ESSAYS ON JAPANESE ART
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TOKUNO'S DESCRIPTION OF JAPANESE PRINTMAKING

Edited by Peter Morse

There is very little firsthand evidence about the technique of making Japanese color woodblock prints. One description, however, goes far beyond any other in its completeness and detail. In 1889, Mr. T. Tokuno, chief of the Bureau of Engraving and Printing (*Insetsu-Kioku*) of the Japanese Ministry of Finance wrote an account of the process for the Smithsonian Institution, the United States National Museum. The text accompanied a collection of woodcutting and printing equipment given to the Smithsonian by the Japanese government, and still on display today (fig. 1). Mr. Tokuno's description (written in English) was published in Washington in 1893.[1] It was edited for publication by S. R. Koehler, the Smithsonian's Curator of Graphic Arts, whose notes are included among the bracketed comments in the text.

Today, this account is little known among scholars of the Japanese print. Because of its importance and interest as primary source material, it is reprinted here in order to make it more accessible to a new generation of connoisseurs.

MR. T. TOKUNO'S COMMUNICATION

I. THE WOODS USED AND THEIR PREPARATION. The wood most generally used is 'sakura', a variety of cherry, although 'tsuge', a variety of Buxus japonica, or 'adasusa', *Catalpa kaempferi* var. *japonica*, are employed, according to the degree of fineness of the written characters or pictures to be reproduced. In all cases, however, the texture must be very fine and hard.

The wood is first cut into planks, and these are planed until they are perfectly level and smooth, free from all traces of the plane, and show some luster on the surface. Both sides are finished alike, as the woodcutter utilizes both of them.

Cut planks which are to be printed in black only are usually mounted between strips nailed to each end. There are several reasons for this. It prevents the warping of the planks; it gives free access to the air between them, when a number are stored on top of one another, and provides the best means of keeping them dry and guarding against damage by insects; it prevents immediate contact of the blocks, and finally, it is sometimes very convenient, as it facilitates the drawing out of such planks as may be needed from among many stored away together, the planks being marked or numbered on the sides of the strips. For color-printing, however, the same plank often has two or three designs upon it for different tints, and consequently has registering marks on different parts. In that case the end strips would be in the way and are, therefore, omitted.

II. THE TOOLS OF THE ENGRAVER. For engraving, knives and chisels of the best quality are required. All the tools needed by the engraver are represented in fig. 2 (nos. 1–13) and fig. 3 (nos. 19–25). With the following explanations their uses will be readily understood:

Fig. 1 Japanese printmaking. Exhibit in the Hall of Graphic Arts, National Museum of American History, Smithsonian Institution. (Smithsonian photo 30461.)

1 Ruler for cutting straight lines and for fixing the registering marks on the planks used in color-printing.

2 Brush for removing from the planks the chips thrown out by the cutting tools.

3 Engraving knife, for cutting out the design. Only one knife [5 inches in length], always of the same pattern and size, is used by the Japanese wood-cutters, and with this one knife they perform all grades of work, from the coarsest to the finest, the execution depending entirely on the skill of the engraver. [The blade is mounted in a handle with a slit in it, into which the blade is wedged, and in which it is held in place by a ferrule. SRK.]

4–9 Chisels for removing smaller portions of wood between the lines of the design. They are used exactly like the engraving knife.

10, 11 Chisels for correcting unsatisfactory parts [i.e. removing parts for 'plugging'].

12 Saw for cutting small pieces of wood to be inserted in the plank where corrections have to be made.

13–16 Chisels for removing larger portions of wood.

17, 18 Semicircular chisels, used for the same purpose as nos. 13–16.

19 A special kind of grinding stone, for leveling the surface of the grinding stone, no. 20.

20 Grinding stone for taking off the somewhat roughened edges of the knife and chisels, after they have been sharpened on the stone, no. 21.

21 Grinding stone.

22 Oil pot, in which oil of *Sesamum orientale* is kept, for rubbing the portions of the plank to be cut, so as to

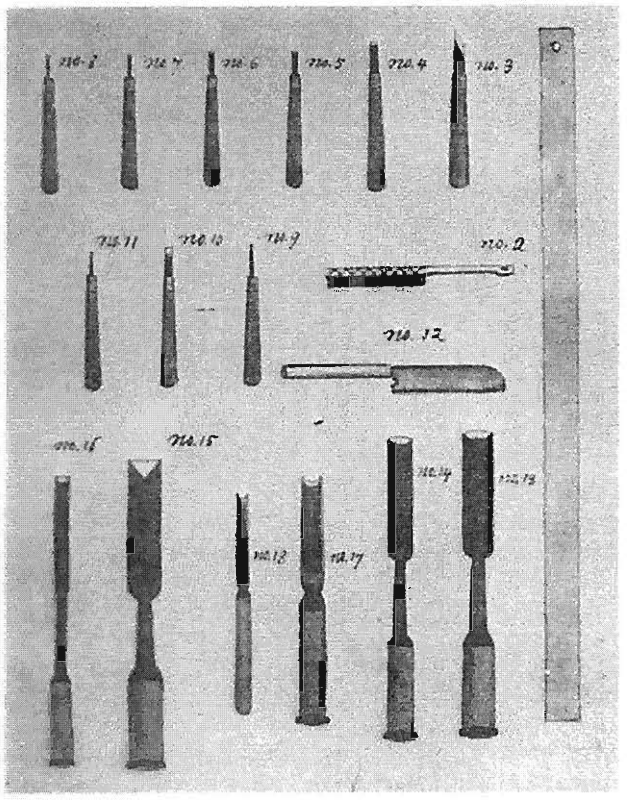

Fig. 2 Tools used by Japanese wood-cutters. Nos. 1–18. (From a drawing by a Japanese artist.)

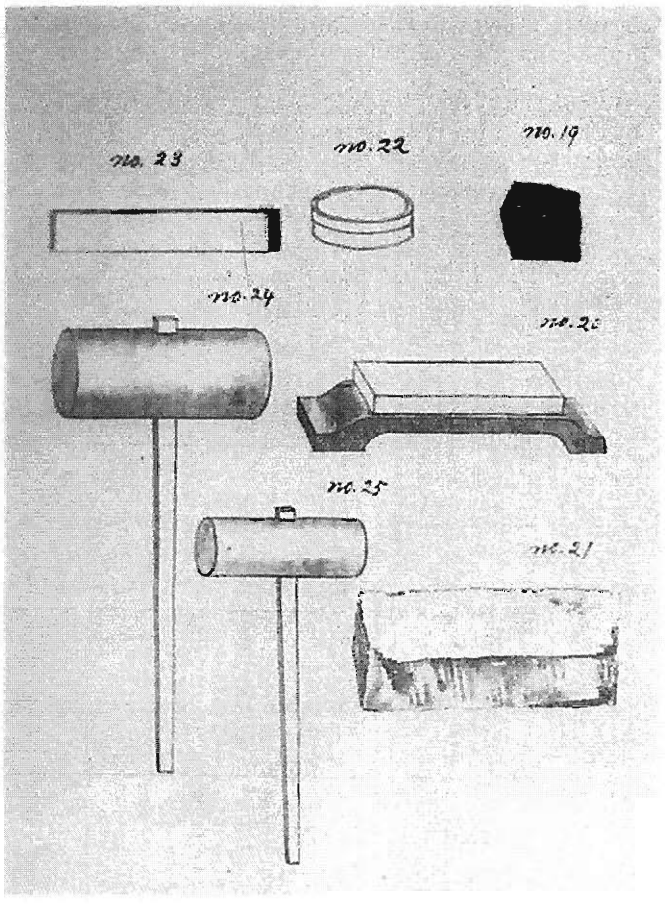

Fig. 3 Tools used by Japanese wood-cutters. Nos. 19–25. (From a drawing by a Japanese artist.)

soften the wood and make the cutting easier and cleaner.

23 Oil brush for the oil just spoken of.

24, 25 Wooden mallets for driving the chisels, nos. 13–18.

III. THE ORIGINALS FURNISHED TO THE WOOD-CUTTERS, AND THE METHOD OF TRANSFERRING THEM TO THE PLANKS. Written characters or pictures to be cut on wood are drawn upon a certain kind of Japanese paper, 'minogami' or 'gampishi', and the drawings thus made are pasted [face downward] upon a prepared plank, by means of starch paste. The plank is now ready for the engraver. This applies to prints in black only. For color-printing, the outlines of the design are first cut and printed in black ink (India ink mixed with a solution of glue) upon 'minogami', and the designer of the picture then marks the parts to be colored [on different sheets]. These sheets are then pasted down on the planks, as before stated, and the engraving also proceeds as before.

IV. AIM OF JAPANESE WOOD-CUTTING. The important point to be kept in view in characteristic Japanese wood-cutting is to show the direction of the brush in painting, so as not to destroy the features of an original picture or of written characters. The direction in which the knife is moved might be said to be almost identical with the direction of the brush, and wood-cuts by skillful hands therefore show the exact features of the originals while, at the same time, they have a special artistic character of their own.

V. MANNER OF HANDLING THE ENGRAVING TOOLS. The tools, having been put in good order and well sharpened, are laid on one side of the engraving table, and upon the latter is placed the plank to be cut. The wood-cutter, holding his knife in his right hand and pushing the back of it with the middle finger of his left hand, first cuts around all the lines of the design, and then removes the wood between them by means of the chisels, so as to leave the lines in relief. He then, with a small brush, cleans and washes the plank, and has a proof taken, after which he makes corrections, if necessary.

Fig. 4 shows a wood-cutter at work. 'A' is the plank; 'B' a grinding stone for sharpening the knife and chisels; 'C' is a box containing engraver's tools.

VI. DIFFERENCE BETWEEN OLD AND MODERN JAPANESE METHODS OF WOOD-CUTTING. Although the method of cutting on wood differs slightly at present from the ancient method, the principal points are, nevertheless, the same.

All ancient wood-cuts are comparatively deeper than those of the present day. The shallowness of modern cutting is due, probably, to the ability to do much finer work.

In the ancient style the outer boundaries of letters or pictures were cut away deeply before they were properly engraved. At present the stages are reversed. The latter method takes less labor and time, and it is probably one of the causes of the shallow cutting at present in vogue.

Formerly the paper bearing the original design, after it had been pasted down on the plank, was oiled so as to make it transparent, and to enable the wood-cutter to see the design quite distinctly. This is not necessary now, as it

is easy to get paper sufficiently thin and transparent in itself.

Semicircular chisels are now in use for removing some of the parts between the lines of the design. There were no such chisels formerly, and hence much more time and labor were spent on this part of the work than at present.

VII. PAPERS USED FOR PRINTING, AND THEIR TREATMENT. The papers used, whatever their quality, should be sized with a thin animal size. Among the prints sent to the U.S. National Museum are impressions on three different kinds of paper:– a special Japanese paper, made at the Insetsu-Kioku paper mills [known in America as Imperial Japan paper], a Chinese paper, and 'masa' paper.

The sheets are moistened with water before the printing begins, the degree of moisture differing according to the quality of the paper, the proper degree being determined by the judgement of the printer. 'Masa' paper, for instance, on which the progressive proofs of one of the pictures (*Inaka Genji*) are printed, should be very slightly moistened by means of a brush. Experiment has shown the amount of moisture in this case to be 13.86 percent. A single wet sheet is put between every three or four dry sheets, until a suitable layer is formed, which is pressed between two wooden press-boards. When all the sheets have the proper degree of moisture they are ready for printing.

As the printing on this moist paper is done with water colors, it can be well done only by an experienced printer. The following points are to be noted: first, the paper should rather be under- than over-moistened. If it is over-moistened the water colors will spread beyond their limits.

Fig. 4 Japanese wood-cutter at work. (From a drawing from life by a Japanese artist.)

If the paper dries during the progress of the work, wet sheets are put between the sheets to be printed, and the heap is allowed to lie until the proper degree of moisture has been obtained. If the paper is thick and strong it should be slightly moistened from the back by means of a brush. Second, great care must be taken not to put an excessive quantity of color on the plank. Rice paste serves well to prevent the water colors from spreading, and it ought to be used for every impression.

The printed sheets, in the interval between two printings, are laid on top of one another, to the number of many hundred sheets. If the water colors have been properly applied there is no fear of offsetting on the backs of the sheets.

A backing sheet is not generally used, but if it is desired to avoid all traces of the 'baren' on the back of the printed sheets, a sheet of thin paper is used for backing.

VIII. PRINTING ON SILK. Silk is occasionally used for printing instead of paper, and one of the specimens sent to the U.S. National Museum is on this material. It is usually found necessary to mount the silk on paper, but some experts can print without this device. The silk on which one of the impressions of *Nandina domestica* is printed [in 33 colors] was mounted on paper, but only along the edge which was laid against the registering marks. When the printing was finished this edge was trimmed off.

IX. PIGMENTS AND VEHICLES USED FOR PRINTING. Five colors or pigments only [black, white, red, yellow, blue] are generally used for the most characteristic Japanese printing, such as the picture called *Inaka Genji* sent to the U.S. National Museum (fig. 5). They are all mixed with the necessary quantity of water when about to be used, and the various hues, shades, and tints required are obtained by mixing the proper pigments together [before printing, not through overprinting]. These pigments, of which samples were sent to the U.S. National Museum, are the following:

a. Black, 'tsūke-zumi', is generally prepared by macerating Japanese ink (a kind of India ink) in water for a few days, until the glue contained in it is dissolved and the ink is sufficiently softened. It is then ground by means of pestle and mortar. As, however, the 'tsūke-zumi' so made is very liable to deterioration, a sample of a lampblack obtained from a Japanese ink macerated in water so as to remove the glue was sent to the U.S. National Museum. Consequently, when this lampblack is to be used, and after it has been mixed with water, glue solution or rice paste (according to the judgement of the printer) will have to be added. If glue solution is used, it should be mixed with the lampblack in a basin, but if rice paste is used, that is mixed with the pigment on the plank itself by means of the brush.

b. White, 'tō-no-tsuchi', is white lead. It is used either alone, for prints of flowers, birds, etc., or mixed with other colors, if light tints or body colors are wanted.

c. Red, 'yō-kō', a kind of scarlet (imported), probably carmine. Formerly the best kind of safflower, called 'ki-jō-mi', was used, but on account of its present high price the use of 'yō-kō' has become quite popular.

d. Blue, 'bero-ai', is Prussian blue. Formerly 'ai-rō' paste, obtained by extraction from blue threads or rags

Fig. 5 *Inaka Genji* by Kuniteru, progressive proof no. 16 of the third (left) sheet of the triptych. Vertical ōban, 14×10 inches. (Smithsonian Institution.)

Fig. 6 *Nandina Domestica* by Chinzan. Vertical chūban, 10×6 inches. (Smithsonian Institution, Division of Graphic Arts.)

dyed with indigo, or from 'ai-gami', a paper saturated with indigo, was used. But since the introduction of Prussian blue from Europe its use has become quite general.

e. Yellow, 'ki-wō', is orpiment. Formerly 'zumi', extracted from a particular yellow wood; turmeric, 'wukon-ko'; and a yellow ocher, 'wo-do', were used, but orpiment has now taken their place.

For mixing these colors water only is used, but never any sizing such as glue, except with lampblack, as stated before. A small quantity of rice paste is, however, mixed with the colors on the block or plank when color prints are to be made.

By mixing these pigments the various hues desired can be obtained, but the results will be as bright as those shown in *Inaka Genji* only in the hands of a skilled workman. There is, however, no particular method of producing these colors; the result depends entirely on the practical experience of the printer, who can judge the exact proportions of the pigments to be mixed, without using either balances or measuring glass, and who does the mixing either in his color dishes or upon the blocks themselves. Rice paste gives a peculiar luster to the colors, and much of their beauty depends upon the time and care devoted to grinding them with water. It is a fact well known to Japanese printers that skilled hands produce much finer colors with the same pigments than unskilled hands.

There is a brilliant purple in *Inaka Genji* which has been taken for an aniline color, although no aniline color has been used in the printing of this picture. The color in question was obtained by boiling a certain quantity of red (scarlet) and blue (Prussian blue), such as those just described, with water, and with proper treatment a bright purple can be obtained, almost the same as an aniline purple. This latter purple, however, has now come more generally into use, owing to the ease with which it can be managed.

A brown color, formerly made by mixing red, yellow and black, has now also been replaced by 'bengara', which is a kind of red ocher.

The pigments used for printing *Nandina domestica* (fig. 6) are quite different from those so far spoken of, but the method of using them is the same. Following is a description of these pigments:

a. Black, 'sumi', the best kind of India ink made in China or Japan (the particular place is Nara). It is prepared for use by rubbing it with water upon the surface of a stone vessel called 'suzuri', familiar to every Japanese.

b. White, 'gofun', calcium carbonate [white chalk]. For use it is put in a color dish, and a few drops of glue solution are added. It is then rubbed with the finger in contact with the dish, until it becomes a wet mass and somewhat pasty. A little glue solution is again added, and the rubbing repeated, and so on several times. When the mass has become sufficiently pasty to be made into a pudding, it is beaten several times against a plank, and then reduced to thin paste by diluting with water.

c. Pink, 'shō-yen-ji'. This is apparently cochineal, but its chemical nature has not yet been ascertained. It is imported from China, in the form of cotton felt dyed red. To prepare it for use, this felt is put into water and gently pressed. The resulting pink water is poured into a color dish and evaporated nearly to dryness in a water bath or over a very slow fire, care being taken not to let it dry completely, as otherwise its brilliancy would be destroyed. It is then kept in a cool place, and protected from dust by putting a cover on the dish or by placing it upside down in a box.

d. Blue, 'ai-bō', a dark blue, hard stick made of indigo. For use it is ground like 'sumi' in a color dish with a few drops of glue solution. When a sufficiently deep blue color has been obtained, it is well rubbed with the finger in contact with the dish, and then evaporated to dryness over a slow fire. A few drops of water are now added, the dish is again placed over a slow fire, the rubbing with the finger gone through with as before, and water is added gradually, until the proper shade of color has been obtained. If these directions are not strictly followed, the pigment is not well diffused in the water, and the resulting color, as a matter of course, is not satisfactory. The treatment of the pigments *gofun, shō-yen-ji, ai-bō*, etc., requires great caution, and the Japanese printers and painters consider it one of the difficulties of their art.

e. Yellow, 'shi-ō'. This is gamboge and is imported. For use it is diffused in water, and no glue whatever is added.

f. Brown, 'tai-sha-bō', a hard brown stick made of a red ocher. For use it is treated exactly like 'ai-bō'.

g. Red, 'shu', vermilion. For use it is well mixed with a few drops of glue solution, ground thoroughly with the finger, and then diluted with water to the proper consistency.

The following pigments are also used in printing, and samples of them have been sent to the U.S. National Museum:

Red, 'ki-jō-mi', safflower. This color, in solution, is very apt to suffer on exposure to sunlight, and the bottle in which it is sent is, therefore, wrapped up in black paper. After it has dried on the paper, it is not so fugitive as to make it undesirable for printing.

Red ocher, 'ben-gara'.

Turmeric, 'wakon-ko'.

Yellow ocher, 'wō-do'.

Yellow, 'zumi', extract from a particular yellow wood.

Blue, 'ai-gami'. Paper saturated with a solution of indigo.

Blue, 'ai-rō'. Indigo paste.

Of the vehicles used by the printer in the manipulation of his colors, the following is to be said:

Glue solution. The strength of this solution differs according to the different pigments, printing papers, silks, etc., to be used. About one-third of an ounce of glue to about three-fourths of a pint of water is, however, an approximate proportion.

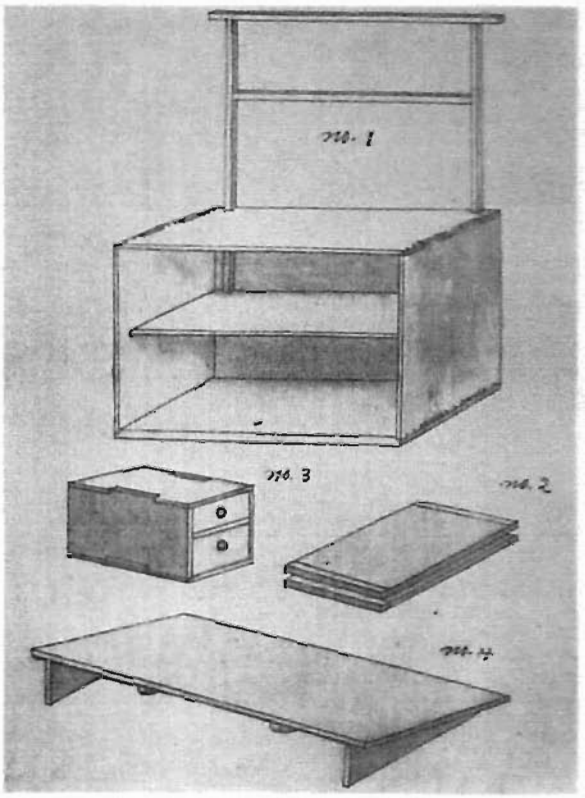

Fig. 7 Tools and appliances used by Japanese woodcut printers. Nos. 1–4. (From a drawing by a Japanese artist.)

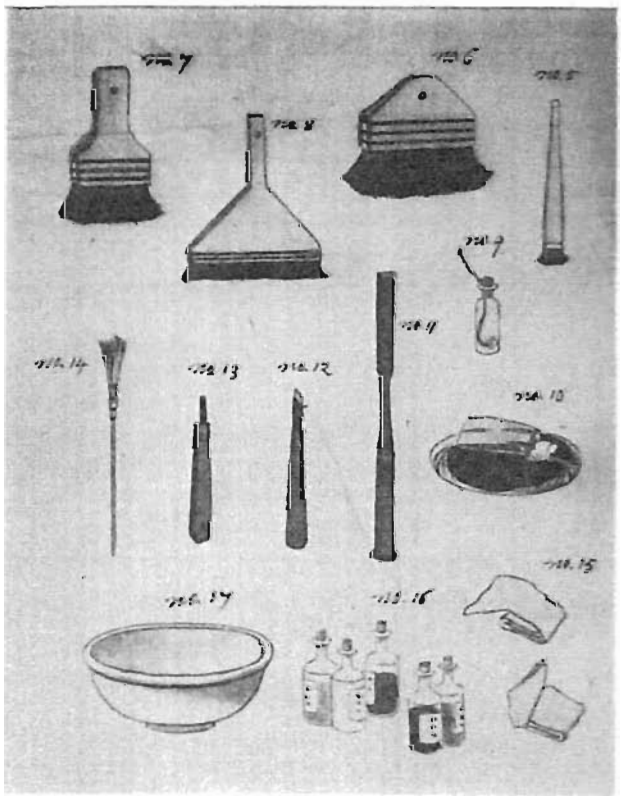

Fig. 8 Tools used by Japanese woodcut printers. Nos. 5–17. (From a drawing by a Japanese artist.)

few drops of glue solution, ground thoroughly with the

Fig. 9 Japanese woodcut printer at work. (From a drawing from life by a Japanese artist.)

Rice paste. This is used for both of the classes of pigments described. It is made by boiling rice flour with a certain quantity of water, and is kept in a suitable vessel. Newly made paste is preferable; old and rotten paste should not be used. The pigment to be used is put on the block or plank, and some of the paste is then added, care being taken to mix the two well and evenly by means of a brush. If the printing brushes are not charged with this paste, the brilliancy of the colors is much lessened.

X. THE TOOLS OF THE PRINTER. The use of these tools will be understood from the examination of fig. 7 (nos. 1–4), fig. 8 (nos. 5–17), and fig. 9, in connection with the following explanations:

1 Box, for keeping all the tools and materials required for printing. The rack on top is used to hang the brushes on, and can be removed and packed in the box. The paper is kept on the shelf, so as to prevent its drying and being carried away by the draft. The colors are placed into the lower compartment. The box serves to keep the dust and dirt from the papers and the colors.

2 Boards, for pressing wet paper.

3 Small box, for keeping colors, color dishes, etc. This is stored in the box no. 1 when not in use.

4 Printing table, which, when not in use, serves to close the front of box no. 1.

5–7 Brushes, for charging the cut planks with the printing colors, one particular brush being used for each color. When not in use, they are hung on the rack on top of box no. 1.

8 Brush, for wetting paper.

9 Oil of Sesamum orientale, contained in a bottle. (See no. 10.)

10 Baren, a little shield which answers the purposes of the European press. After the sheet has been laid down on the plank charged with color it is rubbed on the back with the 'baren', so as to make it take the impression. The face of the 'baren' in contact with the paper is occasionally rubbed with oil of *Sesamum orientale*.

11–13 Chisels and a knife, used to correct the registering marks, if that should be necessary.

14 Agitator, for mixing colors in the basin, no. 17.

15 Pads of cotton cloth, to be placed under the four corners of the planks, while printing, to keep them from moving.

16 The five dry colors described above as used in the printing of *Inaka Genji*, put up in bottles.

17 Basin, for mixing colors.

XI. THE PRINTER AND PRINTING. The method of taking impressions is illustrated in fig. 9. The printer seats himself and arranges all the tools and materials required, in good order, as shown. The plank to be printed is placed on the printer's table, A, and the required color is laid on with the brush, B. The paper being ready for printing, and having been placed upon the shelf, C, of the box, D, a sheet of it is laid down upon the plank, and is rubbed lightly with the 'baren', E. The printed sheet is then placed on a board which rests upon the box, F, used for keeping colors, color dishes, etc., and when the required number of sheets has been printed, they are put back on the shelf, C. Another plank is now taken, the second impression is made upon the sheets bearing the first, and this is followed by the third, fourth, etc., until the printing is completed.

Charging the block with color. ['Inking' the block.] As before stated, the pigment to be used is put on the block or plank, and some rice paste is then sprinkled upon it. It is well, also, to soak the brush properly with this paste, so as to mix it thoroughly with the pigment. This increases the brilliancy of the colors and also fixes them more completely. [All the gradations from light to dark seen in Japanese color-prints are the result of the printer's brush used on the block, assisted sometimes, it is said, by wiping with the finger. SRK.]

Dry impression. [Embossing.] There is a special kind of printing, called 'dry impression'. This is used when it is desired to represent designs of the same color as the ground, but differing in brilliancy. It is executed after the printing has been finished, and the paper has become quite dry. The sheet is then laid upon a plank specially cut for the purpose, but not charged with color, and is rubbed with the 'baren'. [Some progressive proofs sent to the U.S. National Museum show, however, that this embossing is occasionally done before the printing is finished. SRK.]

The 'baren' and the method of using it. The 'baren' (see fig. 10, nos. *a–d*) is a little hard shield, *d*, consisting of a stiff disk, *a*, made of layers of paper pasted together, and turned up at the edge so as to form a very shallow receptacle, and covered with cotton cloth on the outside. A second disk, *b*, formed of twisted cord, fits into this shallow receptacle, and is held in place by the bamboo sheath, *c*, made of the ribbed leaf of the bamboo, which is drawn tightly over it and twisted together on the back, so

as to form a handle. This latter is made more convenient for the hand to grasp it by a strip of paper wound around it and so arranged as to assume the shape of a rectangular pad. [This description is based upon the object itself, rather than upon Mr. Tokuno's notes. SRK.] The reason why it is made so hard, besides making the filling of twisted cord, is to prevent its bending during use. Moreover, if it were not so hard and rigid, the full stretching of the bamboo sheath would be impossible. The ribbed surface of the bamboo serves not only to get a sharper impression, by limiting the contact to the ribs, but it also prevents the adhesion of the wet paper to the 'baren', which would occur, to the spoiling of the paper, if the covering were smooth. The contacting surface should be applied only to those parts of the plank which have been left standing in relief. If this precaution is neglected, there is the possibility of smearing from the depressed parts of the block.

The direction in the movement of the 'baren' should be zigzag, but if a very small and isolated part of the design is to be printed, it is better to give a lighter rub with the edge of the instrument. In fig. 11 the dotted line shows the direction of the 'baren', while the solid curved lines mark the outlines of the design. The ribs of the bamboo sheath should be kept as nearly as possible at a right angle to the direction of the 'baren'.

Smearing from the depressions of the block. As the depressions of the cut plank – that is to say, those parts which have been cut away between the lines and masses of the design – are rather shallow, and at the same time in many cases quite extensive, it would seem almost impossible to prevent the sinking of the sheet into the depressions and taking the color in those places, more especially when the method of applying the printing color with a brush is considered, which makes it impossible to keep the depressions clean. Experienced printers, nevertheless, work without fear of smearing, and no special precautions are used to guard against it.

Registering. As each color requires a separate cut, each plank must have certain fixed marks [registering marks], so that all the sheets may be laid down in exactly the same position, to insure the fitting of each color upon the others. No mechanical means whatever are used, either in placing the sheet, or for holding it in position after it has been placed. The Japanese printer, in these matters as in all others, depends simply upon experience. The registering marks on the block or plank consist of a rectangular notch ⌐ at the right and a straight notch ——— at the left.

General remarks about printing. The printing may differ in quality, but the method employed is always about the same. The printing of a picture like *Nandina domestica* [which is an imitation of a watercolor painting without outlines] requires, of course, greater skill than the printing of *Inaka Genji* [which is a drawing in outlines, with color washes]. The aim in this case is to produce impressions which an inexperienced eye can hardly distinguish from the original. But there is no special way of treating either class of prints. The difference between the best and the less good is due entirely to the skill of the printer in producing the various hues, tints, and shades with printing brushes in precisely the same way as the water-color painter. This holds good also of the engraver. The arts of engraving and of printing are practiced in Japan according to the dictates of experience, with no, or at the most but very slight, mechanical assistance.

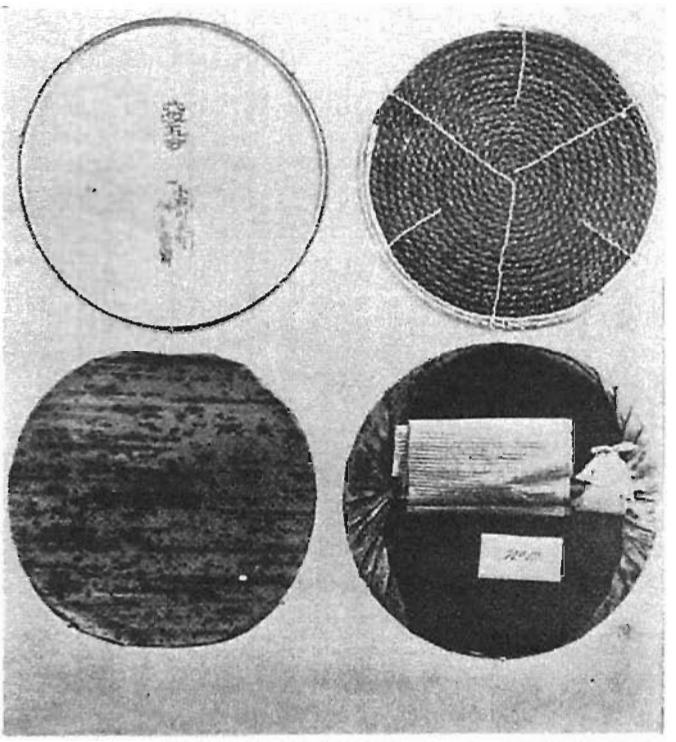

Fig. 10 The *baren* and its parts. Nos. *a–d*. (Smithsonian Institution, Division of Graphic Arts.)

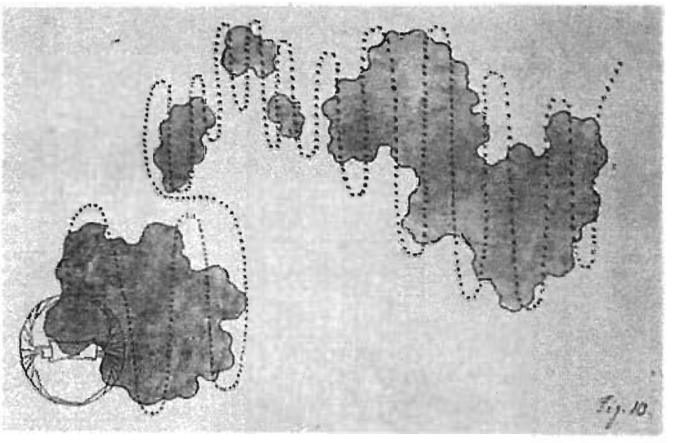

Fig. 11 Method of using the *baren*. (From a drawing by a Japanese artist.)

XII. COST OF DESIGN, ENGRAVING, AND PRINTING. The original design of *Inaka Genji*, by Kuniteru, called also Ichiyūsai, cost 10 yen (about $7.60).

The engraving by Kōkichirō Morikawa cost 16 yen (about $12.30) and took about seven days in the doing.

The printer of *Inaka Genji*, Tsurūsaburō Nakamura, received 70 sen (about 54 cents) per day. He printed

3,000 sheets per day from the black block, and 700–800 sheets per day from the color blocks.

[The three prints of the triptych required respectively: the first – 25 impressions, from 14 printing surfaces, on 8 planks; the second – 26 impressions, from 10 printing surfaces, on 6 planks; the third – 23 impressions, from 13 printing surfaces, on 7 planks. It is apparent that the same printing surface needs to be used more than once on the same picture. PM.]

The original design of *Nandina domestica*, by Tsubaki Chinzan, also cost 10 yen (about $7.60).

The engraving by Kōtarō Kido cost 8.4 yen (about $6.38) and took about seven days in the doing. [There are 33 printings, but the number of blocks used is not stated. SRK.]

The printer of *Nandina domestica*, Iwakachi Yamamoto, received one yen (about 76 cents) per day. He finished about 200 sheets per week.

The people engaged in home industries do not generally take a rest on Sunday. The week, therefore, has seven days of about eight hours each. As *Nandina domestica* has 33 printings, two hundred finished sheets are equal to 6,600 impressions per week, or 943 per day. The numbers differ, however, according to the different nature of the blocks. Of the easiest, for instance, such as a uniform green for the leaves, 1,200 to 1,800 sheets can be printed in a day, while of the most difficult ones, such as those giving the half-tints in the fruit, only 600–700 sheets can be printed.

NOTES BY THE EDITOR

Appended to Tokuno's original text was an extensive commentary by S. R. Koehler, concerned almost entirely with comparing Japanese and European woodcut techniques. In the present case, Tokuno's description remains intact, except that one section has been rearranged, and some words have been changed to agree with modern spelling. (Color names, however, have been left exactly as Tokuno gave them, since there is still some controversy about which names apply to which pigments.) Three minor illustrations have been replaced with new ones.

Only a fraction of the original correspondence has been recovered in the files of the Smithsonian Institution.[2] These papers indicate that Mr. Koehler requested tools and materials relating to Japanese woodcuts from the Japanese government and also asked for a description of the techniques employed. The Smithsonian was, and remains today, one of the few museums with a special interest in the techniques of printmaking. Mr. Tokuno (whose personal name is not known) supplied both the materials and the text in 1889. The objects remain today in the Smithsonian and are on display in its Hall of Graphic Arts in the National Museum of American History. A comprehensive collection of American printing materials was sent to Japan in return. It might make an interesting study itself, if it could be located today.

It is clear that the two color-print subjects, *Inaka Genji* and *Nandina domestica*, were made at the same time as the description. There are complete series of progressive proofs for both prints and a complete set of woodblocks for Kuniteru's triptych in the Smithsonian collection. Together, the description and the materials form a time capsule. Shortly thereafter, the production of color woodblock prints ceased entirely in Japan, not to be revived until well into the Taishō period, perhaps twenty years later.

Tokuno's account is by far the most complete to have been made before the cessation of woodblock printing. To place it in perspective, we must consider the few other primary sources. Yoshino Sakakibara's *Bungei ryūsan* was published in 1878. Though being mostly a study of Japanese literature, it contained a chapter on the processes of printing and woodcutting. This chapter was translated by the eminent Mr. Hogitarō Inada. His typescript is in the library of the Victoria and Albert Museum.[3] Its text is about one-fifth the length of Tokuno's. There is no serious disagreement between the two descriptions. It is, of course, quite possible that Tokuno was familiar with *Bungei ryūsan*. Tokuno's text, however, multiplies many times the detail given in the earlier source.

Edward S. Morse made a brief observation of woodcutters at work. In his diary for 1879, published first in 1917, he wrote (in full): "The wood engravers are interesting to watch, to see the rapidity with which they slash away, cutting on the side of the grain and not on the end as with us . . . Most of the books are printed from blocks the size of the page. The copyist writes the page on thin, translucent paper, which is pasted face down on the block, thus reversing the characters which show through. The engraver with quick movements of the hand cuts through the paper and into the wood with a sharp-pointed knife, which is clutched in the hand and drawn inward. After the

outlines of the characters have been engraved, gouges are used to remove the intervening wood. In one small room opening on the street were seven engravers at work, four in one row and three in a row just behind. These men sat in the usual manner on the floor before tables a foot high, working away with people watching them and often getting in their light."[4] This is the only firsthand account by a Westerner that I have found before 1890. It supports Tokuno's description in every respect.

Much later, in the 1920s, Ishii Kendō talked with retired blockcutters and printers, giving their recollections of the printmaking process in *Nishiki-e no hori to suri.*[5] This was the main source used by Hirano in her classic account of the process.[6]

S. R. Koehler cites in his notes to Tokuno a prior account by Brinckmann.[7] Brinckmann was familiar with Sakakibara's book, but adds nothing to it. Binyon and Sexton also give a brief account of an interview with an old printer.[8]

It is clear, however, that of the contemporary sources (before 1890), Tokuno's is by far the most detailed account of Japanese printmaking. Since its 1893 publication, however, in a place not usually known to students of the Japanese print, its use has been sporadic. Edward Strange gave it more attention than other authors.[9] William Anderson also acknowledged it as an important source.[10] The English artist F. Morley Fletcher made good use of it in his re-creation of the Japanese techniques in the 1910s.[11] Some later authors, such as Shibui, Seidlitz, Turk, and Lane have listed it in their bibliographies.[12] Others, notably Hirano and Volker, seem to have been unaware of it.[13]

Some aspects of Tokuno's account are part of today's 'general knowledge' of Japanese techniques. Others have largely been forgotten or are still a matter of controversy. These points deserve renewed attention, keeping in mind that the writer Tokuno was professionally knowledgeable about the entire process and described what he actually saw.

I. The use of box and catalpa wood in addition to cherry is sometimes neglected today, although Turk (pp. 62–68) compares the carving quality of the three woods. The perfectly smooth planing of the plank faces seems to contradict the 'hewing' described by Hirano (p. 35). Blocks that I have seen appear to support Tokuno's description. It is clear that strips were attached to the key blocks (and not the color blocks) for many more reasons than simply the prevention of warping.

II. A most interesting observation is that one and only one knife was used for every different kind of outline cutting on the blocks. (In the Edo period, it is implied, the same knife was also used for clearing the wood between the relief areas.) The block-cutter must indeed have had great skill to accomplish such a variety of work with a single tool.

The use of three whetstones is an interesting feature. It was probably made necessary by the lack of a true hardstone in the volcanic geology of Japan. Tokuno's description here can perhaps be clarified by explaining that: no. 21 was used for the first or rough stage of sharpening the tools; no. 20 was for the second or fine stage; and no. 19 was for smoothing off the surface of the fine stone (no. 20). Oil was apparently not used on the whetstones. The use of sesame oil to soften the plank before cutting, however, is a significant point.

III. It should be noted that the *minogami* and *gampishi* used for the drawing and the transfer proofs are very thin and translucent papers compared to those used for the regular printing.

IV. Tokuno shows, as no other author does, the intention of the woodcutter to duplicate the artist's brushstrokes, even moving his knife in the same direction as the brush. This applies more, of course, to Shijō-style prints, such as the *Nandina domestica* than it does to most ukiyo-e prints.

V. The drawing illustrated was made from life by a Japanese artist (name unknown). The positions of the block-cutter and the printer were reproduced by mannequins for the present Smithsonian exhibit (fig. 1).

VI. This is an interesting and unique discussion of the differences between the 'ancient' (i.e. Edo period) style of block-cutting and the 'modern' (Meiji period) style.

VII. It is worth noting that only *masa* paper, among the three named by Tokuno, was traditionally used for ukiyo-e prints, such as the *Inaka Genji* triptych.[14] I can only presume that the 'Imperial Japanese' paper was the functional equivalent of *hōsho*, which was generally favored over *masa* during the Edo period. The careful moistening of the paper before printing explains the delicate balance achieved in woodblock printing between brilliance of color and a lack of spreading. This section also explains why many fine prints have no trace of the *baren* on the back of the sheet.

VIII. This short section describes a Meiji procedure of little interest.

IX. Tokuno names first the colors used for *Inaka Genji*. They are (except the black) imported colors used in Meiji times. For red, blue, and yellow, he also gives the names (and samples) of pigments used in earlier eras. An entirely different group of pigments is then described for *Nandina domestica*, some of which are also imported. The whole subject of pigments used in Japanese prints deserves much greater study, to which this information can contribute.

The fact that each inking of the block was a two-step process is not widely known. Tokuno says that the pigment was applied to the block before rice paste was brushed on. This statement is in contradiction to Strange's assertion that the paste came first.[15] Inada's translation of Sakakibara, however, which Strange cites as his source, does not say which came first. Further, Tokuno mentions the use of either rice paste or glue solution as a medium for lampblack (*tsūke-zumi*), but he does not state the reasons for choosing one or the other. Sakakibara, however, supplies the missing information. He states that glue is used when a glossy surface is required for details such as women's hair or lacquer utensils.

It is amusing to note the length Tokuno takes to deny the use of aniline purple in *Inaka Genji*. Apparently Westerners' antipathy to this color was already well-known in Japan.

X. The printer's box and tools described in this section

are also in the Smithsonian exhibit today.

XI. The construction of the *baren* is worthy of particular attention. Fig. 11 shows the specimens in the Smithsonian collection. These may be the only surviving examples of *baren* dating from the original period of Japanese print production. (Early examples of printing equipment were given to the Rijksmuseum voor Volkenkunde, Leiden, in 1905, and to the Victoria and Albert Museum, London, in 1909, by the Japanese government.) Koehler was particularly interested in how the printer avoided smearing – accidental printing of color from the depressed area of the block. He questioned Tokuno closely on this point, and Tokuno's reply is part of the text as given here.

XII. With a little effort we can translate the cost figures for 1889 into present-day terms. Various multipliers have been given for the effect of inflation over a span of a hundred years. If, however, we take a factor of ten for dollars (more for yen, of course), we discover the cost of the two print subjects in today's money to be:

Inaka Genji (*ōban triptych*) – *200 sets*		
Artist (Kuniteru)	$76	(17,000 yen)
Wood-cutter (Morikawa)	$123	(27,000 yen) – 20 days – 37 blocks
Printer (Nakamura)	$108	(24,000 yen) – 20 days – 14,800 impressions
Nandina domestica (*chūban*) – *200 prints*		
Artist (Chinzan)	$76	(17,000 yen)
Wood-cutter (Kido)	$64	(14,000 yen) – 7 days – est. 16 blocks
Printer (Yamamoto)	$53	(12,000 yen) – 7 days – est. 16 blocks
Printer (Yamamoto)	$53	(12,000 yen) – 7 days – 6,600 impressions

Koehler was skeptical about the speed of both the wood-cutting and the printing. He wrote: "The short time spent in cutting the 37 planks needed for *Inaka Genji*, i.e. twenty days, is astonishing enough in spite of the simplicity of the blocks, but our astonishment increases to wonder when we read of the number of impressions made per day by the Japanese printers. As I feared a misunderstanding on my part of the figures given by Mr. Tokuno, I asked him to consider my interpretation, and in reply the original figures were confirmed." We should realize, too, that Koehler was familiar with a printing trade in which 250 impressions a day was considered a good production from a handpress in either lithography or letterpress. A production four times as great, with no press used at all, was almost incomprehensible.

NOTES

1 Tokuno, T., "Japanese wood-cutting and wood-cut printing", edited by S. R. Koehler, *Report of the United States National Museum of 1892*. Washington 1893, pp. 221–244, plates IV–XIII. Reissued as a pamphlet, 1894.

2 Correspondence and inter-office memoranda in the Smithsonian Institution Archives, provided with the kind assistance of Dr. Elizabeth Harris, Curator of Graphic Arts, Smithsonian Institution, who also provided the photographs for most of the illustrations. I am most grateful to her.

3 A three-page typescript in the library of the Victoria and Albert Museum, London, was provided with the kind assistance of Joe V. Earle, Assistant Keeper, Far Eastern Department, who searched 'high and low' for it. The information was quoted extensively in Edward F. Strange, *Tools and materials illustrating the Japanese method of colour-printing*. London (Victoria and Albert Museum) 1924.

4 Morse, Edward S., *Japan day by day: 1877, 1878–79, 1882–83*. New York 1917, pp. 265–266, reprinted Dunwoody, Georgia, 1978.

5 Ishii, Kendō, *Nishiki-e no hori to suri* (The engraving and printing of color woodblock prints). Tokyo and Kyoto (Unsōdō) 1929, reprinted Tokyo (Geisōdō) 1965. I am most grateful to Mr. Roger Keyes for his help in finding and interpreting this source.

6 Hirano, Chie, *Kiyonaga: A study of his life and works*. Boston (Museum of Fine Arts) 1939, pp. 33–41.

7 Brinckmann, Justus, *Kunst und Handwerk in Japan*. Berlin 1889. Another early Western study (not mentioned by Koehler) is Louis Gonse, *L'Art japonais*. Paris 1886, pp. 320–323, which contains no useful information on technique. Another early study (which I have not seen) is Audsley, G. A., *The ornamental arts of Japan*. 2 vols., London 1882, ref. vol. 1, pp. 36–41.

8 Binyon, Laurence and Sexton, J. J. O'Brien, *Japanese colour prints*. London (Ernest Benn) 1923, p. 60; reprinted Boston 1960, etc.

9 Strange, Edward F., *Japanese illustration*. London (Bell & Sons) 1897, pp. 118–124; also *Japanese colour prints*. London (Victoria and Albert Museum) 1904, p. 115.

10 Anderson, William, *Japanese wood engravings*. London (Seeley & Co.) 1895, pp. 62–71, and two illustrations from Tokuno. Also the 1908 edition, pp. 160–199.

11 Fletcher, F. Morley, *Wood-block printing*. London (Pitman & Sons) 1916, pp. 1–8.

12 Shibui, K., "Ukiyo-e bibliography", *Ukiyo-ye no kenkyu*, vol. 6, no. 1 (June 1928), nos. 129–130. Seidlitz, W. von, *A history of Japanese colour-prints*. London (Heinemann) 1920. Turk, F. A., *The prints of Japan*. New York (October House) 1966. Lane, Richard, *Images from the floating world*. New York (Putnam) 1978.

13 Hirano, op.cit.; Volker, T., *Ukiyoe quartet*. Leiden 1949.

14 As cited by Hirano, op.cit., pp. 37–38.

15 Strange, *Tools*, op.cit., p. 16.