

# 10

## Edo's Water Supply

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One of the defining characteristics of early-modern cities—what made Edo Edo and Paris Paris—was the way in which governments increasingly provided what Japanese historians call “urban facilities” (and what Roger Chartier in Chapter 6 terms “urban improvements”). In the case of Japan, such facilities, or improvements, included roads and bridges, water supply networks and sewer systems, the wooden gates and guardhouses that stood at entry points into residential quarters, and the fire and bell towers that punctuated the urban landscape. Perhaps even neighborhood graveyards should be considered among such facilities. The collection of garbage and human waste and the organization of firefighting brigades were, strictly speaking, services rather than facilities, but they also supported human life in urban centers.

*E. of modern facilities*

The characteristics of urban areas emerge very clearly when we compare the roles assigned to public facilities in urban areas with those in rural areas. It was possible to construct facilities that serviced a small village or a limited geographical area. Farm families drew water for drinking and household use from nearby rivers or even from wells sunk down in their own yards, and they usually put their garbage and human waste to use on croplands. In cities, by contrast, people drank water that was delivered to them from the upper reaches of rivers, far distant from the urban center. They also had to rely on farmers from the surrounding hinterland to journey into the city to buy human waste for use as fertilizer, and they had to bury their dead in communal graveyards. To be blunt, people in cities were entirely dependent on others for everything from the food they ate to the water they drank, and even to the disposal of the consequent garbage and waste. In this sense, cities can be seen as settlements that lacked the most fundamental essentials necessary to support human habitation. Still, one should not think of early-modern cities just in a negative sense. Rather, the fact that city residents could rely on others for the basics of existence permitted them the freedom to create a wide variety of business enterprises, to establish a high level of

*Village takes water*  
*use water*  
*different between city & rural*  
*City has*

handicraft technology, and to fashion an enduring legacy of artistic accomplishments.

Centre (highest) → outside (lower class...)

Beyond setting the city in contrast to the village, the way urban facilities were brought into existence during the seventeenth century illuminates important dimensions of the political philosophy embraced by the governing authorities. Such was certainly the case when it came to providing drinking water for the people who lived in Japan's early-modern cities. Urban planning in Edo and the castle towns was based firmly on the feudalistic notion of rule by status. Consequently, the shogun in Edo and the daimyo lords in their regional cities established geographically distinct neighborhoods for warriors, merchants, and artisans. Typically, samurai residences clustered together around the castle, which was usually located at the strategic heart of the community. In the samurai portion of the city, each warrior family was assigned a residential plot whose dimensions and location depended on its standing within the samurai hierarchy and on the amount of its stipend or fief. The homes and shops of the more prosperous merchants lined the major thoroughfares that radiated like spokes from the castle center, while less affluent merchants and artisans lived on the back streets.<sup>1</sup>

Across Japan, daimyo laid out water supply systems that both respected and reinforced the basic referents of status and power. So did the shogun in Edo. Yet in the end, the shogun's water would come to belong to the people. In the eighteenth century, the Edokko—those proud, cocky plebeians of the downtown area—were extremely proud of Edo's supply of fresh water, and they boasted of it in earthy expressions that became clichés, such as "I was bathed in this water at the moment of my birth." But we can best understand the development of Edo's water supply system, and the ironic hollowness of the Edokko's bravado, by beginning with an overview of the castle towns.

→ separated different type of PP1.  
(Edokko) ↓  
JPB 商人  
Tak)

→ Proud.  
→ 豊かな  
時代).

Brief intro -

## THE CASTLE TOWNS

### Open and Enclosed Systems

The organization of the water networks that flowed through castle towns can be divided roughly into two broad categories: open systems, in which canals, moats, trenches, and flumes carried the water exposed, on the surface of the earth; and enclosed systems, which employed stone-covered waterways, pipes, troughs, and culverts to deliver water to the urban popu-

- Residential organization varied among cities, in accordance with the size of the community, topography, antecedent communities, and so forth. Still, not a few communities made the transition into the modern period from this basic pattern. Yamori Kazuhiko has mapped many castle towns in his *Toshizō no rekishi* (Kōdansha, 1974), and those communities are examined in depth in Ono Hitoshi, *Kinsei jōkamachi no kenkyū* (Shibundō, 1928); Nakabe Yoshiko, *Jōkamachi* (Yanagihara Shoten, 1978); and Toyoda Takeshi, *Nihon no hōken toshi* (Iwanami Shoten, 1952).

↳ Japanese local secondary source ✎.



Distribution of open and closed water supply systems

lation.<sup>2</sup> The overwhelming majority of castle towns in eastern Japan relied on open networks, in contrast to western Japan, where nearly all daimyo built enclosed systems. Moreover, almost all of the castle towns in eastern Japan that employed open-type systems were located some distance inland from the ocean on fan-shaped alluvial cones and elevated plains, whereas virtually all of the castle towns in western Japan that used an enclosed system had grown up on deltas and flood plains adjacent to the sea. Thus cities in eastern Japan that constructed closed-type systems—such as Edo, Mito, and Kōfu—were exceptions to the general pattern.

Historians have long been aware that most daimyo at the end of the sixteenth and beginning of the seventeenth centuries built their castles on sites that permitted them to control transportation routes and thus to dominate economic activity in the surrounding region. In western Japan, lords of domains that fronted the Seto Inland Sea attached particular importance to exerting their authority over ocean shipping, so at the beginning of the early-modern period they tended to erect fortifications on the coast, where they could develop harbors. In eastern Japan, most daimyo favored building larger, more magnificent castles where cruder, rudimentary fortifications and small trading communities had existed since the medieval period. Many of those sites were inland from the ocean, but the lords were able to extend their control over river ports and to use river transportation to their own benefit.

Differences between eastern and western Japan can be seen as well in the manner in which topography influenced the placement of residential wards within the cities. In the late-medieval period, daimyo commonly chose the highest piece of ground available for their redoubt, and the altitude of the samurai and merchant housing areas in relation to the castle expressed the difference in status between the two groups, with samurai residential areas being physically above those of the merchants and artisans. This principle was clearly followed in many castle towns in eastern Japan which grew up on the sites of medieval settlements. Along the coast of the Seto Inland Sea, by contrast, it was common for daimyo to erect castles whose walls and ramparts actually sat on rock formations or on spits of land that jutted out into the ocean. These lords usually instructed their samurai followers to live near the castle, virtually at sea level. Consequently, the principle of associating eminent social status with a lofty geographical location was nullified, and it was the merchants that resided at higher elevations. → 高海拔地帶

Differences of this sort between east and west had an influence on the planning of water supply networks. The open type of water supply system was prevalent in eastern Japan, where many castle-town lords put to use

2. For additional details see Hatano Jun, "Kaikyo no jōsui no kensetsu-ki to jōkamachi sekkei ni hatashita yakuwari—toshi shisetsu to shite no jōsui o tōshite mita jōkamachi sekkei hōhō no kenkyū 1," *Nihon kenchiku gakkai keikakukei ronbun hōkokushū* 397 (1989), pp. 100–111; and "Ankyo no jōsui no kensetsu-ki to jōkamachi seibi ni hatashita yakuwari—toshi shisetsu to shite no jōsui o tōshite mita jōkamachi sekkei hōhō no kenkyū 2," *Nihon kenchiku gakkai keikakukei ronbun hōkokushū* 400 (1989), pp. 105–14.

↳ Secondary Source

geo fact

Keitō

(W) Source of water  
 X 污染.

(W)

whatever facilities remained from earlier medieval settlements. Also, since most of those cities were located well above sea level on fan-shaped alluvial cones and elevated plains, they were assured of plentiful and dependable reserves of fresh water. Moreover, the chief source of that water usually was the runoff from nearby mountains, and there probably was little danger of contamination of the water supply even though the waterways were left uncovered. In the castle towns of western Japan, by way of contrast, the lord's engineering corps often laid clay pipes and wooden troughs underground, probably because those western cities were located on flat deltas. Thus the flow of water through these areas was sluggish, and there was a constant danger that ocean salt would pollute underground reservoirs of fresh water.

缺水.

### Castle Towns and the Provisioning of Water

Most of Japan's great early-modern castle towns came into being between the beginning of the 1580s and the end of the 1650s. Planning for the provisioning of water began at the same time, and most urban water supply systems were completed by the end of the seventeenth century.<sup>3</sup> When they designed the layout of their fortified enceintes, most daimyo thought of water as useful to their defenses. Thus many opted for open-type systems that would assure them of plentiful amounts of water to fill their castle moats. Of course, many daimyo also acted to furnish drinking water to the castle and to the residences of their samurai, but few concerned themselves at first about the needs of ordinary residents of the community. By the middle decades of the seventeenth century, however, most daimyo had come to realize the utility of drawing water from their interlocking system of rivers, canals, and moats to provision the merchant and artisan quarters of their cities. Their new consciousness may have been inspired in part by the concept of public authority, or *kōgi*, which compelled them to act benevolently toward their subjects; in part it surely derived from a fuller appreciation of the contributions that merchants and artisans made to the prosperity of their lord's domain. In any event, many daimyo in the middle and late seventeenth century extended their open-type water supply networks into the commoner sections of the castle towns.

There were some exceptions to this general chronological pattern, particularly in castle towns that were founded in the latter half of the Keichō period; that is, between roughly 1605 and 1615. In some locales there were insufficient supplies of water below ground which merchant or artisan families could reach easily by boring wells (as was the case at Yonezawa), and in those communities the ruling lords sometimes decided to include the merchant quarters within the coverage of the open, above-ground network of canals at the time of their construction. In other cases (Kōfu is an example), the daimyo was particularly anxious to attract to his city merchants and artisans who could provide him with essential goods and services, so

3. Hatano, "Kaikyo no jōsui" and "Ankyo no jōsui."

道筋 → Primary.

好意的

he tried to create a hospitable living environment for them at an early date.

In contrast to the open networks, the enclosed, underground systems had no military utility; their sole purpose was to provide water, indispensable to the daily lives of the city's residents. In some castle towns that were constructed at a comparatively late date, in the 1620s and even thereafter, the daimyo went to considerable expense to lay out an enclosed system at the same time that the castle town came into being. (Akō and Nakatsu are examples). In the 1610s and early 1620s, however, most enclosed systems generally were designed to supply water only to the castle complex, and their extension into the merchant and artisan neighborhoods had to await the middle decades of the seventeenth century. → citizen use → underground

Book e.g.

From the 1620s enclosed systems were figuring more prominently in the water supply networks of many cities, even in the castle towns with the longest pedigrees. In many cases, daimyo extended existing enclosed systems as a way of encouraging settlement of low-lying areas (Mito, Nagoya). In other instances, daimyo converted open systems to the enclosed variety as they extended the water supply network into the commoner sections of their cities. Conversion generally took place where the open waterways interfered with transportation (at Fukuyama), or where water supplies had become contaminated as the population expanded. Only in a very few communities, however, were the extended enclosed systems actually capable of supplying the entire needs of the residents. Most enclosed systems were fairly simple and rudimentary, and peddlers continued to sell water from door to door (as at Kuwana), or the daimyo's engineers diverted additional water from nearby rivers (at Tottori), or individual families drew their water from wells that served a neighborhood or even an entire community (Takamatsu). This conversion of open to enclosed systems and their expansion into merchant neighborhoods marked a matched pair of turning points in the history of Japan's early-modern cities—the transition of castle towns first from military headquarters to residential communities that centered on the samurai and then finally into diverse and complexly structured centers of urban living that included increasingly significant merchant and artisan populations.

economic

reason for switching  
open → close

interesting party.

town plan

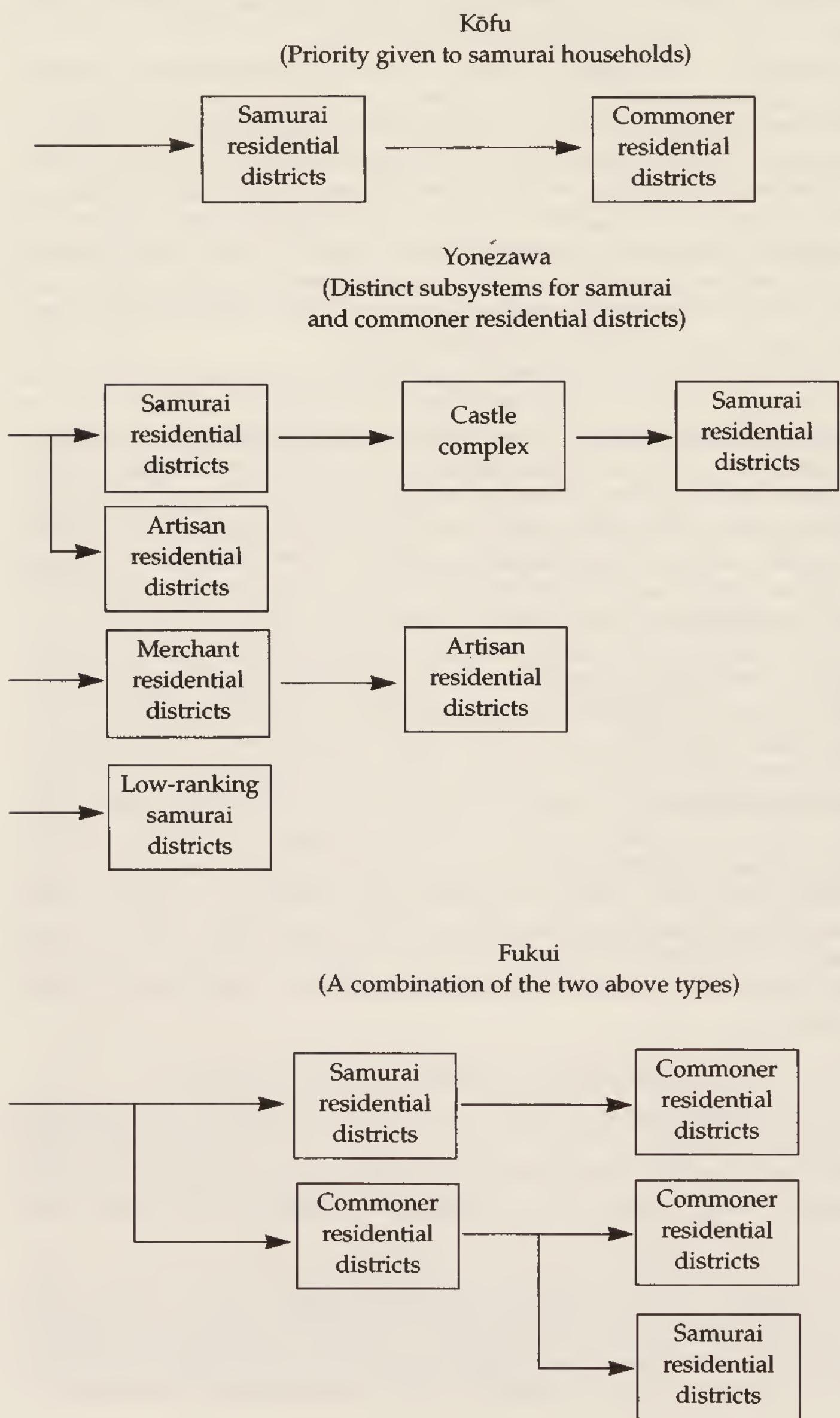
change of cities.

### Water Supply Systems and Rule by Status

If we reconstruct the water supply networks found in castle towns throughout Japan and then examine them in relation to the layout of residential wards, whose spatial contours evolved in accordance with the dictates of the system of rule by status, three classifications become evident (see Figure 10.1).<sup>4</sup>

4. Hatano Jun, "Kaikyo no jōsui no haichi keikaku to jōkamachi no jūku settei—toshi shisetsu to shite no jōsui o tōshite mita jōkamachi sekkei hōhō no kenkyū 3," *Nihon kenchiku gakkai keikakukei ronbun hōkokushū* 408 (1990), pp. 17–29; and "Ankyo no jōsui no haichi keikaku to jōkamachi no jūku settei—toshi shisetsu to shite no jōsui o tōshite mita jōkamachi sekkei hōhō no kenkyū 4," *Nihon kenchiku gakkai keikakukei ronbun hōkokushū* 416 (1990), pp. 8–14.

**FIGURE 10.1.**  
*Water supply systems in three castle towns*



① Type 1: A single water supply network served the entire city, but the samurai residential quarters were given priority in use of the water, and whatever water remained then was directed into the merchant and artisan neighborhoods. Among such cities were Sunpu (modern-day Shizuoka) and Fukui, which used open systems, and Kōfu, which changed from an open to an enclosed system during the early-modern era.

② Type 2: Water was drawn from a single source but the supply network was divided into two or more distinct subsystems [one to serve samurai residential areas and another for merchant and artisan neighborhoods.] The network might split either at the source itself or at the point where water from the source entered the castle town. Such cities include Yonezawa and Shirakawa, which employed open systems; Nakatsu and Takamatsu, which had enclosed systems; and Fukuyama, which converted from an open to an enclosed system.

③ Type 3: A single, integrated system served samurai and commoner neighborhoods equally, with neither having priority. Such cities include Sendai, Yamagata, and Saga (open systems) and Mito and Akō (enclosed).

Factors that influenced the design of any particular system included the topography of the city, the purpose for which the water was being used, and the chronology of the system's construction. Topological features were especially important. As we noted earlier, in those castle towns in eastern Japan which had existed as settlements from the medieval period and which had inherited the traditions of that earlier time, the lords were able to place the homes of persons of distinction at a higher altitude, thus ordering their early-modern cities in accordance with the concept of rule by status. In those cities, residential areas for samurai and commoners were clearly delineated, and it was possible to design a water supply network that served samurai homes first, and to direct the water supply into merchant and artisan neighborhoods (type 1) only after the samurai's needs had been satisfied. It was not physically possible to engineer this sort of system in the castle towns along the Seto Inland Sea, and there the relationships between elevation and status were reversed.

The period when any particular water supply system was constructed also had a lot to do with its design. A great many of the water supply systems that were laid out during the final decades of the sixteenth century or in the early seventeenth century were constructed principally to provide water to the moats that surrounded the castle or to the canals that functioned both as defensive moats and as sources of drinking water. Many of these cities designed systems to give priority to samurai households, as in type 1. Later, when lords became more concerned with providing drinking water to their communities rather than with constructing elaborate systems of defensive moats, the second type of system, with separate subsystems for samurai and merchant residential areas, became more prevalent.

Reason for using type 2

## FOUNDING EDO: EASTERN TRADITION, WESTERN TECHNOLOGY

As we have seen, the site selection for castles and the planning for water supply systems answered to very different principles in eastern and western

Difference Between West & East

Japan. An anomaly, Edo confounded the general rules in several ways. The shogun's city was located in the east, of course, but it was situated on the ocean, and it was thus constructed on a site typical of the west. Moreover, in contrast to the lords of the other cities of the east, who depended on open-style water supply networks, Ieyasu favored enclosed waterways, just as did the daimyo of the west, whose castle towns, like Edo, were also located on low ground near the sea.

When Toyotomi Hideyoshi awarded the Tokugawa family a domain in the Kantō region in 1590, it would not have been surprising if Ieyasu had chosen one of two existing cities, Odawara or Kamakura, as the site for his new castle and town. Odawara had some advantages: it was the most prosperous city in eastern Japan, and it had been designed and built up as a sophisticated military bastion. Kamakura's allure derived from its historical prestige as the home of an earlier warrior shogunate from 1192 to 1333. Yet, in the end, Ieyasu forswore both of those possibilities in favor of Edo, and the reason was that he could build secure port facilities at the innermost reaches of Edo Bay. Edo → mixing East & West.

When Tokugawa Ieyasu made his entry into Edo in 1590, eastern Japan economically and culturally still lagged far behind those regions in the west that surrounded the older cities of Kyoto and Osaka. Thus it is easy to speculate that what Ieyasu wished to do was to create for himself in eastern Japan a thriving economic realm similar to those in western Japan with which he was familiar. In Chapter 9 Hayashi Reiko details how the Tokugawa shoguns enacted various policies designed to make Edo the center of a national system of economic distribution. Many of those measures involved great expense and remarkable feats of engineering, as when the shogun's engineers diverted the Tone River, which originally emptied into Edo Bay, so that it flowed from the Ara River to the Pacific Ocean at Chōshi. This change permitted raw materials and goods from northeastern Japan to be sent more directly to Edo, without having to be shipped around the dangerous outer reaches of Bōsō peninsula.

change  
water/  
river But even if Ieyasu chose Edo as the site of his castle town in accordance with his notions of urbanism in western Japan, the ultimate spatial organization of Edo was influenced by the medieval traditions of eastern Japan. In the medieval period, military lords in the east often built their headquarters at that point on a conical, alluvial plain where a river emptied out from a mountain valley onto the tableland, or where the mountains swept down onto the tip of a tongue-shaped plateau that intruded between mountain and ocean and that constituted prime agricultural land. The basic reason for the lords' choices is straightforward: at such places they could erect military strongholds that overlooked and dominated the people and the agricultural resources of their domains.]

This was not the sole reason, however, for those locations also permitted the lords to control water. By commanding the key topographical points on the landscape, the medieval lords were able to construct waterways that directed the flow of cold water down the steep slopes of nearby mountains

into the moats that encircled their fortifications. Then, after the water had warmed and its volume had reached sufficient proportions, the lords released it for use in rice paddies in the villages surrounding their cities. Thus the moats were not just part of an encirclement of military defenses; they also constituted reservoirs of agricultural water, and by controlling the distribution of this crucial resource, the daimyo tightened domination over their domains.

These considerations weighed on Tokugawa Ieyasu as he pondered the location of his castle and the organization of his city. He erected his citadel on the tip of the plateau where the Musashi plain, which spread out to the west, dropped off toward Edo Bay to the east. Thus from his headquarters Ieyasu was able to control water and the rice-growing villages on the rich Kantō plain. He answered defense concerns by stationing his direct retainers, the bannermen (*hatamoto*) and the housemen (*gokenin*), in an arc around that portion of the perimeter of the city which fronted the plain. He instructed the daimyo to build their mansions to the east and south of the castle, and beyond those estates, again to the east and south, Ieyasu reclaimed land to use for roads and merchant quarters. In other words, in laying out Edo, he preserved in a comparatively full sense the relationships between place of residence, elevation, and the requirements of the status-based feudal order.]

→ headwaters  
↓  
water

### THE EDO WATER SUPPLY SYSTEM

→ Originally -  
In early Edo, much of the water used for daily needs came from the many small rivers and streams that emptied into Edo Bay and from the numerous natural springs and fountains that bubbled up out of the ground and provided good-quality drinking water. As the city's population continued to grow, however, such sources became inadequate, and the shogunate turned to designing a supply network that drew water from the major rivers that traversed the Kantō plain and entered Edo Bay. Although the documentary evidence is not conclusive, it seems likely that by the 1630s the so-called Koishikawa system of canals and ditches fed water to some neighborhoods in the northern section of the city, and a second rudimentary system, referred to as "Edo's water supply system" in contemporary documents, took its water from the Akasaka Tameike Pond.<sup>5</sup>

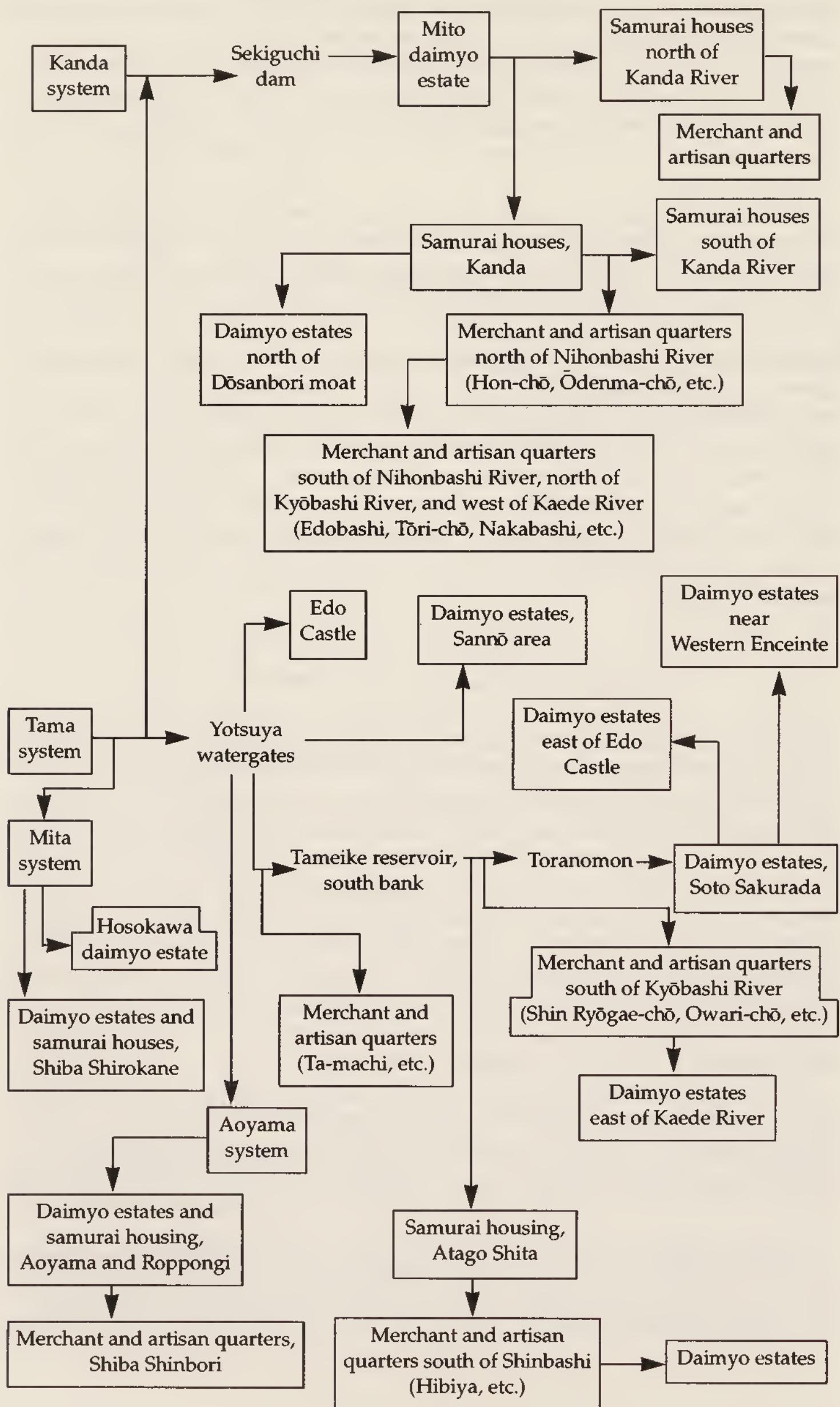
→ more people

By mid-century the institutionalization of the system of alternate residence, which brought the daimyo and their retinues to the shogun's capital, together with the continued expansion of Edo's commoner population, necessitated more sophisticated means for provisioning water. This water was intended not only for drinking but for firefighting and craft production, and

5. This document is in the manuscript collection of the Tokyo Metropolitan Central Library (Tōkyō Toritsu Chūō Toshokan); it probably dates to the 1630s. Printed documentation concerning Edo's water supply can be found in Tōkyō-shi, ed., *Tōkyō shishikō: Jōsui-hen*, vol. 1 (Tōkyō Shiyakusho, 1919).

↳ Primary Source

**FIGURE 10.2.**  
*Edo's water supply network circa 1690*



→ 國都用水

to fill the ponds and streams that fed the gardens that adorned the shogun's castle and major daimyo estates. The shogun put his engineering corps to work, and by the end of the seventeenth century they had completed two major and four supplementary systems that carried water to every part of Edo.

→ Evidence

Much of northern Edo received its water from the Kanda system. This was probably the first of the systems to come into operation, although we cannot be certain about the exact date. One document, the "Tenshō nikki" (Events of the Tenshō Period), bestows upon Ieyasu the foresight of appointing, even before he arrived in Edo, a certain Ōkubo (Monto) Tadayuki to construct a system of waterways that the overlord envisaged, but historians have long harbored doubts about the reliability of this source.<sup>6</sup> It seems more likely, when we take a closer look at the features of the Kanda system, that it constituted an expansion of the earlier Koishikawa system and was completed sometime during the middle decades of the seventeenth century. This judgment is made more certain by the appearance of the Kanda system on the first map to depict reliably Edo's complete water supply network, the "Jōkyō jōsuizu," a source that probably dates to the late 1660s (despite the inclusion in its title of the era name Jōkyō, 1684–1688).<sup>7</sup> ↗ Example far away.

The Kanda system took its water from Inokashira Pond, some ten miles to the west of the city, and it ran aboveground until huge flumes downstream from a dam erected at Sekiguchi, on the northern fringe of Edo, diverted the water underground. Construction workers recently came across a section of these flumes as they excavated ground for the foundation of a new office building, and their gigantic proportions testify to the expense that the shogunate assumed in order to complete this urban improvement. The bottom of each section of the flume was made of wood into which grooves had been cut and then packed with hardened sand and clay to make a bottom as durable and impervious as armor. The sides consisted of large stones, hewed into rectangles and piled one on top of the other, and wide slabs of stone were placed across the top to complete the enclosure, which was so large that a person could easily walk upright inside it.<sup>8</sup> Only the main trunk line was this elaborate, however; the secondary branches were fashioned of hollowed-out logs or of planks joined together, while bamboo commonly was used for the small feeder tubes that led to the individual wells from which people pulled up buckets of water.

→ 王朝時代

✖ The Kanda system also embodied two features that would characterize each of Edo's water supply systems: it was laid out in a planned, methodical manner and it gave priority to the needs of the shogun and samurai, with the provisioning of merchant and artisan neighborhoods being only a secondary concern (see Figure 10.2). Thus, after disappearing underground downstream of the dam at Sekiguchi, the flumes, sluices, and troughs that made up the Kanda system directed water first to the extensive residential compound at Kōrakuen that belonged of the lord of Mito domain, a collat-

6. Itō Tasaburō, "Tenshō nikki to kana seiri," *Nihon rekishi* 196 (1964), pp. 2–13.

7. See the illustrations in Tōkyō-shi, *Tōkyō shishikō*.

8. Bunkyo-ku Kanda Jōsui Iseki Chōsadan, ed., *Kanda jōsui* (Bunkyo-ku, 1988).

eral line of the main Tokugawa family. From there the water ran into Edo Castle and through daimyo neighborhoods. Only after the shogun and the vast retinue who lived within the castle complex had taken their fill could merchant and artisan families in northern Edo (along the Kanda River and from Ryōgoku Bridge south to Kyōbashi) receive water from the pipes and culverts that ran beneath their quarters. ↗ *System D*

The Tama system was even more extensive. The date of its completion is no more certain than that of the Kanda network, but an interlacing set of rivers and canals carried water from the Tama River as far as Toranomon by 1654, and the entire maze of waterways probably came into operation not long thereafter. In its final form, the system began upstream on the Tama River nearly twenty-five miles from Edo Castle. Secondary rivers and open canals brought the water as far as Yotsuya, where it entered a complexly structured set of underground passageways. [Two main branches directed water into the castle and to daimyo estates in the Sannō area, to the southwest of the castle.] Another branch carried water through Toranomon and then to numerous daimyo estates on the eastern flank of the castle walls, as well as to the residences of bannermen and housemen at Atago Shita. Sub-branches supplied the needs of the many densely populated merchant and artisan neighborhoods south of Kyōbashi.

Two other systems, the Mita and Aoyama, took their water from the Tama trunkline, and like the Kanda and Tama networks, they were intentionally designed to give priority to the needs of the shogun and of Edo's samurai residents. Commissioned in 1660, the Aoyama underground lines began at the great watergates at Yotsuya and served daimyo estates and samurai housing in Aoyama and Roppongi before traversing merchant and artisan quarters at Shiba Shinbori. From 1664 the Mita system tapped into the Tama network at the village of Shimo Kitazawa and flowed in parallel channels, one leading to the estate of the eminent Hosokawa daimyo family, which hailed from Higo in Kyūshū, the other to daimyo estates and samurai households around Shiba Shirokane. Two additional systems had rather short life spans. The Kameari system was established in 1659 to supply water from Kawarazone Pond on the Ara River to the Honjo area, where the shogunate was encouraging merchant and artisan families to settle in the wake of the disastrous fires of 1657. But the Kameari system was plagued by trouble from the very beginning: the quality of the water was extremely poor; shortages were common in the dry seasons; and even slightly higher than normal tides carried salt water into the lower portions of the system. As a consequence, the shogunate stopped using the line as a source of drinking water in 1683 and decommissioned the system in 1722. The Sen River system, another offshoot of the Tama network, supplied water to Hongō, Yushima, and Asakusa, in northern Edo, between 1696 and 1722.

## WATER AND EDO'S COMMONERS

As long as the shogun and daimyo enjoyed priority in use of the water delivered by the various systems that crisscrossed Edo, they also shouldered

*right & responsibility (of using water system)*

the main responsibility for managing and maintaining the system. When the Tama system came on line, for instance, the shogunate appointed a "general commissioner" (*sōbugyō*), who supervised two men, Shōemon and Seiemon (identified in some documents as peasants, in others as merchants), who actually oversaw the day-to-day operation of the system. For their services Shōemon and Seiemon received salaries and the privilege of using the surname Tamagawa. Assisting these two men were patrols dispatched by the shogunate to make certain that farmers did not bathe in the waterways or let their draft animals get into the rivers and canals. Salaries, office expenses, and the cost of repairing the system came from levies imposed on the samurai and merchant households served by the Tama network, with the samurai bearing a disproportionately heavy burden.

→ 費用

cost of  
water  
system

↓  
from AT  
tax

→ situation change

幕府が用

→ later =  
由布院管理

→ 重税被

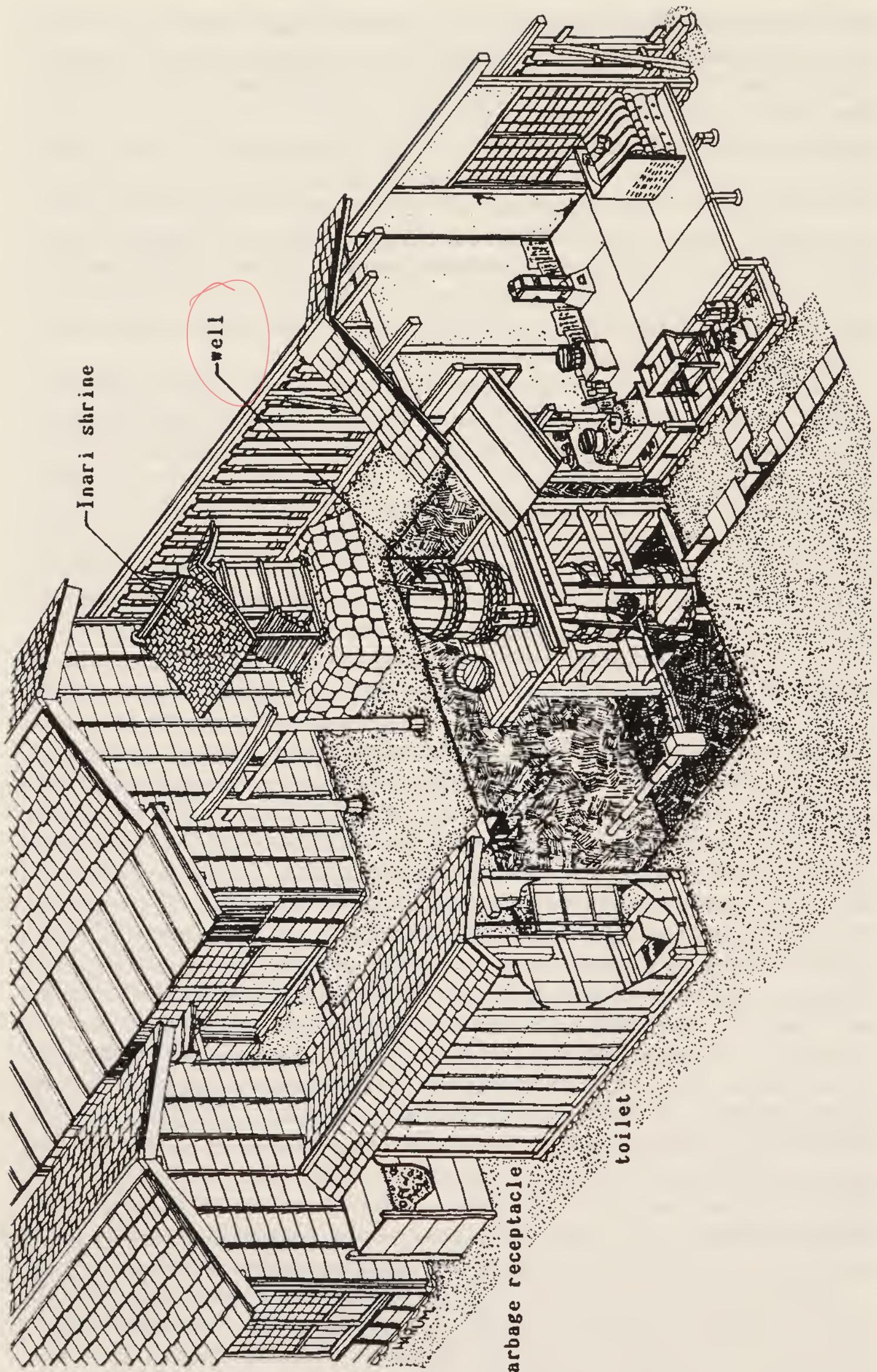
→ X 税  
G 汚水

This situation changed during the eighteenth century. Increasingly dissatisfied with the quality of water drawn from the Tama and Kanda systems, many daimyo and samurai families began to bore wells for fresh water, as did the shogunate itself. One after another the shogunate and many other heavy users disconnected themselves from the established network, and the water carried in the maze of waterways increasingly served just the needs of the ordinary people of Edo. Responding to this transition, the shogunate shifted administrative authority over the water system to the city elders in 1670 and then to the city magistrates in 1693. Perhaps a more sensitive barometer of change was the reallocation of the main burden of maintaining the systems away from the samurai and onto the merchant and artisan neighborhoods. Commoner property owners had to dig deeper into their own pockets to pay the salaries of the functionaries, such as Tamagawa Shōemon and Tamagawa Seiemon, who continued to oversee matters that affected the various systems as a whole, and merchants and artisans also had to maintain the branch and feeder lines that extended into their own neighborhoods. This was an onerous duty, requiring hundreds of days of labor each year to dredge the lines, which silted up easily and frequently became clogged with dead fish and other debris. At first neighborhoods organized their own work crews, but many people quickly tired of this unpleasant task and instead increased the levies collected for local needs (*machi nyūyō*) so that they could employ day laborers.

Many commoners resented the imposition of the extra duties and expenses, just as they reacted negatively to the delegation of new firefighting responsibilities in the early eighteenth century, as William W. Kelly explains in Chapter 13. But just as merchants and artisans came to incorporate the horrors, adventure, excitement, and rituals of firefighting into their own Edokko culture, making an honored virtue of what had been an unwelcomed burden, those same families became extremely proud of their water system, no matter how muddy or fouled it might become.

→ 比較  
G 自豪

Probably the reason for this about-face was that the provisioning of water became complexly interwoven with the social life of the commoner neighborhoods. It is helpful to recall that two-story merchant houses lined the main streets of all those neighborhoods. The lots on which they sat were narrow but rather long. Behind the merchants' houses were rows of back-



House Situation

A neighborhood well

court tenement houses, divided into tiny apartment-style accommodations, where the poorer artisans and day laborers lived. Most such apartments were entered through an unfloored kitchen area equipped with an earthen oven. Beyond lay a single room: "2 by 3s," they were called, since they typically accommodated 6 tatami mats (each approximately 3 feet wide by 6 feet long), although 4.5-mat-sized rooms were not uncommon. A communal latrine was located in a common area outside, together with a well for drawing drinking water from the water supply system and an area to dispose of garbage. This well constituted an important "community center" for the women of the row houses, who traded news and gossip as they fetched drinking water or washed clothes together. *社會習俗*.

The water supply system helped to shape social customs in other ways as well. The periodic drying out and cleaning of the well was a particularly important event, and all of the people who used the well would come together to carry out this task. It is easy to imagine that the same sort of communal spirit that historians have noted among persons who "ate rice out of the same pot" probably also joined together those who drank water from the same well. Thus the water supply fostered a spirit of communal responsibility, a sense of what historians in other contexts have termed *Gemeinschaft*. And the commoners of Edo came to celebrate their water supply network in pithy sayings ("I was bathed in this water at the moment of my birth") and in poetry:

Kane mo waku Edo e tennyo no mizu ga kuru,  
 Hanjōsa masu de hakatta mizu o nomu  
 Tamagawa o kakedoi ni tsukau hana no Edo.

Into Edo, where money too gushes forth, flows the water of the celestial maidens;

Oh, what a luxury! Drinking this water, measured out in serving boxes,  
 Carried along the flumes of the Tama River, a flower of Edo.

→ Interesting  
 ↗ use some  
 well  
 ↗ water pipe  
 来る

### CONCLUDING REMARKS

Heretofore historians have supposed that the water supply networks constructed in the various castle towns across Japan were based on the design of the system that provisioned Edo. However, nearly the opposite seems to have been the case: the shogunate modeled its water supply network on daimyo precedents. It was quite common for a castle town's original water supply system to serve two purposes—to provide drinking water and to form a network of interlocking moats and canals for defensive purposes. In such a case open waterways were employed and water might be supplied only to samurai households. Later the system would be extended into merchant and artisan neighborhoods, and culverts would replace ditches. This change reflected a broader set of transformations that were coursing

throughout all of society as castle towns evolved from military bastions into settlements where samurai could set up households and then into complex urban centers that welcomed merchants and artisans and became important points of economic consumption and commercial production.

In a similar pattern, the shogunate first designed and laid out a water supply system for Edo that gave priority to the needs of the shogun, the daimyo, and other samurai families. Only later, when the warrior estate could rely on water drawn from its own wells, was the great network converted into a facility that served the needs of Edo's commoners. As this development took place, the various systems could be managed and maintained successfully only if a communal consciousness emerged among the residents of the city. Contributing to the growth of that community spirit was the particular composition of commoner neighborhoods, as well as the ironic, almost perverse delight that the Edokko took in boasting about something that was in many ways repulsive. Yet, as untasty as that water may have been, it had become the water of the commoners, and its passage through the city carried in its flow another suggestion of Edo's transformation into a city of merchants and artisans. There is, of course, a very great difference between the early-modern period and today, when we drink water out of faucets with few worries about its purity. City folk may well be losing the old sense of communal solidarity as bureaucracies expand and become so impersonal that we are not even aware of them as we go about our daily affairs.

→ modern = health concern

