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25. Japanese Geothermal Waters throughout History

by
Mitsuru Sekioka

Abstract: From prehistoric times to just before the industrial age, the history of geothermal waters in Japan is the history of hot spring bathing. The oldest vestiges, dating from the pre-pottery period before 11,000 B.C., can be found near Oyu hot spring, Akita Prefecture. Archaeological evidence and bathing myths and legends appear in several stories from ancient times. Of particular importance in early records are the visits made by Emperors to hot spring spas. From the beginning of the Heian era in 794 to the late Edo era, ending in 1868, some texts describe the primary characteristics of bathing in hot springs, including ways of making artificial hot spring water.

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INTRODUCTION

AS A VOLCANIC COUNTRY, JAPAN IS BLESSED WITH MANY HOT springs. Vestiges from hot spring bathing in prehistoric ages have been excavated in every part of the country. These imply that ancient peoples had a habit of bathing in hot springs.

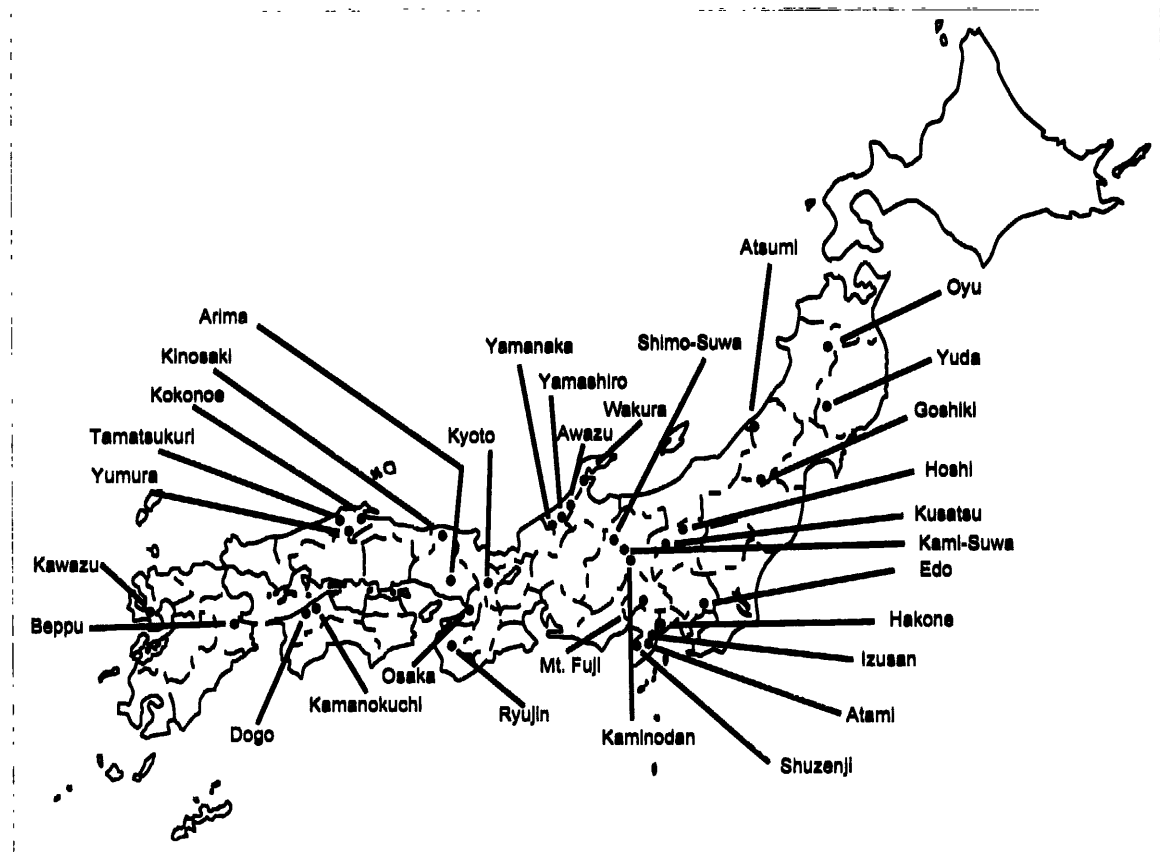
In the preindustrial ages, the only recognition of geothermal heat was the water in hot springs used for balneotherapy. Because baths in hot springs were shown to hold various medical benefits, the discoverers of hot springs in myths and legends were frequently gods, Buddhas, high priests, and marvelous animals.

This chapter describes prehistoric vestiges of hot spring baths and recounts typical myths and legends of volcanoes and hot springs. There are details of bathing as it is described in old, historical books, and retellings of imperial visits to spas, for they symbolize the Japanese enjoyment of hot spring bathing.

The history of hot spring bathing is described from the years 794 to 1868, and some conclusions and remarks are included, along with some hot spring locations.

PREHISTORIC PERIODS

EVIDENCE INDICATES THAT ANCIENT PEOPLES LIVED IN JAPAN, CULTURES THAT USED NEITHER pottery nor polished stone implements. Old stone implements used during the third ice age, about 200,000 years ago, were excavated at a site in Niisato, Gumma Prefecture.



Location of the hot springs and the three big cities cited in the text, Edo (Tokyo), Kyoto, and Osaka.

The ancient Japanese peoples lived in a warm and humid climate, particularly in the summer. They must have felt especially refreshed in mind and body after taking hot and cold baths. It is easy to imagine that ancient peoples brought up in a country blessed with pure springs and clear rivers took dips in them to forget the summer heat and to sweat.

Moreover, since many hot springs are distributed along volcanic zones all over Japan, the people probably enjoyed bathing in them year round. Thus, bathing practices came into

existence. Once people learned that bathing in hot springs had medicinal value, bathing may have become connected with natural reverence. This reverence for hot springs, in turn, promoted bathing in hot springs, and the process gradually gave the Japanese people a passion for hot spring baths.

Large stones smelling of hydrogen sulfide and arranged circularly were found at a depth of 5.5 m in Suwa, Nagano Prefecture. Experts believe that the stones were used about 6,000 years ago as the frame for hot spring bathing, for broken pieces of pottery and polished stone tools excavated together here were coated with encrustations.

Ruins of an ancient colony from about 6,000 years ago were excavated on the eastern side of Lake Suwa, Nagano Prefecture, and large stones with encrustations were found buried 6 m deep. The site is believed to be the ruins of a public hot spring bath for ancient peoples. Moreover, even today hot spring waters well up from the lake bottom near the eastern shore of Lake Suwa. About 10,000 years ago, the water level of the lake was around 2 m lower than at present, and the ancient peoples may have used the hot water to boil fish seized from nearby rivers and to warm themselves by bathing.

Many other vestiges of ancient Japanese culture have been unearthed near present-day hot springs sites. Prominent sites include Yuda hot spring, Iwate Prefecture (during the pre-pottery period before 11,000 B.C.); Oyu hot spring, Akita Prefecture, Kaminodan hot spring, Nagano Prefecture, and Kawazu hot spring, Nagasaki Prefecture (during the Jomon period from 11,000 B.C. to 300 B.C.); and Kokonoe hot spring, Shimane Prefecture, and Kamanokuchi hot spring, Ehime Prefecture (during the Yayoi period from 300 B.C. to 300 A.D.).

MYTHS AND TRADITIONS

VOLCANOES

SINCE JAPAN HAS MANY VOLCANOES, MANY MYTHS AND TRADITIONS ARE ASSOCIATED WITH them. The two imperial histories that include myths, *Kojiki* published in 712 and *Nihonshoki* published in 720, tell of Prince Izanagi and Princess Izanami giving birth to the gods of house, tree, wind, sea, river, mountain, and field, followed by the Japanese countryside, consisting of many islands. Their youngest child was the god of fire, who burned the genitals of Izanami and

she died. The god may have created the volcanic islands, which appeared last after the other islands, and it is well known in geoscience that the formation of the volcanic islands is very recent in geologic time, relative to the other islands.

These two histories also describe Prince Susano. He was exiled from heaven due to his sin, descended to a village in Izumo (presently in Shimane Prefecture), and saw a crying old couple hovering around their daughter. They replied to his question that a big red-eyed snake with eight hands and tails separated by its tree- and shrub-coated body lying across eight hills had descended from a mountain to attack the village and that it ate a young girl every year. Their daughter's turn came this year. Susano took pity on them. He changed her into a small comb to keep within his hair after he married her. Susano asked the old couple to make a strong liquor by fermenting the brew eight times and then pouring it into eight large tanks placed in front of eight gates in the fence enclosing the "snake living mountain." After a while, the snake came to drink the eight tanks of liquor, emptying them. When the snake was dead drunk, Susano attacked and scattered the snake with his sword until a nearby river was dyed red with blood. Last of all, cutting off the tail, he discovered a big sword. The scene is similar to that of a volcanic eruption. If the snake is replaced with an erupting volcano, red scorching lava from the crater can be envisioned flowing along eight ravines.

A VOLCANIC FOLDING SCREEN

Another volcanic legend, unique in its charm, is recounted by Takumi Tsukamoto in *Folk Legends of Aso*.

"On the Southern Japanese island of Kyushu, behind the blood-red hot spring called Chinoike-jinko, there rises Mt. Yomineyama. Here is the story of its birth.

"Long, long ago, there was a young empress of great grace and beauty named Asotsuhimeno-mikoto. When she became pregnant, her husband, Lord Takeiwatatsuno-mikoto (alias Aso Daimyoin, or the Great Gracious Lord of Aso) began to take better care of her.

"Now that her time was near, she naturally had become very large and fat around her middle. And so she became very worried that others might see her with this altered figure. The lord was all the more pleased with his wife, who looked very abashed like a blushing bride.

"All right, I'll do something for her before the night is out,' he swore to himself. And overnight he built a mountain to keep his pregnant wife from being seen by others. As the mountain arose in a single night, it was named *Yomineyama* ('Night Peak Mountain').

"Since the mountain stands behind the spa, it is like a *byobu* ('folding screen') that hides from view the young girls bathing in the spa's open-air bath." (*A photograph of the hot spring is in this chapter.*)

MOUNT ASO, CALMING THE GOD

Mount Aso, an active volcano 5223 meters high on the Southern Japanese island of Kyushu, has an immense caldera, among the largest in the world. The volcano has influenced not only the physical lives of people but their imaginations as well. The following account is by Takumi Tsukamoto, from his book *Folk Legends of Aso*.

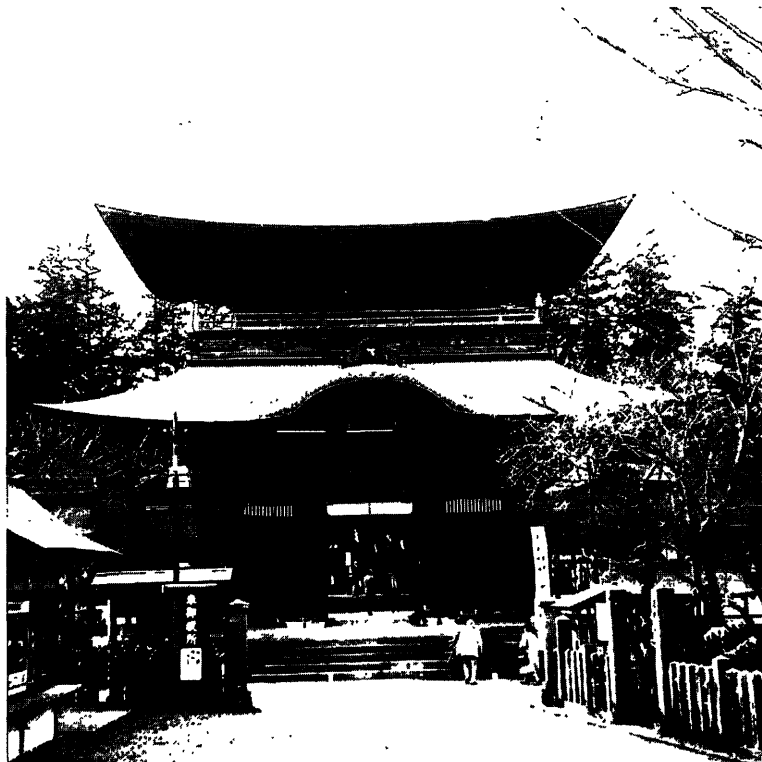
“Abundant folk legends were born and cultivated in the long history of the Aso people. Archaeological evidence reveals that a great many settlements existed in and around the Aso caldera in the Iron Age, about 300 B.C. to 200 A.D. By the 3rd century in Ichinomiya, Aso Valley, there was a clan state called Kuni.

“In those days, Mt. Aso was worshiped because it was believed that a god lived within it. Its eruption was dreaded as an expression of the god’s anger. Prayers were offered morning and evening in hopes of keeping the god calm. This worship eventually led to the establishment of the Aso Shrine, one the oldest in Japan, in the 4th century A.D. Enshrined there is Takeiwatatsuno-mikoto, called the Great Gracious God of Aso. The Kuni Clan gradually expanded and later became know as the Aso Clan. The Yamato Imperial Court, headed by the ancestors of the present Imperial Family, having brought most of the Japanese islands under its control by the middle of the 4th century, appointed the head of the Aso Family as the governor of the Aso Area.

“In the 5th century, leaders of this clan were not only the officials of Shinto rites at the Aso Shrine, they were also the rulers of the entire Aso Valley. The Aso Family’s divine authority as the custodians of a ‘volcanic god’ helped to advance the family’s position.

“By the 12th century, the Aso Clan dominated not just the Aso and Nango Valleys, but all of Aso County and beyond. An organization of samurai headed by the Aso Clan helped them extend their influence even further.

“The peasants of the area lived very hard lives. They suffered from the cold of the mountains and also from the volcanic ash, *yona*, which often severely damaged rice, wheat, and vegetables. They had to work hard to reclaim and cultivate the poor land. Aso was under the reign of the Aso Family until the late 16th century when the family’s power was severely curtailed by an angry General Hideyoshi Toyotomi.”



The Aso Shrine, a Shinto shrine of the highest class established in the 4th century A.D., is still cared for by members of the Aso Family. Over 400 branch shrines fall under the influence of this shrine. *S. Hodgson*

Since ancient times, the Japanese have had faith in the gods. Because they believed that a volcanic eruption was due to the anger of a god living within the volcano, they would build a shrine on the volcano and decorate it with the order of merit from the Emperor.

Mount Takachiho in the Kirishima volcanic range has been handed down through tradition as the site at which the ancestor of the Emperor descended from the Plain of High Heaven, or the Japanese Olympus.

These episodes imply that the ancient Japanese might have combined ideas of gods and mankind through the mysterious presence and activities of volcanoes. This is also suggested in a story that occurred about 1150, when a Buddhist priest saw a Buddhist saint, Sengen, disguised as a woman in self-exile at the top of Mt. Fuji, the most famous volcano in Japan and the highest (3776 m). The priest realized that the Buddhist saint, Sengen, was identical to Prince Asama, the god of Mt. Fuji. Thus began the mixing in Japan of Buddhist and Shinto beliefs, which have persisted into the modern era—beliefs that were born from volcanoes.

HOT SPRINGS

OLD HOT SPRINGS IN JAPAN FREQUENTLY HAVE THEIR OWN MYTHS AND TRADITIONS. THE following are well known.

Kami-Suwa and Shimo-Suwa hot springs, Nagano Prefecture. When Prince Takeminakata and Princess Yasakatome were divorced, they were residing at the main palace of the Suwa Shrine on the southeastern side of Lake Suwa. As a sort of consolation, the princess received a cotton ball wet from soaking in a hot spring near the main palace. Holding the ball, she passed over Lake Suwa and put the ball in the autumn palace of the shrine. Here a hot spring began to well up, and this hot spring was named “Cotton” hot spring (Shimo-Suwa hot spring, at present). At the same time, waters in the hot spring near the main palace decreased in temperature and flow.

In addition, a spring gushing great quantities of hot water appeared at a site where many drops of hot water dripped from the cotton ball the princess held. Today, this is Kami-Suwa hot spring. Since drops dripped over the lake as well, some hot springs gushed from the lake bottom. Finally, so many drops dripped out that the cotton ball gradually dried up and Cotton hot spring became a low-temperature spring with weak water flow.

by
Kokan Shiren
(1278-1346)

Small things moving,
firm become unfirm,
and like ocean waves,
house like a boat—
a time to be fearful,
but to delight as well:
wind, yet the wind-bells
keep on ringing.

Atami
by
Chugan Engetsu
(1300-1375)

Atami is a famous hot spring resort near Kamakura in the
14th century, with a glimpse of the island of Hatsushima in the distance.

Midnight dreams broken by the hissing roar—
hot water boiling from the roots of the cliff:
pipes this way and that lead the water, houses wreathed in steam,
every inn fitted with a bath, rooms let out to travelers.
By the sea's border land is warm—winter it never snows,
though cold days on mountain paths, on treads through frost at dawn.
A far-off island in fine rain, black with clouds and fog:
over red tides I watch the moon sink dimly out of sight.

TWENTY-FOUR HOKKI
(An excerpt)
by
Takai Kito
(1741-1789)

Atami, located by the foot of Mount Asama, there were no trees and grasses growing though the
springs and autumns of three years had passed since the volcanic fires, and even boulders were
buried under the ashes. After going over Usui Pass, my palanquin bearers told me that the red
soil showing about ten feet below us was just about where the old road used to be. In the fields
and paddies burned sand was raked into piles, and things looked quite desolate:

Even the soil is withered and saddening in this winter field.

These three poems, written by Japanese Zen monks, are reprinted from *From the Country of Eight Islands*,
by Hiroaki Sam and Burton Watson, 1986 by Columbia University Press. Reprinted with permission of the
publisher.

Atami hot spring, Shizuoka Prefecture. Before the descent to the Earth by the descendants of the Sun-Goddess, the ancestor of the Japanese Emperor, Prince Omunachi, felt pity for the early deaths of Japanese people in that time. He taught Prince Sukunahikona about preparing medicine and bathing treatments. He was sent as the god of the hot spring presently called Atami hot spring in Izu Province, Shizuoka Prefecture. The hot spring boiled and gushed hot water twice a day, and all kinds of diseases were treated there by soaking the patient in a tub filled with hot water.

Dogo hot spring, Ehime Prefecture. When Prince Omunachi dipped Prince Sukunahikona in a state of apparent death into a hot spring, Prince Sukunahikona was revived. At that time, the hot spring—now called Dogo hot spring—was believed to flow through an underground waterway from Beppu hot spring in Oita Prefecture, across the sea.

Arima hot spring, Hyogo Prefecture. Princes Omunachi and Sukunahikona discovered Arima hot spring from fumes in a ravine.

DISCOVERY LEGENDS

OLD SPAS ARE ALMOST ALWAYS ASSOCIATED WITH THE LEGENDS OF A DISCOVERER. THE RESULTS of the classification of these legends by discoverer are as follows (the prefecture names are in parentheses):

- Gods and Buddhas: Arima (Hyogo), Dogo (Ehime), and Tamatsukuri (Shimane)
- High priests: Ryujin (Wakayama); Goshiki and Atsumi (Yamagata); Atami, Izusan, and Shuzenji (Shizuoka); Kusatsu and Hoshi (Gumma); Awazu, Yamanaka, and Yamashiro (Ishikawa); and Yumura (Shimane)
- Marvelous animals: Yuda (Iwate) and Kinosaki (Hyogo)

FUDOKI

IN 713, THE IMPERIAL COURT OF JAPAN ORDERED ALL JAPANESE PROVINCES TO COMPILE A *Fudoki*, a description of the natural features of the province. The origin and description of hot springs are found in several *Fudokis*, as follows.

Fudoki of Izumo Province, Shimane Prefecture (733). The *Fudoki* says that when the governor of Izumo went up to the Imperial Court in Yamato to present New Year's greetings to the Emperor every new year, he always performed his ablutions at the site of a hot spring in Izumo. Usually, men and women gathered at the hot spring to enjoy baths, drink sake, and celebrate. The hot spring, today known as Tamatsukuri, was popularly believed to cure many diseases. The *Fudoki* also described Yumura, Yunokawa, and Ushio hot springs.

Fudoki of Bungo Province, Oita Prefecture. The *Fudoki* said that the water of Red hot spring is red and that it provides red mud used to paint pillars of houses. (In ancient times, the color red was held in esteem to avert evil.) The muddy red water turns clear as it runs eastward from the spring, depositing the red mud on the bottom of the river. Today, Red hot spring is called *Chinoike-jigoku* ("blood pond in hell") hot spring in Beppu. Here is where the hot spring gushed hot water and red clay mud, colored from ferric sulfide.

The *Fudoki* said that when a man cries in a loud voice near the erupting hole, very hot water with steam will boil out and wither the surrounding vegetation. This geyser survives in Beppu today.

Fudokis of Settsu Province, Hyogo Prefecture. This *Fudoki* describes Arima hot spring in simple form.



Chinoike-jigoku, "Blood Pond in Hell." The 78° C thermal waters are in a pond of 1,300 square yards. About 1800 kiloliters of hot water flow each day. S. Hodgson

IMPERIAL VISITS TO HOT SPRINGS

THE FIRST IMPERIAL VISIT TO HOT SPRINGS WAS MADE BY EMPEROR JOMEI IN 631. HIS MAJESTY the Emperor went to Arima in September and returned to the Imperial Court in December. Hot springs were so appealing to him that he returned to Arima in October of 637 and stayed there until the next year. Two years later, in 639, he visited Dogo hot spring in Ehime Prefecture.

Legends say that the Emperor Keiko (71-130) visited Dogo hot spring, Ehime Prefecture, and others. The Prince Shotoku also visited Dogo in 596.

HOT SPRINGS IN HISTORY

THE HEIAN ERA (794-1192)

DURING THE HEIAN ERA, ONE OF THE LARGEST CHANGES IN JAPAN OCCURRED WHEN RICE PADDY lands were developed in warm and mild climates. Many new villages appeared and there were frequent population movements to them. Increased agricultural production from newly reclaimed paddy fields fostered the growth of commerce and, in his reign, the Emperor extended his control.

Noblemen frequently went to spas for bathing and for medicinal purposes. A poem composed by Lord Kanesuke Fujiwara, a famous poet, on his way to Kinosaki spa, Hyogo, was found in an old anthology, titled *Kokin*, published in 913. History books record that in 998, Lord Yuken Fujiwara took a vacation to improve his health in a hot spring in Nagano Prefecture. Lord Michinaga Fujiwara went to Arima spa for the baths in 1024, and Lord Sadatsugu Hamuro went to Arima spa in 1086.

THE KAMAKURA ERA (1192-1393)

IN THE KAMAKURA ERA, WHEN SAMURAI OR JAPANESE WARRIORS GOVERNED THE COUNTRY, noblemen still went to spas for baths. It is on record that Lord Karumitsu Fujiwara went to a spa in 1231. In September of 1287, Emperor Gofukakusa had hot spring water brought to him from Arima spa, over a distance of about 100 km, so he could bathe in the Imperial Palace in Kyoto. There are many descriptions of samurai who bathed at hot springs to heal injuries incurred in wars.

An episode from a famous history book, *Heike Monogatari*, describes a Buddhist priest exiled to a lonely southern island. He climbed a nearby volcano and dug for sulfur, exchanging it for food with nearby merchants. During this period, various parts of the country offered presents of sulfur to the Imperial Court as raw material for medicines and gunpowder.

THE MUROMACHI ERA (1393-1574)

IN THE MUROMACHI ERA, TEMPLES AND SHRINES HAD LARGE TERRITORIES ALL OVER THE COUNTRY and custodians came and went everywhere to administer them. Conditions at nearby hot springs were included in their reports. At the same time, there were many tours, including pilgrimages to several spas.

THE AZUCHI-MOMOYAMA ERA (1574-1603)

IN THE AZUCHI-MOMOYAMA ERA, OR THE LATE JAPANESE WARLIKE AGE, MANY WARLORDS AND subordinate personnel were in the habit of salving wounds by bathing in hot springs in their territories. The warlords were known to have several of their own secret spas for healing wounds.

THE EDO ERA (1603-1868)

FROM EARLY IN THE EDO ERA, GIFTS OF HOT SPRING WATERS WERE MADE FROM ATAMI SPA TO the sovereign entrusted with full power by the Emperor. This was done several times a year by transporting 300 kiloliters of water in barrels for about 100 km. The gifts included water from Hakone spa, about 100 km west of Edo (modern-day Tokyo). Transporting barrels of hot spring water began in 1644. Under such circumstances, the *Daimyos* (“feudal lords”), warriors, and the general populace were attracted to bathing in Hakone and Atami spas.

Since about 1654, the Kaga local government (Ishikawa Prefecture) exported hot spring water barreled from the Wakura spa to Kyoto, Osaka, and Edo, where it was sold at a relatively expensive rate. This greatly enriched the local government.

During the Edo era, Japan had one of the most advanced publishing industries in the world, well before the invention of modern printing machines. Two medical books, one called *Yojokun* and published in 1710, are very famous in Japan. They include descriptions of diseases for which

hot spring bathing, by spa, is efficacious. Guidebooks for many spas were printed from 1710 to 1730, describing medical benefits, ways of bathing, lines of travel, nearby sightseeing resorts, and souvenirs.

In the mid-Edo era, medical and pharmaceutical practices began including experimental techniques. A famous medical doctor, Konzan Goto, selected Kinosaki spa, Hyogo, as the experimental site for balneotherapy. He tested the medical benefits of hot springs for edema, lumbago, gout, palsy, paralysis, beriberi, gonorrhoea, anal fistula, and menopause. The four volumes he and his follower, Shuan Kagawa, published in 1734 said that balneotherapy had medical benefits for chronic diseases, an opinion still held today.

Because the doctors said that Kinosaki hot spring offered such excellent medical benefits, many people came from all around to take the hot spring cure and the spa flourished. Another follower of Dr. Goto, Tsuan Yamamura, compared various hot springs in many places. He concluded that the medical benefits of Kusatsu hot spring equaled those of Kinosaki, and, in fact, a beautiful woodblock print of the time shows a bathing scene from Kusatsu spa in the Edo era. Tsuan Yamamura realized that travel to any spa was difficult for a sick person. Thus for home bathing, he developed a formula to make artificial hot spring water by adding sulfur to rice bran concentrated in salt water.

Other artificial hot spring waters were created by medical doctors who had studied western sciences in the Dutch language. Kondai Utsugi made artificial waters by heating pulverized sulfur, alunite, and arsenious sulfide in salt water. He claimed the water held the same medical benefits as Arima hot spring water. Finding his artificial water very expensive for most people, he lowered the price by altering the formula, dissolving natural geysers into salt water.

In the late Edo era, between 1828 to 1843, Yoan Utagawa chemically analyzed water samples from 36 spas, classifying them as to acidity, salinity, sulfur, and chalybeate (iron salts) content, and identifying the medical benefits derived from each one.

CONCLUSIONS AND REMARKS

AS THE AUTHOR IS NOT AN HISTORIAN AND ENGLISH IS NOT HIS MOTHER LANGUAGE, THE author has gone through all sorts of hardship. But it is a pleasure to compare Japan's geothermal

history with the histories of other countries in this book. Since each section of the chapter was composed mainly by citing Yatsuiwa (1993), the other references listed were not noted in the text.

ACKNOWLEDGMENTS

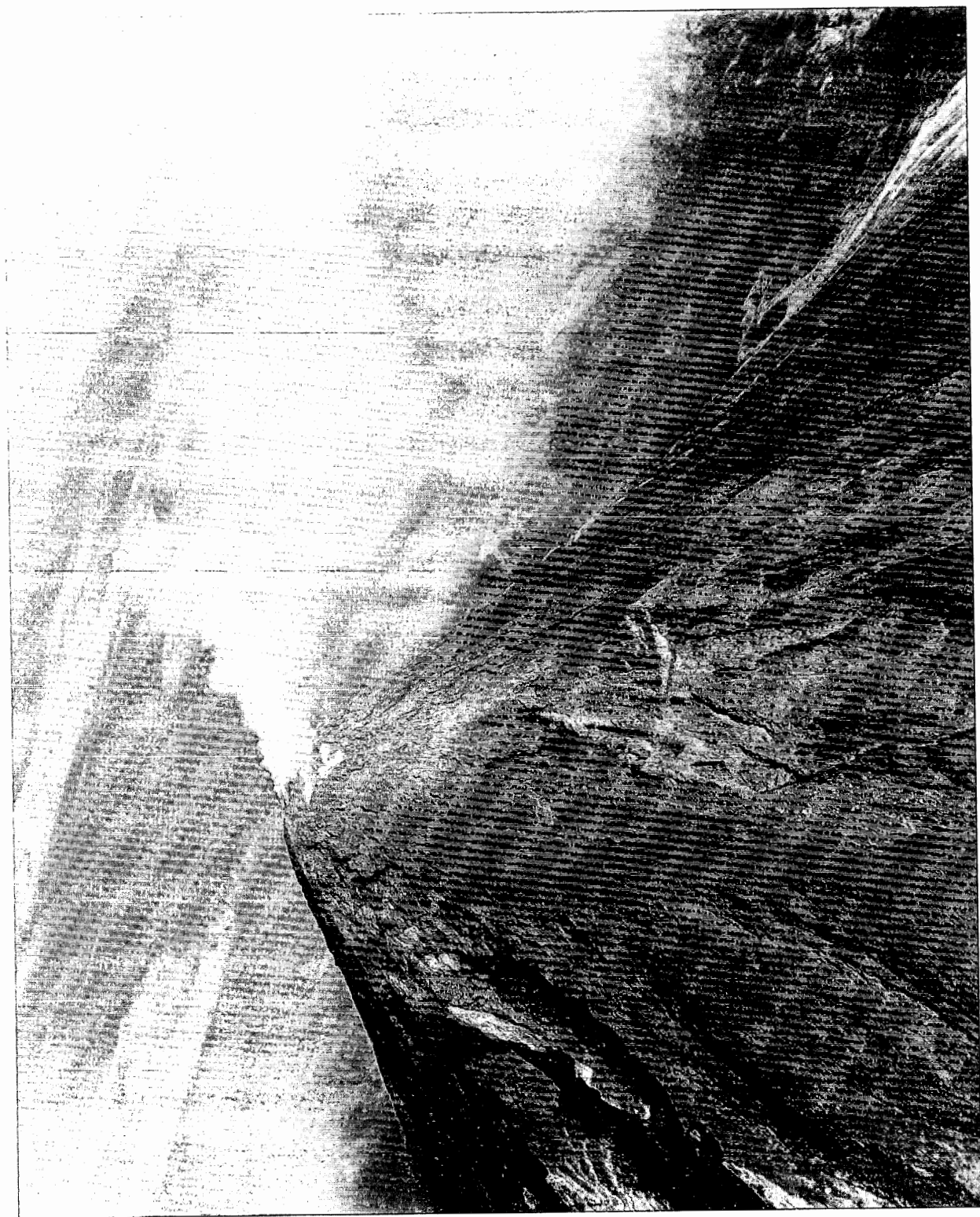
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A rare and stunning view of the steaming summit of Mount Mayon, looking north. *B. J. Barker*