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Specters of Edo Castle: Incomplete Proposals for an Unburnable Tokyo

Liam Ross

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At the hour of the Dragon, the eighteenth day of the first month of the year of the Cock, third year of Meireki (8 a.m., March 2, 1657) a great fire broke out in the city of Edo. Popularly known as the *Furisode* (the "Young Girl's Kimono"), the fire is thought to have been started by a priest; while cremating a cursed kimono, a large gust of wind is said to have fanned the flames, causing a wooden temple to ignite. Spreading to consume two thirds of the city, the resultant firestorm lasted for three days and claimed over 100,000 lives.

Few written records of that event exist; indeed, the only first-hand Japanese language account is a novel, the *Musashi Abumi,* attributed to Asai Ryōi. **fig.1** Surprisingly, that book recounts the fire through a series of comic episodes. The narrator, Rakusaibo, survives the first day of the fire, returning to the city to search for his lost mother. Identifying what he takes to be her corpse among the crushed and charred remains, he gathers his family to mourn, only to be surprised when his mother walks by, very much alive. First taking her for a ghost, he goes on to complain that his prayers for her rebirth in paradise have been a complete waste of time, and gets drunk. When he wakes the next morning, hungover inside a chest, he climbs out into a blackened city, again engulfed in flames.

fig.1 *Great Fire of Meireki* from Asai Ryōi, *Musashi Abumi* (1661). Illustration from the image shown depicts the Asakusa Gate during the Great Fire of Meireki. The architecture of fire-defense, gates, ramparts and moats, can here be seen turning against the inhabitants of the city, who are trapped by them.
Source: *Musashi Abumi*, Asai Ryōi, 1661 (Manji 4), New Acquisitions 584, Tokyo Metro Library.

> *"Well, when I stood up and looked around, all was darkness but way off in the east flames were burning and I could hear people shrieking. In my heart I thought that must surely be the Muken hell and those must be the cries of sinners being burnt with fire as they are tormented by the demons. Gosh, how terrible; I must take the road for paradise, I thought, and set out."* [1]

He assumes that he has died and gone to hell. But finding the remains of his family around him, consumed by fire, he realizes that things are worse still: he is alive, all is lost, and he might as well become a monk. Parodying the moral of Buddhist disaster parables, the *Abumi* suggests that when faced with tragedy, comedy is the secular alternative to religious withdrawal. [2]

The Great Fire of Meireki was only the first of three events that transformed Edo into a burning hell. The second was the Great Kanto Earthquake of 1923. Measuring 8.3 on the Richter scale, the most powerful then on record, it struck at lunchtime, spilling cooking pots and char, starting over 130 recorded fires within thirty minutes. These individual domestic fires merged into three distinct firestorms which, generating their own winds, moved around the city consuming whatever fuel was available.

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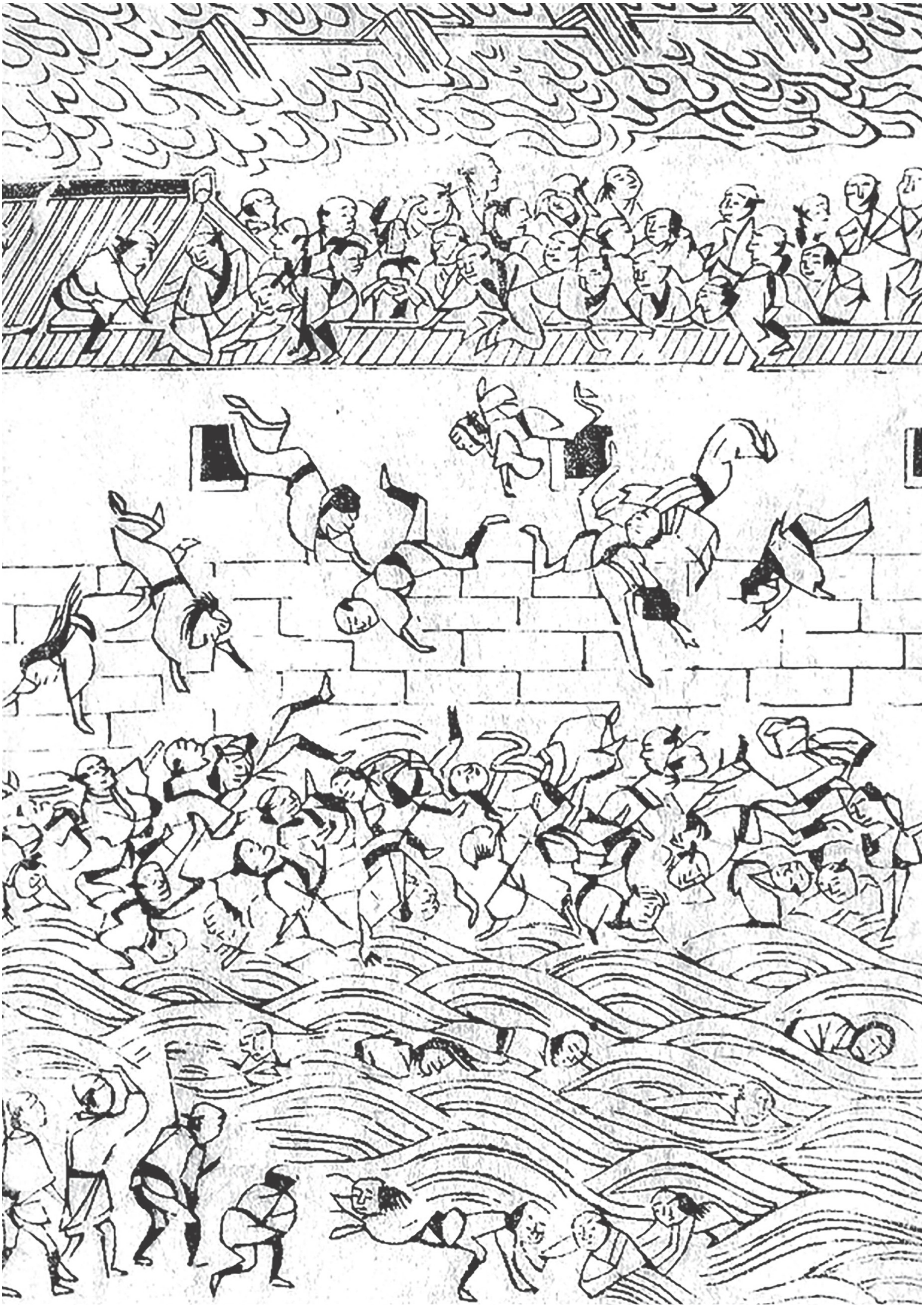
[1] The *Musashi Abumi*, Asai Ryōi, 1661, quoted in Peter Kornicki, "Narrative of a Catastrophe: Musashi Abumi and the Meireki Fire," *Japan Forum* 21, no. 3 (May 24, 2010), 347–61, here 356. The *Muken-jigoku*, or "hell of incessant suffering," is the eighth and lowest level of hell in Buddhist cosmology.

[2] With reference to Freud's essay on humor, Kornicki invites us to read the *Musashi Abumi* in this light: the therapeutic function of the wandering monk is transformed into that of an entertainer. Ibid., 357–58.



An estimated 140,000 people died, again over three days, as the infrastructure of the city turned against them: they were burned to death or were asphyxiated as their homes became infernos; trapped in the streets by molten tarmac; blocked by canals and rivers as bridges burned down; crushed to death by crowds swelling into squares and open spaces; drowned in waterways, leaping to extinguish burning hair and clothes. [3]

On March 10, 1945, flames burned in the east again. During a single bombing run code-named "Operation Meetinghouse," American B-29 Superfortress bombers dropped 165,000 tons of napalm on Tokyo. This event, known locally as the Great Tokyo Air Raid, was the single most destructive air raid in history. A fierce wind spread the fire through the dense residential districts of eastern Tokyo, destroying sixteen square miles of housing, again killing over 100,000 people. The principle cause of death this time was suffocation; purpose-built air raid shelters failed to protect their inhabitants as the firestorm consumed all available oxygen. [4]

The Great Fire of Meireki, the Great Kanto Earthquake, the Great Tokyo Air Raid: the story of Edo-Tokyo is often told through these repeated tragedies in which the feudal, imperial and modern cities were destroyed, only to be built again. But beyond and between these superlative catastrophes, countless uncontrolled fires shaped the everyday life of that city. During the Edo period (1603–1868), 1,798 major fires were recorded in the city, compared to the 184 recorded in Japan's second city, Osaka, hence the proverbial witticism *Kaji to kenka ha Edo no hana* (fires and fights are the blossoms of Edo). [5]

There are some simple reasons why Edo-Tokyo has burned so often and so catastrophically. Japan is a country in which most buildings were traditionally made of wood and paper, providing ready sources of combustion; situated on an exposed and windy plain and subject to long, dry winters, Tokyo is the country's largest tinderbox, in which sparks spread rapidly. But this physical explanation is not the whole story. It fails to explain why, despite many opportunities to replan the city, Edo-Tokyo has repeatedly been rebuilt in flammable materials. While the city has been subject to numerous grand plans to improve urban fire safety, it has consistently avoided the use of noncombustible building materials, such as plaster wall coverings and ceramic roof tiles, even though these were commonly used in other Japanese cities.

This chapter is an attempt to extract a moral from the story of Edo-Tokyo burning. The *Musashi Abumi* is not its only precedent: the frequent destruction and replacement of Japanese buildings is often interpreted in relation to Buddhism, Tokyo's failure to implement comprehensive fire safety regulations being understood as part of a broader Asiatic "fire regime," characterized by a fatalism inherent to Buddhist culture. [6] The ambition here is to offer an alternative, political-economic account. The chapter begins by reflecting on the detailed fire safety legislature that existed during the Edo period. It recognizes that legislation as intentionally limited; it is understood that, during this period, fire was seen to have a strategic benefit for both the shogun and an emerging merchant class, one that legislation sought to choreograph, rather than prevent. Within the fire regime of Edo, it identifies a planning practice that will go on to be considered the "mother of urban design" in modern Japan, that of "land readjustment." It goes on to study how practices of land readjustment shape fire safety initiatives in modern-day Tokyo. Finding those initiatives similarly limited, it suggests strategic benefit that fire offers Tokyo today, particularly for the state and its landowning class. That is, as for Asai Ryōi, in the story of Edo burning it finds opportunity for an ironic parable, here about planning and risk.

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[3] For a detailed description of the earthquake and its aftermath, see J. Charles Schenking, *The Great Kanto Earthquake and the Chimera of National Reconstruction in Japan* (New York, NY: Columbia University Press, 2013).

[4] I am drawing on the verbal testimony of Saotome Katsumoto, recorded in Richard Sams, "Saotome Katsumoto and the Firebombing of Tokyo: Introducing the Great Tokyo Air Raid," *The Asia-Pacific Journal* 13, no. 10 (2015), 1–30.

[5] Fire statistics are here drawn from Jordan Sand, "Property in Two Fire Regimes: From Edo to Tokyo," in Carole Shammas, ed., *Investing in the Early Modern Built Environment: Europeans, Asians, Settlers and Indigenous Societies* (Leiden: Brill, 2012), 33–66.

The Edo period, running from 1603 to 1868, began when the Tokagawa Shogunate—the last feudal rulers of Japan—made Edo Castle its seat of government. That castle sat at the mouth of a river (Edo means "estuary") on an elevated area of land, two kilometers square, defined by a series of concentric ramparts and moats. Already a citadel in itself, it was divided into numerous internal *maru* (wards) by further walls and canals, housing the shogun and his *bakufu* (military government, literally "tent"). This military settlement was extended into a city proper through the *sankin-kōtai* (alternative residence) system, a policy that required 300 regional *daimyō* (the nobility, literally "big land owners") to establish a residence in Edo, occupying it in alternate years, organizing lavish processions as they arrived and left. Servicing the needs of the shogun and these feudal lords was a floating town of densely settled, cheaply built buildings developed to the east of the castle, nestled on islands built of sludge dredged from the moats. [7] The physical fabric of that fortification and settlement was, from its inception, a political-economic device. As Morton Schmorleitz describes, its strategic importance was "not only to build a capital and castle fitting for the shogun but also to reduce the wealth of the *daimyō* by making them supply labor, materials, and money for the construction, thereby lessening their ability to overthrow the Tokagawa Dynasty." [8] Not built on a local resource or industry, Edo established itself as the nation's "consumption city," a necessary passing point for all its wealth, an elaborate mechanism through which to pay tribute to a shogun and impoverish his rivals.

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[6] Innumerable popular accounts of the frequent destruction and rapid replacement of Japan's building stock seek to ground this phenomenon within Japanese spiritual practices. The following article in the *Economist* is indicative: "Why Japanese Houses Have Such Limited Lifespans," *Economist*, March 15, 2018, https://www.economist.com/finance-and-economics/2018/03/15/why-japanese-houses-have-such-limited-lifespans (accessed July 20, 2020). Within academic literatures on property and fire, Jordan Sand cites the folklorist Lafcadio Hearn and economist Lionel Frost as supporting this same cultural explanation, one he finds ahistorical. Sand, "Property" (see note 5), 36. This same explanation can be found in Japanese literature; as Schenking reports, the prominent Buddhist thinker Takashima Beiho contributed to the interpretation of the earthquake as divine punishment, and recognized that reconstruction was an opportunity to demonstrate Japan's strength on an international stage. Schenking, *Great Kanto Earthquake* (see note 3), 121–22.

[7] In this section I am drawing on the historical account of Edo Castle offered by Schmorleitz in Morton S. Schmorleitz, *Castles in Japan* (Rutland, VT: Tuttle, 1974), 99–113.

[8] Ibid., 101.

Fire played an important role in this political economy of consumption. Indeed, we might even say that, more so than the shogun, fire was the real consumer of Edo, one that required not just its construction but its perpetual reconstruction. The residential buildings of the townspeople, for instance, were known as *yakiya* — literally "burnable buildings".[9] In an era without piped water, and in which firefighting was conducted through preventative demolition, cheapness and simplicity — making buildings quick to demolish, without great financial loss — was itself a precaution against fire. And the likelihood of fire was great; the shogun advised landlords to calculate construction costs so as to ensure a return on investment within six years to limit their potential losses.[10] By contrast, the architecture of the shogun's *donjon* (the castle's "keep") was rich with technologies and symbols of fire safety. Its ridges were capped with *shachikoko* (Vedic sea creatures, carps with tiger heads), who were seen to provide protection against fire; its many roofs were covered with ceramic tile, whose wave form and raised eaves made iconic allusions both to fishes' tails and waves; its exposed beam-ends were literally and symbolically protected by ceramic caps featuring a wave motif; and its interiors were papered with repetitive patterns that continue the double allusion to fish-scales and waves.[11] But perhaps more importantly, the wider infrastructure of the castle also played an important fire safety role. Never being subject to military assault, the castle's real defensive value was in protecting the shogun and his government against the spread of fire. Moats formed a wide water firebreak, ramparts a high noncombustible fire wall; gardens were planted with fire-resistant trees; *maru* formed effective internal fire compartments. The soldiers that patrolled the castle walls were armed with fire-brooms, not spears.

It is in the context of this political economy of consumption that we can understand why Edo continued to be rebuilt using flammable construction materials. As Donald Shively explains, "indulgence" was an important governmental rationale during this period.[12] Detailed legislation existed proscribing those of lower social class from "indulging" in luxuries proper to those of higher status. These luxuries included details of building design; it was through sumptuary mechanisms that the shogun prohibited townspeople from using noncombustible building materials, such as plaster wall coverings and ceramic roof tiles. Because these features were expensive and would not succumb to a major fire, they were deemed an "extravagance" that the urban poor could not afford. As such, the fire safety of buildings was incorporated and enrolled within the enrolling symbolic ordering of status.[13]

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[9] Richard L. Wilson, *The Archaeology of Edo: Premodern Tokyo*, Working Papers in Japan Studies 7 (Tokyo: International Christian University, 1997), 15.

[10] Sand, "Property" (see note 5), 57.

[11] My thanks to four students, Euan Miller, Damien Theron, Yannick Scott and Rachel Smilie, for drawing my attention to the relationship between decorative orders and seismic performance at the Edo Donjon.

[12] The impoverishing effect of sumptuary law, and the way the *Bakafu* used fire as an opportunity to impose new regulations, are recognized in Donald H. Shively, "Sumptuary Regulation and Status in Early Tokugawa Japan," *Harvard Journal of Asiatic Studies* 25 (1964), 123–64.

[13] A detailed review of the way sumptuary law affected architectural style is offered in Laurel Cornell, "House Architecture and Family Form: On the Origin of Vernacular Traditions in Early Modern Japan," *Traditional Dwellings and Settlements Review* 8, no. 2 (1997), 21–31.

Sumptuary laws often responded to the exigency of particular fires, too; large fires were prompts for change in these regulations, changes often understood through the lens of fire safety. In the immediate aftermath of the Great Fire of Meireki, sumptuary edicts against noncombustible materials were temporarily extended to include the *daimyō*.[14] But by reducing the potential loss associated with fire, these laws also increased the likelihood and structured the distribution of such fires. That is, by enrolling fire within this legislative framework, sumptuary law not only sought to represent wealth disparity but also worked to actively sustain it.

An argument that fire functioned as a political-economic device in feudal Edo is supported by the work of Japan scholars Jordan Sand and Steven Wills. In their detailed study of Edo's legal codes, they suggest that, prior to the Great Fire of Meireki, the shogun approached fire with a "castle—town" mentality: fire that happened outside the castle precinct was not really a problem; fire was another enemy to be kept outside the gates.[15] Though the shogun passed many laws concerning fires within the town, few were concerned with preventing it. Indeed, Sand and Wills suggest a number of ways in which fires in the town were politically expedient, offering the shogun an opportunity to demonstrate his sovereignty: public executions of convicted arsonists offered a spectacle of power over life and death, just as post-fire disbursements were an opportunity to demonstrate compassion and largesse. But perhaps most importantly, they argue that the aftermath of large fires allowed the shogun to re-adjust land ownership patterns, and so redesign the city, undermining any physical or legal attachment that townspeople or nobility might develop over the land they occupied.

Through Sand and Wills's account of Edo's fire regime, we can understand something of the significance of the Great Fire of Meireki. Property loss from that fire exceeded the shogun's capacity for reconstruction. Furthermore, the scale of the blaze was such that sparks and embers carried over the moat and walls, beyond the reach of the soldiers' brooms. Fire engulfed the whole of the castle complex, destroying its central keep, which was never to be rebuilt. Perhaps for the first time, fire weakened the shogun's position as opposed to strengthening it, prompting his first attempt to improve the fire safety of the city as a whole.

Response to the *Furisode* was led by Rōjū Matsudaira Nobutsuna, one of the shogun's leading *daimyō*. He used the event to make widespread readjustments to the plan of the city, ones which can still be read in its plan today. The *daimyō* were moved out of the castle, creating a verdant ring of estates to

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[14] Wilson, *Archaeology of Edo* (see note 9), 14.

[15] Jordan Sand and Steven Wills, "Governance, Arson and Firefighting in Edo," in Greg Bankoff, Uwe Lübken, and Jordan Sand, eds., *Flammable Cities: Urban Conflagration and the Making of the Modern World* (Madison: University of Wisconsin Press, 2012), 44–62.

the north and west, today occupied by ministries of the state. The townspeople were moved further east, to the districts which today comprise the working-class residential districts of the city. Through these changes, Nobutsuna created a large clearing around the castle. In the new town, canals, earthen walls and wide clearings were proposed as a means to subdivide housing into fire safety wards. That is, at the moment of its destruction, Edo's castle was given an uncanny afterlife. Continuing to approach fire "on a war footing," Nobutsuna used the architecture of that building—its ramparts, moats, parks and *maru*—as a paradigm through which to think of the city as a whole. As we have already noted, though, no efforts were made to require rebuilding using noncombustible materials.

For the remainder of the Edo period, successive shoguns attempted to realize the ambitions outlined by Nobutsuna, but to limited effect. None had the capital to build canals and fire walls directly; their limited autocracy was such that they had to enroll landowners, merchants and tenants within these initiatives. In the wake of fires, it was relatively easy to readjust ownership patterns so as to create fire safety clearings—the moats of this castle paradigm—though these were often filled in by informal settlements. Establishing the urban "ramparts" was even more challenging.

At the beginning of the eighteenth century, Tokagawa Yoshimune overruled the edict banning fireproof materials, even introducing subsidies incentivizing the use of plaster and tile, in a first attempt to build a noncombustible city. This initiative was of limited effect, for paradoxical reasons. Landlords and tenants complained that they could not afford to invest in expensive, fire-safe construction on account of losses they had accrued through previous fires. That is, the rationale of sumptuary law had by this time become self-sustaining; the townspeople were caught in what economist Lionel Frost has described as a "prisoner's dilemma"—unable to invest in their collective interest due to the risk of individual loss. [16]

Jordan Sand's work on Edo-era property law shows us that what success Yoshimune did have in improving the city's fire safety came in the form of a novel building type, the *dozu zukuri,* or "go-downs." Due to the likelihood of fire, Edo's residents stored valuables in firesafe chests. But for a burgeoning urban poor, unable to afford the risk of owning seasonal commodities such as futons or mosquito nets, pawn brokering was an important service industry. The *dozu zukuri* emerged in order to meet the business needs of such brokers. These storehouses were the first in Edo to feature significant fire safety features: their walls were made of plaster and mud, their doors and windows were designed to be sealed seasonally with plaster, and, unlike other buildings in the town, they included cellars. Indeed, legally these structures were thought of less as buildings, more as "improvements of the ground." By building in this manner their owners not only secured their stock of mobile capital but also—being the only building type recognized in the shogun's register of titles—an increased claim to land ownership. By giving ground in this way, which granted permission for such buildings along the flanks of major arteries, Yoshimune sought to enroll an emerging merchant class into his fire regime, building mercantile "ramparts" that would not prevent individual fires but limit their catastrophic urban spread. [17]

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[16] Lionel Frost, "Coping in Their Own Way: Asian Cities and the Problem of Fires," *Urban History* 24, no. 1 (May 1997), 5–16, here 12.

Through Sand's work, we can understand the problem of fire risk and fire safety at the end of the Edo period through the interaction of two distinct property regimes: the "burnable buildings" of the working class, mobile and disposable commodities that fueled the economy of this consumption city; and the firesafe structures of the landowning and merchant class, structures of fixed capital, distributed so as to limit the city from catastrophic physical and economic shocks. The pre-fire dialectic of Castle and Town is here given an extended and spectral form. What I wish to stress here, though, is that the capacity of the *dozu zukuri* to safeguard the city was inherently limited, both spatially and economically. When futons and mosquito nets are collected in storehouses, they take up much less space than they do when distributed in dwellings across the city. That is, there could never be enough *dozu zukuri* to encircle and protect the *yakiya*. Furthermore, should those storehouses have been able to fulfill that collective role, they would have undermined their individual purpose. Had the risk of fire ever have been fully extinguished, the urban poor would have been able to keep their futons and mosquito nets at home. I think it is possible to suggest that the fire safety rationale of the Edo period—intentionally or otherwise—was caught within a reflexive trap; it functioned by sustaining the risk it sought to limit.

Following the Meiji Restoration of 1868, the city of Edo became the city of Tokyo, the imperial capital of Japan. Fire continued to be a problem for that city, but in this new context fire safety took on a novel significance. The risk of fire was understood as a barrier to foreign investment, and so to Japan's broader ambition to internationalize. In the wake of continued major fires, the imperial administration therefore made a number of grand plans to improve, or indeed to completely redesign, the capital city.

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[17] Sand, "Property" (see note 5), 42.

These plans often drew on imported actors and concepts, seeking to consciously "westernize" the city. [18] Nevertheless, I think it is possible to see within those plans a fundamental continuity with the fire safety thinking of Nobutsuna and Yoshimune. Like Edo before it, Tokyo has consistently refrained from mandating the widespread use of noncombustible materials, instead seeking to limit the catastrophic spread of fire through networks of urban clearings and firebreaks. And like those of Nobutsuna and Yoshimune, the grand urban plans for modern Tokyo have also tended to fail, or been left incomplete, for what appear to be similar reasons.

The 1872 Ginza Fire provided the imperial administration with its first significant opportunity to reshape its capital. That fire, which destroyed the city's business district, cleared the space for a new urban gateway leading from commercial port to castle. An English architect, Thomas Waters, was commissioned to complete the design in a self-consciously Western style. With an orthogonal street plan, shopping arcades, and masonry buildings, Ginza's "Bricktown" advertised that investment in Japan was safe. [19] That claim would not be proven false until 1923, when the Great Kanto Earthquake would destroy this district again, proving that its load-bearing masonry was neither earthquake- nor fire-safe. Nonetheless, in the interim, it acted as a model for more widespread urban proposals. Following the Iwakura mission to Europe, where the administration witnessed Haussmann's Paris, Wilhelm Bockman and Herman Ende were commissioned to prepare a plan for the whole of Tokyo, one of wide, regulated boulevards cutting through the existing dense fabric. But this first grand plan for Tokyo, thought of as too costly and drawing resistance from landowners, was rejected by the administration. The preferred plan, the First Plan for Urban Improvements of Tokyo, shared common features with its predecessor, albeit more modest in scope. A network of broad, firesafe streets were proposed, carving through and subdividing the dense built fabric. This proposal looked to Haussmann in another way, from whom it took inspiration for an urban law, facilitating the expropriation and readjustment of land ownership to allow for the creation of new or widened streets. **fig. 2** A version of this legal mechanism was incorporated into Japanese law, first through the Tokyo Urban Improvement Ordinance of 1888 and later through the 1919 City Planning Law. And while this mechanism—which came to be

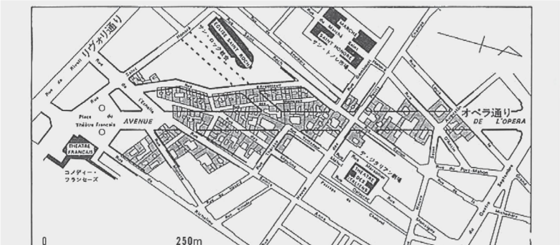

図 4・7　超過収用による直線的大通りの建設（オペラ通り）
出所：レオナルド・ベネーヴォロ著　佐野敬彦・林寛治訳(1983)『図説・都市の世界史 4 』60頁

fig. 2 Urban reform plan in Paris in the nineteenth century by Georges Haussmann, author unknown. A Japanese illustration of Haussmann's boulevard proposals and the mechanisms of state expropriation they entailed.
Source: Ai Sekizawa, *History of Urban Disaster Preparedness since Meiji-Era 1868 to the 1923 Kato Earthquake*, Tokyo Graduate School of Global Fire Science and Technology, Tokyo University of Science, October 21, 2016.

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[18] Ibid., 64–65.

[19] Edward Seidensticker, *Tokyo from Edo to Showa 1867–1989: The Emergence of the World's Greatest City* (Tokyo: Tuttle Publishing, 2011).

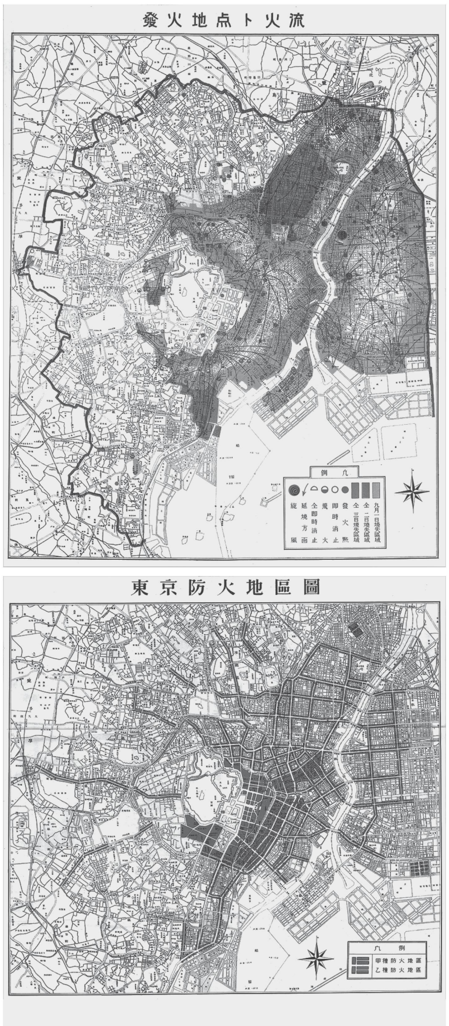

fig. 3 City of Tokyo fire prevention district plans, author unknown. Map illustrating fire-prevention districts proposed in the aftermath of the Great Kanto Earthquake. This scheme, similar in nature to the Imperial Capital Reconstruction Plan for Tokyo City, shows the mercantile center to the east of the castle, including Ginza, rebuilt in fireproof building materials. New arterial roads to the north and east are proposed, facilitated by "land readjustment" practices, inspired by Haussmann. These are to be wide and lined with fireproof buildings. Source: www.greatkantoearthquake.com. (accessed, July 29, 2020)

known as land readjustment—was considered a Western import, it had a local precedent, reconstructing the shogun's sovereign right for a context where private ownership was now legal. Nonetheless, this planning instrument was rarely used for its originally intended purpose. The imperial administration, like the shoguns before it, rarely engaged in the compulsory purchase of land for coordinated redevelopment, nor sought to establish detailed master plans for private-sector developers to work within. Rather, where land readjustment did occur, it happened piecemeal, in the aftermath of local fires. Landowners whose buildings had been destroyed by fire used this mechanism to subdivide their lots, creating new streets to offer access to previously landlocked sites. In this way, a legal mechanism established to support the creation of wide firesafe streets in practice supported the further subdivision and densification of areas that were already fire prone. [20]

The Kanto earthquake struck only four years after the City Planning Law was passed, providing a "golden opportunity" for Tokyo's planners. Shinpei Goto, then Mayor of Tokyo, responded with his New Tokyo Plan. That plan again sought to embrace a number of self-consciously Western planning ambitions: a combination of urban and economic planning, speculation on population increase, ambitions for decentralization, social housing, increased public spaces and amenities, as well as coordinated visual control of the streetscape. This modernizing program again associated a Western-looking urban pattern with the question of fire safety. But this comprehensive vision was also abandoned, this time in favor of the Ad Hoc Town Planning Law of 1923. The two principal vehicles that this law supported were the Imperial Capital Reconstruction Plan for Tokyo City of 1923 and the Earthquake Reconstruction Land Readjustment Project of 1927. Both proposed extensive rezoning and street-widening initiatives, made possible through plot adjustment, but neither required the mandatory use of fireproof construction materials or a coordinated master plan for building designs. **fig. 3** The cadastral plan of 33 million square meters of the city was redrawn, with the intention to reduce individual plot sizes and increase the orthogonality of street layout. fig.4 But again, these plans were only partially realized, the imperial government lacking capital funds to make compulsory purchases. [21] What resilience the city did demonstrate was again due to the cheap and simple nature of its predominantly timber construction; destitute and homeless survivors picked up the remains of their broken homes, rebuilding them as best they could, creating the simple timber dwellings, or *barakku*, recorded by “modernologist” Wajiro Kon.

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[20] This important point is made by Carola Hein. Discussing the 1919 law, she suggests that planners "deployed it in ways very different from its framers' original intent: As the Japanese urban historian, Ishida Yorifusa, has shown, by drawing building lines in the interior of blocks, administrators created virtual access routes to lots at the interior of deep blocks, thus providing a means to continuously use these areas and maintain high population density after the 1923 earthquake. Often enough these lines existed only on paper, but that was enough to allow construction in the block interior. Japanese planners thus transformed a planning instrument designed to unify urban landscapes and made it into a tool to preserve a particular Japanese status quo instead of transforming it," Carola Hein, "Shaping Tokyo: Land Development and Planning Practice in the Early Modern Japanese Metropolis," *Journal of Urban History* 36, no. 4 (Jan. 7, 2010), 447–84, here 454.

If the vision of Tokyo as a durable, disaster-resilient infrastructure supporting disposable individual living units is familiar to a Western audience, it is probably due to the celebrated urban proposals of the Metabolist group. Kenzo Tange’s Tokyo Bay Plan was proposed when the memory of firebombing during World War II was fresh. Transposing the city out into the bay, Tange’s proposal gave its street infrastructure a new purpose and an architectonic form. Kurakawa’s *Agricultural City* was based on a similar gesture; proposed here in response to the Ise Bay typhoon, a grid-like megastructure lifts the city above an anticipated sea, allowing for flexible accommodation of infill. Kurakawa’s *Wall City* appears like a modernist rendering of Nobutsuna’s distributed castle; the existing, piecemeal, low-rise built fabric is left untouched while being subdivided by a network of rampart walls, here in the form of an elevated and inhabited highway. [22]/fig.5 Needless to say, none of the group’s urban-scale plans for Tokyo were realized. The adopted postwar reconstruction plans reiterated the ambitions of those set before them: 20,000 hectares of land were scheduled for readjustment to facilitate widened infrastructure forming preventative firebreaks. By 1983, when this plan was officially considered complete, less than a tenth of those changes had been made. [23] Failing to plan for the massive population increase that occurred in the postwar period, an entirely new city developed on its perimeter: the swath of dense, speculatively built housing known as the "Cheap Wooden Apartment Belt" that comprises Tokyo’s major contemporary fire risk.

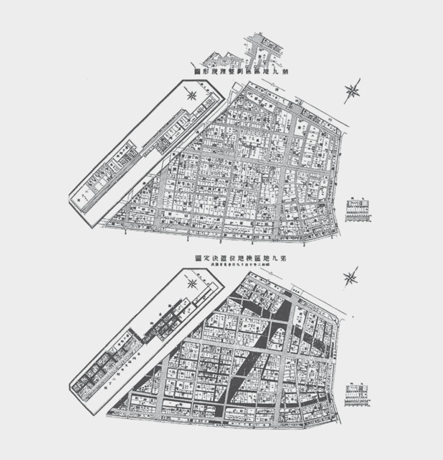

fig. 4 Land readjustment used to create the intersecting Showa-dôri and Yasukuni-dôri Streets in 1927 left the surrounding areas largely untouched, creating numerous irregular and tiny sites. Source: Carola Hein, “Shaping Tokyo: Land Development and Planning Practice in the Early Modern Japanese Metropolis,” *Journal of Urban History* 36, no. 4 (Jan. 7, 2010), 447-84, here 459.

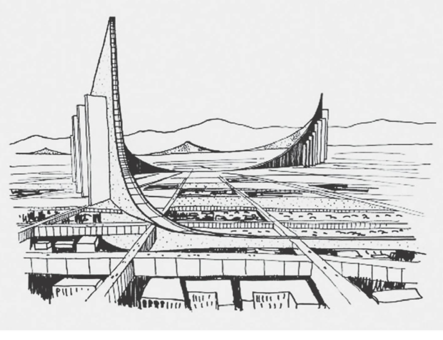

fig. 5 Kisho Kurokawa’s resilient infrastructures from *Wall City* (1959), which proposes a network of raised arterial road, subdividing the existing city. It bears a striking resemblance to previous plans for urban fire safety in Tokyo, from the Tokagawa era onward. Source: Kisho Kurokawa, *Metabolism in Architecture* (London: Studio Vista, 1977).

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[21] In this chronology I am drawing from Hein’s detailed account of changing land practices and urban regulation in the aftermath of the Kanto earthquake. Ibid., 450–61.

[22] This aspect of the Metabolist legacy is explored in Meike Schalk, “The Architecture of Metabolism: Inventing a Culture of Resilience,” *Arts* 3, no. 2 (June 13, 2014), 279–97.

[23] Carola Hein, "Visionary Plans and Planners: Japanese Traditions and Western Influences," in Nicolas Fiévé and Paul Waley, eds., *Japanese Capitals in Historical Perspective: Place, Power and Memory in Kyoto, Edo and Tokyo* (London: RoutledgeCurzon, 2003), 309–46.

Perhaps the most complete gesture of urban fire safety in Tokyo is also one of the most recent. When concern about fire within the "Cheap Wooden Apartment Belt" became a political issue, the then governor of Mukojima ward launched a mayoral bid on a platform of improving urban fire safety. [24] His pitch was a single project, the Shirahige-Higashi complex. Explicitly invoking the traditional castle-form as its urban and architectural precedent, this scheme was initially conceived as a series of defensive ramparts surrounding a protected *maru*, with staggered and defensive entrance sequences. [25] As constructed, its eighteen interconnected apartment blocks, each fifteen stories high, form an urban fire wall running along the Sumida River. The elevation of the city-side of this building, which looms over a district of two- to three-story timber buildings, is equipped with steel shutters that, in the event of fire, create an unbroken rampart over a kilometer in length. Along the riverside of the building lined with open access galleries, fire cannons are placed to douse a fire safety park that runs along the banks of the river. The scenario that this building anticipates is that of a citywide firestorm, during which its purpose is to maintain a means of egress for the entire population of the city. As an isolated fragment of this imagined infrastructure, the already daunting building, like a stretch of Franz Kafka's *Great Wall*, only alludes to the impossible scale of that task. [26]

The threat of a catastrophic post-earthquake firestorm still hangs over Tokyo; seismologists predict a 98 percent chance of a magnitude 7.0 earthquake striking the metropolitan region within the next thirty years. Such an event would likely kill tens if not hundreds of thousands of people and lead to property damage worth hundreds of trillions of yen, with fire the chief cause of both losses. [27] Indeed, despite the efforts of Tokyo's city planners, the global reinsurance agency Swiss RE ranks Tokyo as the world's riskiest city within which to invest in property. [28] The mapping that supports the analysis would seem to confirm the assumptions of the urban plans recounted above: in the center and along major circulation routes where buildings have typically been built in concrete, pyro-seismic hazards are considered well-managed. Fire risk concentrates in the dense low-rise timber buildings that still predominate between these arteries and define the peri-urban sprawl of the “Cheap Wooden Apartment Belt.”

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[24] I was directed to the Shirahige—Higashi project through personal correspondence with Professors Ai Sekizawa and Osamu Nishida, of the Tokyo Graduate School of Global Fire Science and Technology, Tokyo University of Science, whose verbal account of the political background of this project I draw upon here.

[25] Osamu Murao, "Case Study of Architecture and Urban Design on the Disaster Life Cycle in Japan" (14th World Conference on Earthquake Engineering, October 12–17, 2008, Beijing, China), https://www.iitk.ac.in/nicee/wcee/article/14_S08-032.PDF (accessed July 20, 2020).

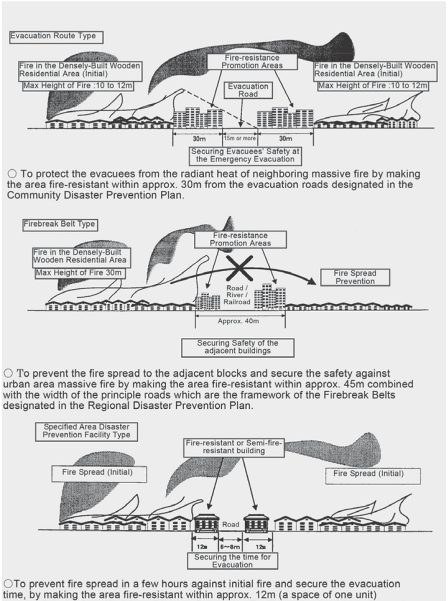
[26] In the story the "Great Wall of China," Kafka's mason struggles to understand the construction logic of his imperial commissioners. Work proceeds in a piecemeal fashion — with work crews completing isolated fragments of wall within the vastness of the steppe — appearing to defer any possible military advantage. The mason concludes, though, that the purpose of the wall is not, in fact, to keep out the "invaders from the north" but rather to create a subjectifying experience in which the scale of the individual laborer's accomplishment is rendered insignificant with respect to the scale of the empire. See Franz Kafka, *The Great Wall of China: Stories and Reflections*, trans. Willa and Edwin Muir (New York, NY: Schocken Books, 1970).

[27] Elizabeth Yuan, "Tokyo Sees High Quake Probability, Scientists Warn," *CNN*, http://www.cnn.com/2012/01/24/world/asia/tokyo-quake-forecast/index.html (accessed July 20, 2020).

[28] For a mapping of Swiss RE's finding against the current built fabric of the city, see section 11.1 of "Mind the Risk: Cities under Threat from Natural Disasters," http://institute.swissre.com/research/collaborations/in_focus/Mind_the_risk_cities_under_threat_from_natural_disasters.html (accessed Mar. 13, 2018).

The tragedies of Meireki, Kanto, and the Tokyo Air Raid appear almost certain to repeat themselves, such that it seems important to ask, given repeated historical opportunities for learning, why Tokyo has consistently failed to implement the comprehensive fire safety strategies it has so frequently proposed. In her own study of Tokyo's many reconstruction plans, Carola Hein argues that comprehensive urban master plans, enforced by detailed building regulations, simply had no urban and architectural precedent in Japan She suggests that the implementation of plans, such as those proposed by Waters, Bockman and Ende, or Goto, have consistently been limited by the degree to which they could operate through recognizable planning traditions, such as those represented by land readjustment. [29] That is, while grand urban plans for Edo and Tokyo established an image that that city aspired towards, it moved toward that image only to the degree that it could be channeled through rezoning practices where and when these were supported by individual landowners, usually in the aftermath of fires. Hein's work likewise helps locate the active resistance that comprehensive plans and regulations faced. She suggests that it was a dominant landowning class that consistently opposed such plans, keen to retain their own legal autonomy. [30] And it is in this relationship—between the interests of a landowning class and the limitation of fire safety regulation—that I think we can understand the political-economic agency of fire in Tokyo today.

Current legislation for urban fire safety in Tokyo is set through the creation of “fire-resistance promotion areas” included in the Tokyo Metropolitan Government's urban planning guidance. **fig. 6** This legislation offers relaxed building height limits in exchange for a requirement to use pyro-seismic-resilient construction materials, typically reinforced concrete. These areas flank a network of so-called “global” roads (the association of fire safety and internationalization still persists), designed to act as firebreaks and urban-scale escape routes in the event of a catastrophic post-earthquake fire. This legal frame-


Evacuation Route Type
Fire in the Densely-Built Wooden Residential Area (Initial)
Max Height of Fire :10 to 12m
Fire-resistance Promotion Areas
Evacuation Road
Fire in the Densely-Built Wooden Residential Area (Initial)
Max Height of Fire :10 to 12m
30m
15m or more
30m
Securing Evacuees' Safety at the Emergency Evacuation

○ To protect the evacuees from the radiant heat of neighboring massive fire by making the area fire-resistant within approx. 30m from the evacuation roads designated in the Community Disaster Prevention Plan.

Firebreak Belt Type
Fire in the Densely-Built Wooden Residential Area
Max Height of Fire 30m
Fire-resistance Promotion Areas
Road / River / Railroad
Fire Spread Prevention
Approx. 40m
Securing Safety of the adjacent buildings

○ To prevent the fire spread to the adjacent blocks and secure the safety against urban area massive fire by making the area fire-resistant within approx. 45m combined with the width of the principle roads which are the framework of the Firebreak Belts designated in the Regional Disaster Prevention Plan.

Specified Area Disaster Prevention Facility Type
Fire-resistant or Semi-fire-resistant building
Fire Spread (Initial)
Fire Spread (Initial)
Road
12m
6~8m
12m
Securing the time for Evacuation

○To prevent fire spread in a few hours against initial fire and secure the evacuation time, by making the area fire-resistant within approx. 12m (a space of one unit) surrounding the Specified Area Disaster Prevention Facility under the Act on Promotion of Improvement of Disaster Control Districts in Populated Urban Districts.

fig. 6 Fire resistance promotion areas. Illustration describing extent of fire resistance promotion areas around evacuation routes, sites, firebreak belts, and disaster prevention facilities. Note that no degree of fire resistance is required within “Densely Built Wooden Residential Areas,” and that the scale of the required fire resistance promotion zone relates to the time of evacuation required from those districts; these regulatory mechanism are not anticipated either to stop the outbreak of massive urban fires, nor to prevent those fires from ultimately overcoming the whole of the urban fabric, but only to delay this presumed inevitability.
Source: *Outline of City Planning*, Section 5, “Urban Disaster Prevention,” 119–120. Bureau of Urban Development, Tokyo Metropolitan Government.

[29] Hein, “Shaping Tokyo” (see note 20), 449.

[30] Ibid., 458.

work, I suggest, is the vestige of all those urban plans that have preceded it, making visible a specter of Edo Castle in the contemporary city's form; Tokyo's famously chaotic urban morphology becomes legible as soon as one sees it as a series of fire protection wards, edged by reinforced concrete buildings and separated by wide roads, canals or parks. But, as ever, this spectral castle remains incomplete. Now as before, the city's defensive ramparts depend on its merchant class, and the construction of long, tall, concrete buildings depends on corporate clients in need of big buildings, who are able to acquire large aggregated sites. Where such buildings are constructed, they are built in an ad hoc, isolated manner, failing to provide a meaningful barrier to fire. As with the *dozu zukuri,* there could never be enough such buildings to subdivide the whole of the city, and these buildings completely fail to extend into the "Cheap Wooden Apartment Belt," where risk is highest.

Between and beyond these promotion zones, Tokyo's buildings are still predominantly two- to three-stories high. Low-rise areas, served by narrow “local” roads, are still thought of as fortified “villages.” New buildings in those villages are subject to lower height restrictions but have no requirements for fire- or seismic-resilient construction and are typically built in timber—or perhaps it is more accurate to say rebuilt in timber because, just like the *yakiya* before them, property in the designated “Densely Built Wooden Residential Areas” are remarkably short-lived, on average less than thirty years. The reasons for this rate of reconstruction are complex, but they define the “prisoner's dilemma” of contemporary Tokyo. The practice of generational replacement is set in part by the use of inheritance tax as a lever for economic development. The tax rate is typically set very high, up to 70 percent during the asset-price bubble. Such a high tax rate can seldom be achieved by selling the existing building at a higher price; it typically demands demolition, subdivision and the densification of land use, precisely that process supported by land readjustment. As a result of generational subdivision, average plot sizes in Tokyo have reduced from 240 to 80 square meters since World War II. [31] This urban metabolism is reinforced by the fact that there is little market for second-hand buildings in Tokyo, in part because older buildings are often considered unsafe. Indeed, buildings (as opposed to land) devalue over the course of their life, often becoming liabilities after only fifteen years on the assumption that they will be demolished and replaced generationally. [32] Building in Tokyo still fails to operate as a means of capital accumulation, and there is a financial imperative to limit potential loss by building with cheap and easy-to-demolish materials.

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[31] Yoshiharu Tsukamoto, “Void Metabolism,” *Architectural Design* 82, no. 5 (September 1, 2012), 88–93.

[32] The limited lifespan of Japanese homes is a recognized economic concern, both for individuals and GDP. See Richards Koo and Masaya Sasaki, “Obstacles to Affluence: Thoughts on Japanese Housing,” *NRI Papers* 137 (January 12, 2008), https://www.nri.com/global/opinion/papers/2008/np2008137.html (accessed Mar. 13, 2018).

Indeed, we could say that, despite the fact that there have been no major urban conflagrations since the Great Tokyo Air Raid, Tokyo continues to behave as if it were constantly burning down. Its residential districts are today in their third generation, having been destroyed and rebuilt three times since that event, mostly in timber, the risk of financial loss prohibiting developers from investing in more durable modes of construction.

The historical irony here is that land readjustment, a practice facilitated by fire and promoted as a means to improve fire safety, has not only failed to achieve that goal but in practice appears directly contrary to it. And given the repeated nature of that failure, we might start to think it intentional: that Edo-Tokyo's grand urban gestures remain incomplete by design, not by accident. Seen in this light, plans for improved fire safety in Tokyo might be said to function as a programmatic "as if," an image of change that provides cover for a more fundamental continuity. Such a suspicion might be perhaps supported by the governmental benefit that Tokyo's administrators see in the current rapid rate of reconstruction. The Japanese Land Ministry cites a number of benefits associated with short building life phenomena, including that of land-use flexibility and—ironically—the continued capacity to adopt state-of-the-art seismic and fire safety technologies. While the shogun's six-year recommendation was shorter, the tacit logic here appears consistent. A rapid rate of reconstruction renders building a consumer commodity, continuing to trap renters and building owners in a cycle of generational impoverishment. At the same time, it frees the escalation of land value—whose taxation is today a significant source of government income—from any future limit that durable buildings would place upon it.

That is, Tokyo's ambition to modernize seems subject to a reflexive limitation. The city's plans to develop a Western-looking urban fabric, resistant to the spread of flames and thus effective as a means of capital accumulation, appears to have been frustrated by an economic value inherent to fire. Fire—or more accurately the *risk* of fire—still provides the city with an important opportunity for re-planning, a stimulus for redevelopment, and so a government tax income that benefits industry, landowners and the state. Indeed, with reference to Ulrich Beck, we might suggest this article to be read as an example of "reflexive modernization," an example of the ways industrial modernity become entangled in their own side effects. In Beck's risk society analysis, this occurs when technologically manufactured risks produce markets for mitigation technologies, the commercialization of which traps "progress" within a vicious circle. [33] Nonetheless, with Beck in mind we might conclude here by noting a minor homeopathic irony within this broader historic ruse.[34] The generational subdivision of land in Tokyo today seems to be reaching a point of finitude. In the "fourth generation village" that is being built in Tokyo today, plot coverage approaches 100 percent.[35] The simple subdivision of land is no longer possible; landowners seeking to increase density now need to bundle plots into footprints large enough to support high-rise redevelopment. As the Metabolists predicted, and as current fire safety regulations specify, the *vertical* subdivision of land development requires the use of reinforced concrete structures and circulation cores. So, as land value transforms Tokyo from a low-rise timber city to a high-rise concrete one, the problem of fire safety might simply solve itself, as if by accident.[36] This solution, however, perhaps only poses another, more wicked problem. If this chapter has suggested a political economy of cheap flammable buildings, one that has persisted in Tokyo since its creation, we might wonder how the city will survive without it. What will this consumption city consume when it petrifies itself into accidental durability?[37]

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[33] Ulrich Beck, Anthony Giddens, and Scott Lash, *Reflexive Modernization: Politics, Tradition and Aesthetics in the Modern Social Order* (Cambridge: Polity Press, 1994).

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[34] I refer here to the situated optimism allowed within Beck's "risk analytic": "[Our] knowledge of the irony of risk suggests that the omnipresence of risk in everyday life should also be treated with sceptical irony. If irony were at least the homeopathic, practical antidote to world risk society." Ulrich Beck, *Risk Society: Towards a New Modernity*, trans. Mark Ritter (London: SAGE, 1992), 345.

[35] Atelier Bow-Wow's Yoshiharu Tsukamoto reflects on this phenomenon in his essay "Escaping the Spiral of Intolerance: Fourth Generation Houses and Void Metabolism," in *Tokyo Metabolizing: Koh Kitayama, Yoshiharu Tsukamoto, Ryue Nishizawa* (Tokyo: Tōto Shuppan, 2010), 29–34. Tsukamoto associates the dense product of "subdivurbanism" as particularly Japanese, in contrast to the "Western" architecture of firesafe streets. Interestingly, Tsukamoto suggests a social resilience associated within that dense low-rise urbanism, one which we cannot comment on here. He does reflect explicitly on issues of fire safety, though.

[36] Personal correspondence with Professors Sekizawa and Nushida suggests that a laissez-faire attitude toward fire risk in Tokyo was, perhaps, due to a sense that the problem will solve itself as the city is replaced with high-rise structures.

[37] This problem is elegantly illustrated by the current state of Tokyo's most famous Metabolist project. Kurakawa's prediction that the capsules of the Nagakin Tower would be replaced every generation has of course been proved wrong. The reasons for this are many, but the relevant fact here is that it is difficult, and not economically advantageous, to subdivide a 10 square meter apartment. His assertion that its core will last for 200 years, though, may yet prove true. No commercial pressure has yet proved strong enough to justify the cost of its demolition and replacement. That is, through its attempt to celebrate the "metabolism" of Japanese architecture, the project inadvertently stalled it, becoming an unusually long-lived building. Kurokawa introduces his concept for the "metabolism" of this tower, at the same time as calling for its preservation, in "Kisho Kurokawa on the Nakagin Capsule Building," *Tokyo Art Beat*, July 3, 2007, http://www.tokyoart-beat.com/tablog/entries.en/2007/08/kisho-kurokawa-on-the-nakagin-capsule-building.html (accessed, July 20, 2020).

Figures 7–14 offer a series of analytic diagrams that map relationships between historic fires, contemporary fire risk, and fire safety construction promotion policies in Tokyo. Produced in collaboration with master's students Max Ochel and Yida Zhou, the images superimpose graphic sources referred to in this document with Google Earth data as a means to identify their relationships with contemporary built fabric.

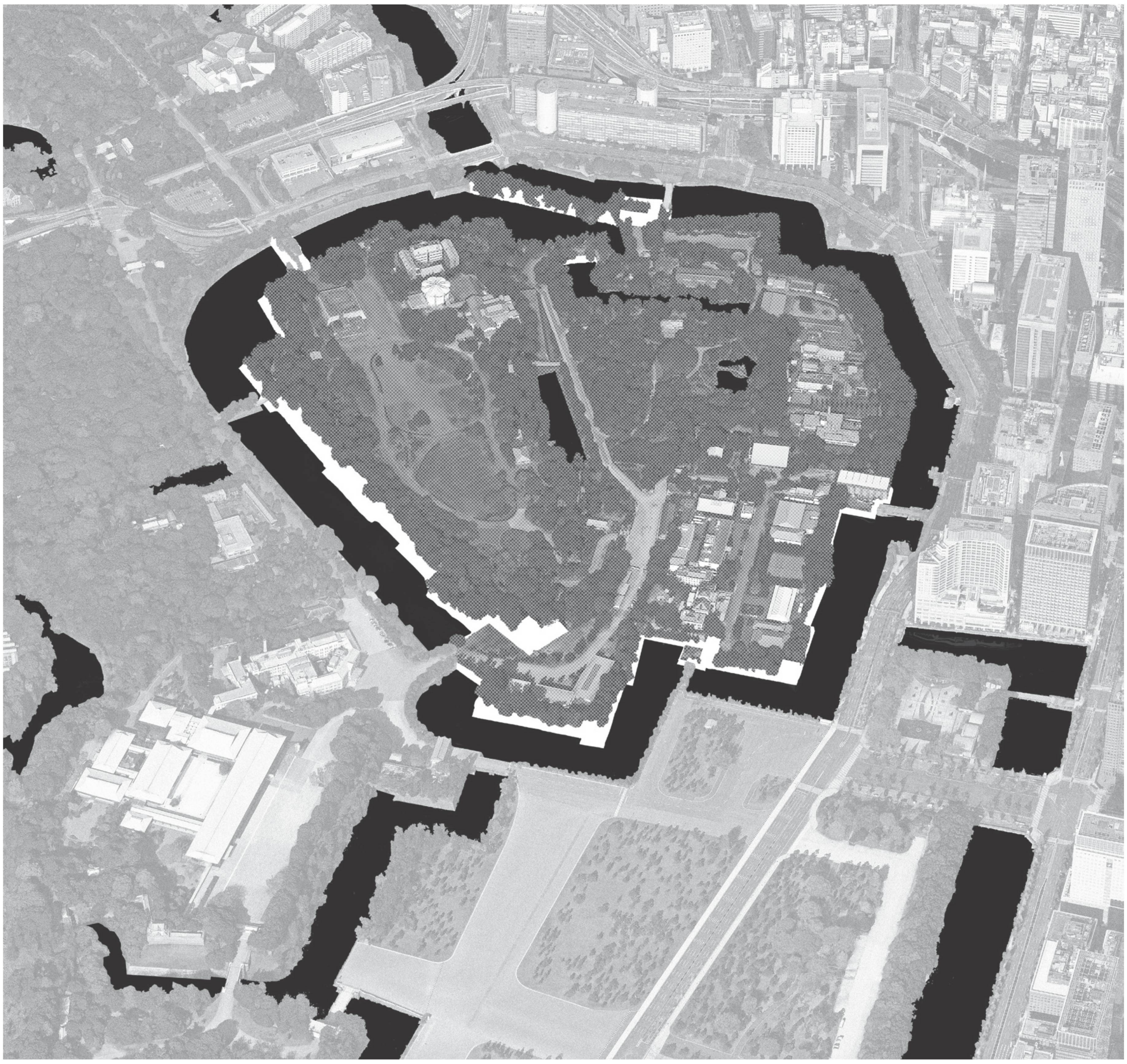


fig. 7 Urban paradigms: Chiyoda Castle. Imperial palace and inner moat of the former Chiyoda Castle. Note fire safety paradigms of moat (black), rampart (white), and fire-resistant planting (gray). Source: Max Ochel and Liam Ross.

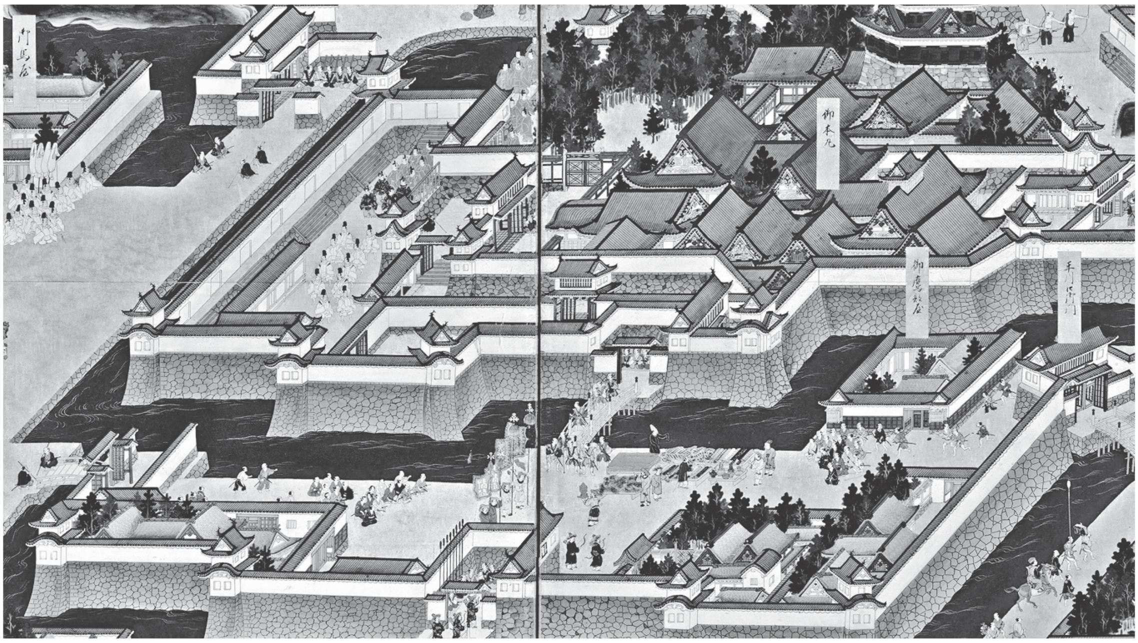


fig. 8 *Edo Castle. "View of Edo" (Edo zu)*. Pair of six-panel folding screens (seventeenth century). Note moats (black) and stone ramparts and plaster walls defining concentric wards, or *maru*. The Donjon is located in the upper-right panel. Source: https://en.wikipedia.org/wiki/Edo_Castle (accessed, July 29, 2020).

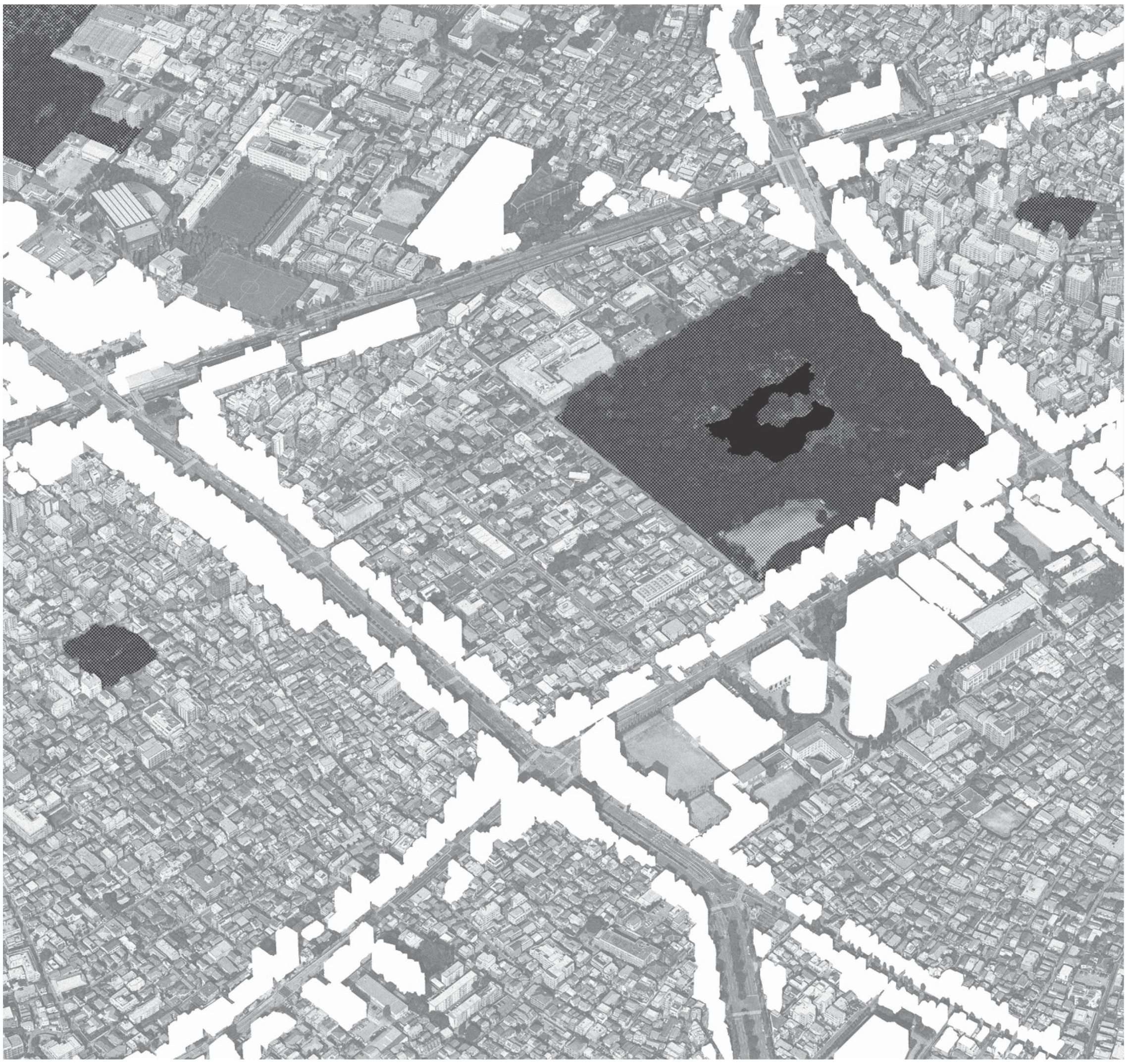
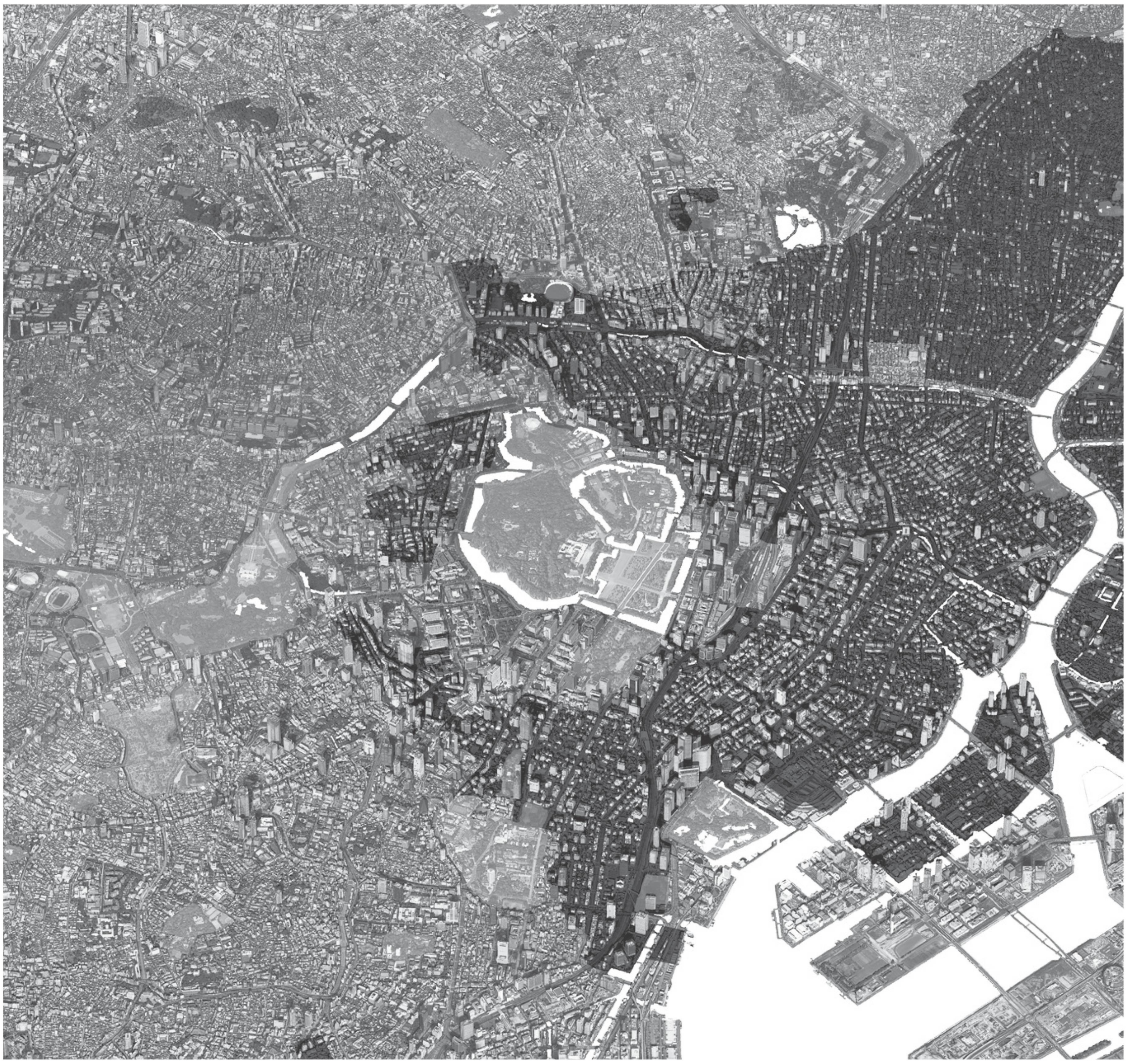


fig. 9 Urban paradigms: Sengoku Superblock. Example of a well-formed "hard shell / soft yolk" morphology. Note fire safety features of roads and waterways (black), firebreak buildings (white), and fire-resistant planting for urban muster zones (gray). Source: Max Ochel and Liam Ross.

fig. 10 1923, The Great Kanto Earthquake. Extent of destruction, superimposed over Google Earth plan. Note that Chiyoda Castle is not destroyed in the fire.
Source: Max Ochel and Liam Ross.



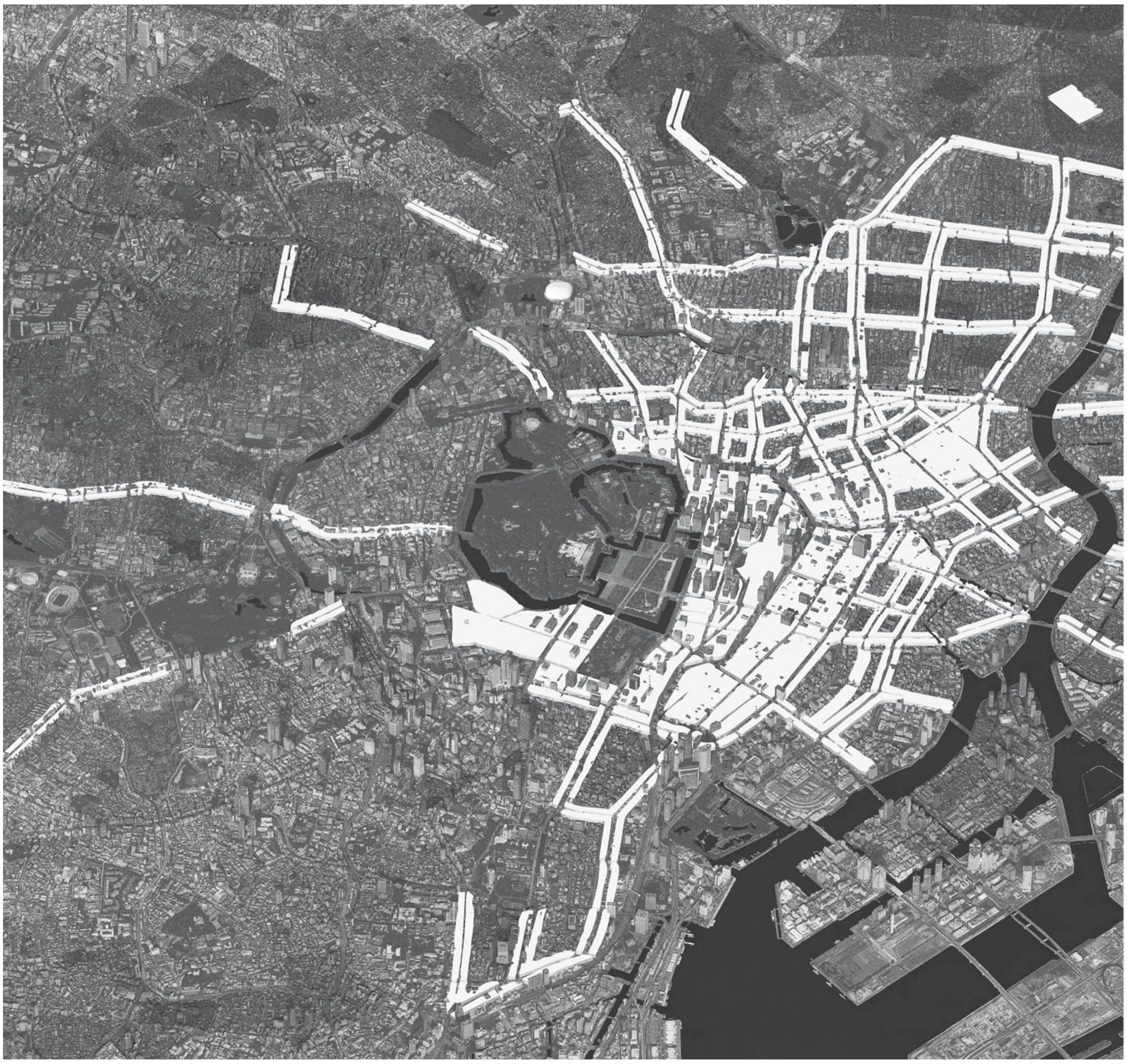
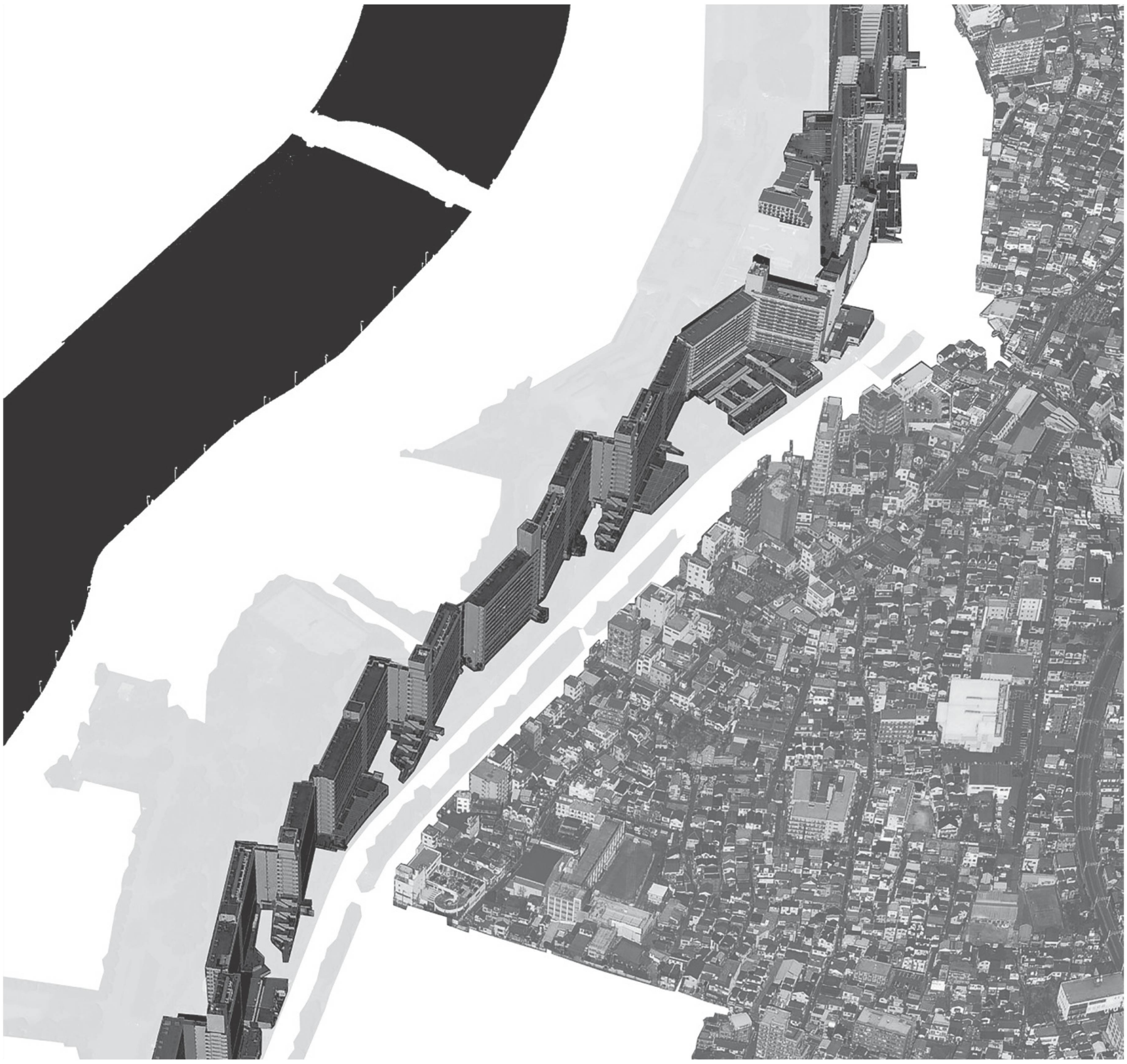


fig. 11 "Specters of Edo Castle." Swiss RE mapping of fire risk (darker tone) superimposed over City of Tokyo Fire Prevention Districts (white). After the Kanto earthquake, major routes were planned to be lined with firesafe construction, dividing the city into fire prevention "wards." White volume depicts designed height and depth of the urban fire wall. Note that contemporary fire risk reads as the inverse of the Kanto fire map; note also that areas of greatest fire risk are areas beyond the reach of planned fire-prevention construction. Source: Max Ochel and Liam Ross.

fig. 12 Urban paradigms: Shirahige Higashi. Complex of fifteen-story, interconnected housing units of reinforced concrete, creating a firebreak protecting the urban egress route beyond. Urban egress route follows the waterway (black), protected by firebreak buildings (darker tone) and fire-resistant planting (gray).
Source: Max Ochel and Liam Ross.



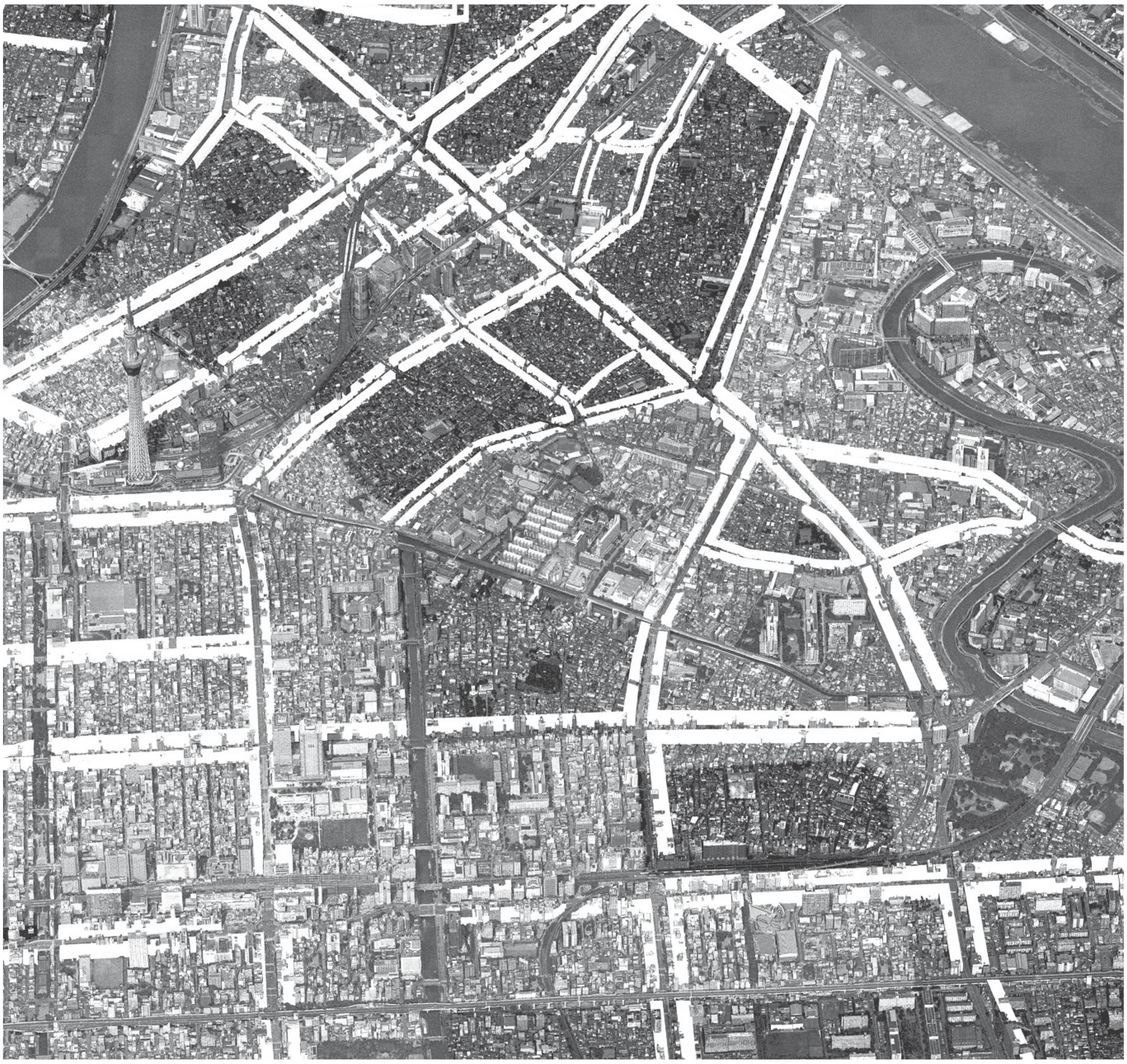


fig. 13 Incomplete castles: Sumida Ward. Contemporary fire risk in Sumida Ward (darker tone) superimposed with contemporary fire safety promotion zones (white). White volume depicts designed height and depth of urban fire wall; wherever this is visible, existing buildings fail to reach this height or depth. Note fire-risk patterns within dense low-rise areas and the incomplete state of firebreaks. Source: Max Ochel and Liam Ross.

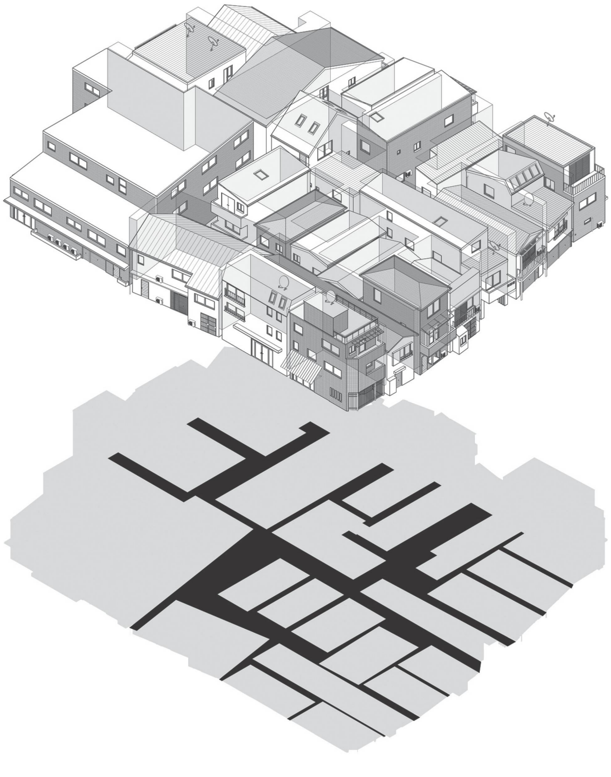


fig. 14 Accidental urbanism: Ojima Roji. Survey of dense wooden housing and narrow roads in Ojima ward. Note that building coverage approaches 100 percent, and that many properties have no street address, only being accessible through informal alleys, or *roji* (black), created by the regulated gaps between buildings. Source: Yida Zhou.