CREATING THE KIMONO
Weaving Materials and Techniques

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Illustrations are of the author's collection unless otherwise stated

Introduction

Over the centuries, the Japanese borrowed and refined a diverse range of sophisticated weaving techniques to create cloth for their kimonos. The earliest concrete evidence of basic weaving in Japan corresponds to the Jomon period (14,000–300 BC), involving fibres created from bark and hemp. The Chinese and Korean-influenced Yayoi culture (300 BC–300 AD) saw the introduction to Japan of more sophisticated weaving techniques and fibres, ramie and silk, which were softer and more appropriate for the pre-kimono poncho-type garments of the Yayoi rice-growing society of the time.

Trade and cultural contact with the more advanced Chinese technologies had a profound influence on Japanese weaving during the 1000-year period of the 6th to the 16th century, bringing increasingly sophisticated techniques. Cotton cultivation belatedly took hold in Japan in the late 16th century, and over the next several centuries became the material of choice for weaving everyday clothing. It was also during this time that Chinese-introduced multi-harness looms, as well as improved draw looms, allowed the creation in Japanese workshops of complex silk fabrics, such as *rinzu* (damask) and *shusu* (silk satin), that were previously only available through import from China.

The Edo period (1603–1868) was a time during which Japan isolated itself for the most part from the outside world, and was an era of refinement of silk practices, and a growing weaving expertise lead by the Nishijin district of Kyoto. The opening of Japan to the West during the Meiji period (1868–1912) resulted in the import and adaptation of various Western industrial revolution technologies, including chemical dyes and power looms, that had a profound impact on the speed and cost of the kimono. This modernisation, while rapid, was not complete, and there survived a good deal of manual techniques and craftsmanship, as there continued to be a need, and market, for exploring and maintaining Japanese artistic sensibilities that only traditional methods could address.

Fabric materials

Asa (bast-fibre) ramie and hemp

Ramie, created from the stalks of the Chinese nettle, is a strong and durable fibre that is resistant to bacteria, mildew and insects. Hemp, another popular plant fibre, has roughly similar properties as ramie. Until the advent of Japanese cotton cultivation during the 16th century, ramie and hemp were the main materials utilised for everyday Japanese clothing for the masses, with expensive silk being reserved for the upper classes. During the Edo period, there was a high-quality ramie referred to as *jôfu*, brought from Okinawa, that was sometimes used for upper-class summer wear. Bast-fibre kimonos continued to be created locally, on a small scale, until recent times.

Cotton

Cotton, originally native to India, began replacing ramie and hemp in the 16th century, as cotton enjoyed the advantages of being easier to process and to transport, while it was also softer, warmer and more flexible than bast-based fabrics. While making ramie and hemp into cloth could be accomplished on the family and local level, the processing and marketing of cotton was much more involved, so that by the Edo period much of the population purchased, rather than made, their clothing. Cotton continues to be utilised in Japan for informal unlined summer kimono, called yukata, and for everyday working kimono in the countryside.

Silk

Silk is a strong, light, soft and sensuous fabric produced from cocoons of the silkworm caterpillar. Silk's renowned sheen is the result of triangle-shaped fibres that reflect light-like prisms along with layers of protein that build up to a pearly lustre. Silk was cultivated by the Yangshao culture in China between 4000 and 3000 BC, and for 2000 years remained a strict Chinese monopoly defended by Imperial decree. It was not until about the 3rd century AD that the Japanese succeeded in obtaining silkworm eggs and the basic art of sericulture. Eager to emulate Chinese and Korean noble refinement, the Japanese court offered both land and special privileges to Korean and Chinese silk weavers willing to emigrate to Japan. In the centuries that followed, Japanese sericulture techniques were improved, so that by the Edo period, Japan was recognised as producing the best quality silks in the world. This high quality, coupled with modernisation of sericulture during the Meiji period, allowed Japan to become the world's foremost silk producer—by the early 20th century, Japan was producing as much as 60 per cent of the world's raw silk (1, 2). Dur-

1 Winding silk from cocoons. Early 20th century, Japan

2 Winding silk on a loom. Circa 1900–1905, Japan. T. Enami hand-coloured lantern-slide view, *No. 451*. Image courtesy of Rob Oechsle

ing the 19th and the early 20th century, silk was the preferred material for ceremonial and formal kimonos, with its use becoming popular even for informal kimonos during the latter part of this period, i.e. the late Meiji, Taisho (1912–1926) and early Showa (1926–1940) years.

Rayon

Rayon is a semi-synthetic silk-like fabric based on wood pulp. Rayon was invented in France during the 1880s, and became commercially available in Japan in 1918, where it was referred to as *jinken* (human-made silk). Japan rapidly became the world's largest producer of rayon, as this silk substitute had certain advantages compared to silk: rayon does not cling to the body in warm humid weather, has more resistance to weakening by exposure to light, and is easier to clean and maintain. In contrast, silk superiority over rayon involves its softness, heat-retention abilities and lustre. Due to the mentioned properties, *jinken* was popular for creating sheer summer kimonos during the 1920s and 1930s. Other summer kimonos and all-season kimonos during this same period enjoyed a rayon/silk blend (silk warp and rayon weft), to combine the best qualities of both fibres.

Polyester

Polyester, a synthetic petroleum-based product, was invented in Britain in 1941 as another substitute for silk. Polyester fabric is relatively crease-resistant, durable, easy to clean, and much less expensive than silk; on the other hand, polyester fabric does not breathe as well as silk, can get sticky in humid summer weather, and is burdened by an artificial, plasticky texture. A minority of post-war kimonos were constructed of polyester, or a blend of polyester and natural fibres, with polyester inner kimono linings being somewhat more common.

3 Weaving (silk) on a draw loom. Late Meiji period, 1910. Herbert Geddes, photographer

Different weaves

Woven fabrics are created by crossing over the vertical (warp) and horizontal (weft) threads using a loom (**3**). Two of the oldest and simplest techniques are *hira-ori* (plain weave), which simply involves the warp and weft threads crossing over each other every other line, and *aya ori* (twill weave), where two or more warps cross an equal number of weft threads, resulting in a subtle diagonal pattern.

Gauze weaves: sha, ra, ro

Several gauze weaving techniques made their way to Japan in the 8th century by way of the Middle East and China. The Japanese refer to these gauze techniques as *karami-ori* (entwine weave) or alternatively *mojiri-ori* (movement weave), which can be subdivided into three types: *sha*, *ra* and *ro*. While most weave structures possess parallel warps intersecting the wefts at right angles, in gauze weaves the warps are shifted so that they cross each other, thus creating spaces between the weft threads. *Sha*, a plain gauze weave, is the simplest of the gauzes, yielding a relatively crisp, stiff fabric (4). *Ra* is a complex gauze weave, using warp threads at diagonals, with the warp and weft being able to be combined in various ways, allowing the weaver to create highly intricate weaves (5).

During the 19th and early 20th century, the Japanese utilised the soft and pliable *ro* gauze technique much more often than *sha* or *ra*. *Ro* is woven in alternating stripes of airy open-eye gauze and densely-packed plain weave, yielding its characteristic, almost transparent, gauze stripes (6). *Ro* was developed in Japan later than *sha* or *ra*, becoming established during the 18th century at about the same time as the development of *yuzen* resist-dye painting, as the two were complementary. *Ro* fabric was used for many types of summer kimonos, including *tomesode* (informal summer kimonos), as well as children's ceremonial kimonos. Such summer kimonos were unlined, and the sense of the air travelling through the open gauze weave was considered physically cooling for the wearer and mentally cooling for an onlooker. As *ro* was quite costly, it was a luxury; as the 20th century progressed, the inexpensive light cotton yukata became a popular summer alternative to *ro* silk kimonos.

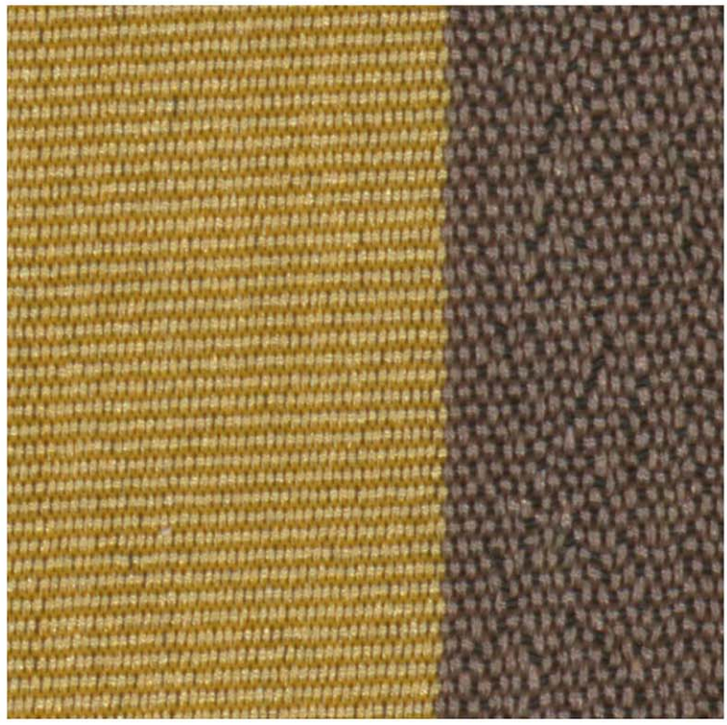
Nishijin weaves: weft-faced brocade

In contrast to the airy gauze weaves, *nishijin-ori* (west-position weave) was a type of weft-faced brocade that is the heaviest and warmest of the Japanese weaves. *Nishijin-ori* is both time-consuming and labour intensive compared to most other weaving techniques.

Nishijin weaves were introduced to Kyoto by a Japanese family returning from China during the 5th or the 6th century. During the 8th century, when Kyoto became Japan's capital, *nishijin* fabric became firmly established as a high-class product for the court and aristocracy. Later, this fabric began to be utilised for Noh theatre costumes. The name "*nishijin*" started being used for this weave during the 15th century, as it was in the Nishijin district of Kyoto where the weaving workshops congregated at that time. A popular variation of *nishijin* weave, called *nishiki*, involves multicoloured threaded drawloom-woven fabric in which complex motifs are woven that resemble intricate embroidery. *Nishiki*-woven fabrics became popular in the creation of the thick wide sashes called obi, and for *uchikake* (wedding robes). A typical *nishiki* weave consists of a silk twill-weave ground with silk discontinuous supplementary patterning wefts tied down with supplementary warps in twill-weave (7).

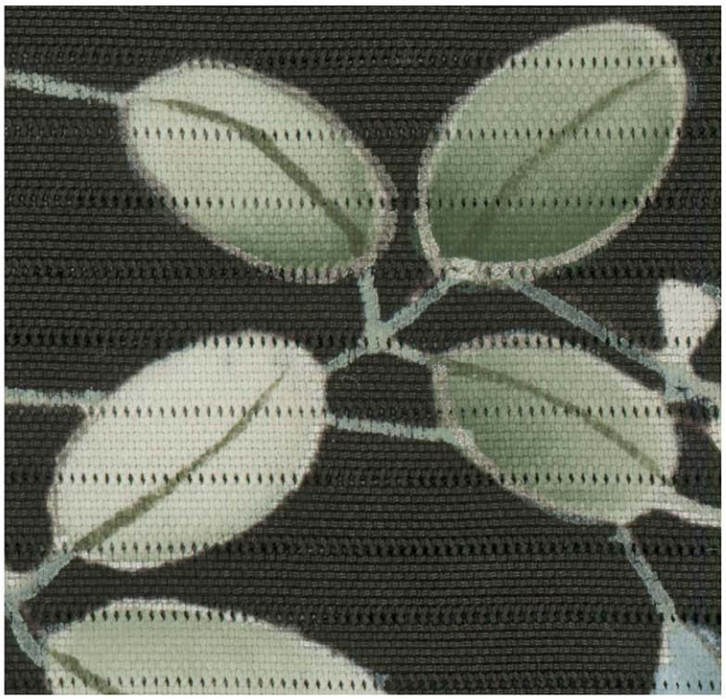
Shusu weave: satin

The smooth and shiny *shusu* (satin) weave was invented in China more than 2000 years ago and introduced to Japan likely during the 7th or the 8th century. Japanese traditional *shusu* is a warp-faced weaving technique in which warp yarns are floated over weft yarns; these floats result in an even sheen, as in contrast to other weaves, the reflected light is not scattered as much, resulting in a lustrous, smooth surface (8). During the 19th and the early 20th century in Japan, the two most popular colours for *shusu* fabric were black or deep blue. Although *shusu* was utilised often on *fukusa* (gift cloths) and obi (kimono sash), the fabric was also utilised for some *uchikake* (wedding robes), in which



4 Plain weave only in the yellow stripe on a Taisho period (1912–1926) silk kimono

5 *Ra* weave in a Taisho period (1912–1926) silk summer kimono



6 Classic *ro* weave in a mid to late Meiji (1880–1912) summer silk *kurotomesode*. *Yuzen*-painting of leaves over the black *ro* weave

8 *Shusu* weave in a Meiji period (1868–1912) silk *uchikake* (wedding robe). Japanese artists would often add embroidery to a *shusu* fabric, as in this case

7 *Nishiki nishijin* weave in a 1880–1920 silk *uchikake* (wedding robe)

9 Detail of *rinzu* weaving in a Taisho period (1912–1926) silk kimono. Note the pleasing interplay of the hand-painted motifs on the *rinzu* base fabric

the main decorative element was applied embroidery.

Rinzu weave

Rinzu, a type of monochrome figured satin silk weave similar to damask, involves utilising different types of silk threads for the warp and weft. *Rinzu* fabric exhibits a three-dimensional effect due to the way the light is reflected by the monochrome patterning. This forms a double design, with the dyed, painted or embroidered design over the top of the damask pattern. The intricately woven *rinzu* motifs, resembling brocade in complexity, require substantial skill and expertise and, as a result, *rinzu* is one of the most expensive Japanese silks (**9**).

Rinzu fabric was initially imported from China in the 14th century, with the renowned Nishijin weavers of Kyoto producing this rich cloth by 1615. At this time, *rinzu* fabrics were prominent in men's clothing, but by the late 17th century, the fabric began to be used for upper-class women's garments. During the early to mid-Edo period, the *rinzu*

patterns were very small, gradually becoming larger by the late Edo period. *Rinzu* was initially woven on draw looms, with most of the production passing on to the more efficient European Jacquard looms by the late 19th century.

Chirimen and kinsha: crepe plain weaves

Chirimen and *kinsha* are plain weaves possessing a crinkled crepe-like texture and matt appearance produced by overtwisting the weft threads during the weaving process. The main difference in weaving *kinsha* (**10**) compared to *chirimen* (**11**) involves less twist to the weft threads, resulting in a smoother texture and crisper lines. The *chirimen* and *kinsha* techniques were introduced from China in the 16th century; however, they only rose to prominence in Japan during the late 17th century, as their textured matt surface was a wonderful ground for the newly developed *yuzen* resist-painting technique. Kimonos of *chirimen* or *kinsha* drape exceptionally well and are difficult to crease. *Chirimen* continued to be created during the second half of the 20th century—albeit to a lesser extent—while *kinsha* was rarely created after the mid-20th century.

Tsumugi: pongee

Tsumugi (pongee) is a sturdy plain-weave hand-spun and handwoven fabric that is sourced from leftover silkworm cocoon floss scraps. Technically silk, *tsumugi* fabric appears more like cotton (**12**). Its charming and rough, uneven, nubby texture is the result of uneven thread widths and the many tiny knots originating from twisting and joining the short scrap fibres as it is spun. A renowned trait of *tsumugi* fabric is that the more it is used and washed, the softer it becomes, as the starch applied during spinning gradually disappears.

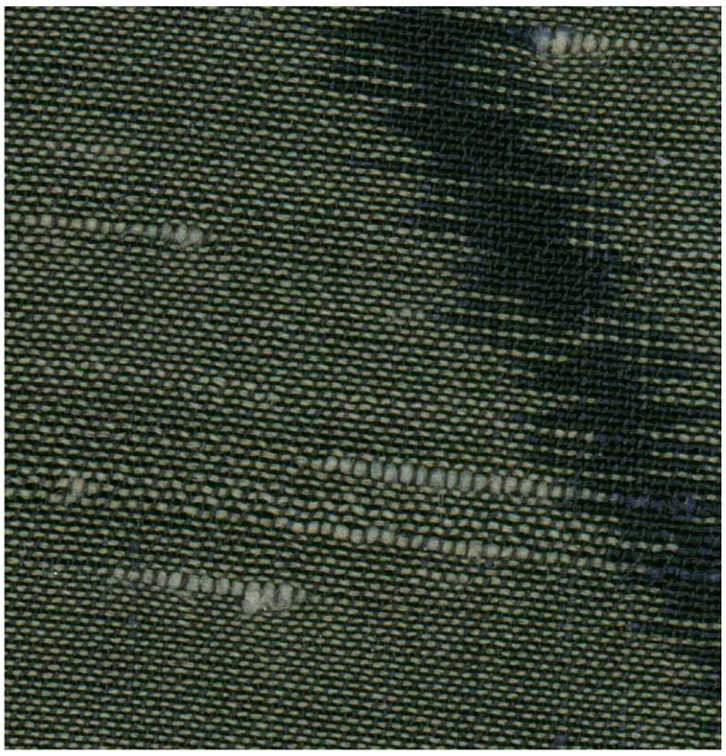
Tsumugi originated in the countryside during the Edo period, a time when decrees forbade the wearing of silk by anyone not of the noble or samurai class. *Tsumugi* silk, which was unmarketable and had a cotton-like appearance, was a sturdy fabric by which the farmers could ingeniously evade these strict decrees. Often created at home, the fact that the same person might spin the thread, weave the cloth, and sew and wear a kimono lends *tsumugi* an esteemed uniqueness. One kimono would take an average of one month to spin due to the time required to join the short threads together so often. Stripes and checks are common patterns on the *tsumugi* kimono, which remained popular among farmers and town merchants until the mid-20th century. As creating *tsumugi* fabric is an elaborate and time-consuming process, in recent decades the *tsumugi* kimono has, not surprisingly, become an elite garment worn by the wealthy.

Kasuri: simple ikat

The tie and resist (ikat) *kasuri* (to blur) technique seemingly originated on several different continents over one or two millennia ago, and by the Edo period spread to most regions of Japan via Okinawa. Cotton was the fibre of choice for *kasuri*, although infrequently silk was used (**13**). The *kasuri* technique involves selectively binding and dyeing parts of the warp or weft threads, or sometimes both, prior to weaving the fabric. The bound sections of the threads remain undyed, and when woven, a pattern is created against the dyed background. One popular *kasuri* technique is referred to as *tate gasuri*, that involves dyeing the warp threads. A less common technique is *yoko gasuri*, whereby only the wefts are dyed; and finally, the extremely complicated and difficult *tate-yoko gasuri*, a double *kasuri* found in Okinawa, where both warps and wefts are dyed. Since the cotton threads are never perfectly aligned, the resulting patterns have pleasing soft blurred edges. The dark blue extracted from the indigo plant was the dye most common-

10 *Kinsha* plain weave in a 1890–1920 silk *kurotomesode*. *Yuzen* and hand-painting over the *kinsha*

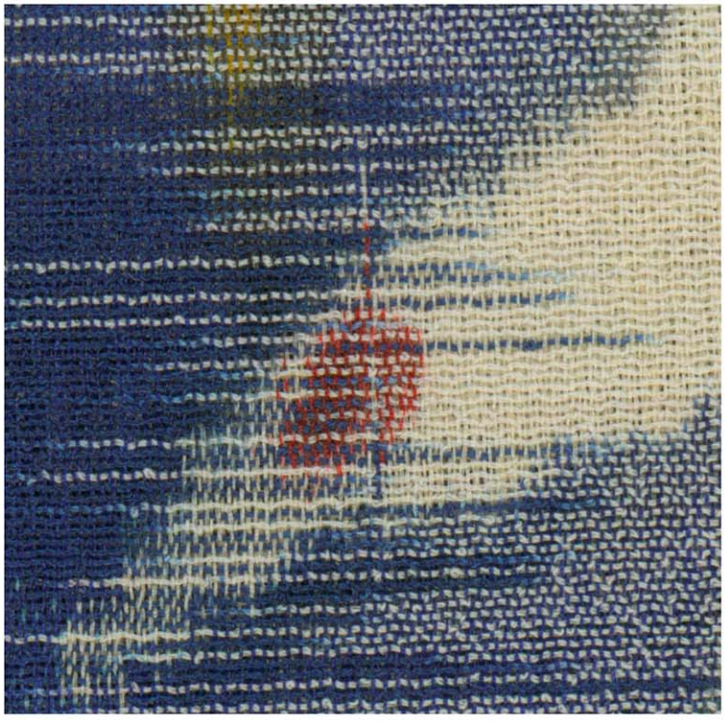
11 *Chirimen* plain weave in a 1800–1850 wedding robe. The *chirimen* crepe is especially noticeable in the blue background



12 *Tsumugi* in a 1970s silk kimono

14 *Nuitori-omeshi* in a 1940–1960 silk kimono

13 *Kasuri* weave in a 1880–1912 small girl's kimono



15 Unknown style of *omeshi* in a 1926–1940 silk/rayon-blend summer kimono

ly used for *kasuri*. The most popular *kasuri* variety has always been *kon-gasuri* (to blur blue), characterised by white patterns on a dark blue background. Cotton *kasuri* fabrics, very rugged and durable, are found mainly in Japan's countryside, where farmers' wives would weave ikat work garments for the family. Geometric patterns dominate *kasuri* fabrics, with popular motifs being crosses and crosses enclosed in a *kikko* (tortoise) lattice. In instances where pictorial motifs are utilised, they are typically in combination with geometric patterns.

Omeshi: pre-dyed crepes

During the 1880s, Iwase Kichibei, a Japanese inventor, developed a water-powered spinning machine that could produce highly-twisted silk yarns, which in combination with the recently imported Jacquard loom, was capable of weaving a new type of crepe cloth called *omeshi* (being worn by noble persons), a heavy crepe silk woven with strongly twisted pre-dyed threads (**14**–**19**). In contrast, *chirimen* crepe is dyed after weaving. The first popular *omeshi* variety was

16 Majolica *omeshi* in a 1959–1965 silk kimono

a reversible figured crepe called *futsu-omeshi*, which was superseded in popularity in the 1890s by a supplementary embroidery-like weft-patterned *omeshi* variety called *nuitori-omeshi*. There are other varieties of *omeshi* besides these two, including *shima* (striped) and Majolica (with lame threads). *Futsu*, *nuitori* and Majolica *omeshi* kimonos are relatively stiff and thick, due to their complex construction, and were among the highest in value among pre-dyed silk kimonos, suitable for both informal and semi-formal occasions.

Many of these varieties of *omeshi* kimono were created during the first four decades of the 20th century, while the second half of the century saw a decrease in variety. By the end of the 20th century, the main *omeshi* being produced was monochrome or minimally patterned. The last brief heyday for *omeshi* was the development in 1959 of the complex Majolica *omeshi* technique, which combined the techniques of weft *kasuri* and Jacquard weaves and incorporated metallic lame threads. This colourful and intricate confection was ideal for creating large European-influenced pictorial embroidery-like images on the fabric.

17 Majolica *omeshi* in a 1959–1965 silk kimono

18 *Shima omeshi* in a 1950s silk kimono

19 *Shima omeshi* in a 1950s silk kimono

Meisen: stencil-dyed ikat

At the same time as the invention and rise of *omeshi* came the arrival of another new Japanese fabric that was to have a profound effect on the Japanese kimono industry—*meisen* (20–23). This refers to an inexpensive, thickly woven and glossy fabric with a stiff drape, produced from reeled low-quality silk, with the patterns possessing the slightly blurred appearance of very complex *kasuri*. Sheila Cliffe explains the process wonderfully:

> "Kasuri was made by tie-dyeing individual threads before weaving them together. When making meisen, all the warp threads were laid out and held in place with a few temporary weft threads. The warp threads were then stencil-dyed using nassen, a dye in resist paste technique. One stencil was used for each color, so they were dyed up to 5 times… After dyeing, the warps were transferred onto a weaving loom, and the cloth was woven up on hand or power looms. The

20 Stencilled weft *meisen* in a 1930s kimono

22 *Meisen* kimono created in the mid-Showa period (1940–1960)

21 Stencilled weft and warp *meisen* in a 1935–1940 kimono

> technique of stencil dyeing at the thread stage enabled far more complex patterns to be created than before. Also, a wider variety of colors could be used than are found in handmade kasuri."[1]

The *meisen* production process involved several treatments that allowed this leftover silk to be both more durable and yield bolder colours. *Meisen* kimonos were created with stencilled warp and wefts, or alternatively, weft-only warp-only stencilling.

The first authentic stencil-dyed *meisen* fabric was produced in Chichibu, just north-west of Tokyo, in 1887; and it was the Kanto region near Tokyo that continued to be at the forefront of *meisen* kimono production during the late Meiji and Taisho periods. For the first twenty years or so of production, *meisen* kimonos were largely for domestic use, and were sombre coloured and patterned, with simple and restrained patterns such as stripes and small cross ikat motifs. Schoolgirls in the Kanto region were asked to wear *meisen* kimonos as their school uniform—often decorated with *yagasuri* (arrow feather) motifs. During the Taisho period, Tokyo department stores, eyeing a market opportunity for an inexpensive fashionable kimono for the flourishing middle class urban female, invested heavily in *meisen* kimono production, design and marketing. These efforts yielded *meisen* kimono designs that became larger and bolder—eye-catching, often floral, modern designs—that were taken from both native and Western art movements, such as Art Nouveau and Art Deco. *Meisen* kimonos were more affordable than any other silk fabric on the market, becoming the favoured informal, everyday garment. Each season, the department stores would present a new line of *meisen* kimono, and so during the 1920s and 1930s, they became the popular domestic haute couture.

Meisen comprised approximately half of Japan's production of silk kimonos during this period, as women became enamoured of their relatively low cost, durability and adventurous designs. During the 1920s and the following decades, roughly 70 per cent of all Japanese women possessed at least one *meisen* kimono. *Meisen* production almost ceased during the Second World War, but enjoyed a resurgence in the late 1940s and 1950s, after which its popularity fell until the early 21st century. This recent modest revival is due, in part, to the arrival of several exhibitions of, and publications about, *meisen* kimonos from the 1920s to the 1950s. Once very affordable, *meisen* kimonos are created in small runs, selling at prices that only the wealthiest can afford.

[1] Cliffe, Sheila, *The Social Life of Kimono: Japanese Fashion Past and Present*, London: Bloomsbury Academic, 2017, pp. 51–52.

23 *Meisen* kimono created in the Taisho period (1912–1926)

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