



De Magick Mirrour
of Old Japan

BY SILVANUS P. THOMPSON,
Magnetizer to the Sette of Odd Volumes

N^o XXX
PRIVATELY PRINTED OPUSCULA
ISSUED TO THE MEMBERS OF THE
SETTE OF ODD VOLUMES

1893

Downloaded from <https://www.holybooks.com>



CARL
W
JONES



PRIVATELY PRINTED OPUSCULA

ISSUED TO MEMBERS OF

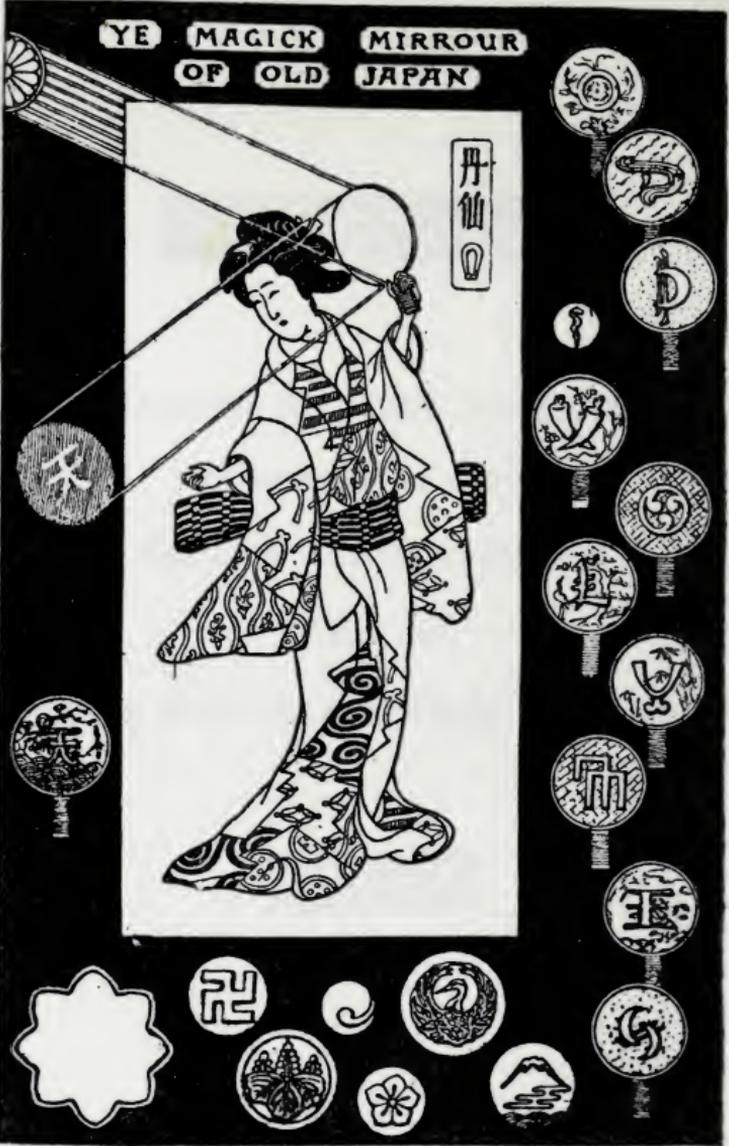
THE SETTE OF ODD VOLUMES.

No. XXX.

Y^E MAGICK MIRROR OF OLD JAPAN.



YE MAGICK MIRROR
OF OLD JAPAN



The Magick Mirrour of Old Japan

BY

SILVANUS P. THOMPSON, D.Sc., F.R.S.

Magnetizer to the Sette of
Odd Volumes

A DISCOURSE DELIVERED AT A MEETING OF THE
SETTE HOLDEN AT LIMMER'S HOTEL, ON
FRIDAY, DECEMBER 2, 1892



LONDON

Imprinted for the Author at the Chiswick
Press ; and to be had of no Booksellers

CIO IO CCC XC III

Night's Robe to-night with Orient Sorcery gleams—
Say: "Magick Mirrour!" murmur: "Old Japan!"
Each Sound's a Spell, each Word a Talisman,
And we but Dreamers in a World of Dreams.

J. T.



DEDICATED TO
THE UNITED SETTE
BY
THEIR
MAGNETIZER.



This Edition is limited to 97 copies, and is
imprinted for private circulation only.

No. 8.

Presented unto

The Alchymist

by

The Magnetizer.



THE HISTORY OF THE

REIGN OF

CHARLES THE FIRST

BY

JOHN BURNET

OF

OXFORD

IN TWO VOLUMES



PLATE I.



Y^E MAGICK MIRROUR OF
OLD JAPAN.

IN old Japan the mirror occupies a peculiarly important place. Travellers in that land of strange arts and quaint customs tell us of mirror-worship as one of its forms of primitive religion. In old Japan the mirror is not, as in our Western civilization, a mere article of furniture, an accessory of the toilet, or a means for covering up the otherwise undecorate breadth of wall above a mantel-piece. One finds the mirror in Japan surrounded with pomp and circumstance on every hand. It is prominent amongst the symbolic objects that constitute the imperial regalia of the Shogun. One sees it depicted in Japanese

pictures of the infernal regions. In the temples of the old Shinto religion, precious old mirrors are enshrined in costly arks, only to be exhibited on the occasion of some great ceremony. Innumerable mirrors, some of them of old date, but mostly of modern manufacture, are to be found hung upon the walls of the Shinto temples. There they have been deposited as votive offerings by women who had perhaps nought else so precious to offer. As the Japanese warrior offers as a votive gift to the temple his cherished sword, so the Japanese lady bestows her treasured mirror. There they hang in thousands, swords and mirrors, side by side, thank-offerings to the gods. In the scant furniture of the Japanese *ménage*, the mirror, reposing in its place upon the lady's toilet-table, forms the one significant object; the central feature to suit which all the rest is subordinated. The mirror enters into the myths of the Japanese race: it is the emblem of light, or the sun, and of the divine right of the dynasty. In the trousseau of the bride the mirror is the most precious object—her one cherished possession. The first-made mirror—or the one

held to be such in the estimation of the Japanese, and venerated accordingly—is enshrined in the great sacred twin-palace at Isé, the holy spot to which pious pilgrims turn their steps with devoted zeal. Its origin is related in the famous myth of the sun-goddess, Amaterasu oho-mikami, who, on one occasion, withdrew offended to a rocky cavern, leaving the world in darkness. From this retreat she was enticed by the other gods, after many curious artifices had been tried, by their successful making of a mirror, in which seeing her face reflected, she was impelled by jealousy and curiosity to venture forth. This mirror was fashioned by the Vulcan of the Shinto Olympus to imitate the sun, being in shape a disk with eight rays. In modern Japanese heraldry the sun, as blazoned upon the national flag, is a red orb with sixteen red rays, not pointed as in European heraldry, but widening out to the margin of the flag. Some hold that the Japanese imperial crest, the *kiku*, which resembles a flower with sixteen petals joined and rounded at the outer extremities, and issuing from a small central disk, is also a blazon of the sun; others hold it to

represent the chrysanthemum. In Japanese pictures of the sun-goddess myth, the mirror is always represented as of the eight-point form. Tradition states that the flaw still to be seen in its surface was caused by a blow it received when the gods thrust it into the half-opened doorway of the rocky cavern as the sun-goddess peeped out. The standard version of the entire myth is to be found in a memoir on the Shinto Temples of Isé by Mr. Ernest Satow, in the second volume of the "Transactions of the Asiatic Society of Japan" (1873-74). In the British Museum, in Dr. Anderson's collection of Japanese drawings, No. 1905, there is a silk roll painted in colours, depicting the scene outside the cavern. It is without signature or seal, and the artist is unknown. A further myth narrates the subsequent history of the mirror. It was handed by the sun-goddess to her grandson Nini-gi no mikoto when he descended from heaven to subdue the earth, along with the sacred sword and the sacred seal-stone (the three sacred treasures of the Japanese regalia), with these words: "Look upon this mirror as my spirit: keep it

in the same house and on the same floor with yourself, and worship it as if you were worshipping my actual presence." Nini-gi no mikoto founded the empire of Japan, and is worshipped as the first Shogun, all subsequent sovereigns claiming divine right by descent from him. All mirrors in Shinto temples, whether exposed to view or concealed in shrines or arks, are imitations of this one, though some are regarded as being representative of other secondary deities. At Isé, where the first mirror is preserved, each mirror is enclosed in a box standing on a stand, and covered with a cloth of silk. The mirror is itself wrapped in a brocade bag, which is never opened or renewed, but which, when nearly worn out, is enclosed in a new bag. Over the numerous wrappings is a cage of wood with gold ornaments, draped with a curtain of coarse silk. At festivals, when they open the shrines, all that can be seen is the boxes with the coverings over them.

The mirror of old Japan is however a very different article from that known in modern Europe as a mirror. European mirrors are

made, as everyone knows, of glass silvered at the back. Japanese mirrors are invariably made of metal, the bronze employed being a compound of copper and tin, with traces of antimony or lead.¹ The mirrors preserved in the temples are not all of the eight-pointed form. Some are simply circular, with a thick rim behind, and a central button perforated to receive a suspending cord; the front being quite plane. Others are oval, with feet, or with perforated handles at the upper part for suspension. In the houses square mirrors are very rarely met with, and these are mostly small. Those for the lady's toilet table are usually circular, from four to five inches across, without handles, possessing a thick rim and a raised pattern on the back. Commonest of all are the hand-mirrors, which are usually circular, from three to eleven inches in diameter, with a metal handle covered with bamboo or with brocade. They are usually slightly convex on the front surface, which is brightly polished; while the back, which is for the

¹ For some analyses of the metal see Appendix IV.

most part unpolished, exhibits a fine raised pattern. Often the raised ornament consists of two distinct kinds. There is made in high relief, and polished bright so as to stand out from the background, a simple bold symbolic device, sometimes a Chinese character signifying "good-luck," or "long-life," sometimes a family crest, such as the imperial *kiri* (or Paullonia leaves and flowers), or a circlet, or three feathers crossed, or the jagged peak of Fuji-yama, or the outline of a bird. Ornament of the second kind is in low relief, and, though often symbolic, consists of naturalistic representations of trees, flowers, storks, bamboos, and the like. A group comprising pine-trees, storks, and the hairy-tailed tortoise, all symbols of longevity or immortality, is a favourite one. Sometimes the ornament consists exclusively of one or other of these kinds ; but more frequently both are present ; the unpolished low-relief work forming an artistic background for the crest or the Chinese letters, which stand out polished. In passing it may be remarked that the Japanese make use of Chinese characters in addition to their own form of writing,

just as we still use old English black-letters for ornamental or distinctive purposes.

But the most interesting thing about Japanese mirrors—the one thing that has made them famous and brought them to the notice of lovers of the curious and the occult—is their reputed *magical* property. Oriental stories of magic mirrors have been current from the middle ages, most of them wholly childish and absurd. But along with these there have existed accounts, of a more reliable character, of mirrors which are capable of reflecting, in a beam of light that falls on their face, the pattern which they carry on their back. This singular property is no myth, though the true explanation of the phenomenon was long unknown. When first seen, the phenomenon is so startling that it seems almost incredible. You take the mirror into your hand and examine it. Its face is slightly convex, perfectly polished, unless scratched by use or tarnished; and on looking into it you see only your own image, or the objects about you—not a hint or trace of the raised pattern at the back. Now hold up the mirror in direct sun-



PLATE II.

light, or in the path of a powerful beam of light from some artificial source, such as an electric lamp. It will reflect back the beam, and cast an illuminated patch on the wall or floor, just as any other mirror will do. But on examining this luminous patch you will at once observe—if your mirror is a good one—that the salient features, and sometimes even the fine details, of the pattern on the back are reproduced in the light reflected from the front. Some dozens of Japanese mirrors, most of them quite modern, have passed through the hands of the author for optical examination. Some of these failed to show any magical properties whatever. Others showed the property very well. Others again, which showed nothing at first, were found capable of being converted into magic mirrors by a course of treatment subsequently discovered.

Down to about 1845 these mirrors were excessively rare in Europe, though it is quite possible that they may have occasionally formed part of the stock-in-trade of mediæval conjurers and magicians. Amidst the mass of occult rubbish one may here and there discern

B

statements probably relating to the genuine phenomena exhibited by mirrors of the class in question, having little or nothing in common with the visions to be seen in crystal spheres, or beryls, or in pools of ink. Thus Gaspard Schott, both in his "Physica Curiosa" and in his book on Magic, refers to the Mirror of Pythagoras, in or on which he is said to have written in blood the things which he wished to signify, and which, when turned to the moon, displayed upon the disk of the moon, visibly to one standing behind, the things so inscribed. The "disk of the moon" here referred to may have been simply the luminous patch cast by the reflected moonbeam.

Again, it is stated that the Italian historian, Muratori, makes two references to magic mirrors, one in the possession of Bishop Bartolomeo of Verona, who was murdered by Mastino della Scala in 1338; the other found in the house of Cola di Rienzo (or Rienzi), which had upon its back the word "Fiorone." Not having been able to verify the statement from literature available in the British Museum, I am in doubt about the last case. It is much

more likely that the mirror bore on its back a large flower, than that it bore the word meaning a large flower.

Except for obscure references such as these, there is no record of real magic mirrors prior to 1832. Yet a few did undoubtedly exist. There were some in the collection of the royal family of Savoy at Turin, which were later examined by Professor Govi. There was one reputed to be magical in Berlin. The great Von Humboldt thought it worth his while, in 1830, to bring this mirror to Paris to show it to his *confrères* of the *Académie des Sciences*; but having brought it, found himself unable to show anything. In 1842 several mirrors were brought from Nankin by Admiral Mouchez (commander of "La Favorite"), M. Arosa, and M. Piou. One was in the possession of the Marquis La Grange in 1847.

With the opening of Japan to the commercial world, in 1867, came the export of mirrors amongst other articles of metal-work; amongst them some that were of magic quality. One was displayed in 1876 in the Loan Collection of Scientific Apparatus in the western galleries

of the South Kensington Museum. The official Catalogue (p. 927) thus describes it: "983 c. Magic Mirror. [Exhibited by] Robert von Tarnow. This mirror is a curiosity, and consists of a brass concave disc with finely polished surface. At the reverse rough side there are several Arabic (*sic*) characters in relief. By exposing the polished surface to the rays of the sun in such a way that they reflect them on the wall, the Arabic figures of the reverse side of the disc become plainly visible in the reflected light on the wall." It was this mirror which, in the following year, the present writer had in mind when, writing in "Nature," he proposed that an investigation should be made into the strange optical property so exhibited. Happily at that time his friend Professor W. E. Ayrton was resident in Japan as Professor in the Imperial College of Engineering at Tokio, and he and his colleague, Professor Perry, at once engaged in an exhaustive research on the subject, in the course of which they not only examined some hundreds of mirrors, but also acquainted themselves on the actual spot with the methods of

manufacture, which until then were entirely unknown, or misunderstood. A year or two later, after the publication of the researches of Ayrton and Perry, other researches of an entirely confirmatory character were published in France by M. Bertin. In fact, the scientific investigations may be sharply divided into four periods.

(i.) 1832. Elementary guesses by Brewster and Prinsep, the former of whom ascribed the phenomenon to some supposed molecular changes in the metal at the surface, due to a pattern having been stamped on the front to imitate that on the back, and then ground off. The latter ascribed it more correctly to differences of curvature of surface, but also fell into the error of supposing the ornament to have been stamped.

(ii.) 1844-1853. French investigations by Arago, Julien, Person, and Maillard. Of these investigators Person gave the suggestion of the true cause, namely, minute differences of curvature in the polished surface, a circumstance which he proved by covering the mirror with a piece of paper having a circular hole,

about one centimetre in diameter, and which, when moved about over the mirror (in sunlight), caused as a reflected image a spot of light, the size of which varied from point to point of the mirror. He also soldered a narrow slip of sheet metal behind a polished daguerreotype plate, and found that when the latter was slightly bent the image from the front showed a luminous line at the corresponding place. Maillard later adopted Person's theory, and confirmed it by employing an optician to burnish on the lathe a piece of metal which had raised markings on its back. He also noted that a scratch on the mirror back gives a bright line in the image.

(iii.) 1864-66. Investigations of Govi, in Italy, and his controversy with Brewster thereon. Govi frankly adopted the views of Person, and confirmed them by an experiment based on the mode adopted by the constructors of reflecting telescopes for testing the accuracy of the figure given by the grinding machinery to specula. He caused a magic mirror to reflect upon a screen the image of a fine grating of lines, ruled upon glass with a diamond,

and placed close to a brilliant point of light. By the distortions which the mirror produced in these lines he found the whole reflecting surface to be minutely undulated over with slight variations of curvature in complete correspondence with the raised arabesques on the back. These undulations, he observed, escape notice when one is looking into the face of the mirror because they are so gentle, and are such that, to perceive them, we require organs that are more delicate than our own. On the publication of this account, and of a translation of it in the "Scientific Review" for 1865, Sir David Brewster wrote to say how, in 1832, he had explained the phenomenon as being due to differences of density or other quality of molecular structure, or to fine scratches produced by trickery, and doubting Govi's explanation. He declared that similar phenomena had been produced by stamping patterns into the face of brass and grinding them down to be invisible on inspection. He considered the only way in which they could be proved to be due to delicate differences of curvature was either to show that they dis-

appeared on re-surfacing the mirror with a soft speculum-tool, or by taking an exact cast from the mirror, and seeing whether this also had magic properties. Govi thus challenged, at once disproved Brewster's position, and established his own by showing that the character of the image, white lines on dull ground, is changed to that of dull lines on a brighter ground, by simply interposing in front of the mirror a convex lens. This effect can only be produced by difference of curvature of surface. Further, Govi performed the following striking experiment. Taking a Japanese mirror which ordinarily showed no magic effects, he heated it behind with a spirit lamp, when at once it acquired magic properties. He further improvised with a piece of daguerreotype plate, and a metal ring which he soldered to the back at as low a temperature as possible, a mirror which showed the same effects when, by heating, there arose an unequal expansion between the thin and the thick parts.

(*iv.*) 1878-80. Researches of Ayrton and Perry, and those of Bertin, of Laurent, and of



PLATE III.

Muraoka. First, Ayrton and Perry set about procuring mirrors from the shops in Japan, and found that the vendors were in many cases wholly ignorant of the existence of the magic property. Further, the mirror makers could not say how the mirrors became magic, nor which of their mirrors were such ; or they gave explanations subsequently found false, declaring the effect to be produced by application of an acid paste to etch the face prior to polishing. The investigators then, having procured some good mirrors, proceeded to test the various possible suggestions as to the origin, such as the supposed difference of density, or of molecular constitution, or the supposed inlaying of the face with inferior metal, or to supposed concealed scratches on the surface, or, finally, to differences of curvature. By simple experiments in which bright light was caused successively to fall upon the mirror in diverging, parallel, or converging beams, it was demonstrated beyond question that the last-named cause was the true one. The whole phenomenon is explained if once it could be established that the surface over the thick

parts is flatter (less convex, or even actually slightly concave) than the surface over the thin parts. Using a large convex lens to converge sunlight that had been reflected from a mirror, they showed that by merely altering the distance of the screen on which the image was received they could make the image either positive or negative at will; a result impossible on any other hypothesis than that of differences of curvature of surface. This being established, they then investigated the process of mirror manufacture, to ascertain how these delicate inequalities of surface arise; and they found it to be due to an accident, or incident, of manufacture. All the finished Japanese mirrors may be observed to be slightly convex in the face. They are cast in moulds, the surface of each half of which is quite flat save for the ornament incised on the mould for the back. The following is Ayrton and Perry's description of the process of casting.

“The material used for making the mould is a mixture of a special kind of clay (found near Tokio and Osaka), with water and straw-ash. Two suitable slabs having been formed

from this plastic compound with the aid of wooden frames, a thick layer of half-liquid mixture of powdered old crucibles, or of a fine powder called *to-no-ko*, made from a soft kind of whetstone, is spread on them. The design for the back of the mirror is then cut directly on one half of the mould, or a sketch drawn on paper is first stuck on and used as a guide in cutting the design in the clay. Sometimes, but rarely, the design is stamped in the clay with a pattern wood-block cut in relief like the proposed back of the mirror. After the design is complete, a rim of the same material as that used in the construction of the mould, and having a thickness equal to that desired for the mirror, is attached to one half of the mould. The two halves are then dried in the smoke of a pine-tree fire, pressed and tied together, and laid in the casting-box at an angle of 80° to the horizon, the half of the mould on which the design has been cut being uppermost. Finally the molten speculum metal is run into a number of moulds at the same time, which, when cold, are broken up, and the castings removed. Mirrors cast in a mould, in

which the design has been cut by hand, are called *ichi mai buki*, 'mould used once,' and are regarded as artists' proofs, as the design on the back is well defined. To form subsequent moulds the two halves are pressed, when the clay is wet, on an *ichi mai buki* mirror, and the pattern is in this way transferred, but the designs on the backs of the mirrors cast in such moulds are not as clear as on an *ichi mai buki* mirror, which therefore sells for a much higher price." Flaws in the face of the casting are filled by inserting little balls of copper—giving rise, perhaps, to the idea that inlaying was used to produce the illusions. The handle is not cast along with the disk of the mirror, but is attached afterwards. Mirror castings when they are removed from the mould are roughly flat on the face, and need to be subjected to several processes to finish their reflecting surfaces: during these processes they acquire their characteristic convexity and their high polish. The mirror is laid down on its back on a wooden board, and then scraped or scratched with a rounded iron rod about a foot long, called a *megebo* ("distorting rod"). The process of scor-

ing over with the blunt tool is called *mege*. After being scored all over with scratches in every direction, it is found to be convex. Next the face is scraped with a hand-scraping tool, then rubbed down with a whetstone, then polished over with a piece of magnolia-charcoal; and lastly, when quite smooth, the amalgam of tin and mercury is rubbed in with a stiff straw brush, and polished off with soft paper. Thicker mirrors are sometimes pared down with a knife to the convex shape: they seldom or never show magic properties. The knife is also used to pare down any portion which in the operation *mege* may have become too convex. The convexity is tested from time to time by applying a concave wooden form. Professor Ayrton was of opinion that the magic properties were conferred during the operation of scraping with the *megebo*, the thicker parts of the mirror yielding less, and therefore being polished down more than the thinner parts. He also noted that if the face was scored by the *megebo* with parallel lines in one direction only, the convexity acquired was cylindrical. His conclusion was: "It appears then that

the magic of the Eastern mirror results from no subtle trick on the part of the maker, from no inlaying of other metal, or hardening of portions by stamping, but merely arises from the natural property possessed by thin bronze of buckling under a bending stress, so as to remain strained in the opposite direction after the stress is removed. And this stress is applied partly by the 'distorting rod,' and partly by the subsequent polishing, which, in an exactly similar way, tends to make the thinner parts more convex than the thicker." The researches of Ayrton and Perry may be said to have determined once and for all the main cause of the magic properties. No one has since disputed the principal propositions of their memoir, though it is certain that the differences of curvature may be produced in several varieties of operation.

Bertin, who wrote two years later, confirmed the conclusions arrived at, and repeated on other mirrors the experiments of Ayrton and Perry, as well as those of Person and Govi. Finding that the distortions produced by heating were particularly efficacious in bringing out the

magic qualities, he sought to imitate them mechanically, and, with the aid of the optician Duboscq, constructed an apparatus for conferring temporary convexity upon mirrors by mounting them against an air-tight back, with a cavity behind into which air could be driven by a force-pump. With this apparatus he examined the effects that are produced by drilling cavities, cutting grooves, and etching depressions in the backs of mirrors. Laurent, taking up this line of suggestions, produced magic mirrors of thin glass, etched into patterns at the back, and silvered on the front face. These, when mounted on an air-tight back, could be made to show either positive or negative figures by diminishing or increasing the pressure of the air behind the mirror by means of a simple india-rubber pear attached by a flexible tube to an aperture in the back; the pressure of the hand sufficing to bring out the optical effects. Laurent further showed that by taking an ordinary piece of mirror glass (patent plate glass silvered at the back) magic effects could be produced by lightly pressing against the back hot pieces of metal on which a raised

pattern had been engraved. In this case the portions of the mirror nearest in contact with the hot metal became hotter than the other parts, and expanding more, set up minute differences of curvature sufficient to concentrate the reflected rays of light from the heated parts.

About the same time Mendenhall, then in Japan, made further observations, which were communicated to the American Association for the Advancement of Science at its meeting at Cincinnati. Mendenhall was followed by two Japanese observers,—both trained in physical research in Europe,—Goto and Muraoka, the latter of whom, while confirming the main propositions that the effects are due to differences of convexity, and that the convexity is acquired during the process of *mege* or scoring over with the *megebo*, gave some further details learned from the mirror-makers of Tokio. He showed that any plate, if thin enough, whether of bronze, brass, copper, lead, zinc, iron, or glass, acquires the property of convexity on being scored over with scratches; and he came to the conclusion that this surface-expansion on the scored side of the metal arose



PLATE IV.

from some sort of release of molecular tension across the lines so scored. Like Ayrton, he held that this production of convexity on the scored surface explained the phenomenon that a scratch made by a file or pointed tool on the back causes a corresponding bright line to be reflected from the face. In a second article Muraoka sought to prove that the differences of curvature are not really due to differences of pressure during the operations of scoring and surfacing, but are due to the unequal rising-up of the metal in the thick and thin parts when the surface is caused to expand by scoring it over with scratches.

In May, 1886, Professors Ayrton and Perry, having discovered that the act of amalgamating with mercury the surface of a thick brass bar produces a powerful expansion of the amalgamated surface and bends the bar convexly, made the further suggestion that the employment by the Japanese mirror-polishers of a mercury-amalgam might assist the operation of the *megebo* in producing the differences of curvature between the thinner and thicker parts.

c

The author having from time to time picked up a number of Japanese mirrors from dealers in oriental curiosities, and having repeated all the researches enumerated above and added some others, is able to demonstrate very completely the phenomena in question.

Plate I. depicts a mirror in the author's possession, about 7 inches in diameter, the back of which bears in high relief a crest in the form of a bird (*hoho*). The casting has evidently been tooled up to give greater sharpness, and the part in high relief has been ground and polished. The pattern which this mirror casts from its face is shown beside the mirror, both being photographically reproduced. This mirror shows the pattern with sunlight, or with the light of the electric arc, or with limelight. It can also be shown to a few persons at a time by means of the flame of a paraffin lamp twenty feet away, or even by the light of an ordinary candle a couple of feet away. In the case of these weaker sources of light the mirror must be held close to the white screen or card upon which the image is to be received.

Plate II. is taken from a mirror upon

which there is, in high relief, polished, a crest consisting of the imperial *kiri* within a circlet, together with a landscape of storks and bamboos in lower relief. In this case only the ornament in high relief produces any effect: and it is interesting to notice that, whereas the circlet on the back is a simple flat band, the circlet in the image (which is distorted in consequence of a general distortion of the mirror face as a whole) presents double lines. The author is disposed to think that the ornament on the back must in this instance have been subjected to polishing subsequently to the front face.

Plate III. represents a very thin mirror, about $9\frac{1}{4}$ inches in diameter and not more than 0.04 inch thick in its thinnest parts. The central character in high relief is surrounded with the seven precious objects in lower relief. Most of these may be seen more or less distinctly in the luminous pattern cast from the front.

Plate IV. is a rather smaller mirror, $6\frac{7}{8}$ inches in diameter, having low-relief ornament only; yet of this almost every detail is visible

in the image as cast by electric light or sunlight.

Plate V. shows a mirror which has two Chinese characters in high relief, polished, with a background made up of symbols of longevity—pine-tree, two storks, and a hairy-tailed tortoise. But though these are in almost as high relief as the polished letters, only the former are to be distinguished in the image. Here again the author conceives that the two letters have been polished down subsequently to the face; the pattern of these parts having been thus, to a minute degree, forced into the reflecting surface.

Plate VI. depicts a rectangular mirror, 15 inches high by $10\frac{1}{2}$ inches wide, and weighing $5\frac{1}{2}$ lbs. It is the only one of this form that he has seen or heard of; though smaller square mirrors of 3 to 4 inches in the side are not infrequent. One of the latter, in his possession, an old mirror covered at the back with Chinese characters, has no magic qualities at all. The large rectangular mirror is slightly convex, but more so in its longer direction than in its breadth. The bamboos in the pattern, though



PLATE V.

not very highly raised, are in very sharp relief, the mirror being, apparently, an *ichi mai buki*, or artist's proof. There are two raised lumps on the back, apparently the remains of the parts where the metal was poured into the mould ; and, curiously enough, neither these nor the rims of the rocks in the foreground yield any image, though they are more highly raised than any part of the bamboos.

To complete the proofs that the effects are due to differences of curvature the author has made the following observations.

By holding a magic mirror very obliquely to the light one can discern traces of the pattern in the face, especially if one is accustomed to examine optical surfaces for small inequalities of curvature. For example, on examining (at oblique reflection) in such a mirror the image of a horizontal window-bar or of the roof-line of a house, one sees the straight line slightly curved downwards out of the level wherever the image is made from a slightly concave (or less convex) part of the surface. Acting on this hint the author found that if one chooses as an object to be viewed in a mirror a pattern of

narrow parallel straight lines, such as a finely-striped blind, the pattern on the back of the mirror can be dimly seen in the face, resembling that species of line-engraving, sometimes used for medallion portraits, in which the whole picture is crossed by lines from side to side, the lines being bent toward one another or widened out to give effects of light and shade. Another variety of the same experiment is to place a ruled diffraction-grating of 100 lines to the inch (ruled in a silvered surface on glass) close to a bright light, and with a short-focus lens project the lines upon a screen. Then interpose the magic mirror to throw the luminous lines upon another screen, when they will be seen with the usual magic image; the bright lines concentrating into the bright parts and avoiding the darker parts of the luminous pattern.

By the use of the spherometer to measure the surface curvatures of the mirror faces, it is easy to show that the surface of the magic mirrors is actually less convex, or even slightly concave, over those parts where the substance of the mirror is thick, as compared with those

parts where the mirror is thin. For example, the curvature of the rectangular mirror, Plate VI., as measured from left to right over the convex surface, is, on the average, about 0·2 dioptries (or its radius of curvature is about 5 metres), but when measured at points over the vertical bamboo stems, its curvature falls to less than 0·05 dioptrie, and in some parts is absolutely flat, or even slightly concave.

Makers of mirrors and lenses for large telescopes are accustomed to test the perfection of their figure by a process known as Foucault's, in which the observer, after allowing light to fall from a single well-defined point upon the (concave) mirror at nearly normal incidence, places his eye at the point where the reflected rays converge to a focus, and then sees the whole surface of the mirror uniformly bright, save only such spots as differ in curvature from the rest. In the case of convex mirrors it is needful to interpose a large auxiliary convex lens to reconcentrate the otherwise divergent beam. Applying this method of investigation, the author finds that it is quite easy in many

cases to see in the front face the pattern that the mirror bears on its back.

Lastly, the author has made one absolutely direct proof of the inequalities of curvature of the front surface. He took the mirror depicted in Plate I., and having taken a mould of its face in a composition of gutta-percha, he deposited a firm layer of copper in the mould by the electrotyping process. The type so made was silvered and polished, when it was found to reflect from its face the image of the bird that was on the back of the original mirror; the image was, however, less regular than that from the mirror's own face. Here, then, was a magic mirror without any pattern on its back.

In repeating the experiments on heating, the author found a very singular effect to be produced by warming (with a flame) the back of a thin piece of mirror glass while it reflected from its face a grating of luminous lines thrown upon it by a lamp as described above. As the flame was passed rapidly across the back, the whole pattern appeared to heave, as though a wave had passed along it.

He was able also to reproduce writing in



PLATE VI.



luminous lines on a screen or wall by the following device. A piece of thin sheet lead (tea-chest lead) was laid on a bed of blotting-paper; and upon this was written with a common lead pencil any word desired, which therefore was slightly indented into the lead. The sheet was then pressed lightly against an ordinary piece of mirror glass and heated from behind by pressing against it a disk of hot metal. The written letters touching the back of the mirror warmed it, and made it curve at these parts. Hence, placed in an appropriate divergent beam of light, it threw the handwriting upon the wall.

Following the hint given by Bertin's research upon the effect of bending mirrors by air-pressure at the back, the author finds that a similar effect is even more powerfully produced by simple mechanical pressure. He took a mirror which, though it had an excellent reflecting face and a well-raised pattern on the back, showed no magic properties, and having clamped it in a wooden frame, he applied screw pressure behind to force against the back a slightly convex piece of soft wood

covered with a pad of cloth. On turning the screw the mirror at once became magic, and was found, even after the screw had been released, to retain some part of its magic property. It was again distorted by screw pressure, and while violently bent was heated to anneal it somewhat. On removing the pressure it was found to retain permanently all the qualities of a good magic mirror, though it is slightly more convex than mirrors ordinarily are. Since then it has been found that many mirrors which, when purchased, showed no magic properties, can be converted into magic mirrors, some by application of screw pressure, some by mere bending by hand over the knee, some by burnishing under pressure the pattern at the back.

Engineers are so familiar with the circumstance that when metal castings are rapidly cooled the internal parts are in a state of strain, that they are not astonished to find that after a casting has been surfaced accurately on one face the figure may alter slightly by the mere release of internal strains in the slow annealing of time. It is quite possible

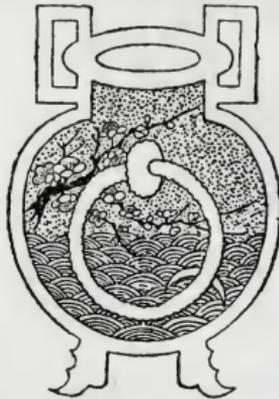
that this too occurs with Japanese mirrors, and that some of them may acquire with the mere lapse of time magic qualities that they do not show at first when newly polished.

There appears to be another species of magic mirror, of which few examples are known, having the property of showing in the face a pattern entirely different from that on the back. Three such are mentioned by Ayrton, though it does not seem that he himself had inspected any of them personally. One of these, which he states to exist at Kamakura, the old capital of the former Shoguns, is a religious mirror about four inches and one-fifth high, by three and a half wide, held in great reverence. In the polished surface, when looked at very obliquely, is seen the image of a Buddhist priest. The pattern on the back is a rosary in high relief with a branch of plum-blossom, and a crescent moon rising out of the sea as a background. It is said that this optical effect is produced by chemically etching the surface with an acid paste, and then repolishing. Professor Ayrton, who had two mirrors made thus by a Japanese mirror-maker, found that if the

face of a mirror that had so been etched was repolished until every trace of the marks disappeared in direct or oblique vision, they then entirely disappeared also from the image cast by the mirror in reflecting a beam of light upon a screen. He greatly doubted whether chemical means could produce a mirror possessed of true magic properties. The cause of the phenomena of the Kamakura mirror and its congeners—should the facts be established as narrated—therefore remains still to be explained.

Though in the case of the ordinary Japanese mirrors science completely explains what would otherwise seem to be a most mysterious and unaccountable phenomenon, the explanation itself involves a very remarkable fact, namely, that there can exist such very delicate and minute differences of curvature in the polished face as to be practically invisible for ordinary purposes, and difficult even of scientific detection, and yet that those minute differences in curvature should be in such exact correspondence to the patterns on the back as to reproduce those patterns in the reflected beams

of light. The facts seem so utterly unlikely *à priori* to be true, that one can only give full credence to them after the most searching scientific demonstration. But is not this, after all, only another example of the truism that when science explains away one mystery she does so by establishing some truth that is itself still more mysterious ?



The Mirror of Kamakura.



JAPANESE WOMAN DANCING, WITH MIRROR.
From a bronze plate (*modern*).



APPENDIX I.

BIBLIOGRAPHY OF THE MAGIC MIRROR.

PART I. REAL MAGIC MIRRORS.



REWSTER, SIR DAVID.

Account of a curious Chinese Mirror, etc. *Philosophical Magazine*, vol. i., p. 438, 1832.

See also *Poggendorff's Annalen*, xxvii., pp. 485-489, 1833. [Translation of the preceding], and *Journal Franklin Institution*, vol. xv., p. 128, 1832.

PRINSEP, JAMES. On the Magic Mirror of Japan. *Journal of the Asiatic Society of Bengal*, vol. i., p. 242, 1832 (1 plate).

ARAGO, F. [Showed at meeting of *Académie des Sciences* (Paris), a mirror brought from China by M. Arosa]. *Comptes Rendus*, xix., p. 234, 1844. [Bertin, see 31 below, says that this mirror was brought by Admiral Mouchez from Nankin; not by M. Arosa.]

JULIEN, STANISLAS. Notice sur les miroirs magiques des Chinois et leur fabrication. *Comptes Rendus*, xxiv., p. 999, June 7, 1847. [This is a translation of a Chinese writer, Ou-tseu-hing (1260-1340), who wrote on this subject in a Chinese Encyclopædia. Also showed mirror belonging to La Grange.]

SÉGUIER. [A note following the preceding.] *Comptes Rendus*, xxiv., p. 1001, June 7, 1847.

PERSON. Observations faites sur un des miroirs chinois dits miroirs magiques. *Comptes Rendus*, xxiv., p. 1110, June 21, 1847.

MAILLARD. Note sur la fabrication des miroirs magiques chinois. *Comptes Rendus*, xxxix., pp. 178-180, 1853. [See also *Journal Franklin Institution*, lvi., 281, 409, 1853.]

GOVI, G. Gli specchi magici dei Cinesi. *Notizia storica della R. Accademia delle Scienze di Torino*, 1864-65, pp. 67-74.

GOVI, G. Chinese Magic Mirrors [a translation of the Italian memoir of Nov. 20, 1864]. *The Scientific Review and Journal* (London), vol. i., April 1, 1865, p. 19.

GOVI, G. Nuove esperienze sugli specchi magici dei Cinesi. *Torino Atti Accad. Sci.*, ii., 1866-67, pp. 357-362 (1 plate). See also *Torino Lavori Sci. Fis. Mat.*, 1869, pp. 67-75.

BREWSTER, SIR D. Observation on the preceding paper [on Chinese Magic Mirrors]. *The Scientific Review and Journal*, vol. i., April 1, 1865, p. 20.

PARNELL, J. Chinese Mirrors, *The Reader*, vol. vii., p. 233, March 3, 1866.

D

PEPPER, J. H. *Cyclopædic Science Simplified* (London, 1869, F. Warne and Co.). A passage on Magic Mirrors on pp. 35-39, with 5 figures [some copied from Prinsep].

JULIEN, STANISLAS, and CHAMPION, PAUL. *Les industries anciennes et modernes de l'empire Chinois* (Paris, 1869), containing a short article on *Les miroirs magiques des Chinois, et leur fabrication*. (Quotation from the memoir of M. Julien of 1847, *supra*.)

SATOW, ERNEST. *The Shiñ-tau Temples of Isé. Transactions of the Asiatic Society of Japan*, vol. i., 1874. Reprinted 1882, p. 101. Gives, p. 114-119, an account of the myth of the sun-goddess, and of the making of the first mirror. Also speaks of the use of mirrors in the Shiñ-tau religion.

GEERTS, DR. *Useful Metals and Metallurgy of the Japanese. Transactions of the Asiatic Society of Japan*, vol. iv., 1875-76, p. 39. [An article on the Japanese uses of Mercury. Appendix, p. 39-41, on Mirrors.]

- ATKINSON, R. W. (Professor of the Tokio Dai Gaku, or Imperial University). Letter in *Nature*, May 24, 1877, vol. xvi., p. 62.
- HIGHLEY, SAMUEL. Letter in *Nature*, June 14, 1877, vol. xvi., p. 132.
- DARBISHIRE, R. D. Letter in *Nature*, June 21, 1877, vol. xvi., p. 142.
- THOMPSON, SILVANUS P. Letter in *Nature*, June 28, 1877, vol. xvi., p. 163.
- PARNELL, J. Letter in *Nature*, July 19, 1877, vol. xvi., p. 227.
- MASSE, E. Miroirs Japonais. *Journal de Physique*, t. vi., p. 320, 1877.
- STERNE, CARUS. Article on Japanese Mirrors in *Gartenlaube*, Jahrg. xxv., 1877, No. 29, p. 487 (1 cut).
- AYRTON, WILLIAM E., and PERRY, JOHN (Professors in the Imperial College of Engineering, Tokio). The Magic Mirror of Japan, part i. *Proceedings of the Royal Society of London*, No. 191, 1878, p. 127-148.

AYRTON, WILLIAM E. The Mirror of Japan and its Magic Quality. *Journal of the Royal Institution*, vol. ix., p. 25, 1879, being a Lecture delivered January 24, 1879. [See also *Nature*, vol. xix., p. 539-542, April 10, 1879, and *Chambers's Journal*, vol. lvi., p. 591, 1879.]

AYRTON, WILLIAM E., and PERRY, JOHN. Sur les miroirs magiques du Japon. [Translation of their paper of 1878, with cuts added.] *Annales de Chimie et de Physique*, 5^e Série, xx. p. 110, 1880.

AYRTON, WILLIAM E. *La Nature*, 1880, May 1, p. 514. (Report of Lecture given in Paris.)

GOVI, G. Les miroirs magiques des Chinois. *Annales de Chimie et de Physique*, 5^e Série, xx., p. 99, 1880.

GOVI, G. Nouvelles expériences sur les miroirs magiques. *Annales de Chimie et de Physique*, 5^e Série, xx., p. 106, 1880.

BERTIN, A., et DUBOSCO, J. Production artificielle des miroirs magiques. *Annales de Chimie et de Physique*, 5^e Série, t. xx., p. 143, 1880.

BERTIN, A. Note sur les miroirs magiques. *Journal de Physique*, tome ix., pp. 401-407, 1880.

LAURENT, L. Miroirs magiques en verre argenté. *Journal de Physique*, tome x., pp. 474-479, 1881; also *Comptes Rendus*, xcii., 21 février, 21 mars, et 4 avril, 1881, p. 412-413.

BERTIN, A. Les miroirs magiques. *Revue Scientifique*, vol. I., 1881, p. 258-263. (Lecture to the Association Scientifique de France).

BERTIN, A. Etude sur les miroirs magiques. *Annales de Chimie et de Physique*, 5^e Serie, t. xxii., p. 472-513, 1881 (avec 1 planche).

MENDENHALL, T. C. *Proc. American Assoc. for Advancement of Science* (Cincinnati, 1881), vol. xxx., p. 57.

- PERSON. *Gakugeishirm*, No. 39, quoted by Muraoka ; see *infra*.
- GOTO, MAKITA. *Tokio-Gakugeisassi*, No. 22, p. 35, quoted by Muraoka ; see *infra*.
- MURAOKA, HANICHI. Herstellung der japanesischen magischen Spiegel, etc. *Wied. Annalen*, xxii., p. 246-252, 1884. (From the *Tokio-Gakugeisassi*.) [See also *Mittheil. der Deutschen Gesellschaft Ostasiens*, heft 31, 1884].
- MURAOKA, HANICHI. Ueber den japanesischen magischen Spiegel. *Wied. Annalen*, xxv., 138, 1885.
- ANDERSON, WILLIAM, F.R.C.S. Description and Historical Catalogue of a Collection of Japanese and Chinese Paintings in the British Museum (London, 1886). (On p. 398, § 1905, is a description of a picture representing the myth of the sun-goddess.)
- AYRTON, WILLIAM E., and PERRY, JOHN. On the expansion produced by Amalgamation. *Proc. Physical Society of London*, vol. viii., p. 88-9, 1886.

PART II. ALLEGED REFERENCES TO
MAGIC MIRRORS.

(i.) THE MIRROR OF PYTHAGORAS. The passage in question is in the *Physica Curiosa* of Gaspard Schottus (4to Edition, Herbipolis, 1667), p. 538, referring to his own book on magic, and runs as follows:

“Ibidem mentionem fecimus speculi Pythagorae, in quo sanguine dicitur scripsisse quae volebat significare, et eo ad Lunam obverso commonstrasse res exaratas stanti a tergo in disco Lunae.”

The reference is to another passage on page 553 of Schottus' *Magia Divinatoria* (Herbip., 1657-59, par. iv.), in the chapter De Catoptromantia:

“Huc referunt aliqui speculum Pythagorae cujus meminit Agrippa in *Retraetat. de Magia*, cap. de *Prestigiis*, qui sanguine perscripsisse dicitur, quae collibuisset, in speculo et eo ad Lunam obverso, commonstrasse res exaratas stanti a tergo in disco Lunae. Hoc si verum est, utique non naturaliter contingit sed ope Daemonis.”

In the same work, par. i., p. 438-440, is a discussion of the proposition: "Utrum in lunari disco aliquid legendum exhiberi potest arte catoptrographica." He says that Baptista Porta maintained this in his *Natural Magic* (cap. xvii., lib. 17). He also quotes from the *Philosophia Occulta* of Cornelius Agrippa (lib. i., cap. 6) as follows :

"Si litteras parabolico speculo inscripseris idque tempori plenilunii Lunae exposueris eae litterae ceu in vasto quodam speculo impressae reflexaeque ubilibet locorum legi poterunt. Ita Pythagoram aiunt, dum Hydrunti moraretur, litteras Lunae inscriptas Constantinopoli amicis legendas dedisse."

There is also a passage in Dr. Thomas Browne's *Pseudodoxia Epidemica* (Vulgar Errors), p. 60 (Edition of 1650), in reference to this myth: "Which is a way of intelligence very strange; and would requite the Art of Pythagoras; who could read a reverse in the Moon."

Other references in occult literature to the alleged mirror of Pythagoras are as follows :

ATHANASIVS KIRCHER. *Ars Magna Lucis*

et Umbrae (Cryptologia, cap. i.) (Romae, 1646, fol.), p. 908. (Quotes from Cornelius Agrippa and Porta, and denounces the account as absurd, and against natural possibility.)

BUBALUS. *Commentationem de Angelis* (Lugduni, 1622, fol.), 9-50, art. 1, quaesito 2, difficult. 2, § 3, pp. 64-66. (Combats views of Paracelsus.)

PARACELUS. *Magia*, lib. 5, de Speculi constitutione. (Distinguishes five kinds of alleged magic mirrors; none of them, however, having any optical significance.)

BOISSARDUS. *Traētatus de Divinatione* (Oppenheim, 1616, folio), p. 297.

(ii.) AULUS GELLIUS. Carus Sterne (*Gartenlaube*, 1877) and Ayrton (*Journal Royal Institution*, 1879) refer to Aulus Gellius as having written of mirrors which "sometimes reflected their backs and sometimes did not." The reference appears to be a mistaken one; for all I have been able to find in Aulus Gellius is the following passage in the *Noētes Atticæ*,

bk. xvi., ch. xviii. (which is upon that branch of Geometry called ὀπτική) :

Ὀπτική) facit multa demiranda id genus; (1) ut in speculo uno imagines unius rei plures appareant; (2) *item, ut speculum, in loco certo positum, nihil imaginet, aliorsum translatum, faciat imagines*; (3) item, si rectus speculum spectes, imago fiat tua hujusmodi, ut caput deorsum videatur pedes sursum.

The passage which I have put into italics appears to have been mistaken in meaning. In Beloe's translation, vol. iii., p. 249, this clause is rendered as follows: "A glass placed in a certain position shows nothing. Turn it, and it shows many things." This is hardly adequate. More accurately it should run: "A mirror set in a certain place shows no image, but when transferred to another position produces images." There is nothing in this at all suggestive of the mirror reflecting from its face the pattern on its back.

(iii.) MURATORI. Sterne (*op. cit.*) and Ayrton (*op. cit.*) refer vaguely to the Italian historian Muratori as the authority for accounts of a "magic mirror found under the pillow of the Bishop of Verona, who was afterwards

condemned to death by Martin (*sic*) della Scala, as well as of the one discovered in the house of Colla da Rienzi (*sic*) on the back of which was the word 'Fiorone.'" The bishop in question was Bartolomeo dalla Scala, who was put to death in 1338 by Mastino della Scala, as narrated by Muratori (*Annali d'Italia*, vol. viii., p. 212, of the folio edition of 1744-49). Cola di Rienzo (or Rienzi) is mentioned many times in the same volume viii. I have not, however, been able to find in this work the mention of the mirror in either case. Neither have I found any as yet in Lessmann's life of Mastino della Scala (Berlin, 1829); nor in Du Cerceau's *Life and Times of Rienzi* (Lond. 1836). Muratori was, however, a prolific writer. Amongst his works were: *Delle forze dell' Intendimento Umano*; *Riflessioni sopra il Buon Gusto nelle Scienze e nelle Arte*; *La Filosofia Morale*. It is possible that the reference may be to some passage in these. Muratori also refers to a *Vita di Cola di Rienzo*, the authorship of which is unknown to me.

(*iv.*) VON HUMBOLDT. In 1830 Von Hum-

boldt brought a supposed magic mirror from Berlin to Paris to exhibit it to members of the *Académie des Sciences*. It was indeed shown to some of them at the apartments of M. Arago at the Observatoire. No reference to the occurrence is to be found in the journals of the Académie, published or private, or in any contemporary journal. Perhaps the reason is that, as is known, the experiments proved a total failure. My information on the subject is derived from Bertin (*Ann. Chim. Phys.*, xxii., 1881, p. 478).

(v.) BABINET. The name of Babinet is sometimes given along with that of Arago in connection with this subject; but I am unable to find that he did anything.

(vi.) HARTING (PIETER). In their 1878 paper Ayrton and Perry refer to a short paper by Professor Harting in the *Album der Natuur* some years before. It appears that this was a short-lived periodical, edited by Harting and Logeman, which was issued at Haarlem (A. C. Kruseman, publisher) in 1872. There is a single part (No. 3 of vol. i.) in the British

Museum. No copy containing the article in question is known in England.

(vii.) TENNANT, PROF. JAMES. The well-known mineralogist Tennant is believed to have issued, about the year 1869, a small pamphlet of about four pages on the subject of Japanese mirrors. No copy has yet been found.



(From a Drawing in the British Museum by
Tachibana no Binkō, 1784.)



MASK OF UZUME (O-KAME).
From a netzuké in the possession of Charles
Holme, Esq. (*Pilgrim*).



APPENDIX II.

THE MYTH OF THE SUN-GODDESS AND THE INVENTION OF THE MIRROR.

(Abstracted from the account given by Mr. E. Satow in vol. ii. of the "Transactions of the Asiatic Society of Japan," 1874.)



IF all the gods of old Japan, there were two whom the father of the gods, Izanagi no mikoto, loved most. These were Amaterasu oho-mi-kami, who shone beautifully and illuminated the heavens and the earth, and her brother, Susanowo no mikoto, who was ruler of the blue sea. Amaterasu was

made ruler of heaven, which she reached by climbing up the pillar on which the sky rested. Susanowo no mikoto, who was ever a *mauvais sujet*, neglected his kingdom, so much so that the rivers and seas all dried up. Amongst other evil deeds, he offended his sister Amaterasu by throwing into the room where she was weaving the body of a piebald horse which he had flayed, so terrifying her that she hurt herself with her shuttle, and retired in wrath to a cave, which she closed with a rock door. Heaven and earth were long plunged into utter darkness, during which time the more turbulent of the gods made a noise like the buzzing of flies, and the general disaster was great.

Then the gods held a council in the bed of one of the dry rivers as to how they might appease the anger of the great goddess, and at the suggestion of Taka-mi-musu-bi no kami the plan of campaign was entrusted to the wisest of the gods, Ame-no-koya-ne no mikoto, who suggested that Amaterasu should be enticed out by artifice to look at her own image. Accordingly two gods, Amatsu-mara no mikoto, the Japanese Vulcan, and Ishi-kori-dome no mi-

koto, were set to work to make a mirror of the shape of the sun, and of metal taken from the mines in heaven. Their bellows were made from the whole skin of a deer. The first two mirrors were voted too small, but the third was large and beautiful. Five gods were then ordered to prepare striped cloth and fine cloth from bark and hemp fibre, and two other gods erected posts and built a palace near the cave. Then Taka-mi-musu-bi no kami commanded another god, Ame-no-kushi-akaru-tama no mikoto, to make a string of *magatama*, or curiously curved charms, such as were worn in those days as ornaments, whilst two other gods made wands from the sakaki tree. Having by strange divinations satisfied themselves that their preparations were likely to come to a successful issue, the gods began their campaign.

First, Ame-no-koya-ne no mikoto pulled up a sakaki tree by the roots and hung upon it the string of charms, the mirror, and the strips of cloth. This trophy was held up by Ame-no-futo-damo no mikoto in front of the cave whilst Ame-no-koya-ne no mikoto pronounced an oration in honour of the goddess. They

E

placed in concealment near the cavern door the god Ta-jikara-wo no mikoto, the Japanese Hercules. Then they set a number of cocks to crow in concert, and organized a dance to the accompaniment of music. A lively goddess, Ame-no Uzume no mikoto (or O-kame), she of the diminutive forehead and swollen cheeks, officiated as mistress of the ceremonies. She blew a bamboo flute, whilst the assembled deities kept time to the music by striking together two pieces of wood. Two other gods performed upon a primitive harp with six strings, which they bowed, violin-like, with grass. Uzume no mikoto adjusted her head-dress and bound up her sleeves preparatory to a dance, and flourished around a spear decorated with grass and bells. Bonfires were lighted, and a large circular box was laid upon the earth, upon which Uzume mounted to execute a *pas seul*. As she flung herself about to the strains there descended upon her the spirit of folly, which possessed her and inspired her to sing. She sang a quatrain of six syllables to each line, which, though in modern Japanese it reads merely "One, two, three, four, five," and so

on, may also be rendered in old Japanese with the following meaning :

Gods, look now at the lid ;
The Goddess no longer is hid.
Our longings she now satisfies :
Behold my bosom and thighs.

And as she pronounced these words she shook off her garments one by one, whilst finally the air shook with a burst of Homeric laughter from the assembled gods.

Hereupon Amaterasu oho-mi-kami, slightly opening the cavern door, called out from within, "I fancied that in consequence of my retirement both heaven and Japan were in darkness. Why has Ame-no Uzume danced, and why do the gods laugh?" Thereupon Uzume answered, "I dance and they laugh because there is here an honourable deity who surpasses your glory" (alluding to the mirror). As she said these words Ame-no-futo-dama no mikoto, who held the trophy, pushed the mirror toward her, so astonishing her that she came forward to look. As they were putting the mirror into the mouth of the cave it struck

against the door and received a flaw, which it bears to this day. As the goddess came forward Ame-no tajikara-wo-no kami pulled open the door and dragged her forth, whilst Ame-no koya-ne no mikoto passed behind with a straw rope to prevent her return.

So light was restored to the world ; and in after days Amaterasu oho-mi-kami gave the mirror to her adopted grandson Nini-gi no mikoto, who in turn handed it down to his descendants, who, after various turns of fortune, placed it, in the year 4 B.C., in the sacred shrine on the bank of the Isuzu river, by the village of Uji in Isé, where it is preserved to this day with religious care.





APPENDIX III.

ORIENTAL WRITINGS UPON THE MAGIC MIRROR.

M STANISLAS JULIEN, the erudite author of *Les Industries anciennes et modernes de l'empire chinois*, has given the following extract from the fifty-sixth volume of the Chinese encyclopædia called *Ke-chi-king-yonen*.

“*Théou-kouang-kien*, or *Mirrors which let the light pass through* (an expression due to a vulgar error). If one receives the rays of the sun upon the polished surface of one of these mirrors, the characters or flowers which are in relief on the back are reproduced faithfully in the (reflected) image of the disk. Chin-kouo

(a writer who flourished in the middle of the eleventh century) speaks with admiration of them in his memoirs entitled *Mong-ki-pi-tân*, book xix., fol. 5. The poet Kin-ma celebrated them in verse ; but, down to the time of the Mongolian emperors, no author had been able to explain this phenomenon. Ou-tseu-hing, who lived under this dynasty (between 1260 and 1341), has the merit of having first done so. This is how he expresses himself on this subject :

““When one places one of these mirrors facing the sun, and causes it to reflect, upon a very near wall, the image of its disk, one sees distinctly appear therein the ornaments or characters which exist in relief upon the back. Now the cause of this phenomenon, which arises from the distinct employment of fine copper and of crude copper. If on the back of the mirror one has produced, by casting it in a mould, a dragon arranged within a circle, one engraves deeply on the face of the disk an exactly similar dragon. Next, one fills the deeply-chiselled cuts with a somewhat baser copper ; then one incorporates this metal with the first,

which ought to be of a finer quality, by submitting the mirror to the action of fire ; after which one flattens and smoothens down the face of the mirror, and spreads over it a slight layer of lead (tin ?).

““When one turnstoward the sun the polished disk of a mirror so prepared, and reflects its image upon a wall, it distinctly presents bright tints and dark tints, which come, these from the purest parts of the copper, those from the baser parts.’

“Ou-tseu-hing, to whom we owe the preceding explanation, tells us that he has seen a mirror of this sort broken into fragments, and that he recognized for himself the accuracy of his description.”

Ayrton quotes from a Japanese work, the *Shim-pen-kamakura-shi*, or New Collection of Writings about Kamakura, a description of a temple-mirror, which when looked at obliquely shows the face of a Buddhist priest, not resembling in the least the raised ornament on the back (see p. 45, *supra*).

The same authority refers to the *Kokon-i-to*, or Genealogy of the Old and New Physicians,

for an alleged process of producing magic effects on mirrors by treating the surface with a peculiar paste. The recipe is as follows: "Take ten parts of *shio* (gamboge), one of *funso*, and one of *hosha* (borax). Powder them thoroughly, and mix them to the consistency of a paste with a little dilute glue. If any pattern be drawn on the surface of a mirror with this paste, and then allowed to dry, the pattern will be seen, even after polishing, if looked at obliquely."

It appears that this process fails in reality to give any result. The process of inlaying described by Ou-tseu-hing is also an error. The magic effect is certainly not produced in this way. Probably he was misled by the circumstance that flaws in the bronze castings are sometimes filled by the insertion of soft copper beads.





APPENDIX IV.

ANALYSES OF JAPANESE MIRRORS.



M. CHAMPION AND PELLET (*Industries de l'empire Chinois*, p. 64) give the following composition for Chinese mirrors:

Copper	50·8
Tin	16·5
Zinc	30·5
Lead	2·2

100·0

Dr. Geerts gives (*Trans. Asiatic Soc. of*

Japan, vol. iv., p. 40), for the alloy used in one of the largest mirror-foundries in Kioto :

Copper	80
Tin	15
Lead	5
	<hr/>
	100
	<hr/>

And for mirrors of inferior quality :

Copper	80
Lead	10
Shirome	10
	<hr/>
	100
	<hr/>

Shirome is a natural sulphide of lead and antimony from Choshu or Iyo.

Professors Ayrton and Perry (*Proc. Roy. Soc.*, 1878) give :

For mirrors of first quality :

Copper	75·2
Tin	22·6
Iyo Shirome	2·2
	<hr/>
	100·0
	<hr/>

For mirrors of second quality :

Copper	81·3
Tin	16·3
Iyo Shirome	2·4
	<hr/>
	100·0
	<hr/>

For mirrors of third quality :

Copper	87·0
Tin	8·7
Iyo Shirome	4·3
	<hr/>
	100·0
	<hr/>

For mirrors of fourth quality :

Copper	81·3
Tori Shirome	16·3
Iyo Shirome	2·4
	<hr/>
	100·0
	<hr/>

For mirrors of fifth quality :

Copper	71·5
Tori Shirome	28·5
	<hr/>
	100·0
	<hr/>

The mercurial amalgam used in polishing the mirrors consists, according to Dr. Geerts (*op. cit.*), of quicksilver, tin, and a little lead. Ayrton gives it as one of tin to one of quicksilver. Champion and Pellet (*op. cit.*) give the composition as :

Tin	69.36
Mercury	30.0
Lead	0.64
	<hr/>
	100.00
	<hr/>



On the occasion of the delivery of this discourse the Author exhibited a collection of thirty-four Japanese mirrors, and by the aid of a lime-light lantern displayed their magic properties upon a translucent screen. He also exhibited sundry experiments with Laurent's apparatus, and showed the effect of heating mirrors.



O. V.

A

BIBLIOGRAPHY

OF THE

PRIVATELY PRINTED OPUSCULA

Issued to the Members of the Sette of Odd Volumes.

“Books that can be held in the hand, and carried to the fireside, are the best after all.”—*Samuel Johnson.*

“The writings of the wise are the only riches our posterity cannot squander.”—*Charles Lamb.*

1. B. Q.

A Biographical and Bibliographical Fragment. 22 Pages. Presented on November the 5th, 1880, by His Oddship C. W. H. WYMAN. 1st Edition limited to 25 copies. (Subsequently enlarged to 50 copies.)

2. Glossographia Anglicana.

By the late J. TROTTER BROCKETT, F.S.A., London and Newcastle, author of “Glossary of North Country Words,” to which is prefixed a Biographical Sketch of the Author by FREDERICK BLOOMER. (pp. 94.) Presented on July the 7th, 1882, by His Oddship BERNARD QUARITCH. Edition limited to 150 copies.

F

3. **Ye Boke of Ye Odd Volumes,**

from 1878 to 1883. Carefvly *Compiled* and painsfvly *Edited* by ye vnworthy Historiographer to ye Sette, *Brother* and *Vice-President* WILLIAM MORT THOMPSON, and produced by ye order and at ye charges of Hys Oddship ye President and Librarian of ye Sette, Bro. BERNARD QUARITCH. (pp. 136.) Presented on April the 13th, 1883, by his Oddship BERNARD QUARITCH.

Edition limited to 150 copies.

4. **Love's Garland ;**

Or Posies for Rings, Hand-kerchers, & Gloves, and such pretty Tokens that Lovers send their Loves. London, 1674. A Reprint. And Ye Garland of Ye Odd Volumes. (pp. 102.) Presented on October the 12th, 1883, by Bro. JAMES ROBERTS BROWN.

Edition limited to 250 copies.

5. **Queen Anne Musick.**

A brief Accompt of ye genuine Article, those who performed ye same, and ye Masters in ye facultie. From 1702 to 1714. (pp. 40.) Presented on July the 13th, 1883, by Bro. BURNHAM W. HORNER.

Edition limited to 100 copies.

6. **A Very Odd Dream.**

Related by His Oddship W. M. THOMPSON, President of the Sette of Odd Volumes, at the Freemasons' Tavern, Great Queen Street, on June 1st, 1883. (pp. 26.) Presented on July the 13th, 1883, by His Oddship W. MORT THOMPSON.

Edition limited to 250 copies.

7. **Codex Chiromantiae.**

Being a Complete Manuelle of ye Science and Arte of Expoundynge ye Past, ye Presente, ye Future, and ye Character, by ye Scrutinie of ye Hande, ye Gestures thereof, and ye Chirographie. *Codicillus 1.*

—CHIROGNOMY. (pp. 118.) Presented on November the 2nd, 1883, by Bro. ED. HERON-ALLEN.

Edition limited to 133 copies.

8. **Intaglio Engraving: Past and Present.**

An Address by Bro. EDWARD RENTON, delivered at the Freemasons' Tavern, Great Queen Street, on December 5th, 1884. (pp. 74.) Presented to the Sette by His Oddship EDWARD F. WYMAN.

Edition limited to 200 copies.

9. The Rights, Duties, Obligations, and Advantages of Hospitality.

An Address by Bro. CORNELIUS WALFORD, F.I.A., F.S.S., F.R. Hist. Soc., Barrister-at-Law, Master of the Rolls in the Sette of Odd Volumes, delivered at the Freemasons' Tavern, Great Queen Street, on Friday, February 5th, 1885. (pp. 72.) Presented to the Sette by His Oddship EDWARD F. WYMAN. Edition limited to 133 copies.

10. "Pens, Ink, and Paper:" a Discourse upon Caligraphy.

The Implements and Practice of Writing, both Ancient and Modern, with Curiosa, and an Appendix of famous English Penmen, by Bro. DANIEL W. KETTLE, F.R.G.S., Cosmographer; delivered at the Freemasons' Tavern, Great Queen Street, on Friday, November 6th, 1885. (pp. 104.) Presented to the Sette on January 8th, 1886, by Bro. DANIEL W. KETTLE. Edition limited to 233 copies.

11. On Some of the Books for Children of the Last Century.

With a few Words on the Philanthropic Publisher of St. Paul's Churchyard. A paper read at a Meeting of the Sette of Odd Volumes by Brother CHARLES WELSH, Chapman of the Sette, at the Freemasons' Tavern, on Friday, the 8th day of January, 1886. (pp. 108.) Presented to the Sette by Bro. CHARLES WELSH.

Edition limited to 250 copies.

12 Frost Fairs on the Thames.

An Address by Bro. EDWARD WALFORD, M.A., Rhymer to the Sette of the Odd Volumes, delivered at Willis's Rooms, on Friday, December 3rd, 1886. (pp. 76.) Presented to the Sette by His Oddship GEORGE CLULOW.

Edition limited to 133 copies.

13. On Coloured Books for Children.

By Bro. CHARLES WELSH, Chapman to the Sette. Read before the Sette, at Willis's Rooms, on Friday, the 6th May, 1887. With a Catalogue of the Books Exhibited. (pp. 60.) Presented to the Sette by Bro. JAMES ROBERTS BROWN.

Edition limited to 255 copies.

14. A Short Sketch of Liturgical History and Literature.

Illustrated by Examples Manuscript and Printed. A Paper read at a Meeting of the Sette of Odd Volumes by Bro. BERNARD QUARITCH, Librarian and First President of the Sette, at Willis's Rooms, on Friday, June 10th, 1887. (pp. 86.) Presented to the Sette by Bro. BERNARD QUARITCH.

15. Cornelius Walford : In Memoriam.

By his Kinsman, EDWARD WALFORD, M.A., Rhymer to the Sette of Odd Volumes. Read before the Sette at Willis's Rooms, on Friday, October 21st, 1887. (pp. 60.) Presented to the Sette by Bro. EDWARD WALFORD, M.A. Edition limited to 255 copies.

16. The Sweating Sickness.

By FREDERICK H. GERVIS, M.R.C.S., Apothecary to the Sette of Odd Volumes, delivered at Willis's Rooms, on Friday, November 4th, 1887. (pp. 48.) Presented to the Sette by Bro. FRED. H. GERVIS. Edition limited to 133 copies.

17. New Year's Day in Japan.

By Bro. CHARLES HOLME, Pilgrim of the Sette of Odd Volumes. Read before the Sette at Willis's Rooms on Friday, January 6th, 1888. (pp. 46.) Presented to the Sette by Bro. CHARLES HOLME. Edition limited to 133 copies.

18. Ye Seconde Boke of Ye Odd Volumes,

from 1883 to 1888. Carefvly *Compiled* and painsfvly *Edited* by ye vnworthy Historiographer to ye Sette, Bro. WILLIAM MORT THOMPSON, and produced by ye order and at ye charges of ye Sette. (pp. 157.) Edition limited to 115 copies.

19. Repeats and Plagiarisms in Art, 1888.

By Bro. JAMES ORROCK, R.I., Connoisseur to the Sette of Odd Volumes. Read before the Sette at Willis's Rooms, St. James's, on Friday, January 4th, 1889. (pp. 33.) Presented to the Sette by Bro. JAMES ORROCK, R.I. Edition limited to 133 copies.

20. How Dreams Come True.

A Dramatic Sketch by Bro. J. TODHUNTER, Bard of the Sette of Odd Volumes. Performed at a Conversazione of the Sette at the Grosvenor Gallery, on Thursday, July 17th, 1890. (pp. 46.) Presented to the Sette by His Oddship Bro. CHARLES HOLME.

Edition limited to 600 copies.

21. The Drama in England during the last Three Centuries.

By Bro. WALTER HAMILTON, F.R.G.S., Parodist to the Sette of Odd Volumes. Read before the Sette at Limmer's Hotel, on Wednesday, January 8th, 1890. (pp. 80.) Presented to the Sette by Bro. WALTER HAMILTON.

Edition limited to 201 copies.

22. Gilbert, of Colchester.

By Bro. SILVANUS P. THOMPSON, D.Sc., B.A., Magnetizer to the Sette of Odd Volumes. Read before the Sette at Limmer's Hotel, on Friday, July 4th, 1890. (pp. 63.) Presented to the Sette by Bro. SILVANUS P. THOMPSON.

Edition limited to 249 copies.

23. Neglected Frescoes in Northern Italy.

By Bro. DOUGLAS H. GORDON, Remembrancer to the Sette of Odd Volumes. Read before the Sette at Limmer's Hotel, on Friday, December 6th, 1889. (pp. 48.) Presented to the Sette by Bro. DOUGLAS H. GORDON.

Edition limited to 133 copies.

24. Recollections of Robert-Houdin.

By Bro. WILLIAM MANNING, Seer to the Sette of Odd Volumes. Delivered at a Meeting of the Sette held at Limmer's Hotel, on Friday, December 7th, 1890. (pp. 81.) Presented to the Sette by Bro. WILLIAM MANNING.

Edition limited to 205 copies.

25. Scottish Witchcraft Trials.

By Bro. J. W. BRODIE INNES, Master of the Rolls to the Sette of Odd Volumes. Read before the Sette at a Meeting held at Limmer's Hotel, on Friday, November 7th, 1890. (pp. 66.) Presented to the Sette by Bro. ALDERMAN TYLER.

Edition limited to 245 copies.

26. Blue and White China.

By Bro. ALEXANDER T. HOLLINGSWORTH, Artificer to the Sette of Odd Volumes. Delivered at a Meeting of the Sette held at Limmer's Hotel, on Friday, February 6th, 1891. (pp. 70.) Presented to the Sette by Bro. ALEXANDER T. HOLLINGSWORTH.

Edition limited to 245 copies.

27. Reading a Poem.

A Forgotten Sketch by WM. M. THACKERAY. Communicated by Bro. CHAS. PLUMPTRE JOHNSON, Clerke-atte-Lawe to the Sette of Odd Volumes, to the Sette at Limmer's Hotel, on Friday, May 1st, 1891. (pp. xi and 66.) Presented to the Sette by Bro. CHAS. PLUMPTRE JOHNSON.

Edition limited to 321 copies.

28. The Ballades of a Blasé Man,

to which are added some Rondeaux of his Rejuvenescence, laboriously constructed by the Necromancer to the Sette of Odd Volumes. (pp. 88.) Presented to the Sette by Bro. EDWARD HERON-ALLEN, in October, 1891.

Edition limited to 99 copies.

29. Automata Old and New.

By Bro. CONRAD W. COOKE, Mechanick to the Sette of Odd Volumes. Read before the Sette at a Meeting held at Limmer's Hotel, on Friday, November 6th, 1891. (pp. 118.) Presented to the Sette by Bro. CONRAD W. COOKE.

Edition limited to 255 copies.

30. Ye Magick Mirroure of Old Japan.

By Bro. SILVANUS P. THOMPSON, D.Sc., F.R.S., Magnetizer to the Sette of Odd Volumes. Read before the Sette at Limmer's Hotel, on Friday, December 2nd, 1892. (pp. 96.)

Edition limited to 97 copies.



YEAR-BOOKS.

- I. The Year-Boke of the Odd Volumes : An Annual Record of the Transactions of the Sette. Eleventh Year, 1888-9.

Written and compiled by Bro. W. MORT THOMPSON, Historiographer to the Sette. Issued November 29th, 1890.

- II. The Year-Boke of the Odd Volumes : An Annual Record of the Transactions of the Sette. Twelfth Year, 1889-90.

- III. The Year-Boke of the Odd Volumes : An Annual Record of the Transactions of the Sette. Thirteenth Year, 1890-1.

Compiled mainly from the Minute Book of the Sette, and imprinted for private circulation only. Edition limited to 133 copies.

- IV. The Year-Boke of the Odd Volumes, 1891-2.

In the Press.



F O L I A.

ORIGINATED BY BROTHER HOLME, *Pilgrim*, WHO
PRESENTED EACH BROTHER WITH A
SPECIAL PORTFOLIO.

1. The Victualling Crew. Presented by Bro. HENRY MOORE, A.R.A., *Ancient Mariner*.
2. Proud Maisie, from a drawing by Frederick Sandys. Presented by Bro. TODHUNTER, *Playwright*.
3. A Rainy Day in Hakone, Japan. Presented by Bro. ALFRED EAST, *Landscape Painter*.
4. The Shelley Memorial. Photogravure from the original Statue. Presented by E. ONSLOW FORD, A.R.A., *Sculptor*.



MISCELLANIES.

1. Inaugural Address

of His Oddship, W. M. THOMPSON, Fourth President of the Sette of Odd Volumes, delivered at the Freemasons' Tavern, Great Queen Street, on his taking office on April 13th, &c. (pp. 31.) Printed by order of Ye Sette, and issued on May the 4th, 1883.

Edition limited to 250 copies.

2. Codex Chiromantiae.

Appendix A. Dactylomancy, or Finger-ring Magic, Ancient, Mediæval, and Modern. (pp. 34.) Presented on October the 12th, 1883, by Bro. ED. HERON-ALLEN. Edition limited to 133 copies.

3. A President's Persiflage.

Spoken by His Oddship W. M. THOMPSON, Fourth President of the Sette of Odd Volumes, at the Freemasons' Tavern, Great Queen Street, at the Fifty-eighth Meeting of the Sette, on December 7th, 1883. (pp. 15.)

Edition limited to 250 copies.

4. Inaugural Address

of His Oddship EDWARD F. WYMAN, Fifth President of the Sette of Odd Volumes, delivered at the Freemasons' Tavern, Great Queen Street, on his taking office, on April 4th, 1884, &c. (pp. 56.) Presented to the Sette by His Oddship EDWARD F. WYMAN.

Edition limited to 133 copies.

5. Musical London a Century Ago.

Compiled from the Raw Material, by Brother BURNHAM W. HORNER, F.R.S.L., F.R. Hist. S., Organist of the Sette of Odd Volumes, delivered at the Freemasons' Tavern, Great Queen Street, on June 6th, 1884. (pp. 32.) Presented to the Sette by His Oddship EDWARD F. WYMAN. Edition limited to 133 copies.

6. The Unfinished Renaissance;

Or, Fifty Years of English Art. By Bro. GEORGE C. HAITÉ, Author of "Plant Studies," &c. Delivered at the Freemasons' Tavern, Friday, July 11th, 1884. (pp. 40.) Presented to the Sette by His Oddship EDWARD F. WYMAN. Edition limited to 133 copies.

7. The Pre-Shakespearian Drama.

By Bro. FRANK IRESON. Delivered at the Freemasons' Tavern, Friday, January 2nd, 1885. (pp. 34.) Presented to the Sette by His Oddship EDWARD F. WYMAN. Edition limited to 133 copies.

8. Inaugural Address

of His Oddship, Brother JAMES ROBERTS BROWN, Sixth President of the Sette of Odd Volumes, delivered at the Freemasons' Tavern, Great Queen Street, on his taking office, on April 17th, 1885, &c. (pp. 56.) Presented to the Sette by His Oddship JAMES ROBERTS BROWN. Edition limited to 133 copies.

9. Catalogue of Works of Art

Exhibited at the Freemasons' Tavern, Great Queen Street, on Friday, July 11th, 1884. Lent by Members of the Sette of Odd Volumes. Presented to the Sette by His Oddship EDWARD F. WYMAN. Edition limited to 255 copies.

10. Catalogue of Manuscripts and Early-Printed Books

Exhibited and Described by Bro. B. QUARITCH, the Librarian of the Sette of Odd Volumes, at the Freemasons' Tavern, Great Queen Street, June 5th, 1885. Presented to the Sette by His Oddship JAMES ROBERTS BROWN. Edition limited to 255 copies.

11. Catalogue of Old Organ Music

Exhibited by Bro. BURNHAM W. HORNER, F.R.S.L., F.R.Hist.S., Organist of the Sette of Odd Volumes, at the Freemasons' Tavern, Great Queen Street, on Friday, February 5th, 1886. Presented to the Sette by His Oddship JAMES ROBERTS BROWN.

Edition limited to 133 copies.

12. Inaugural Address

of His Oddship Bro. GEORGE CLULOW, Seventh President of the Sette of Odd Volumes, delivered at the Freemasons' Tavern, Great Queen Street, on his taking office, on April 2nd, 1886, &c. (pp. 64.) Presented to the Sette by His Oddship GEORGE CLULOW.

Edition limited to 133 copies.

13. A Few Notes about Arabs.

By Bro. CHARLES HOLME, Pilgrim of the Sette of Odd Volumes. Read at a Meeting of the "Sette" at Willis's Rooms, on Friday, May 7th, 1886. (pp. 46.) Presented to the Sette of Odd Volumes by Bro. CHAS. HOLME.

Edition limited to 133 copies.

14. Account of the Great Learned Societies and Associations, and of the Chief Printing Clubs of Great Britain and Ireland

Delivered by Bro. BERNARD QUARITCH, Librarian of the Sette of Odd Volumes, at Willis's Rooms on Tuesday, June 8th, 1886. (pp. 66.) Presented to the Sette by His Oddship GEORGE CLULOW.

Edition limited to 255 copies.

15. Report of a Conversazione

Given at Willis's Rooms, King Street, St. James's, on Tuesday, June 8th, 1886, by his Oddship Bro. GEORGE CLULOW, *President*; with a summary of an Address on "LEARNED SOCIETIES AND PRINTING CLUBS," then delivered by Bro. BERNARD QUARITCH, *Librarian*. By Bro. W. M. THOMPSON, *Historiographer*. Presented to the Sette by His Oddship GEORGE CLULOW.

Edition limited to 255 copies.

16. Codex Chiromantiae.

Appendix B.—A DISCOURSE CONCERNING AUTOGRAPHS AND THEIR SIGNIFICATIONS. Spoken in valediction at Willis's Rooms, on October the 8th, 1886, by Bro. EDWARD HERON-ALLEN. (pp. 45.) Presented to the Sette by His Oddship GEORGE CLULOW.

Edition limited to 133 copies.

17. Inaugural Address

of His Oddship ALFRED J. DAVIES, Eighth President of the Sette of Odd Volumes, delivered at Willis's Rooms, on his taking office on April 4th, 1887. (pp. 64.) Presented to the Sette by His Oddship ALFRED J. DAVIES. Edition limited to 133 copies.

18. Inaugural Address

of His Oddship Bro. T. C. VENABLES, Ninth President of the Sette of Odd Volumes, delivered at Willis's Rooms, on his taking office on April 6th, 1888. (pp. 54.) Presented to the Sette by His Oddship T. C. VENABLES. Edition limited to 133 copies.

19. Ye Papyrus Roll-Scroll of Ye Sette of Odd Volumes.

By Bro. J. BRODIE-INNES, Master of the Rolls to the Sette of Odd Volumes, delivered at Willis's Rooms, May 4th, 1888. (pp. 39.) Presented to the Sette by His Oddship T. C. VENABLES. Edition limited to 133 copies.

20. Inaugural Address

of His Oddship Bro. H. J. GORDON ROSS, Tenth President of the Sette of Odd Volumes, delivered at Willis's Rooms, King Street, St. James's Square, on his taking office, April 5th, 1889. Edition limited to 255 copies.

**WORKS DEDICATED TO THE SETTE.****The Ancestry of the Violin.**

London, 1882. EDWARD HERON-ALLEN.

An Odd Volume for Smokers.

London, 1889. WALTER HAMILTON.

The Blue Friars.

London, 1889. W. H. K. WRIGHT.

Quatrains.

London, 1892. W. WILSEY MARTIN.



De Sette of Odd Volumes.

- Original Member. 1878. BERNARD QUARITCH, *Librarian*, 15, Piccadilly, W. (President, 1878, 1879, and 1882).
- Original Member. 1878. EDWARD RENTON, *Herald* (Vice-President, 1880; Secretary, 1882).
- Original Member. 1878. W. MORT THOMPSON, *Historiographer*, 16, Carlyle Square, Chelsea, S.W. (Vice-President, 1882; President, 1883).
- Original Member. 1878. CHARLES W. H. WYMAN, *Typographer*, 103, King Henry's Road, Primrose Hill, N.W. (Vice-President, 1878 and 1879; President, 1880).
- Original Member. 1878. EDWARD F. WYMAN, *Treasurer*, Nirvâna, Bellaggio, East Grinstead (Secretary, 1878 and 1879; President, 1884).
- Original Member. 1878. ALFRED J. DAVIES, *Attorney-General*, Fairlight, Uxbridge Road, Ealing, W. (Vice-President, 1881; Secretary, 1884; President, 1887).

1878. G. R. TYLER, Alderman of the City of London, *Stationer*, 17, Penywern Road, South Kensington, W. (Vice-President, 1886).
1879. T. C. VENABLES, *Antiquary*, 9, Marlborough Place, N.W. (President, 1888).
1879. JAMES ROBERTS BROWN, F.R.G.S., *Alchemist*, 44, Tregunter Road, South Kensington, S.W. (Secretary, 1880; Vice-President, 1883; President, 1885).
1880. BURNHAM W. HORNER, *Organist*, 29, Redcliffe Gardens, South Kensington (Vice-President, 1889).
1882. WILLIAM MURRELL, M.D., *Leech* (President), 17, Welbeck Street, Cavendish Square, W. (Secretary, 1883; Vice-President, 1885).
1883. HENRY GEORGE LILEY, *Art Director*, Radnor House, Radnor Place, Hyde Park, W.
1883. GEORGE CHARLES HAITÉ, F.L.S., and R.B.A., *Art Critic*, Ormsby Lodge, The Avenue, Bedford Park, W. (Vice-President, 1887; President, 1891).
1883. EDWARD HERON-ALLEN, *Necromancer* (Vice-President), 3, Northwick Terrace, N.W. (Secretary, 1885).

1884. WILFRID BALL, R. P. E., *Painter-Etcher*,
4, Albemarle Street, W. (Master of
Ceremonies, 1890; Vice-President,
1891).
1884. DANIEL W. KETTLE, F.R.G.S., *Cosmogra-
pher*, Hayes Common, near Beckenham,
Kent (Secretary, 1886).
1884. CHARLES WELSH, *Chapman*, The Poplars,
Forest Lane, Walthamstow (Vice-Pre-
sident, 1888).
1886. CHARLES HOLME, F.L.S., *Pilgrim*, The Red
House, Bexley Heath, Kent (Secretary,
1887; President, 1890).
1886. FREDK. H. GERVIS, M.R.C.S., *Apothecary*,
1, Fellows Road, Haverstock Hill,
N.W.
1887. JOHN W. BRODIE-INNES, *Master of the
Rolls*, 15, Royal Circus, Edinburgh
(Secretary, 1888).
1887. HENRY MOORE, A.R.A., *Ancient Mariner*,
Collingham, Maresfield Gardens, N.W.





Supplemental Odd Volumes.

1887. JAMES ORROCK, R.I., *Connoisseur*, 48, Bedford Square, W.C.
1888. ALFRED EAST, R.I., *Landscape Painter*, 4, Grove End Road, St. John's Wood.
1888. WALTER HAMILTON, F.R.G.S., *Parodist*, Keeper of the Archives, Ellarbee, Elms Road, Clapham Common, S.W.
1888. DOUGLAS H. GORDON, *Remembrancer (Master of Ceremonies)*, 41, Tedworth Square, S.W. (Secretary, 1889).
1888. ALEXANDER T. HOLLINGSWORTH, *Artificer*, 172, Sutherland Avenue, Maida Vale, W. (Vice-President, 1890).
1888. JOHN LANE, *Bibliographer*, 37, Southwick Street, Hyde Park, W. (Odd Councillor, 1891; Secretary, 1890; Master of Ceremonies, 1891).

1888. JOHN TODHUNTER, M.D., *Playwright* (~~Secretary~~), Orchard Croft, The Orchard, Bedford Park, W.
1889. FRANCIS ELGAR, LL.D., *Shipwright*, 113, Cannon Street, E.C.
1889. WILLIAM MANNING, F.R.M.S., *Seer*, 21, Redcliffe Gardens, S.W. (Secretary, 1891 ; Odd Councillor, 1892).
1890. SILVANUS P. THOMPSON, D.Sc., F.R.S., *Magnetizer*, Morland, Chislett Road, N.W.
1890. CONRAD W. COOKE, M.I.E.E., *Mechanick*, The Lindens, Larkhall Rise, S.W.
1890. E. ONSLOW FORD, A.R.A., *Sculptor*, 62, Acacia Road, N.W.
1891. CHARLES PLUMPTRE JOHNSON, *Clerke at Law*, 8, Savile Row, W.
1891. FREDERIC VILLIERS, *War Correspondent*, Mashrabeyah, 65, Chancery Lane, W.C.
1891. MARCUS B. HUIISH, LL.B., *Arts-man*, 21, Essex Villas, Phillimore Gardens, W.
1892. W. WILSEY MARTIN, F.R.G.S., *Laureate*, 15, Delamere Terrace, W.

1892. HERBERT WARD, *Vagabond*, Shepherd Hill House, Harefield, Middlesex.
1892. FREDERIC YORK POWELL, *Ignoramus*, The Corner, Priory Road, Bedford Park, W.
1892. ERNEST CLARKE, *Yeoman*, 10, Addison Road, Bedford Park, W.
1892. PAUL BEVAN, *Ready Reckoner* (AUDITOR), 46, Queen's Gate Terrace, S.W.





C. WHITTINGHAM AND CO., TOOKS COURT,
CHANCERY LANE.

