereinafter cited in text.
3. Gilbert Simondon, *Du Mode d'Existence des Objets Techniques* (Paris: Aubier, 1958), ch. 1.
4. I formerly called this "expressive design" (Feenberg, 1995a: 225).

5. I formerly called this "system congruent design" (Feenberg, 1995a: 225).
6. For more on the capital goods market, see Nathan Rosenberg, "Economic Development and the Transfer of Technology: Some Historical Perspectives," *Technology and Culture* 11 (1970). Junichi Murata has developed the significance of Rosenberg's analysis for philosophy of technology. See Junichi Murata, "Creativity of Technology and the Modernization Process of Japan," in this volume.
7. O-Young Lee, *Smaller Is Better: Japan's Mastery of the Miniature* (Tokyo: Kodansha, 1984).
8. Kitaro Nishida, *La Culture Japonaise en Question*, trans. Pierre Lavelle (Paris: Publications Orientalistes de France, 1991); hereinafter cited in text.
9. Andrew Feenberg, "The Problem of Modernity in the Philosophy of Nishida," in *Rude Awakenings: Zen, the Kyoto School and the Question of Nationalism*, eds. John Heisig and John Maraldo (Honolulu: University of Hawaii Press, 1995b); Andrew Feenberg, "Experience and Culture: Nishida's Path to the 'Things Themselves,'" *Philosophy East and West* 49(1) (January 1999): 28-44.
10. This exposition is based primarily on Nishida 1991.
11. See also Kitaro Nishida, "Nihonbunka no mondai" ("The Problem of Japanese Culture"), *Nishida Kitaro Zenshu* (Tokyo: Iwanami Shoten, 1965c), vol. 12, 291-2, 294; hereinafter cited in text.
12. See, for example, Nishida 1970, 78-79, 134-5; Ohashi, Ryosuke "The World as Group-Theoretical Structure," unpublished manuscript, 1997.
13. Kitaro Nishida, "Sekai Shin Chitsujō no Genri" ("The Principle of New World Order"), in *Nishida Kitaro Zenshu* (Tokyo: Iwanami Shoten, 1965a), vol. 12, 428; hereinafter cited in text. Yoko Arisaka, "The Nishida Enigma," *Monumenta Nipponica* 51 (spring 1996), 101-2; hereinafter cited in text.
14. "Rekishi Tetsugaku ni Tsuite" ("On the Philosophy of History"), in *Nishida Kitaro Zenshu* (Tokyo: Iwanami Shoten, 1965b), vol. 12, 270-1.
15. For an analysis of the debate over Nishida's politics and one of the principal texts under dispute, see Arisaka 1996. For a variety of positions, see John Heisig and John Maraldo, eds., *Rude Awakenings: Zen, the Kyoto School and the Question of Nationalism* (Honolulu: University of Hawaii Press, 1995).

References

- Arisaka, Yoko. "The Nishida Enigma." *Monumenta Nipponica* 51 (Spring 1996): 81-105.
- Feenberg, Andrew. *Alternative Modernity*. Los Angeles: University of California Press, 1995a.
- . "The Problem of Modernity in the Philosophy of Nishida." In *Rude Awakenings: Zen, the Kyoto School and the Question of Nationalism*, ed. John Heisig and John Maraldo. Honolulu: University of Hawaii Press, 1995b.
- . "Experience and Culture: Nishida's Path to the 'Things Themselves'." *Philosophy East and West* 49(1) (January 1999): 28-44.
- Heisig, John, and John Maraldo, eds. *Rude Awakenings: Zen, the Kyoto School and the Question of Nationalism*. Honolulu: University of Hawaii Press, 1995.

- Lee, O-Young. *Smaller Is Better: Japan's Mastery of the Miniature*. Tokyo: Kodansha, 1984.
- Malm, William. "The Modern Music of Meiji Japan." In *Tradition and Modernization in Japanese Culture*, ed., Donald Shively. Princeton, Princeton University Press, 1971.
- Murata, Junichi. "Creativity of Technology and the Modernization Process of Japan," this volume.
- Nishida, Kitaro. "Sekai Shin Chitsujo no Genri" ("The Principle of New World Order"). In *Nishida Kitaro Zenshu*, vol. 12. Tokyo: Iwanami Shoten, 1965a.
- . "Rekishi Tetsugaku ni Tsuite" ("On the Philosophy of History"). In *Nishida Kitaro Zenshu*, vol. 12. Tokyo: Iwanami Shoten, 1965b.
- . "Nihonbunka no mondai" ("The Problem of Japanese Culture"). In *Nishida Kitaro Zenshu*, vol. 12. Tokyo: Iwanami Shoten, 1965c.
- . *Fundamental Problems of Philosophy*. Trans. David. Dilworth. Tokyo: Sophia University Press, 1970.
- . *La Culture Japonaise en Question*. Trans. Pierre Lavelle. Paris: Publications Orientalistes de France. 1991.
- Ohashi, Ryosuke. "The World as Group-Theoretical Structure." unpublished manuscript, 1997.
- Rosenberg, Nathan. "Economic Development and the Transfer of Technology: Some Historical Perspectives." *Technology and Culture* 11 (1970).
- Seidensticker, Edward. *Low City, High City*. New York: Knopf, 1983.
- Simondon, Gilbert. *Du Mode d'Existence des Objets Techniques*. Paris: Aubier. 1958.

Science and Other Cultures

Issues in Philosophies of
Science and Technology

Edited by

Robert Figueroa and
Sandra Harding

ROUTLEDGE
New York & London