***Épistémologie à la japonaise*: Kanamori Osamu and the History and Philosophy of Science in Japan**

Author Note

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Kanamori, O. (Ed.). (2016). *Essays on the history of scientific thought in modern Japan* (C. Carr & M. G. Sheftall, Trans.). Tokyo: Japan Publishing Industry Foundation for Culture.

Kanamori, O. (Ed.). (2011). *Shōwa zenki no kagaku shisōshi* [History of the scientific thought of the early Shōwa period]. Tokyo: Keisō shobō.

Kanamori, O. (Ed.). (2016). *Shōwa kōki no kagaku shisōshi* [History of the scientific thought of the late Shōwa period]. Tokyo: Keisō shobō.

Kanamori, O. (Ed.). (2017). *Meiji-Taishō-ki no kagaku shisōshi* [History of the scientific thought of the Meiji & Taishō periods]. Tokyo: Keisō shobō.

In his 1978 introduction to the English translation of Georges Canguilhem's *The Normal and the Pathological*, Michel Foucault quietly chastised Anglophone scholars for their negligence of the French tradition of *épistémologie*. Focused on "noisier theaters" of "psychoanalysis, Marxism, linguistics, ethnology," enamored with the Sartrean archetype of an *intellectuel engagé*, Anglophone

scholars had neglected to acknowledge the salience of philosophers such as Gaston Bachelard, Alexandre Koyré, Jean Cavaillès, and Georges Canguilhem. Admittedly, the works of these thinkers might at first appear "most theoretical…geared to speculative tasks, and the farthest removed from immediate political inquiries." Yet without *épistémologie*, it would be impossible to "understand much about Althusser, Althusserism, and a whole series of discussions which have taken place among French Marxists"; impossible to understand "Bourdieu, Castel, Passeron"; impossible, too, to understand "the theoretical work done by psychoanalysts, particularly by the followers of Lacan." (Foucault, 1991/1978, pp. 7-8).

In the same year that Foucault called for Anglophone attention to *épistémologie*, a young Kanamori Osamu (1954-2016), fresh recipient of a B.A. in French, began postgraduate studies in Comparative Literature at the University of Tokyo. As with many of his era, he disposed of his required course credits, only to depart for a degree program abroad. Paris was his destination, and there Kanamori became the student of Jean-Toussaint Desanti (1914-2002), disciple of Cavaillès and established philosopher of mathematics who served as PhD supervisor to the already notorious Jacques Derrida. Under Desanti, Kanamori plunged into the study of *épistémologie*. The result, in December of 1984, was a doctoral thesis on the philosophy of Gaston Bachelard (Kanamori, 1984).

Returning thereafter to Japan, Kanamori saw his chance to fill a lacuna. For well over a decade by that point, Foucault had enjoyed widespread esteem among an educated Japanese public. Two nationwide lecture tours in the 1970s, covered prominently by major news outlets, had more than cemented his reputation in the popular imagination. Attention only heightened with the "New Academism" (*Nyū akademizumu*) of the early 1980s, further amplified by Foucault's premature death in 1984. However, much as with "French theory" booms elsewhere in the world, Japanese voices who spoke of Foucault typically had little more than nominal familiarity — if that — with the work of Cavaillès, Bachelard, Canguilhem, and company (Cusset, 2008; Felsch, 2016). Enter Kanamori

Osamu. Over the course of the late '80s and early '90s, most notably in 1994's *Furansu kagaku ninshikiron no keifu* [The Genealogy of French Épistémologie], Kanamori established himself as Japan's leading *interprète* of *épistémologie*. From this bedrock, he went to become one of the preeminent architects of science studies in Japan as a whole.

So it is with dismay that one notes the following: though most western scholars of Japan today can give at least a basic account of Bachelard and Canguilhem, the same cannot be said for Kanamori Osamu.[1] In 2020, we have not moved far enough beyond Hiromi Mizuno's 2006 complaint that "Japan studies and science studies…have unfortunately had little interaction so far" (Mizuno, 2006, p. 632). The publication of *Essays on the History of Scientific Thought in Modern Japan* (2016), a partial translation Kanamori's 2011 edited collection *Shōwa zenki no kagaku shisōshi* [History of the Scientific Thought of the Early Shōwa Period], thus presents a welcome opportunity to rectify this imbalance, and in the process, survey directions taken and to be taken at the strange juncture between philosophy, intellectual history, and the history of science. Seizing the occasion is all the more called for by the peculiar conditions under which the collection's companion volumes — *Shōwa kōki no kagaku shisōshi* [History of the Scientific Thought of the Late Shōwa Period] (2016) and *Meiji-Taishō-ki no kagaku shisōshi* [History of the Scientific Thought of the Meiji and Taishō Periods] (2017) — were produced. Diagnosed with colon cancer in the summer of 2014, Kanamori continued to oversee the compilation of these latter works with determined ferocity up until his passing on May 26, 2016. The series as a whole, then, can be said to represent Kanamori's vision of the history of Japanese scientific thought in the face of his own imminent mortality. "I can now imagine my spirit searching around a bookstore for this tome," Kanamori mused poignantly in a private message to contributors less than a month before his death (Okumura, 2017, p. 415). What,

[1] The slim existing Anglophone introductions are Ericson (2019), Okumura & Suzuki (2019), Setoguchi (2007), Tsukahara (2016).

then, would Kanamori's spirit find? What history of Japanese scientific thought have these books bequeathed to us, and how might this legacy inform future research in the history of science more broadly?

In Praise of Eclecticism

In our search for answers, Kanamori's own essay at the start of the *Shōwa zenki* volume serves as a helpful point of departure. Intended as a bibliographical road-map to the history of scientific thought in modern Japan, the essay, while often dry and enumerative, provides a wide-ranging overview of the field, from the late Taishō reception of Neo-Kantianism down to the late Shōwa reception of Kuhn, concluding with reflections on Heisei-era shifts. Part of the essay's strength lies in Kanamori's own willingness to embrace the ambiguity of what precisely constitutes "the history of scientific thought." General-audience writings by practicing scientists receive attention alongside the work of philosophers and historians; the physicist Nakaya Ukichirō's (1900-62) treatises on snow crystallography (*Yuki* [Snow] (1938) and *Fuyu no hana* [Winter Flowers] (1938)) rub shoulders with the dialectical materialism of Tosaka Jun (1900-45). This generosity is also evidenced in Kanamori's injunctions against the facile dismissal of wartime thinkers the like of Maeda Takakazu (1907-2000) and Uramoto Seisaburō (1891-1965), whose articulations of a uniquely "Japanese" science, complicit with the ideology of the Co-Prosperity Sphere, nonetheless presented important insights for defining the specificity of science outside the 'West.'

Sprawling though these 103 pages of introduction are, it would be an error to interpret capaciousness as a lack of definitional rigor. Instead, Kanamori makes it clear that his vision of the history of scientific thought, and through this the history of science in general, rests on a certain foundational eclecticism. Institutional homelessness has been one obvious expression of this. Kanamori understood himself as a philosopher who, like the French *épistémologues* he admired, sought to transform the Kantian critique of reason into a *historical* critique of reason (Lecourt, 1969;

Rheinberger, 2010; Sturm and Feest, 2011). In reality, no History or Philosophy program ever offered him a position, and nearly half of his professional career was spent, of all places, at of The University of Tokyo's Department of Education. Even today, few Japanese universities recognize the history of science as an independent field. Nevertheless, this selfsame homelessness has simultaneously proven productive. As liminal scholars from a discipline few recognized infiltrated departments of Economics and Education, or else fortresses of Law, Philosophy, and Sociology, they necessarily renegotiated the parameters of their research to address concepts, methods, and themes across the humanities and social sciences (Nakayama, 1974).

The new history of science that emerged from this poaching and bricolage stood resolutely opposed to the philosophy of science proper as practiced in Japan – a field for which Kanamori had few kind words (Kanamori, 2010a, pp. 503-6; 2015a, pp. 16-47; Okumura, 2011). At times explicitly contrasting "scientific thought" (*kagaku shisō*) with the "philosophy of science" (*kagaku tetsugaku*), Kanamori repeatedly condemned the postwar hegemony of Anglo-American analytical philosophy. In his view, the legacy of logical positivism and logical empiricism had transformed epistemological questions into dry technical quibbles. For the epigones of Quine and Popper, Kripke and Davidson who populated Japanese philosophy departments, science was a distinctly autonomous form of knowledge, with its own coherent inner semantics, to be dissected in isolation. Kanamori's version of scientific *thought*, in contrast, proceeded from the premise that epistemology was embedded in lived human practice, the analysis of which could not be divorced from examinations of cultural history at large.

Adopting a culturalist stance toward science was by no means synonymous with relativism. Part and parcel of Kanamori's own efforts to introduce *épistémologie* in the late 1980s was also a conscious antagonism toward the way in which Japanese scholars had begun to swoon over allegedly "postmodern" French thinkers. Asada Akira's Deleuzianism was a particular target of Kanamori's

ire, symptomatic of a period he later castigated as a "cultural bubble" paralleling the economic. In their cavalier attitude toward context, specifically the heritage of local epistemic debates in the French philosophical community, Japanese voices of 1980s New Academism had cast aside the continuous project of critiquing reason to join a triumphal parade of endless difference and deferral (Kanamori, 2000, pp. 53-4; 2004, pp. 268-71; 2014, pp. 460-6). Navigating the perilous path between facile postmodern relativism and analytical philosophy's scientism led Kanamori to his most controversial work, 2000's *Saiensu Wōzu* [Science Wars]. A response to the stormy climate of the Sokal affair, the monograph on the one hand aimed to defend objectivity and truth, and on the other hand demanded a pluralist understanding of these concepts. Through chapters on biopolitics indebted to Canguilhem and Foucault, as well as introductions of major ideas from SSK (Sociology of Scientific Knowledge), Kanamori argued that to recognize the contingent socio-historical conditions of scientific knowledge production was not to dismiss "objectivity" and other epistemic virtues as idle illusions, but to extend participation in open-ended debates over their changing meanings. This nuance was unfortunately lost in popular reception. As a result, *Saiensu Wōzu* incurred the wrath both of practicing scientists and of a generation of intellectuals weaned on New Academism's fashions.

Fitting then, are the lengthy pages Kanamori dedicates in his *Shōwa zenki* introduction to the 1930s activities of the Kyoto School and the Yuibutsuron Kenkyūkai [Society for Research on Materialism], then the work of thinkers such as Murakami Yōichirō, who in the 1970s brought Kuhn and Feyerabend's revolt against logical positivism and empiricism to Japanese shores. These two moments, praised by Kanamori as the twin peaks of Japanese scientific thought's florescence, witnessed the elaboration of Marxist and postpositive approaches that not only resolutely employed history as a weapon of philosophical critique, but also maintained a commitment to a continued project for legitimate knowledge under the name of 'science.' Precisely these two features, in

Kanamori's assessment, had come under gradual erasure since the 1990s. His introductory essay thus ends on a note of profound ambivalence, if not pessimism. Relativism and scientism were, to be sure, major threats. Yet more importantly, Kanamori perceived around him the rise of a pronounced presentism that diluted both historical consciousness as well as the philosophical potential of critique. Some presentism was, Kanamori noted, inevitable, if not desirable. Postwar society had been rocked by escalating scandals of science. To latter Shōwa protests over nuclear power and industrial pollution, the Heisei period added bitter reflection on Japan's long silence over its eugenics program; bioethical debates over new genetic modification techniques; the targeted hollowing-out of the humanities in favor of STEM disciplines; dilemmas of privacy in computing and informatics – not to mention the specter of 3.11. Kanamori (2005, 2015b, 2016c) himself did not shy away from these topics; significant energy late in life was diverted toward their investigation, and his contribution to the *Shōwa kōki* volume focuses on atomic bomb literature. But he also lamented a rising myopia. As attention turned to contemporary social and political problems, interest in science's more eclectic past faded. Critique, in turn, came to primarily entail direct intervention in shaping public policy, rather than sustained excavation of the diverse varieties of reason across time. It is in this context that we are to understand the essays collected in the *Shōwa zenki*, *Shōwa kōki*, and *Meiji-Taishō* volumes: a final call to multiply and enrich the possibilities of what we mean by scientific thought, in a manner irreducible to immediate utility for the political problems of the moment. By deliberately emphasizing the manifold and unexpected regions where the history of science can take us, these essays urge us to recover a history of science dedicated to the construction of a pluralist critique of reason (Kanamori, 2010a, pp. 36-7; 2011, pp. 85-8; 2015b, pp. 10-11; 2016a, p. 509; Okumura, 2017, pp. 417-18).

Eclecticism in Practice

"Plural" may indeed at first glance appear as the only fitting word for the contents of these books. Though published out of chronological order, the *Meiji-Taishō*, *Shōwa zenki*, and *Shōwa kōki* volumes offer, as their titles indicate, a broad sweep that begins with Kaneko Ayumi's examination of Fukuzawa Yukichi and ends with Kanamori's own 3.11-inflected meditation on the persistent dilemma of nuclear power. At the same time, the contributions eschew comprehensive coverage, much less the construction of any grand narrative. Physics and the life sciences are recurrent, as are densely theoretical expositions of Kyoto School thinkers. But prevalent also are topics that do not conform to one's typical image of the history of science: agronomy, geography, the legal history of organ transplantation. Meanwhile, key fields such as mathematics and engineering, including computing, data, and information sciences, are notably absent. A *tsūshi* (survey history) this is not. Unlike Nakayama Shigeru's (1978, 2001-6) four-part *Social History of Science and Technology in Contemporary Japan* – the publication on the surface the most comparable to this series – Kanamori's editorial eclecticism seems designed to trouble our image of what constitutes "scientific thought."

Even so, specific themes confer some semblance of unity to individual volumes, and to the series as a whole. Nation, above all, is a red thread that weaves its ways through all three books, albeit manifesting itself in separate ways characteristic of each period. In *Meiji-Taishō*, science emerges as an essential ingredient in the molding of rational subjects fit for the modern state. At the forefront of *Shōwa zenki* is Japan's competition on an international stage defined by empire, with science mobilized, as physicist Nagaoka Hantarō (1865-1950) puts it in Okamoto Takuji's (2011, p. 110) chapter, to "beat the whites." Finally, the majority of *Shōwa kōki*'s chapters are invested in questions of democratic citizenship; here, science comes across most clearly as part of a struggle for agency, amidst vigorous controversy over the role of scientists in the state and civil society.

Within the nation as an overarching framework, one might then differentiate each volume roughly according to respective foci. Boundary work acts as a center of gravity for the *Meiji-Taishō*

contributions, rooted in a period when "modern science," its disciplines, and its institutions were still unstable. Ichiyanagi Hirotaka's chapter on the infamous *Senrigan* Incident of 1910 in many ways functions as a road map. A debate over the existence of parapsychological powers, the *Senrigan* Incident embroiled late Meiji's leading psychologists, physicists, and evolutionary biologists, while also sparking a mass media frenzy. Its resolution led to Tokyo Imperial University's dismissal of psychology professor Fukurai Tomokichi (1869-1952), who was thereafter unable to obtain any academic post. This same dynamic – the policing of the uncertain borders of academic "science" and popular "pseudoscience," the demarcation of professional scientists versus amateurs, the disciplining of an irrational and superstitious populace by Western-educated elites – is evident in all other contributions. Natsume Ken'ichi invites us to explore physicist Yamakawa Kenjirō's (1852-1931) educational reforms at Tokyo Imperial University, which articulated a normative image of the modern "man of science" as heritor of a native warrior spirit. Hashimoto Akira examines the conflict between university researchers, dedicated to German models of physiological causation, and clinical practitioners, who frequently emphasized *sui generis* mental phenomena. Satō Tatsushi treats us to a view of Yokoi Tokiyoshi's (1860-1927) efforts to establish himself, and agronomy, as a legitimate scientific discipline. These university-centric accounts are paired with explorations of popular media: Fukuzawa Yukichi's writings that positioned scientific rationality as a qualification for liberal citizenship; the work of seismologists, in Nakao Maika's chapter, to dispel vernacular understandings of earthquakes as "punishments from heaven."

If the contributions to the *Meiji-Taishō* volume stress the erection of science's boundaries, then those of *Shōwa zenki* attempt to account for the peculiarities of the terrain therein. Why were certain areas of study given greater emphasis than others? What forces shaped science's peaks and valleys in Japan? Direct colonial needs certainly had a part. Sakano Tōru's examination of racial anthropology situates itself in Japanese expansion to Hokkaido and Taiwan; Shin Chang-geon

interprets Japan's synthesis of *kanpō* and Western biomedicine through the Greater East Asia Co-Prosperity Sphere. But this explanation sits less easily with elementary particle physics, which would go on to define Japanese prestige on the international stage for much of the twentieth century. Early on, the immediate practical applications of particle physics were not apparent. Instead, as Okamoto Takuji's essay shows us, researchers were attracted by a feeling that young topics, relatively unestablished, promised a more equal playing field for competition with the West.

An outlier to the above, the final chapter of *Shōwa zenki* begins a pivot into the headier theoretical realm that characterizes the *Shōwa kōki* volume that follows. In the chapter, Itabashi Yūjin offers a detailed exposition of Tosaka Jun's writings on biology, which sought a rapprochement between mechanism and vitalism as a means of conceptualizing free agency within dialectical materialism. Both tone and topic pave the way for *Shōwa kōki*'s overt focus on the political and sociological theorization of science. Another chapter by Itabashi on Tosaka's Kyoto School colleague, Shimomura Toratarō (1902-95), helps facilitate this transition – the closest the series comes to adopting a transwar perspective. But it is Taketani Mitsuo (1911-2000) and Shibatani Atsuhiro (1920-2011) who dominate over half of the book's seven chapters. Essays by Kanayama Kōji and Okamoto Takuji introduce us respectively to Taketani's vision of a "pure" science free from sociopolitical interference, his three-stage model of the logic of scientific discovery, and to subsequent critiques of Taketani that took more seriously how "big science" had irretrievably integrated research into state and industry. More radical were the ideas of molecular biologist Shibatani Atsuhiro (1920-2011). As elucidated in Satō Hikaru and Setoguchi Akihisa's contributions, Shibatani feared the loss of subjective agency in the face of big science, and thus militated for an oppositional "anti-science" (*han-kagaku*) based on values of immediacy, affect, and intuition. Two shorter chapters then round out the volume by bringing readers closer to the ground: Mima Tatsuya

on legal struggles over brain death and organ transplantation, and Kanamori himself on literary representations of the bomb.

Dilemmas of Translation

The bibliographical richness of Kanamori's prefatory essay alone would be of benefit to a wide audience of historians and philosophers of science beyond those with a Japan focus. Christopher Carr and M.G. Sheftall are therefore to be applauded for making it available in English, alongside a selection of other essays from the same *Shōwa zenki* volume. Specialists requiring precision, however, will find that their translation is quite often infelicitous – misleading, in several cases, and outright mistaken, in others.[2] It is a frustrating fact that modern Japanese thought took – and still takes – place in an interstitial space of between languages (Sakai, 1997, pp. 51-63). Those seeking to translate works of this nature should thus ideally possess, in addition to Japanese and English, at least a passing familiarity with German and then French, with special emphasis on their philosophical terminology. Such qualifications are hard to find, and in the grand scheme of things, Carr and Sheftall have demonstrated great courage and perseverance. But for scholarly purposes, their work falls short of the necessary standard.

Consider, for instance, "the theory-ladenness of observation," a key concept in postpositivist philosophies of science. The Japanese – *riron fukasei* – is rendered by Carr and Sheftall as "the notion that observation is biased by theory" (Kanamori, 2011, p. 59; 2016b, p. 60). Such a translation not only misidentifies the exact scholarly vocabulary at stake, but moreover, in introducing the word "bias," implies a kind of possible objectivity of which "theory-ladenness" was itself skeptical: the intended point is that observation is always-already theoretical (Hacking, 1983, pp. 171-2). Or consider Miki Kiyoshi's use of *kōsōryoku*. Drawing directly from Kant, Miki was thinking of *Einbildungskraft*, or "power of imagination," and not, as Carr and Sheftall would have it, "design

[2] cf. Ericson (2019), p. 166.

power" (Kanamori, 2011, p. 19; 2016b, p. 20). Similarly, Tosaka Jun's *kobetsuteki inga* is a reference to Wilhelm Windelband's *Einzelkausalität* – thus, "individual causality" in opposition to "general causality," and not Carr and Sheftall's "idiosyncratic causality" (Kanamori, 2011, p. 15; 2016b, p. 15). Other similar terminological confusions: *manazashi*, by route of the Francophone *regard*, should be "gaze" in English, not "view"; *shizen benshō-hō* is "dialectics of nature," following Engels, not "natural dialectic method"; *datō*, in the Neo-Kantian context invoked, is *Gültigkeit*, and therefore "validity," not "appropriate grounding" (Kanamori, 2011, pp. 10-11, 90; 2016b, pp. 11-12, 89). These are but a small sampling. The overall problem should be clear.

Granted, it may be gratuitous to fault Carr and Sheftall for neglecting the complexity of translingual philosophical legacies. Translations, after all, possess value apart from scholarly utility. Yet at certain moments, one even comes to doubt their grasp of Japanese. Some basic mistakes alert the reader early on to a lack of sensitivity: failure to recognize that the verb *kiku*, especially when written with certain kanji, means to "ask, question, or inquire," rather than to "listen"; rendering a sentence that should read something like "It would not be problematic to describe this [text] as a history of science from antiquity to the present" as "I find no problem with this text in how it traces the history of science from ancient times up through the modern era" (Kanamori, 2011, pp. 10, 13; 2016b, pp. 11, 14). These slippages are not particularly critical for Kanamori's larger argument. Far more troubling are the errors that yield a false representation of Kanamori's fundamental views on the state of the field and its essential purpose.

The first of these occurs in Kanamori's discussion of changes in the history of science since the mid-90s. After outlining how the period could be potentially characterized as one of decline, Kanamori proceeds to entertain a cautiously optimistic outlook, employing the terms *hattenteki kaishō* and *tenkai*. Carr and Sheftall gloss the former as "the dissolution of development," and the latter as "a turning back" (Kanamori, 2011, p. 67; 2016b, p. 68). "Dissolution of development" is an opaque

and inadequate rendition of the fairly standard Japanese phrase *hattenteki kaishō*. Although more common these days as a managerial euphemism for organizational restructuring (*risutora*) – an ironic reference to the wave of '90s *risutora* perhaps intended by Kanamori – it contains in its roots a notion of dialectical *Aufhebung*: some existing entity is dissolved in order to bring about a successive stage of positive development. The pithiest formulations that reflect this meaning would be "dissolution toward development" or "dissolution for development," although a longer, more unwieldy gloss might in this case be warranted for the edification of English readers. *Tenkai* as used here, meanwhile, does not refer to a "turning back," but simply to a "turn," much in the way humanists speak of a "linguistic turn" or "cultural turn." Kanamori's argument is that mid-90s history of science found itself at a point of inflection. Old ideas and practices were disappearing, conferring the appearance of a "decline" that in fact bore within it a new conception of the field. Far from "turning back," Kanamori was looking toward the future.

What Kanamori saw in the future is something again dangerously distorted by the English translation. At the end of his introductory essay, Kanamori suggests that the current state of the field might be better captured by the term *kagaku seijigaku*, instead of *kagakushi* (history of science). Carr and Sheftall employ "scientific politics" and "scientific study of politics" as their translation for the former (Kanamori, 2011, p. 72; 2016b, p. 73). Kanamori's intent was anything but. As much should be evident from any familiarity with his œuvre. Thematically, Kanamori (2003, 2005, 2010b) repeatedly problematized attempts to render politics, or its study, "scientific"; this was most pronounced in his work on biopolitics. Linguistically, Kanamori (2015a) had explicitly equated terms such as *chishiki no seijigaku* with the English phrase "the politics of knowledge." To translate *kagaku seijigaku* as "scientific politics" and "scientific study of politics" is therefore an emphatic misportrayal of the stakes. Building on his above-mentioned interrogation of presentism, Kanamori was suggesting that the history of science was being replaced by a *political science of science* – a study of

contemporary politics that took science's impact on policymaking as its primary object of analysis. Translation errors such as these are a genuine pity, given recent efforts to counter the history of science's well-acknowledged Eurocentricity through the incorporation of non-Western voices into curricula. Unless instructors issue major glosses, emendations, and caveats, these translations cannot be effectively used in classrooms without generating crucial misunderstandings.

Finally, the selection of essays for translation also raises questions. In and of itself, that *Essays on the History of Scientific Thought in Modern Japan* does not reflect the entire *Shōwa zenki* book poses no ground for censure. But it is unclear what principles drove inclusion and exclusion. The essays translated – Kanamori's introduction, and chapters on elementary particle physics, organic chemistry, and *kanpō* medicine – are not necessarily the freshest works in the Japanese volume. Why leave out Sakano Tōru's stellar contribution on race and physical anthropology, or Itabashi Yūjin's essay on Tosaka Jun's philosophy of biology? Race, biopolitics, and the Kyoto School are major objects of Anglophone attention, and Sakano's work in particular is an essential complement to another chapter that is translated: Shin Chang-geon's examination of traditional medicine in Japan's Asian empire. The selection risks making the English edition overwhelmingly nation-centric, and also methodologically outdated. Half the essays in English are straightforward biographies of "great" Japanese scientists, an approach and genre heavily problematized (Nasaw, 2009; Richards, 2006). Once more, a better feeling for the history of science as a field – its interests and trends – would have aided. While translation of academic work from Japanese into English is in general an occasion for celebration, poor translation and topical relevance in this case dampen enthusiasm.

Futures

Where do these volumes leave us? One conspicuous shortcoming must be flagged: the overwhelming majority of these essays focus on a single thinker – at times two – and *his* work. The stress is intentional. Painfully absent in these volumes are female voices. Not a peep, for instance, is

made of Yuasa Toshiko (1909-80), the nuclear physicist whose internationally-acclaimed research brought her to Paris, where she spent well over half her life, and whose voluminous writings are easily available in published form, in addition to well-catalogued personal papers at Ochanomizu University. Just as troubling, in a set of books clearly concerned with the modern nation, is the neglect of gender and sexuality as an analytic. Science defined the modern nation-state's control of bodies, and particularly of reproduction (Frühstück, 2003; Robertson, 2010; Terazawa, 2018). Furthermore, modernity itself was a pivotal moment for the masculinization of science under the banner of professionalization (Jones & Hawkins, 2015; Jordanova, 1993; Schiebinger, 1987).

Still, fruitful lessons can be derived from Kanamori's series. In the past two decades, the history of science has made rapid strides as a key growth field for Anglophone research on Japan. Scholars trained explicitly in the history of science, technology, and medicine certainly comprise one key subgroup of these contributions, in no small part spurred by the rising number of scholars from East Asia publishing in English through such forums as *EASTS*, established in Taiwan in 2007.[3] More often than not, however, arrival at the history of science's doorstep has occurred via side routes, with intellectual history and environmental history arguably the most well-trodden. Long centered since Maruyama around the history of political thought, Japanese intellectual history has of late looked to scientific debates to rethink concepts of "nature" and the biopolitical, for instance, or to clarify ideals of rationality that animated early postwar democracy.[4] That same politics of "nature" is proving essential for new environmental histories.[5] Whereas earlier treatments of industrial pollution and nuclear power, for example, focused on human arenas of social and political struggle, the history of science has offered tools for exploring the technical processes and non-human actants

[3] As a sample, see Frumer (2018), Hsiung (2019), Kobiljski (2016), Lee (2018), Loh (2017), Onaga (2017), Trambaiolo (2014).
[4] For instance, Bronson (2016), Marcon (2015), Stolz (2014), Thomas (2002).
[5] Importantly, Miller (2013), Miller et al. (2013), Walker (2011).

behind more complex chains of causality (Onaga, 2018; Walker, 2011). In particular, attention to resource exploitation and technoscientific development is rapidly revising our image of the Japanese empire.[6]

This increase in popularity, accompanied by a salutary erosion of subfield boundaries, is partially due to the pluralization of the history of science itself. One factor in this pluralization has been the accumulated problematization of "demarcation" (Collins & Pinch, 1982; Golinski, 2012; Gordin, 1992). A term that once seemed to clearly circumscribe certain disciplines while excluding others, "science" has revealed itself to be far more porous, thereby opening the field to approaches beyond the traditional histories of physics, chemistry, and biology that were once dominant. Elements of this trend are partly consonant with Kanamori's calls for eclecticism. Yet as the history of science dissolves into the fabric of intellectual and sociocultural history at large, it also risks weakening its ties to the persistent philosophical project championed both by Kanamori and the *épistémologie* which inspired him: a historical critique of reason. Here, perhaps, are two initial lessons to be taken from Kanamori's example. First, the history of science may wish to maintain an understanding of itself as unsettled and nomadic – an exile undertaking betwixt and between philosophy and history. Second, in pursuing this hybrid identity, Anglophone scholars should benefit from a rich intellectual legacy of Japanese thinkers, breaking out of a canon of European-language philosophers and theorists. The three volumes reviewed in this article provide a valuable entry point into such an engagement.

Excavating the voices of Japanese thinkers as a counterpoint to a Western-dominated theoretical canon can offer much to the history of science as it undertakes its "global turn."[7] At the same time, such an enterprise must guard against the recapitulation of an old binary that pits Japan

[6] Within this quickly growing field, see Christmas (2019), Ericson (2018), Mizuno (2009), Moore (2013), D. Yang (2011), T. Yang (2012).
[7] The most representative statements include Delbourgo, 2019; Fan, 2012; Isahaya, 2014; Nappi, 2013; Raj, 2017.

against the West. A comparatively younger force in the pluralization of the field, the history of science's current "global turn" differs from earlier studies of science and empire in its ambivalent stance toward postcolonial alterity. Suspicious of prior schema that all too frequently deployed non-Western epistemologies as a monolithic foil to "modern Western science," emerging research stresses multipolar connected histories, in order to question whether modern science was every really Western at all (Raj, 2013). On this front, Kanamori's series might be enriched by the new work of Anglophone scholars on transnational circuits of brokerage and links between modernizing efforts across Ottoman Egypt, Qing China, and princely states on the South Asian subcontinent (Elshakry, 2010). An obvious point of departure would be to capitalize on the strength of Sinological studies, which, in part through Needham's legacy, have traditionally been the locus of Euro-American histories of East Asian science. A certain image of Japan versus the West reigns heavy across the Meiji-Taishō and two Shōwa volumes, inadvertently reifying national history as an approach. 2018's *Teikoku Nihon no kagaku shisōshi* [History of the scientific thought of imperial Japan], edited by Sakano Tōru and Tsukahara Tōgo, attempted to remedy this. But its very existence as a separate volume testifies to the compartmentalization of Japan's non-Western others. The task of rewriting "Japanese" scientific thought as part and parcel of a shared Asian modernity may thus be the most fertile ground for coming exchanges between Anglophone and Japanese scholars.

A need to think outside the Japan-West binary also points to another essential problem confronting both scholarly communities. However much Kanamori may have decried the presentism of his age, his presentation of the history of Japanese scientific thought betrays its own bias toward the modern. This bias becomes apparent when comparing the three Japan volumes with his 2010 monograph, tellingly titled only *Kagaku shisōshi* [History of Scientific Thought], despite its exclusive focus on the history of *Western* scientific thought. While *Kagaku shisōshi*'s sweeping history begins, unsurprisingly, with ancient Greece, moving through medieval Europe, the Scientific

Revolution, Enlightenment, down to the present, Kanamori's history of Japanese scientific thought begins from the Meiji period onward, inaugurated by Japan's full-scale encounter with Western science. There are undeniable specificities to the ways in which nation- and empire-building intensified the centrality of technoscience in the modern period. The overwhelmingly modern bent of recent Anglophone work on the history of science in Japan justifiably reflects this awareness. Nevertheless, that very peculiar beast of modern technoscience should not be conflated with 'science' *tout court*. Indeed, if the goal of *épistémologie* is to critique reason through the unmasking of its "Otherness," then the recovery of those premodern theories and practices used to know and control nature appears imperative. Kanamori's deeper philosophical project may be best enabled by an extension of inquiries into Japan's deeper past – a past that in turn again necessitates collaborative engagements between Japanologists and scholars of premodern Eurasia. Strangely enough, though, to critique Kanamori's volumes in this way is simultaneously to testify to their power. The series admirably accomplishes what one hopes from edited volumes: awakening us to the startling richness of a field, while leaving a vast terra incognita for future activity. Encountering Kanamori's spirit wandering bookstore shelves, one imagines it smiling.

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