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The Journal of Indian Art and Industry.

DRAWINGS BY STUDENTS OF THE BOMBAY SCHOOL OF ART.

A party of advanced students of the School of Art are taken every year, for about a fortnight, in charge of the Principal or Vice-Principal, to some place noted for its architecture, for the purpose of study. Sketches and measurements of the buildings are made on the spot, which are afterwards worked out on the return of the party to Bombay. The drawings, some of which are now published, are the result of an excursion at the beginning of the year (1893) to Ahmedabad, which is famous for its architecture, both in stone and wood. The drawings have been worked under the superintendence of Mr. Adams, the lecturer on Architecture.

JOHN GRIFFITHS, PRINCIPAL.

Ahmedabad, the capital of Gujerat, 309 miles north of Bombay, is one of the most interesting cities in India, and its architectural buildings, both in stone and in wood, are as beautiful as they are picturesque. It was founded in 1411 by Sultan Ahmad I., and has passed through five periods—two of greatness, two of decay, and one of revival. First came a hundred years (1411—1511) of growth and rising wealth; then sixty years (1512—1572) of decline during the decay of the Gujerat dynasty; next 135 years (1572—1707) of renewed greatness under the early Moghal Emperors; again 110 years (1707—1817) of disorder and loss under weakly Moghals and greedy Maráthás; and last of all, from 1818 to the present time, of steady progress under British rule.

The buildings in stone and brick of architectural interest in Ahmedabad are Muhammadan, and illustrate 'the most elegant and instructive of Indo-Saracenic styles.' The style of architecture, which is derived from the local Jaina forms which it replaced, is essentially different from that of Delhi, Agra, Futtipur Sikri, and Bijapur of the same period.

Those requiring fuller information regarding the illustrations are referred to Hope and Fergusson's *Architecture of Ahmedabad*, Fergusson's *History of Indian and Eastern Architecture*, and Campbell's *Bombay Gazetteer*.

RANI SIPRI'S OR ASNI'S MOSQUE AND TOMB, AHMEDABAD.—Until lately this mosque was called Rani Sipri's mosque, as it is supposed to have been built by a lady of that name, the wife of Ahmed Shah, in A.D. 1431; but from an Arabic inscription lately translated it is found that it was built by Rani Asni, the widow of Sultan Mahmud Begada. The following is a translation of the Arabic inscription:—"God who is blessed and high has said: 'Of a truth mosques belong to God, then call ye no one else with him'; and the Prophet has said: 'He who builds a mosque for God Almighty, will have a castle built for him by God in Paradise.' This mosque was built during the reign of the great king, whose helper is the All-merciful, Shams-ud-dunya Waddin Abun-násir Muzaffar Shah, son of Mahmud Shah, son of Muhammad Shah, son of Ahmad Shah, son of Muhammad Shah, son of Muzaffar Shah the King. May God make his kingdom last! The builder of this mosque is the mother of Abu Bakar Khan, son of Mahmud Shah Sultan, who is called Rani Asni. During the months of the fourth solar year of the present reign in 920 (A.D. 1514)." Her tomb, which is in front, was also finished probably by herself during her lifetime, in accordance with the prevailing custom. The mosque and tomb are the first of a series of buildings more delicately ornate than any which preceded them. Mr. Fergusson says of the mosque, "that notwithstanding the smallness of its dimensions, it may be considered the gem of Ahmedabad, and in its class, as one of the most exquisite buildings in the world. It is also one of the most perfectly Hindu of the buildings of the city, no arch being employed anywhere (except in one side doorway) either constructively or for ornament.* The minarets, too, though so exquisite in design, are not minarets in reality; they have no internal stairs and no galleries from which the call to prayer could be recited. They are pure ornaments, but of the most graceful kind. The charm of this building resides in two things. First, the completeness and unity of the design: every form and every detail is designed for the place where it is put, and is appropriate to that place. And next to the fact that all the

* This is not quite correct, as the arch appears in the mihrab, in the window shown in the back elevation, and also in the small pierced niches in the minarets.

details are beautiful in themselves, and just sufficient to relieve and accentuate the construction without ever concealing or interfering with it. It would, of course, be absurd to compare such a building with the Parthenon, or one of our great Gothic cathedrals; but it is architecturally a more perfect building than the Erectheion at Athens; and though we have some Gothic chapels of great beauty, there probably is not one that would not look coarse and plain if placed side by side with this mosque."

The tomb is also very beautiful, but not equal to the mosque in design. The parapet surrounding it is a rich specimen of ornamental work cut with remarkable precision and sharpness in the fine sandstone of which the building is constructed, as also are the perforations which fill in the bays that enclose the tomb.

MIHRAB, WITH DETAILS.—This mihrab, which occupies the centre of the mosque, and to which all turn in prayer, is elaborately moulded and carved in marble. There is usually one mihrab opposite each archway of the façade.

CARVED WOOD PIGEON HOUSE.—One of the marked features that meet the eye as one wanders through the streets of Ahmedabad, and which adds so much to their picturesqueness, are the pigeon houses which are placed at prominent places for the accommodation of the thousands of pigeons which here live their happy lives, unmolested by the gun of the sportsman or the net of the snarer. Many of these pigeon houses are elaborately carved in wood; and the two plates of illustrations give a good idea of the wealth of invention and good taste which are displayed even in the humblest object in the domestic life of the people.

LIST OF ILLUSTRATIONS.

Eleven Plates—Rani Sipri's Mosque and Tomb, Ahmedabad.

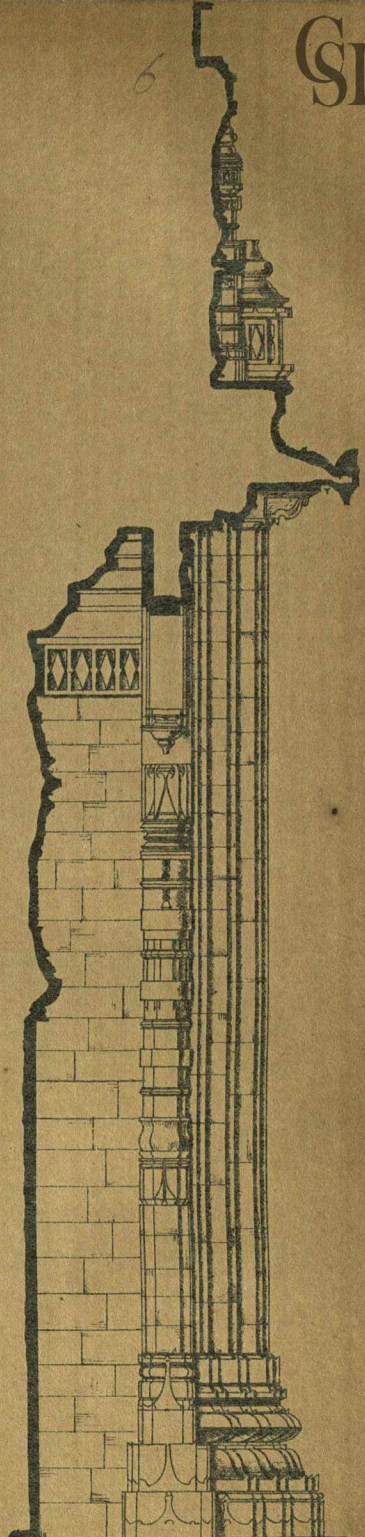
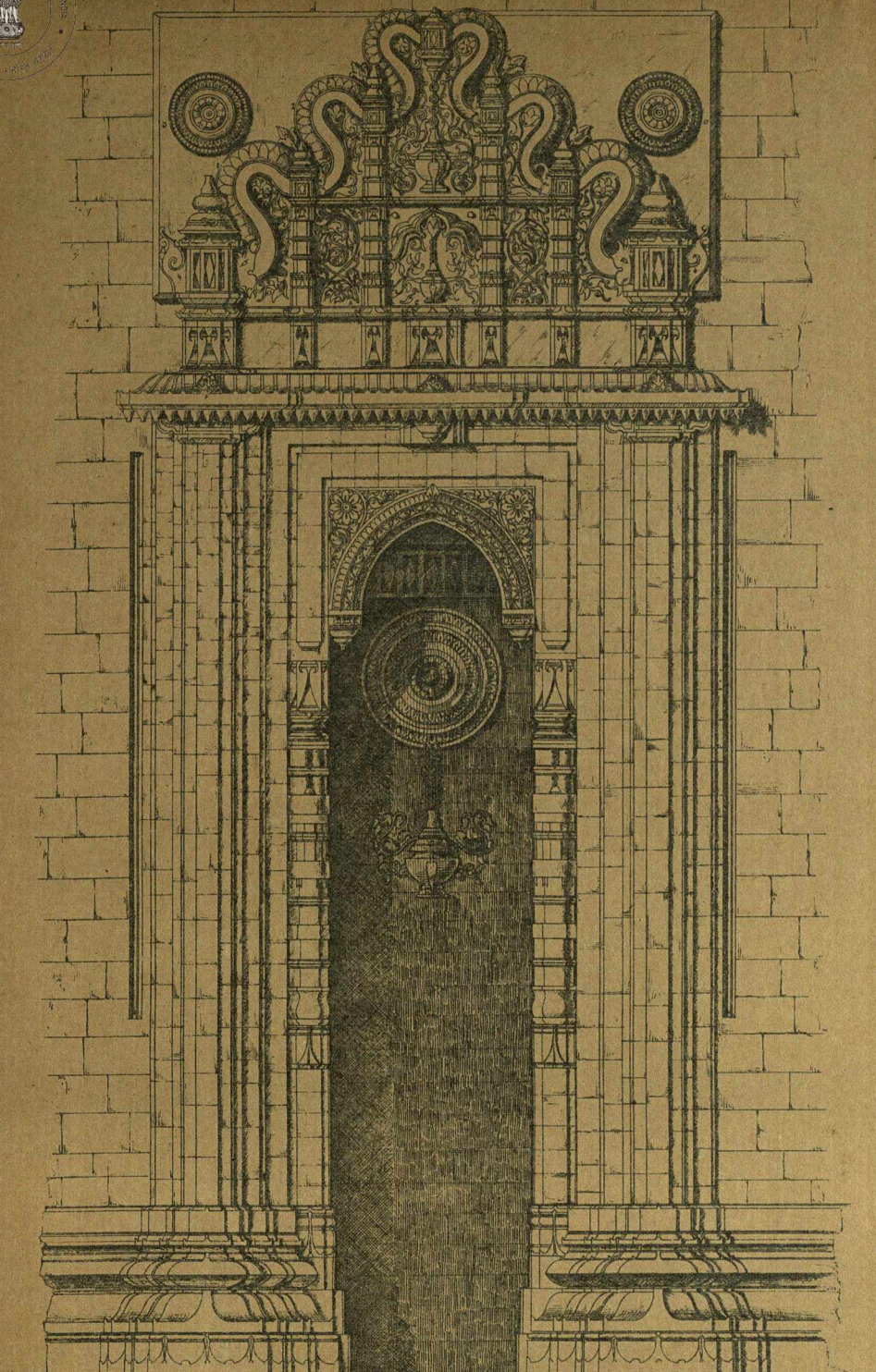
Two Plates—Pigeon House, Ahmedabad.





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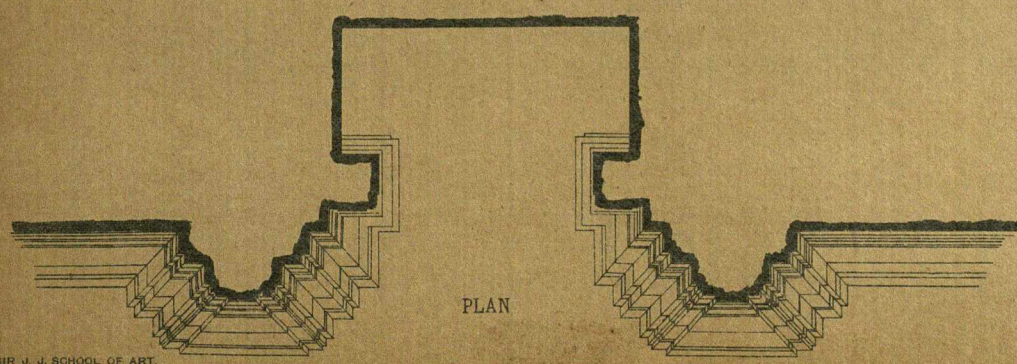
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ELEVATION

SECTION

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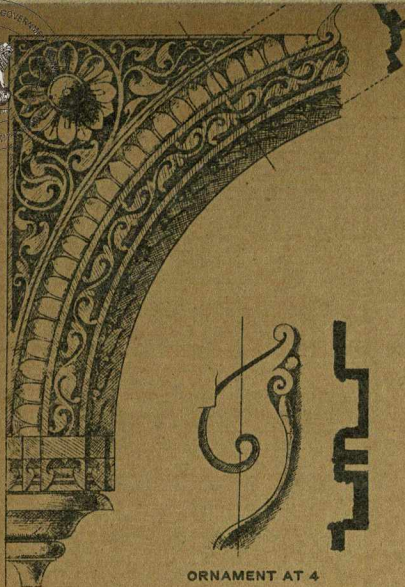


PLAN

MEASURED AND DRAWN BY
A. C. VAZ.

SIR J. J. SCHOOL OF ART,
BOMBAY, 1893.

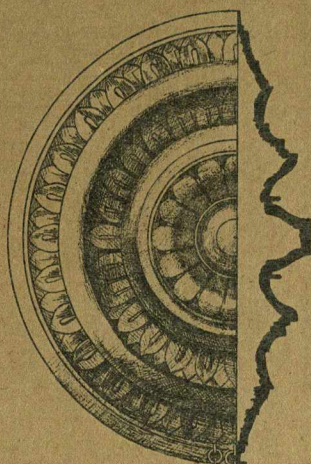
MIHRAB FROM RANI SIPRI'S MOSQUE, AHMEDABAD.



SPANDRIL



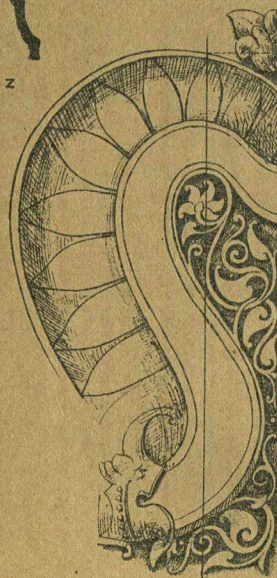
ORNAMENT AT 4



ORNAMENT AT Z



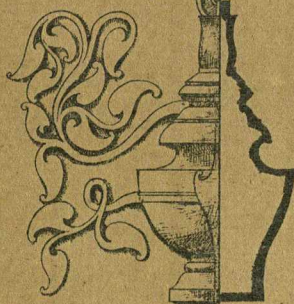
PANEL A



SCROLL 1



SCROLL 2



ORNAMENT AT E



PANEL C



DETAIL AT F



SCROLL 3



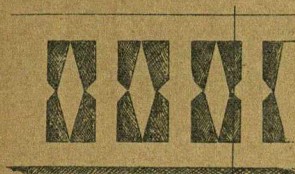
DETAIL AT Y



PANEL B




ORNAMENT AT D



DETAIL AT G



SCALE OF  FEET

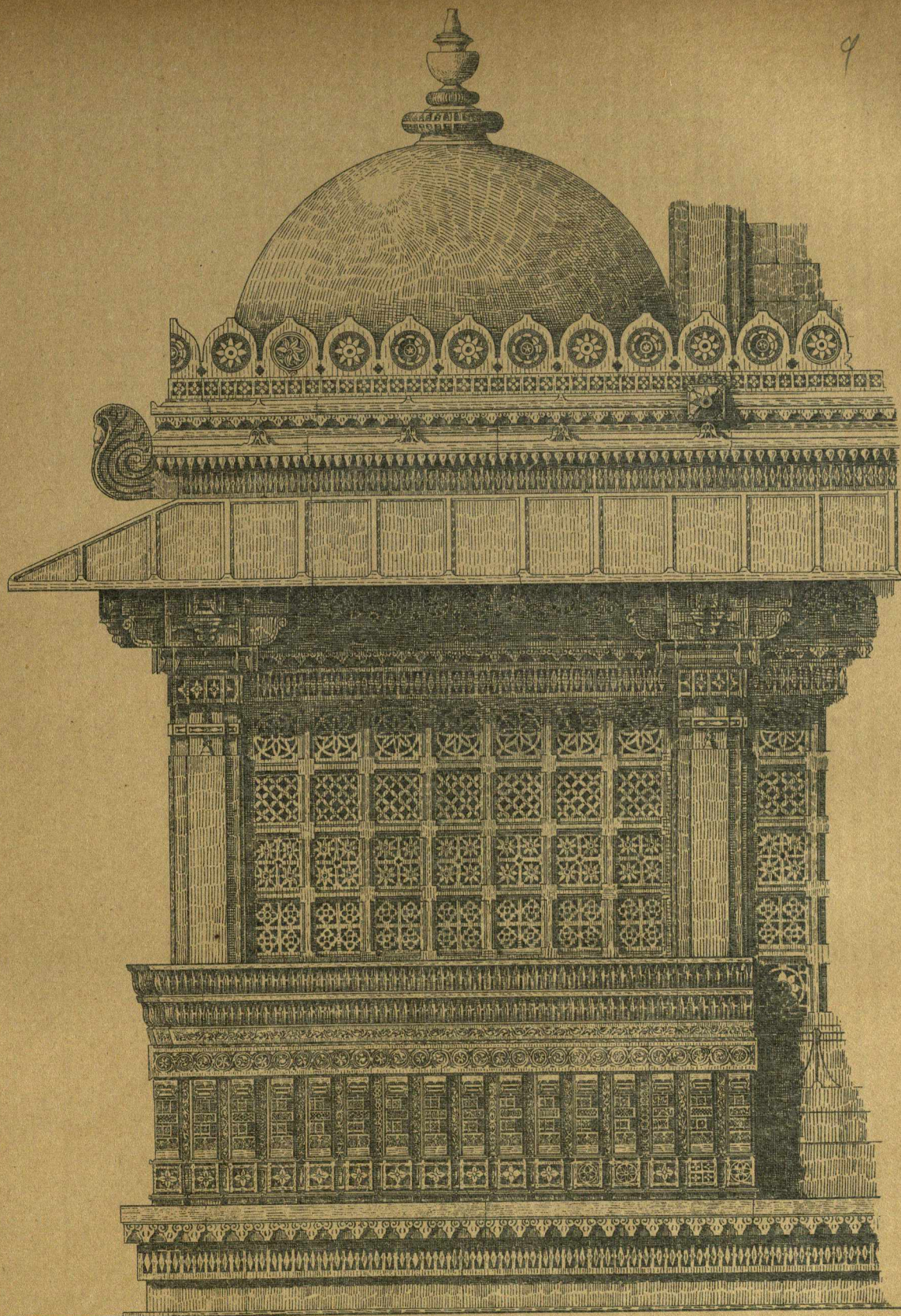
SIR J. J. SCHOOL OF ART,
BOMBAY, 1893.

MEASURED AND DRAWN BY
S. J. FONSECA.

WINDOW FROM RANI SIPRI'S MOSQUE, AHMEDABAD.



CSL



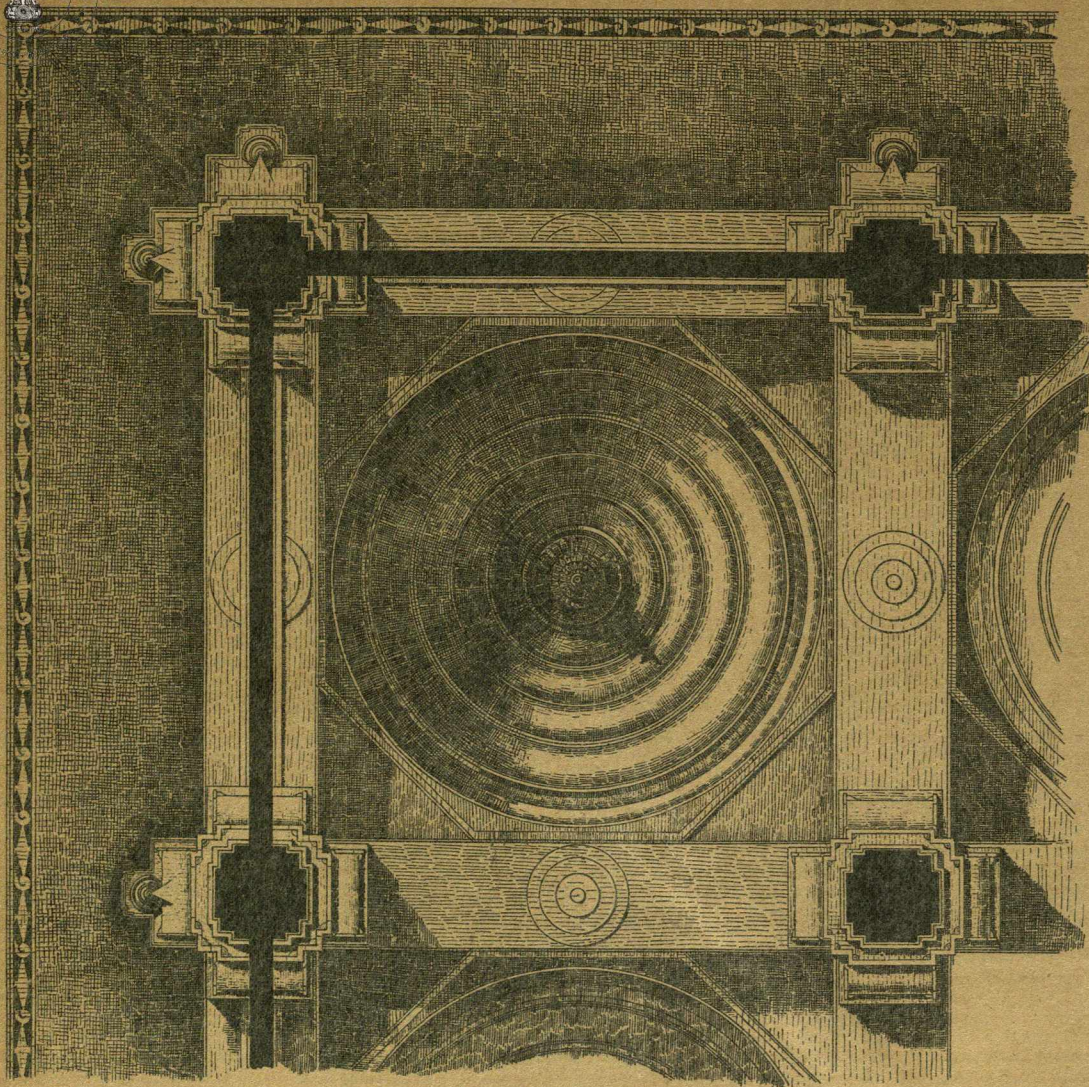
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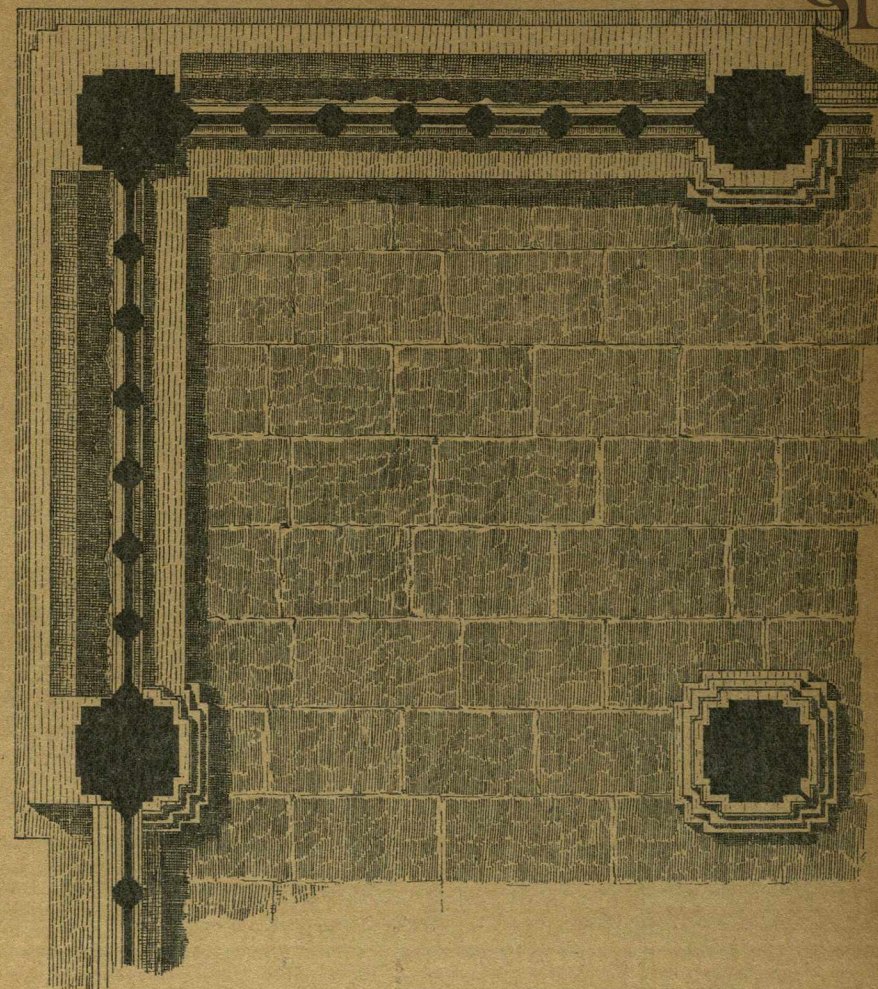
SIR J. J. SCHOOL OF ART,
BOMBAY, 1893.

MEASURED AND DRAWN BY
A. G. VAZ.

CORNER OF TOMB, RANI SIPRI, AHMEDABAD.



PLAN OF CEILING, LOOKING UP



GROUND PLAN

SCALE OF 0 1 2 3 4 5 6 7 8 9 10 11 12 FEET

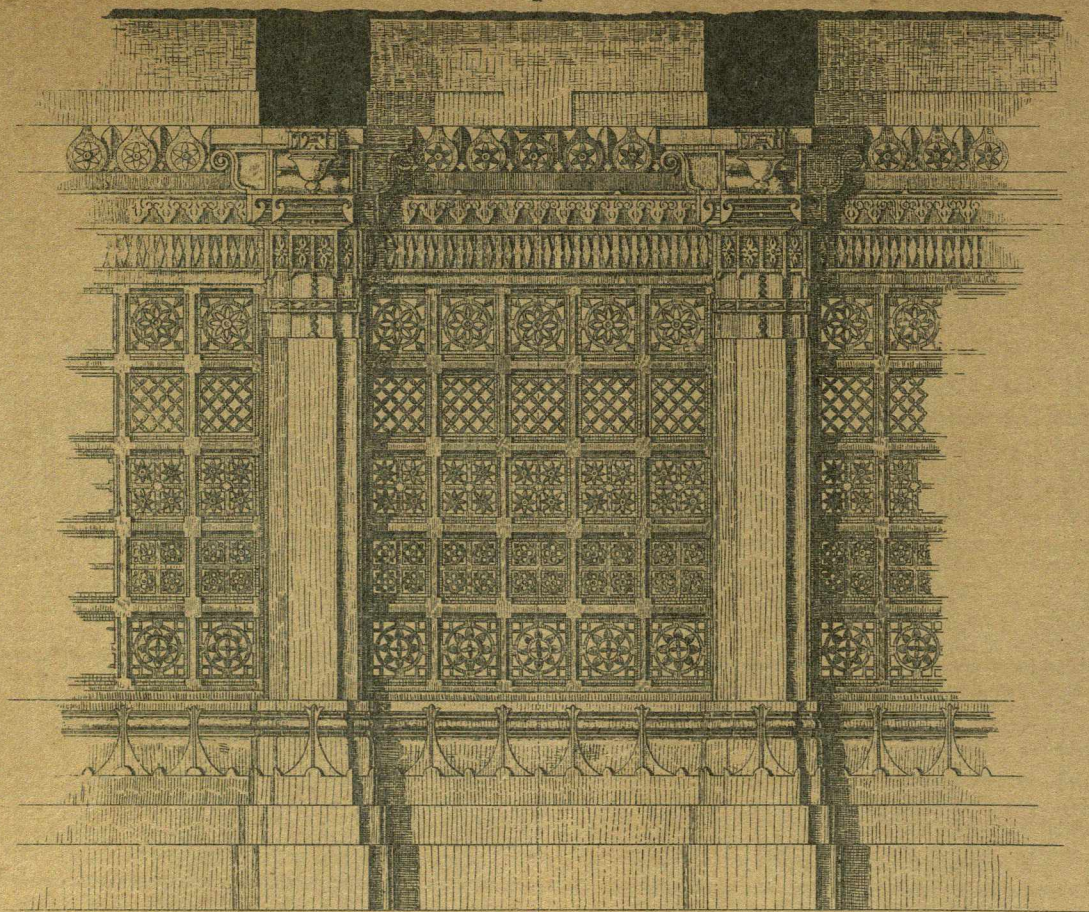
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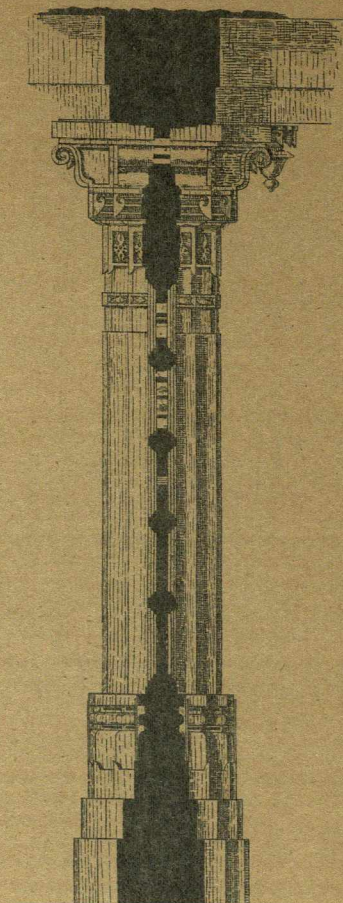
DETAILS OF CORNER OF RANI SIPRI'S TOMB, AHMEDABAD.



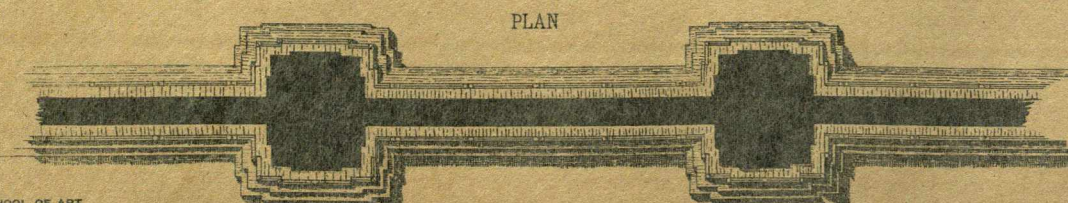
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INTERIOR ELEVATION



SECTION AT A.B



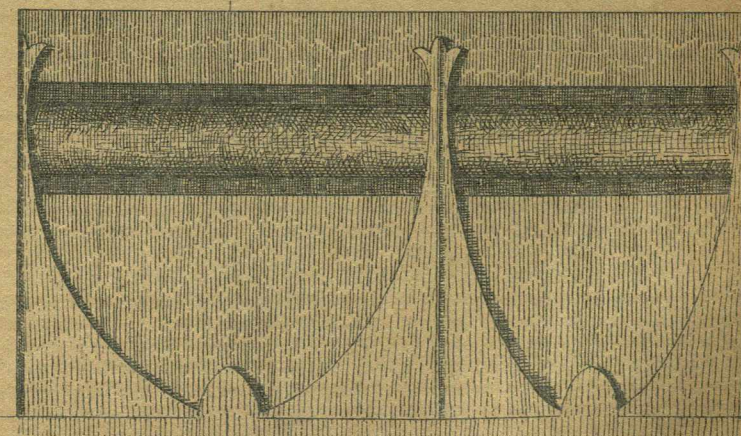
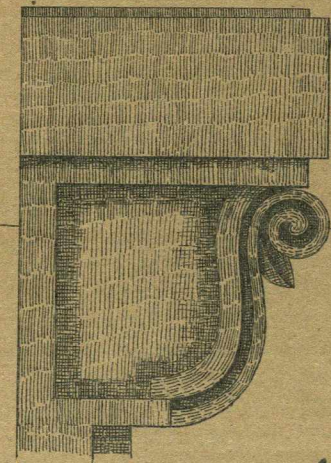
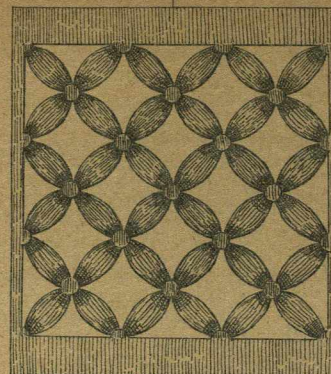
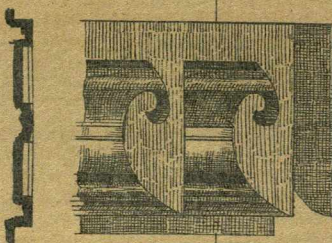
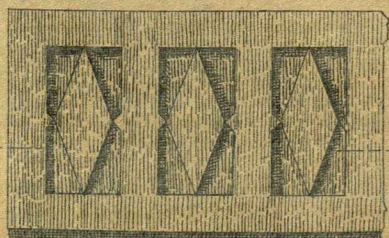
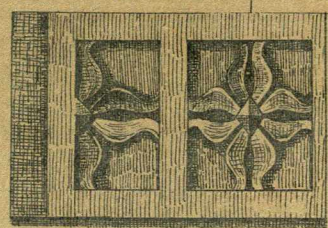
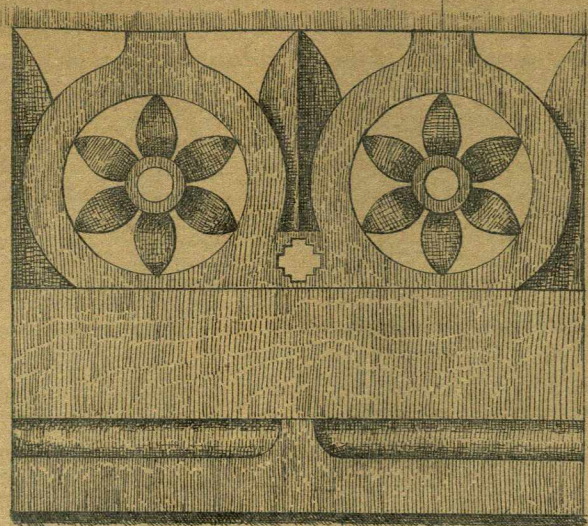
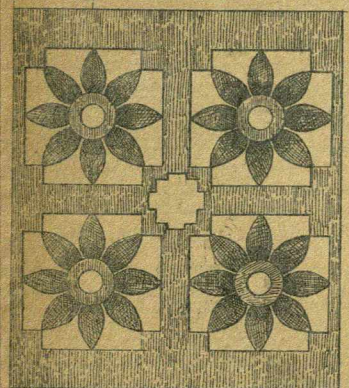
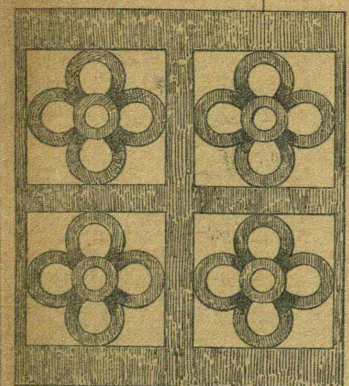
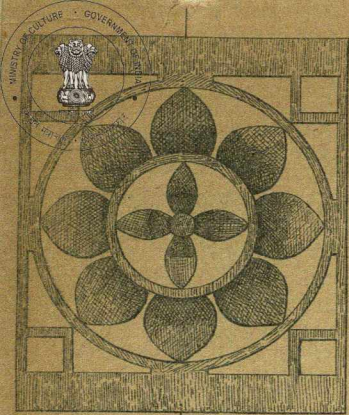
PLAN

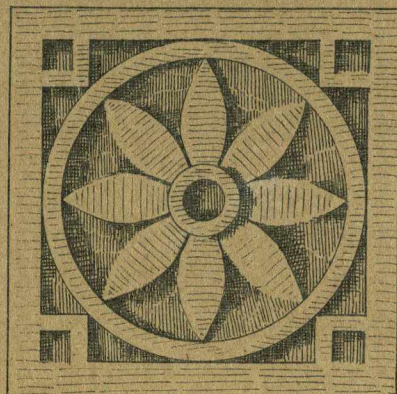
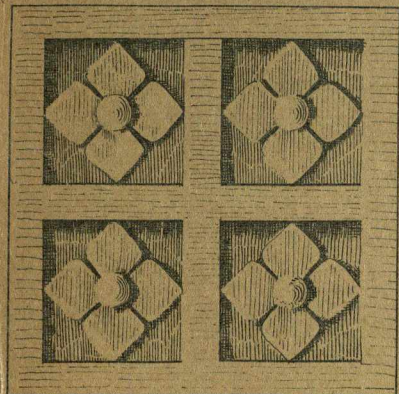
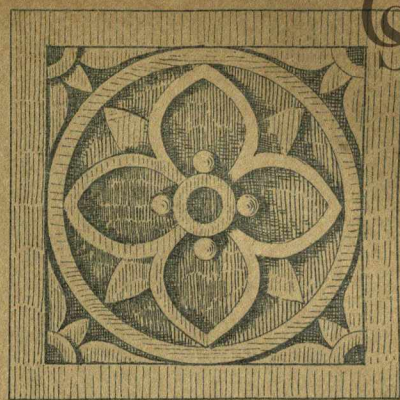
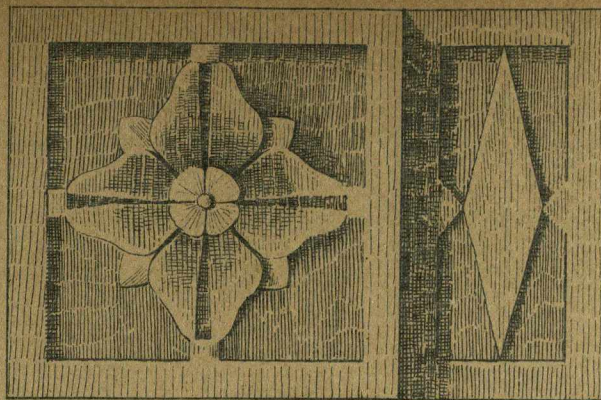
SCALE OF FEET

SIR J. J. SCHOOL OF ART,
BOMBAY, 1893.

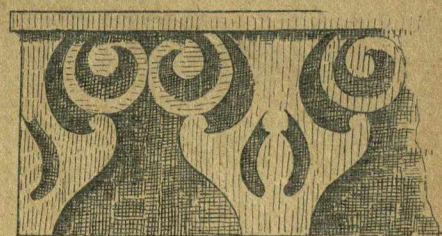
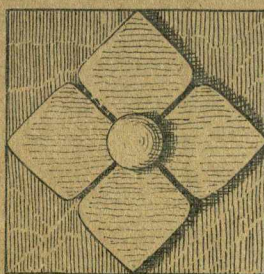
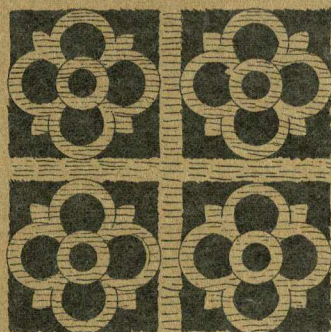
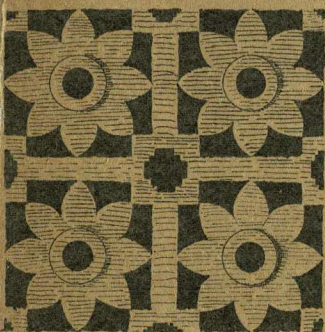
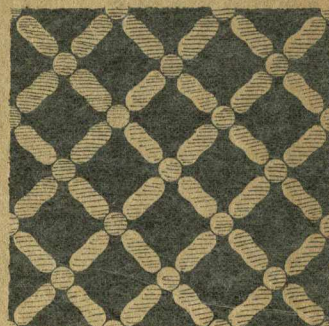
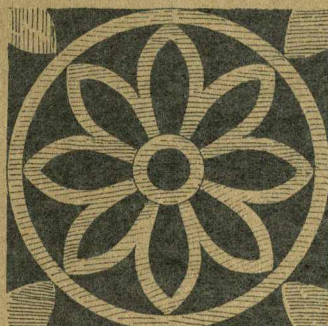
MEASURED AND DRAWN BY
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DETAILS OF A PERFORATED BAY, RANI SIPRI'S TOMB, AHMEDABAD.

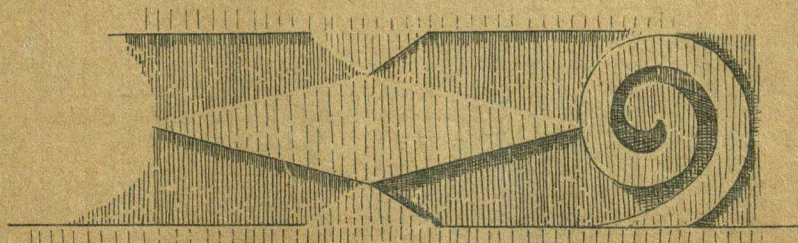
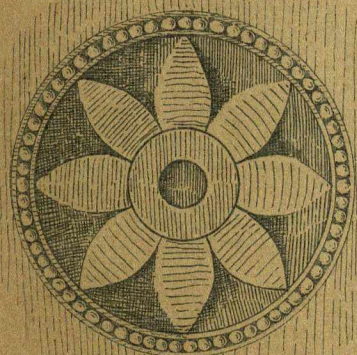
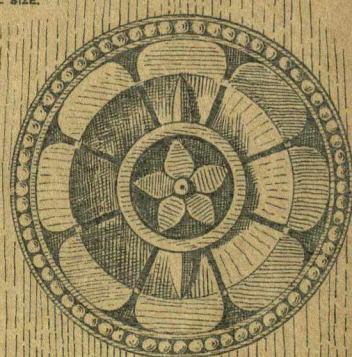
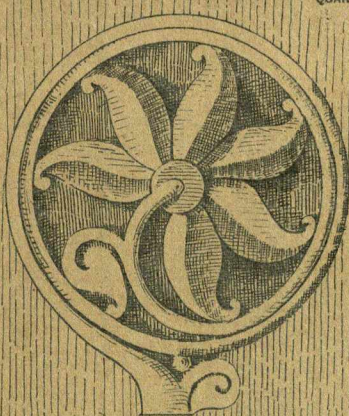
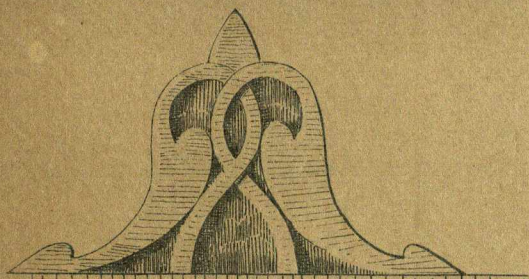


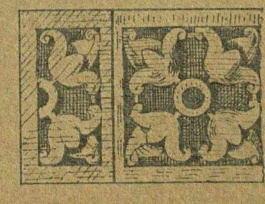
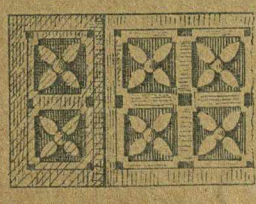
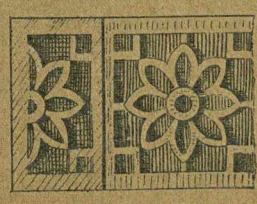
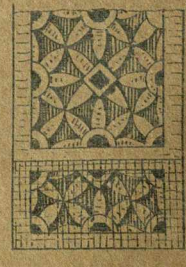
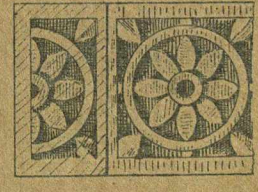
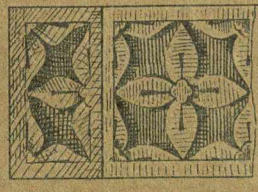
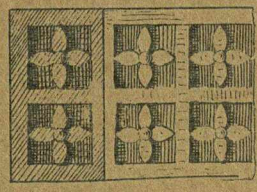
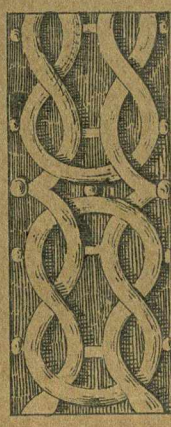


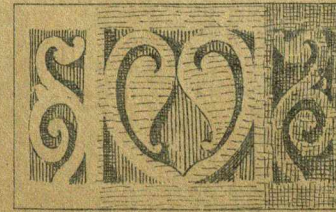
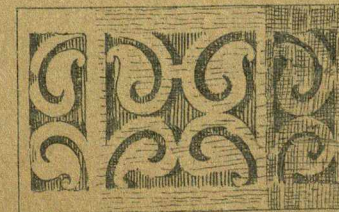
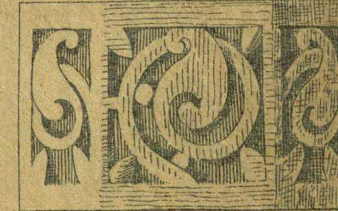
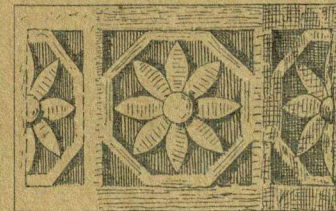
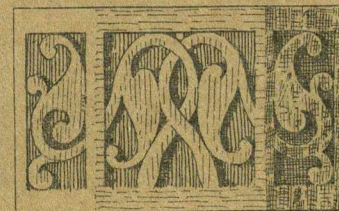
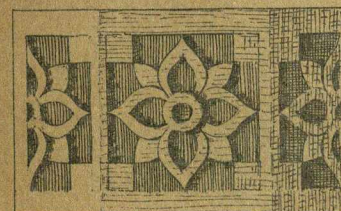
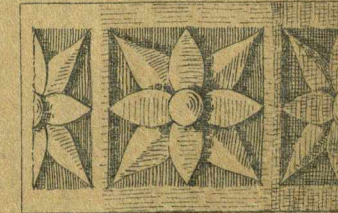
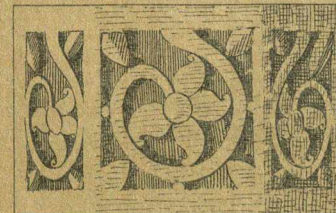
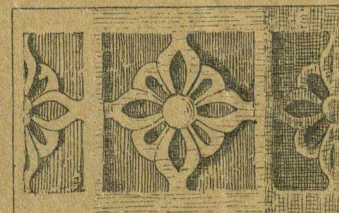
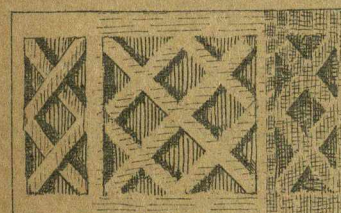
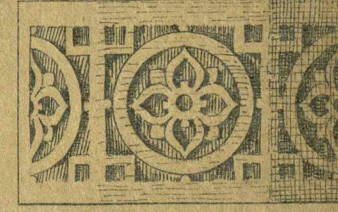
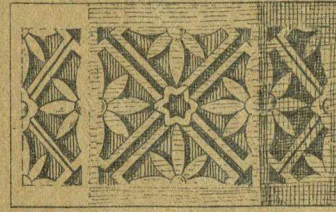
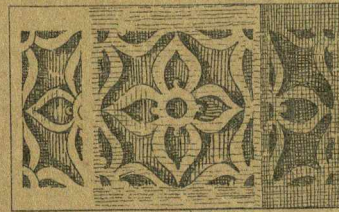
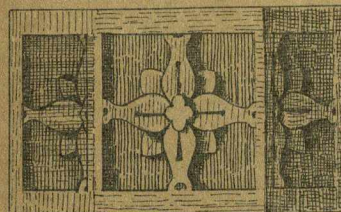
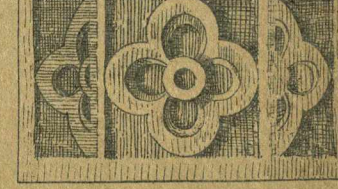
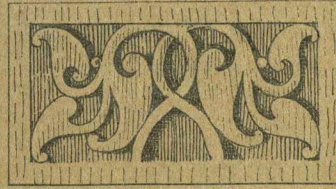
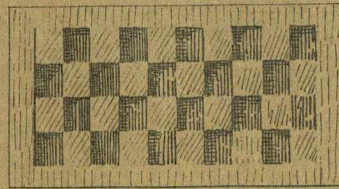
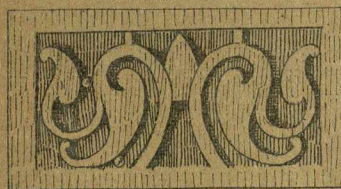
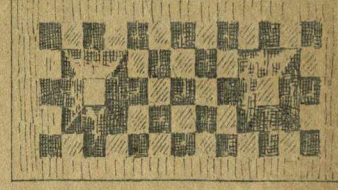
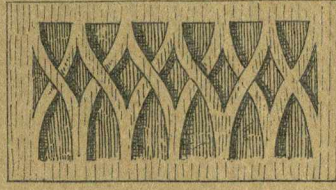
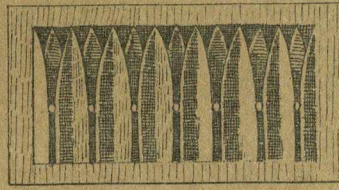
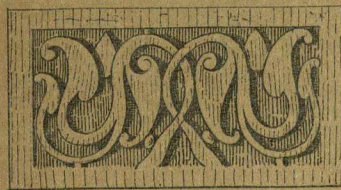
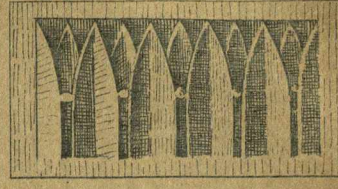
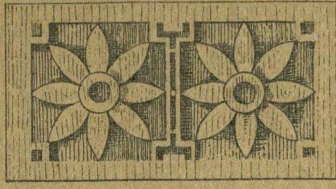
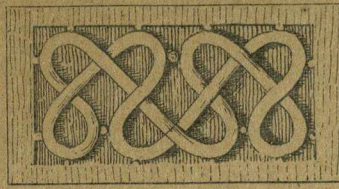
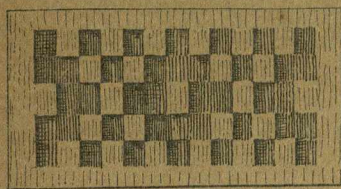
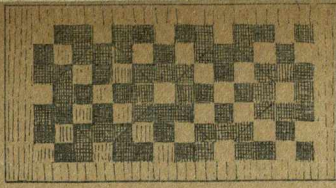
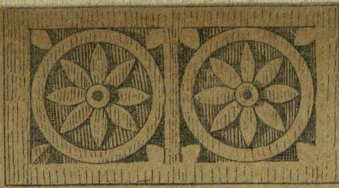
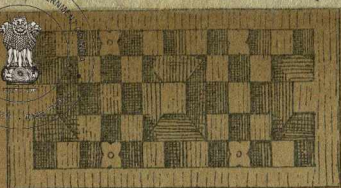
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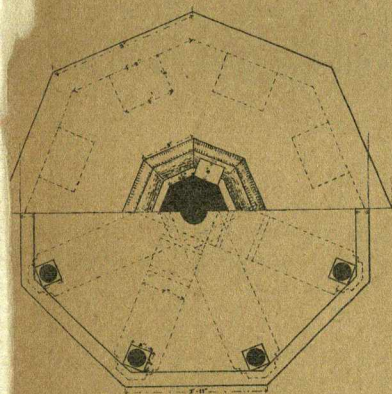
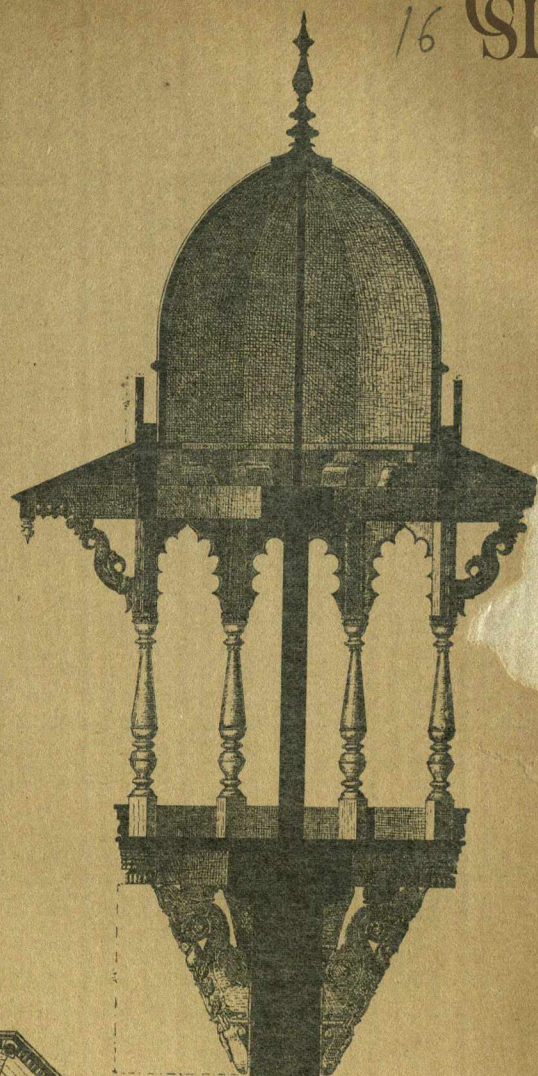
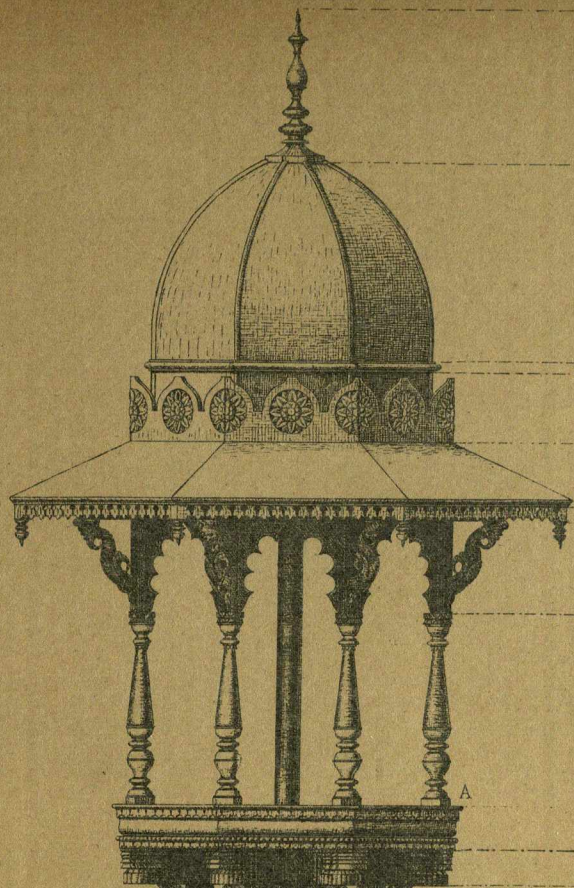


SIR J. J. SCHOOL OF ART,
BOMBAY, 1893.

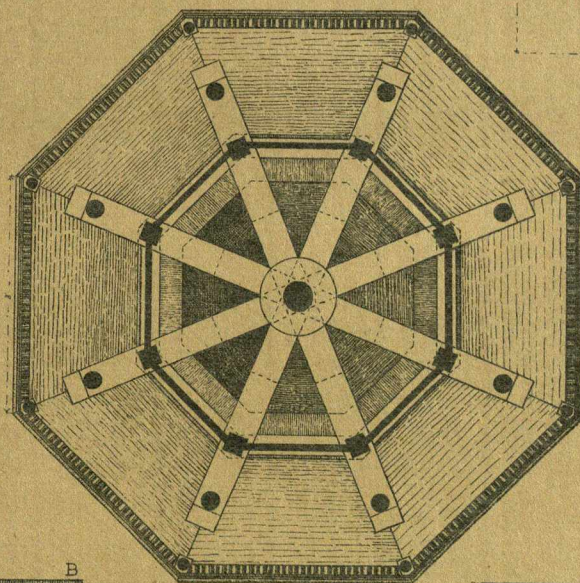
MEASURED AND DRAWN BY
A. X. TRINDADE.

DETAILS OF BASE OF RANI SIPRI'S TOMB, AHMEDABAD.

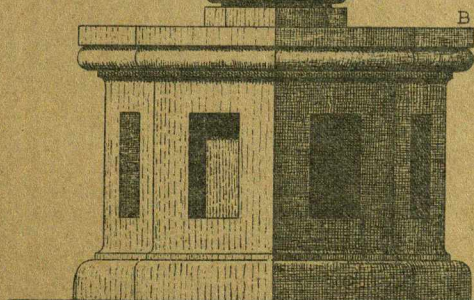
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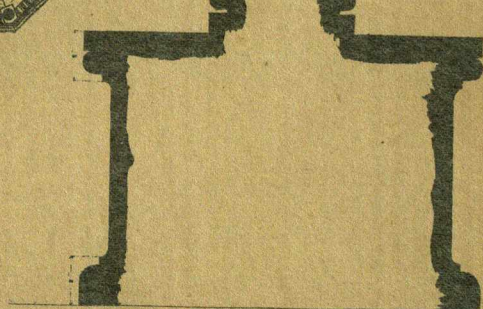
PLANS AT A & B



PLAN LOOKING UP



ELEVATION



SECTION

CARVED WOOD PIGEON HOUSE, AHMEDABAD

SCALE HALF-INCH TO ONE FOOT.



MEASURED AND DRAWN BY
 RAMJEE JEEWAN LOHAR.

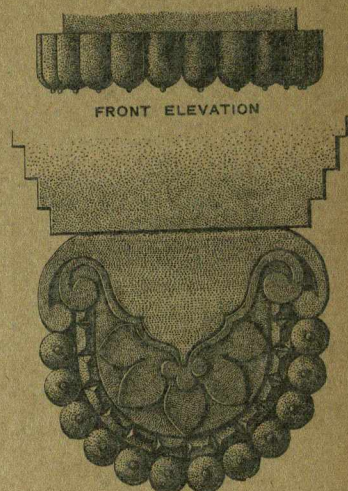


FRONT ELEVATION



SIDE ELEVATION

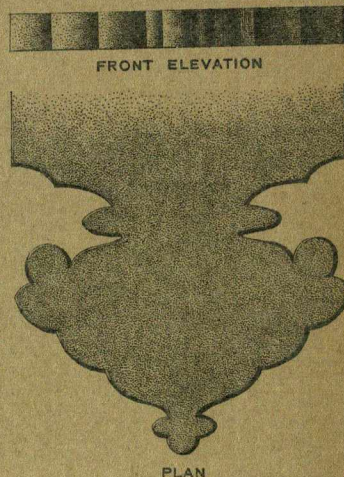
DETAILS OF BRACKETS
 QUARTER FULL SIZE.



FRONT ELEVATION

PLAN LOOKING UP

FINISH OF BOARDING AT EAVES
 QUARTER FULL SIZE.



FRONT ELEVATION

PLAN

CAPITAL OF A PIER
 HALF FULL SIZE

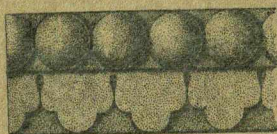


ELEVATION

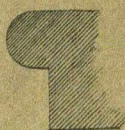


SECTION

LOWER CORNICE
 HALF FULL SIZE.



ELEVATION



SECTION

UPPER CORNICE
 HALF FULL SIZE.



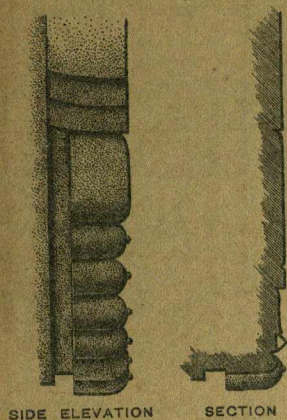
ELEVATION



SECTION

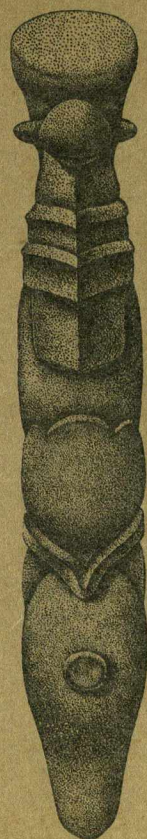


END OF A BEAM
QUARTER FULL SIZE.



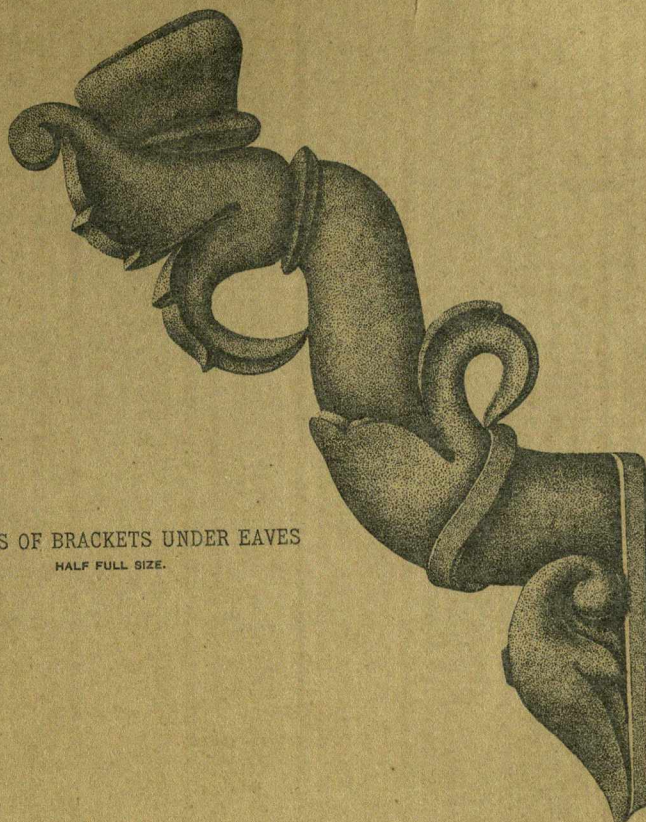
SIDE ELEVATION

SECTION

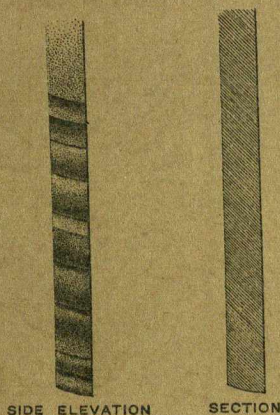


FRONT ELEVATION

DETAILS OF BRACKETS UNDER EAVES
HALF FULL SIZE.

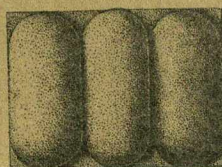


SIDE ELEVATION



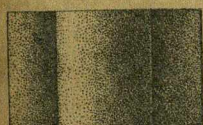
SIDE ELEVATION

SECTION



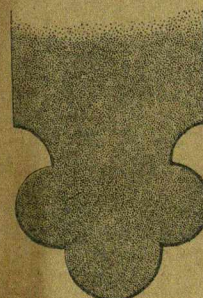
FRONT ELEVATION

END OF PRINCIPAL RAFTER
HALF FULL SIZE.



FRONT ELEVATION

END OF COMMON RAFTER
HALF FULL SIZE.



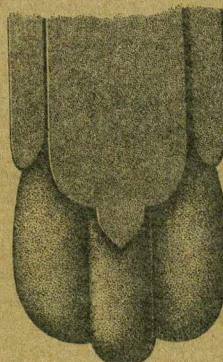
PLAN



SIDE ELEVATION



SECTION



PLAN



SIDE ELEVATION



SECTION

MEASURED AND DRAWN BY
VISHNOO SHIVRAM GHARPURE.

The Journal of Indian Art and Industry.

WALL PAINTINGS

RECENTLY FOUND IN THE KHWABGAH, FATHPUR SIKRI, NEAR AGRA.

By EDMUND W. SMITH, ARCHAEOLOGICAL SURVEY OF INDIA, N.W.P. AND OUDH CIRCLE.

IN Vol. IV. Plate 37 we illustrated a beautiful perforated panel of red sandstone from Fathpur Sikri, occupying one side of a kiosque surmounting a closed viaduct leading from "Jodhbai's" palace towards the Hiran Minâr. It forms one of a series of drawings prepared during the last three or four cold seasons, by the North-Western Provinces Circle of the Archaeological Department of India, to illustrate the work, now in the press, entitled "The Moghal Architecture of Fathpur Sikri."

As Fathpur Sikri is so well known to most who have visited India, being one of the most famous places of interest in the country, and its architecture and decorative ornament cannot but prove interesting to our readers, students, and others interested in art, we reproduce some more of these drawings; and from time to time we hope to publish others which will deal more especially with the colour decoration at the place, in the celebrated shrine of Saint Salim Chishti, the Great Masjid, the Turkish Baths, &c.

For the benefit of those unacquainted with the city, we may mention that it lies some twenty-three miles to the west of Agra, Akbar's capital, built on the banks of the tortuous and mighty Jamnâ, and, as everyone knows, celebrated for its magnificent buildings of the Moghal period; amongst which is the stately Taj, inlaid like the lovely tomb of Itimâd-ad-daula, with precious stones, and thought by some to surpass the Taj itself; the Fort, so notable in connexion with the Mutiny of 1857; Sikandra; Chini kâ Ranza; &c. Fathpur Sikri was built by Akbar, one of India's greatest and most enlightened rulers, between 1570 and 1606 A.D., or about the time of our Queen Elizabeth. Akbar ascended the throne at a most critical time, and when quite a boy,—being only fourteen years old. It was he, it will be remembered, who firmly established the Moghal dynasty in India. His father was the brave and witty Humâyûn, the son of Bâbar, who victoriously descended upon Hindûstan from Kâbul. It is almost entirely constructed of red sandstone and is built upon a low sandstone ridge, and enclosed on three sides by a high embattlemented stone wall, pierced in six or seven places by gateways protected by heavy and grim semi-circular bastions of rubble masonry. It is difficult to say what induced Akbar to build a city in such an out-of-the-way place, but if tradition is to be relied upon, it was owing to the circumstance that, after the death of twin sons, it was foretold by an old saint, Salim Chishti by name, who lived a hermit's life in a cave at Fathpur Sikri, that another would be born to him who would survive. This turned out to be the case, and the child, born at Fathpur Sikri, and called Salim after the saint, eventually ascended the throne under the name of Jahângir.

The city, likened by many to Pompeii, appears to have been deserted soon after the death of its founder, for Finch, in the early part of Jahângir's reign, visited it and found it "ruinate, lying like a waste district, and very dangerous to pass through at night." Had it not been for its splendid masjid and Sheikh Salim Chishti's shrine, which attract pilgrims from all parts of the country, it would probably have fallen into complete decay.

Judging from the remains yet extant, it must have been a noble and magnificent city. Many of the buildings (repaired by our Government) are still standing, and in a good state of preservation, and as one wanders up and down the old stone-paved roadways, and through the courtyards and queens' apartments, the various religious buildings, and the spacious and beautifully decorated baths, he cannot help lingering and picturing to himself the time when it was inhabited by the fair ladies of the harem, and thronged by gay courtiers, induced to take up their abode there through the benign sway of Akbar, who reigned supreme not only here, but over the greater part of Hindûstan.

Although surrounded by beautiful and spacious palaces, and every luxury his exalted position as emperor of a vast dominion commanded, Akbar lived chiefly in a very small and, save for its colour decoration, unpretentious apartment known as the Khwâbgâh—literally "house of dreams,"—measuring internally 13 feet 11 inches by 14 feet 3 inches, and built on the flat roof of one of the buildings forming the Mahal-i-Khâs. It is surrounded by a verandah 9 feet 6 inches wide, covered by a lean-to roof formed of solid slabs of stone carved on the outside in imitation of tiles. The different slabs are notched on to wall plates, and on the outside to lintels, supported on moulded brackets over square columns. It is a strange travesty of things to make stone, a superior and costly material, serve the place of clay, an inferior one; the more so, as the potter's art was and had been known and practised in India from the earliest times. It would seem as if Akbar purposely wished to make his

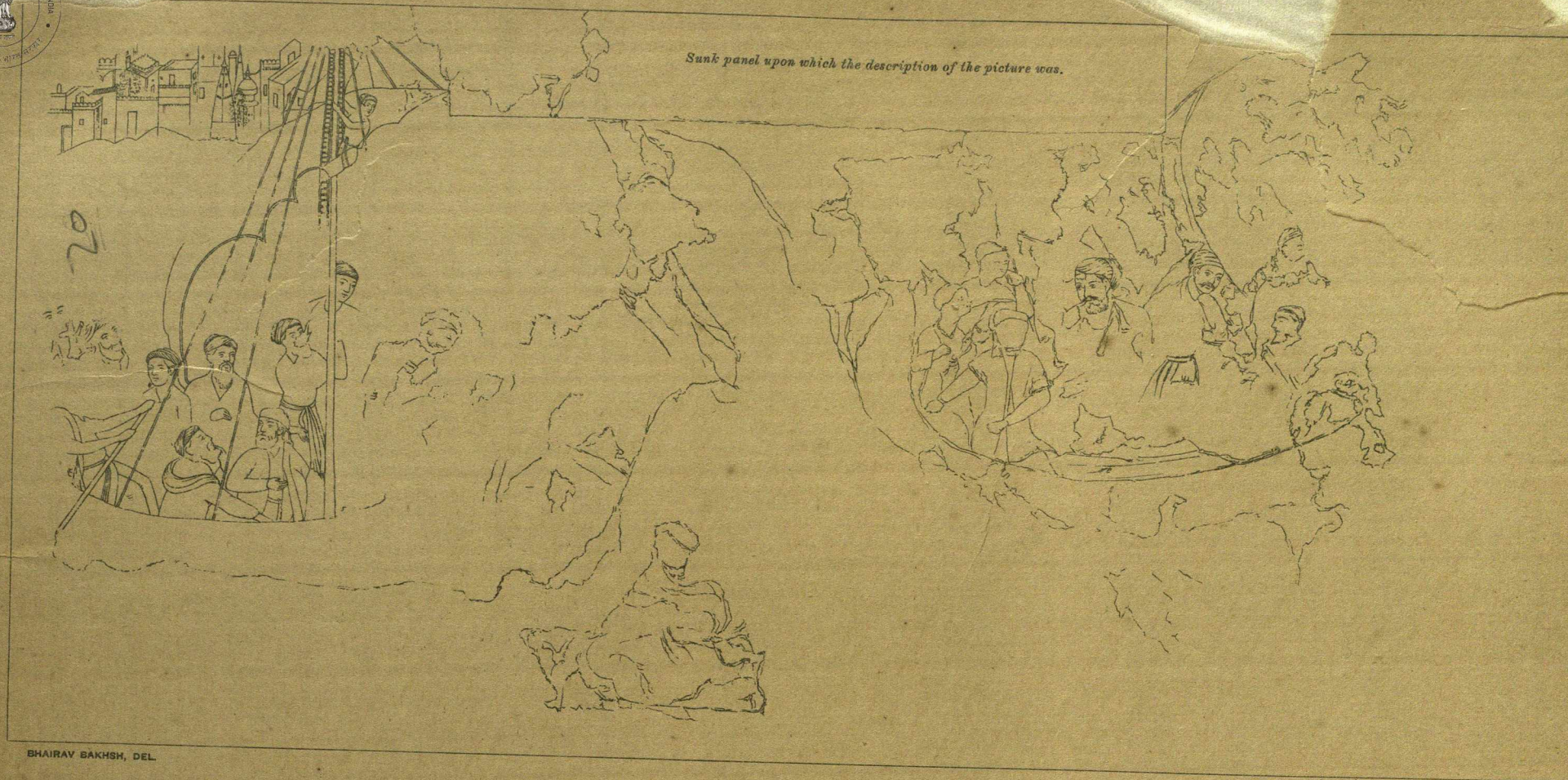
buildings cyclopic, and emblematical of his empire. Judging from the various remains about the city, this kind of roof construction appears to have been much in vogue during his reign, and if not copied from the common tiled roof of the peasant's cottage, may have originated from some Western prototype. Stone roofs, as we are aware, were frequently constructed in the South of France, and, although unknown in England, were introduced into Scotland about the 14th century. The roof of the room is flat on the outside, but the ceiling is coved, and divided up into panels by flat projecting ribs of stone, the centre panel being ornamented with a pretty and uncommon *patera* in relief. In the upper portion of the wall are oblong recesses, 11½ inches in depth, which were at one time filled in with stone lattices of a Chinese pattern, and were used as shelves. The backs were painted a light blue. There are four entrances to the chamber, and over each is a deeply recessed window opening, closed on the outside by pierced stone screens. Upon removing the accumulated dust of ages from the reveals of the windows, I found paintings upon them, but, unfortunately, the impaired state of the colours did not permit of their reproduction with any degree of accuracy. One, especially, tends to substantiate the theory that Akbar employed, amongst others, Chinese artists upon the embellishment of his buildings. The chief figure, almost without doubt, represents Buddha. He is clad in a robe of vermillion and gold, and seated beneath a *dagoba* (shrine) coloured blue, the sides and bottom of which are of white bamboo. On each side of the *dagoba* is a chamber, and the roof and walls of that on the right-hand side are in a fair state of preservation. The latter are white, whilst the former is painted an Indian red. Within the chamber are two decapitated beings, one above the other, with legs crossed. The lower stands upon the bamboo floor, and the upper is suspended in mid-air. Both are robed, and the costume of the lower figure appears to have been red and white, and of the upper gold and ultramarine. The back wall was of ashen hue. In the opposite room is a man standing erect, arrayed in white trousers and a red tunic tied in at the waist by a white sash. He appears to be directing the attention of a companion to Buddha. The space between the bamboo floor and the bottom of the picture is filled up with mutilated fragments of nude human beings of both sexes, coloured in gold, red, black and white. They are falling in different directions, and trunks, heads, limbs, hands and feet are all mingled together. Two or three, judging from the coronets they wear, appear to have been people of distinction. On one side, a man dressed in white is standing, and from the enthusiastic way he claps his hands, he is evidently rejoicing at their downfall. The resemblance between the painting and those executed by Chinese artists is most marked. The treatment of Buddha and the *dagoba*, even to the bamboos forming its sides, is most decidedly Chinese in feeling, and if not by a Chinaman, is a good copy of some Chinese original. The painting probably depicts the Chinese idea of Buddha, as Yamântaka, condemning the enemies of Buddhism to eternal punishment. If so, it is of great interest, as it is the first instance on record of Akbar having concerned himself with Buddhistic doctrines. It is an established fact that he enquired into the doctrines of Roman Catholicism, Hindûism and Zoroastrianism, but we were not aware that the tenets promulgated by Buddha engaged his attention.

A painting on one of the other window-reveals shows a rock-cave, within which is an angel holding a new-born babe in his arms. The figure is very well drawn, and the flowing robes are of gold, blue and red, fastened round the waist by a long white girdle. The wings are white, and spread out so as to nicely fill up the entrance to the cave. Only the outline of the babe's head remains to us, but the angel's is in a very fair state of preservation. It is surmounted by elaborate head-gear and feathers, caught up at intervals by strings of pearls. A brace of peacocks, upon a dark blue field, are strutting over the top of the cave (tinted a yellowish-white and light blue), and at their feet are other birds, emerging from the trees and grass growing in the crevices of the rock.

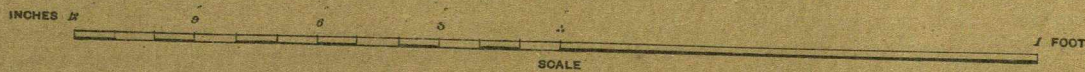
From the fact that even the reveals of the window openings were decorated, it will be seen that no pains were spared to beautify this regal, though so small, sleeping apartment. The walls, the ceilings, the columns, yea, even the very lintels, were all decorated in turn; and I was fortunate in finding and bringing to light these lost specimens of the artists' work of the 16th century as practised in Hindustân. Akbar was a lover of the arts, and we read in his life that he made a fine collection of paintings; and, for the benefit of himself and others, was very careful that a description of each was written over the top.

As before mentioned, the walls are recessed for *almirahs*, and the wainscoting below the recess and the floor of the room was found to have been painted. It is divided up into eight panels, and to each a painting was devoted. Unfortunately, portions of two only out of the eight are left to us, and these are reproduced on Plates 1 and 2, whilst Plate 3 is a detail of the latter. Only a few characters of the description are left, so that it is now difficult to say what the subjects represent. In the right hand corner of Plate 1 is a house with a flat roof, and looking down from it are four people clad in gay costumes of red and vermillion, fastened at the waist by narrow *kamarbands* (girdles). Two wear beards and have the first finger (sacred with the Muhamadans) pointed to the chin. All wore turbans, but only those of the two central figures remain. One is of plain red and resembles the Parsi or Banya hat, whilst the other is white and twisted in coils round the head and forehead. The face of

Sunk panel upon which the description of the picture was.



BHAIRAV BAKSH, DEL.



Fresco upon the North Wall.
Fathpur Sikri: The Mahal-i-Khas—Khwabgah.

Edmund H. Smith
Archaeologist, Surajgarh
1977



the figure on the extreme right is in a very good state of preservation, and the two next fairly so; but that on the left is quite obliterated. The sky is represented by blue, and becomes lighter towards the horizon. Behind the central figures is an arched entrance to a house, with a small square-headed doorway below, and a little window on each side. The parapet is embattled, and partially hides a dome in the Pathan style, surmounted by a small finial. Below the window opening is a red tiled dado. The parapet of the house upon which the figures are standing appears to have been an open one, and, like the windows beneath, filled in with screen work. To the left of the house, judging from the domes, minarets, &c., there appears to have been a mosque; whilst at the bottom of the picture are the remains of bystanders. The rest of the subject is too much obliterated to make much out of, but on the extreme left of the panel is a deer, behind which are fragments of tents, and probably a hunting scene was depicted.

The painting on Plate 2 is from the north-west angle of the chamber, and is in a somewhat better state of preservation than that just described. It represents a boating scene. On the left hand upper corner is the bank of a river, studded with houses of Eastern type, intermingled with trees, spires and minarets. The drawing of these is bad, and shows that the native artists of the 16th century had little knowledge of the laws of perspective. Being propelled along the water by oar and sail are two small boats, both laden with men. In the first we can trace nine people, although the faces of three are beyond recognition. Only the outline of the boat is visible, with its mast, rigging, dark red sail and ratlines, descending by which is a sailor. Save the *dhoti* and *pagri*, he is devoid of clothing; and it should be observed how much darker he is than the men below, who, from their general appearance and costume, belong to the upper classes.

The oarsman is situated at the extreme end of the boat, and is clad in a kind of sepia costume fastened by a waistband, and just above are the ends of an untied turban, which falls loosely over his shoulder. His arms are very slender, and with his ill-shapen hands he holds the oar. Of the other occupants, some are standing and some sitting. They are quite fair in complexion, but this is a marked feature with the upper classes of Hindustân, particularly when of Persian or Kashmirian descent. The central figure is tall and majestic and has a fine face, a pointed grey beard, and long drooping moustache. His dress is of dark blue, rich in tone, and contrasts well with those of his confrères, who are clad in scarlet and light blue. On his left is a lad, probably his son, and the brother of the boy whose head appears from behind the mast. To the left of this boy is the head of another figure. Holding on to the mast is a man in a bright scarlet *chapkan* bound round the middle by a narrow white band; the flowing ends of which are worked, and hang below the knee. Only his turban, forehead and beard are preserved. At his feet are two other figures in a somewhat better state of preservation. Both wear beard and moustache, and the heads of both are covered with prettily twisted *pagris*. The coat of one is of a light blue tint, and is thrown loosely open, disclosing beneath, a white tunic fastened in at the waist. The forepart of the left arm is missing, and the right is held towards the breast, and shows the tight-fitting sleeves of the Muhammadan costume. The other man, dressed in scarlet, leans forward, and is conversing with his companion. The right arm is outstretched, whilst the left is pressed towards the lower lip. The face is upturned, and the head crowned by a *pagri*, finishing off in a conical coil at the back. Unlike his companion, he wears a loose shawl over the shoulders and across the back. All the figures are carefully drawn, and particular attention was bestowed on the faces, which, in point of finish, resemble the work of a miniature artist.

The outline of the second boat, to the right of the drawing, is fairly distinct, and in shape resembles a gondola. In it we can trace the remains of six or seven figures. The mast and sails have disappeared, but a jagged line above the turbaned head of the central figure indicates the former position of the latter. The faces of the principal figures are fairly well preserved, and the one on the left has the fore-finger resting on the lower lip, and is bearded; whilst the other wears a moustache only. The remaining passengers are looking towards them, and from this it may be surmised they are persons of quality.

The framing of the panelled wainscoting is carried up around the angles of the room, and merges into the lintels over the doors and windows, which are ornamented with painted panels containing beautifully written Persian couplets, flattering to the vanity of Akbar. The characters were in gold upon a chocolate ground, enclosed by borders of vermillion and light blue, separated by edgings of dark blue and gold. Most of them are too much impaired to make much out of, though the colours are, in places, clearly visible. Sufficient traces of the inscriptions remained to enable me, by the aid of the copies made in 1874 by the Archaeological Society of Agra to reproduce Plates 4 and 5. Twenty years ago the inscriptions appear to have been in a fair state of preservation and it is fortunate that the Society, from whose *Journal* they are now reproduced, had them copied:—

- I.—“The Imperial Palace, with reference to each of its gates, is superior to the exalted Paradise”; or per rather, “The Imperial Palace, in every respect, is superior to the exalted Paradise.”
- II.—“There can be no question that it is a sublime Paradise itself.”
- III.—“This royal palace is elegant, pleasant, and exalted.”
- IV.—“It is made to represent Paradise in form.”
- V.—“Rizwan [the Janitor of Paradise] may make the floor of this dwelling his looking-glass.”
- VI.—“The dust of its threshold may become the *surma* of the black-eyed Hûri.”
- VII.—“The foreheads of those who bow down in adoration like the angels and touch the dust of will shine like Venus.”

VIII.—“What a light! so great that the sun borrows his lustre from it!”

IX.—“What generosity! that the world derives light from it!”

X.—“May his good fortune cause the country to be populated!”

XI.—“May the light of his countenance dispel darkness.”

XII.—“The decorator of the land of Hindûstân.”

XIII.—“The destroyer of thorns from this garden [i.e. Hindûstân].”

XIV.—“I swear by the Almighty that the happiness of this building is augmented by its beauty.”

XV.—“May the felicity of its owner be perpetually increasing!”

The stone borders around the panels, recesses, doors and windows were also decorated in colour, and specimens are shown on Plate 6, fig. 1. Here again chocolate has been used as a background; but in lieu of an inscription, a conventional flower pattern, in white, has been introduced. The borders assimilate, but in this instance they are edged by lines of bright yellow and blue, instead of gold and blue. Figs. 2 and 3 of the same plate, and fig. 2 of Plate 7 show the kind of ornament on the chamferings of the borders round the *almirah* recesses in the walls. In each case the field is of yellow and the floral design upon it of dark blue, enclosed between two parallel lines of the same tint.

Plate 8 is a beautiful piece of conventional floral composition in blue, upon a chocolate ground, from one of the square piers in the north verandah. It is reproduced just as it now is, and the white patches show the decayed portions. In the centre was a serrated panel, rich in design and colour, extending the width of the pier; and below and above it were others, smaller and horizontal, after the style of those met with in old illustrated Persian MSS. The ornament is flat and devoid of all shading. That its composition was carefully studied is evident from the setting out lines, which can be traced throughout the design. There is a symmetry and steadiness about the whole, and the masses balance. Excrescences have been avoided, and nothing could well have been omitted without spoiling the design. In the composition of the flowers an odd number of leaves has been used, and whilst more pleasing than an even number, is in accordance with fundamental rules laid down for designing ornament.

We said before, that in designing this regal sleeping apartment, even the soffits of the stone lintels carrying the verandah roof were not forgotten, and Plate 9 shows a sample of the style of decoration upon one of these on the west façade. It is in blue, white and red, and like fig. 4, Plate 4, is of Arabian origin. It consists of a six-pointed star in French grey, edged round by blue lines upon a hexagonal ground of white surrounded by a field of chocolate, upon which is lined, in white, a most uncommon and complicated Λ or spear-head pattern, which is known in Upper India as the *Katâr-chhawês*, i.e. “hexagon and spear-head.” The pattern is still met with in Northern India, and is sometimes found on pottery made in the Punjab. The writer has seen it used as a centrepiece in “basket” or “wicker” plates. The Λ and hexagonal pieces have been pierced, and in lieu of the star in the centre of the latter a delicate open-work rosette has been very effectively introduced. The enclosing border has been made into an open and dainty floral scroll, and picked out in conformity with the rest of the plate in various bright and effective colours. The plates look both delicate and pretty, and amongst other things, can be used as fruit dishes for the dessert table; or as wall plaques, but when thus utilized they require a dark background to throw the pattern up.

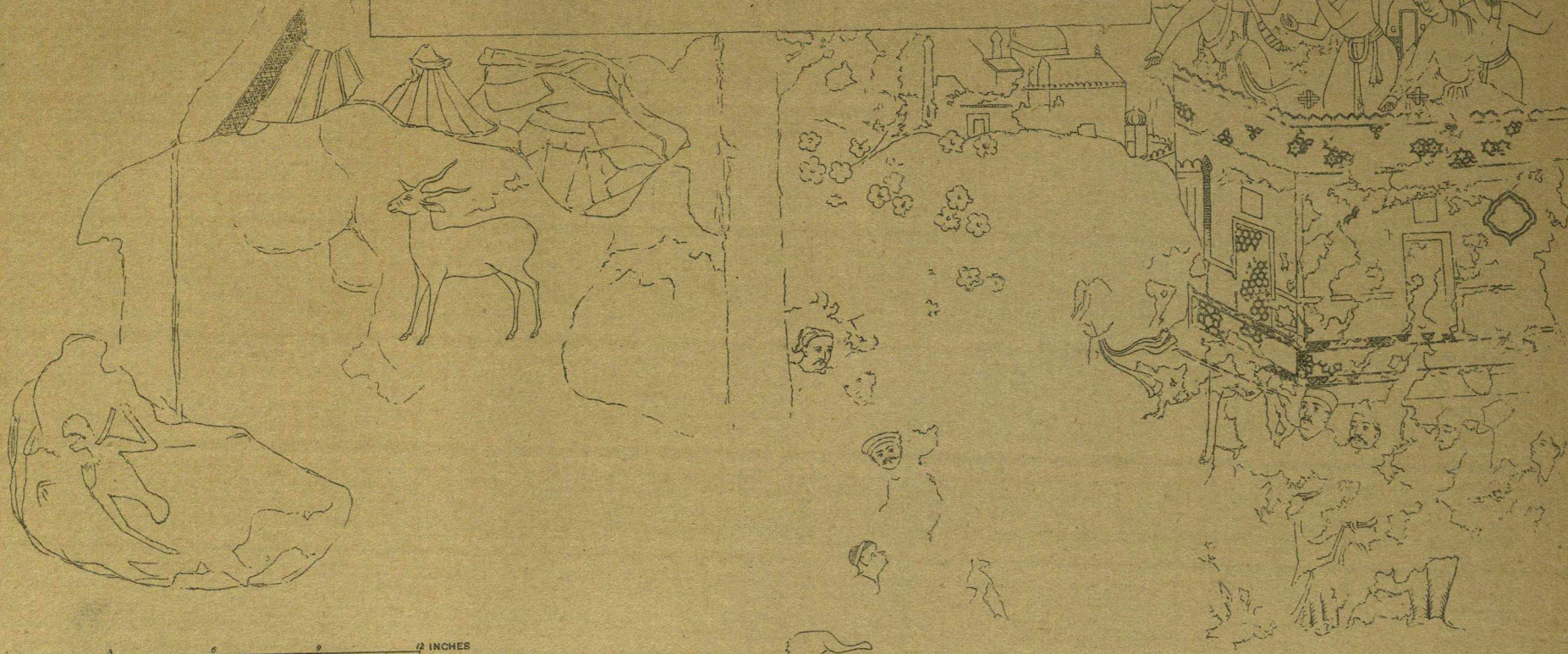
The two remaining plates (10 and 11), with which this series closes, are taken from the reveals of the doorways entering from off the verandah into the bed-room, which, though generally hidden from view by heavy folding stone doors swung in stone sockets, were also beautified at the hands of the decorator. The colouring speaks for itself, and the pattern betrays a Persian influence. The serrated panel shown on Plate 10 occupies the centre position of the reveal; and the spandril pieces shown on Plate 11 are employed to fill up the four corners. It will be observed that although the patterns assimilate, they are not quite alike. The design, which is rather an unusual one, is made up of four main parts: three fret-work, in line only, and one floral, which permeates throughout the others and forms a very rich background. It will be seen, by looking at the drawing, that one runs perpendicularly from top to bottom; another horizontally across it; and the third occupies the “tympanum-like” spaces at the upper and lower ends of the shield. Though each is separate and distinct one from the other, they are interlaced and plaited together so as to form one, complete in itself, and quite distinct and separate from the floral design forming the background.

From these illustrations one may judge how rich Fathpur Sikri is in colour design; and yet, strange to people who have visited the city go away with not the slightest idea that anything of the kind exists, and Agra stands alone in this respect. “They who seek, find,” and on careful examination it will be found many of the buildings are just as rich in colour ornamentation as those of the famous cities of Agra and Delhi.

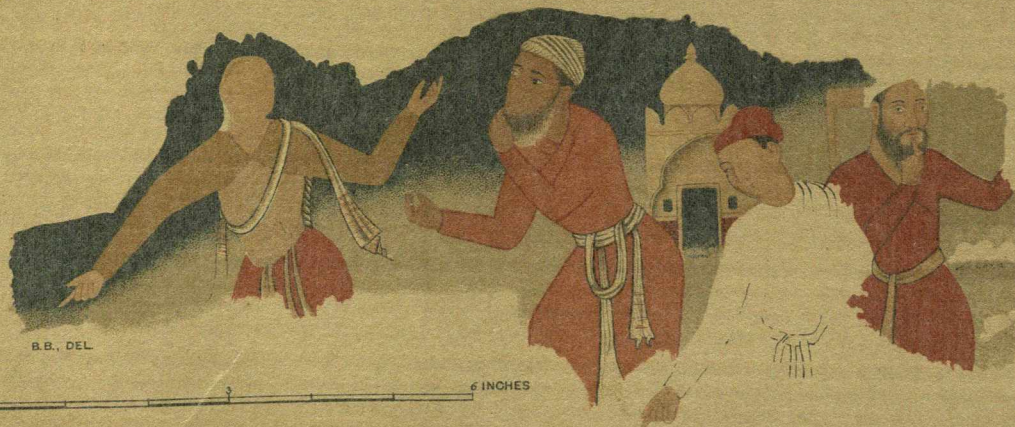
LIST OF ILLUSTRATIONS.

Eleven Plates—Wall Paintings recently found in the Khwabgah, Fathpur Sikri.

Panel upon which description of fresco was written.



SCALE 0 1 2 3 4 5 6 7 8 9 10 11 12 INCHES



B.B., DEL

SCALE 0 1 2 3 4 5 6 INCHES

DETAIL OF FIGURES STANDING UPON THE ROOF OF THE HOUSE ON THE RIGHT HAND CORNER OF THE FRESCO.

FRESCO UPON WEST WALL.

La Khás-Khwáhal

Edmund H. Smith
 Architectural Surveyor
 1896



BHAIRAV BAKSHI, DEL.

Edwin H. Smith
Architectural Surveyor
1902

SCALE 12 INCHES

DETAIL OF FRESCO UPON THE NORTH WALL.
Fatehpur Sikri: The Mahal-i-Khas—Khwabgah.



CSL



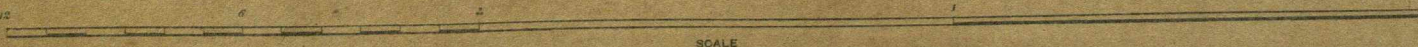
PERSIAN COUPLET OVER EAST DOOR.



BHAIKAV BAKHSN, DEL.

PERSIAN COUPLET OVER WEST DOOR.

INCHES 1/2



2 FEET

SCALE

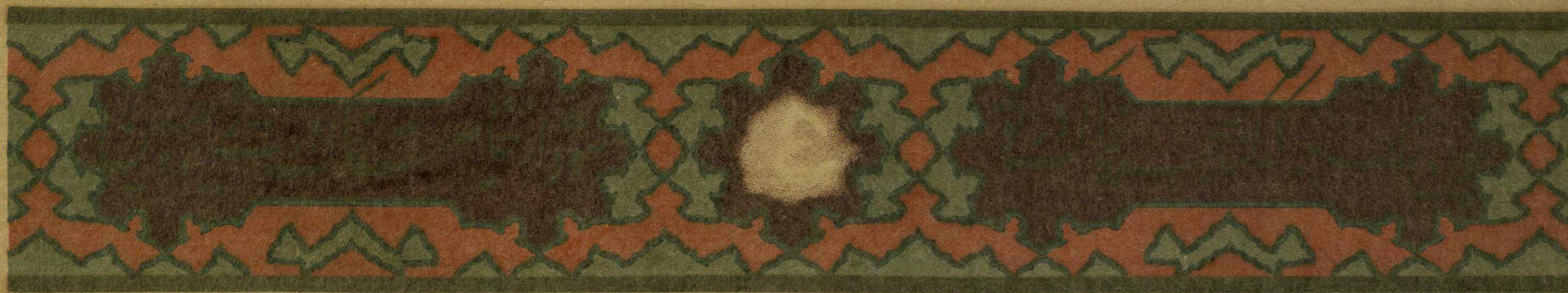
Fathpur Sikri: The Mahal-i-Khas—Khwabgah.

*Edmund D. Smith
Architectural Surveyor
1892*

25



PERSIAN COUPLET OVER SOUTH DOOR.



BHAIRAV BAKHSH, DEL.

PERSIAN COUPLET OVER NORTH DOOR.



Fathpur Sikri: The Mahal-i-Khās—Khwābgāh.

Edmund H. Smith
Architectural Surveyor
1892



FIG. 1.



FIG. 2.



FIG. 3.



FIG. 4.

BHAIRAV BAKSHI, DEL.

SCALE: 12 INCHES

SCALE: 9 INCHES

Edwin H. Smith
Architectural Surveyor
1992

COLOURED BORDERS AROUND RECESSES, &c.
Fathpur Sikri: The Mahal-i-Khas-Khwabgah.



FIG. 1.

BHAIRAV BAKSHI, DEL.



FIG. 2.

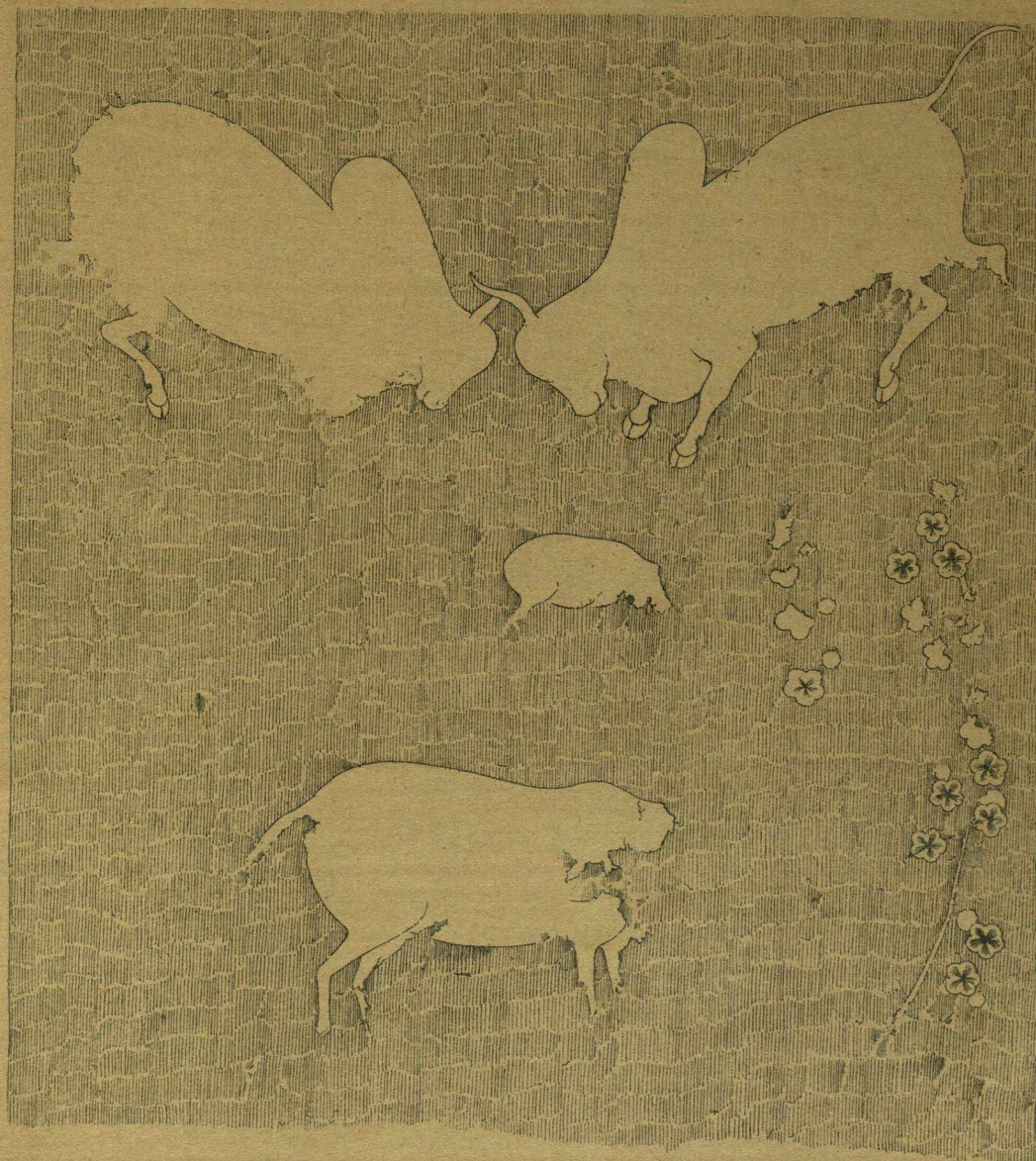


FIG. 3. DECORATION UPON ONE OF THE NORTH VERANDAH PIERS.



COLOURED ARCHITRAVES.

Faṭhpur Sikrī: The Mahal-i-Khās—Khwaḡgāh.

Edwin M. Smith
Architectural Surveyor
1921

2
7



BHAIRAV BAKSH, DEL.

Edmund H. Smith
Architectural Surveyor
 1912

SCALE : 1 INCHES

COLOURED DECORATION UPON ONE OF THE NORTH VERANDAH PIERS.
 Faṭhpur Sikrī: The Mahal-i-Ḳhās—Khawābgāh.

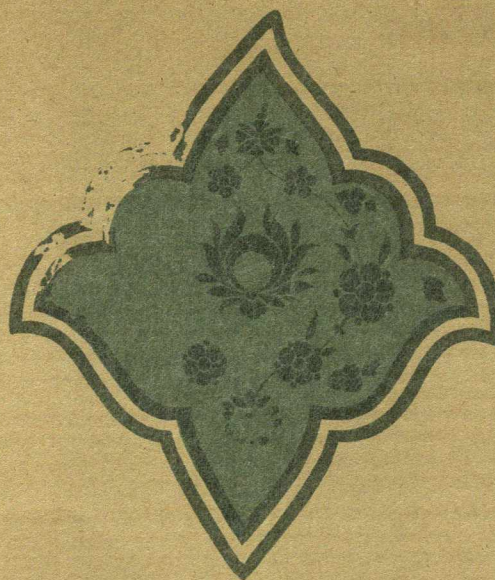
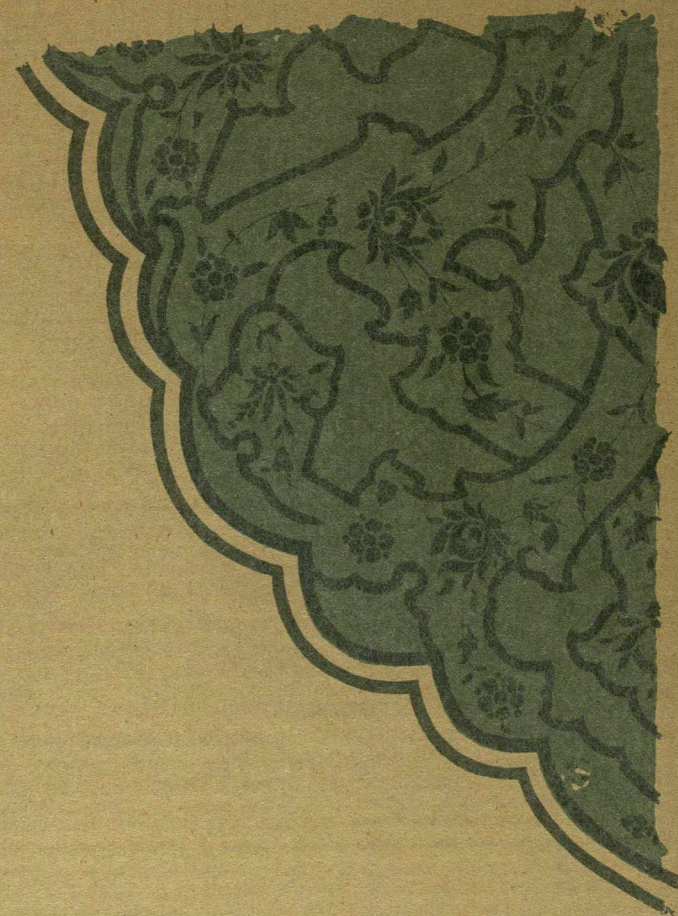


BHAIRAV BAKHSH, DEL.

SCALE 0 3 6 9 12 INCHES

Eduard W. Lindt
Architectural Surveyor
1896

COLOURED ORNAMENT UPON THE SOFFIT OF ONE OF THE LINTELS OF THE NORTH VERANDAH.
Fathpur Sikri: The Mahal-i-Khâs—Khawâbgâh.



BHAIRAV BAKHSH, DEL.

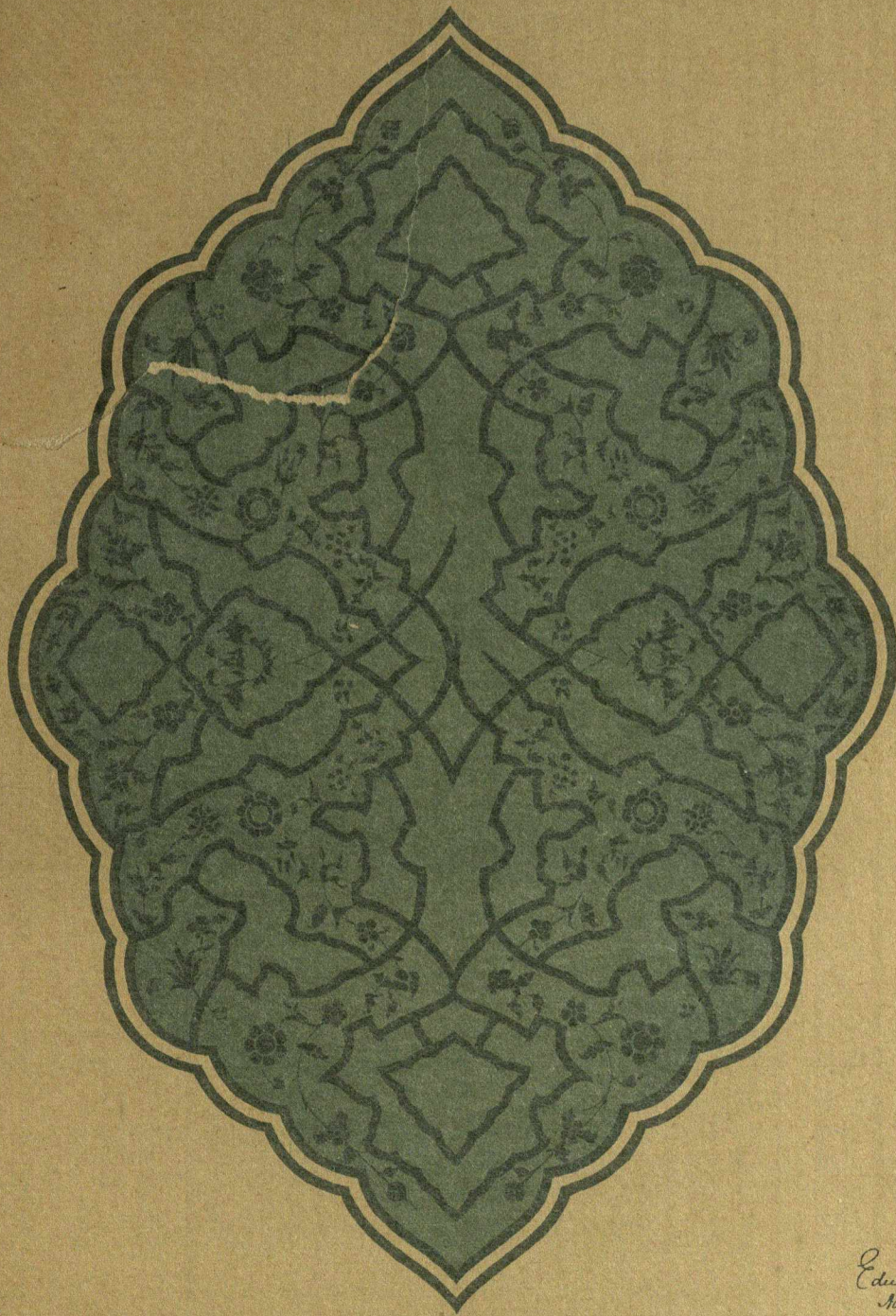


COLOURED ORNAMENT UPON REVEALS OF DOORWAYS.

Fathpur Sikri: The Mahal-i-Khâs—Khawâbgâh.

Edward H. Smith
 Architectural Surveyor
 1952

31



BHAIRAV BAKHSH, DEL.

Edmund W. Smith
Architectural Surveyor
1892

SCALE 0 3 6 9 12 INCHES

COLOURED ORNAMENT UPON REVEALS OF DOORWAYS.

Faḥpur Sikrī: The Mahal-i-Khās—Khawābgāh.

The Journal of Indian Art and Industry.

32 THE ART INDUSTRIES OF THE MADRAS PRESIDENCY.

By MR. E. B. HAVELL.

I.—JEWELLERY. (Continued).

The illustrations in the previous articles (Vol. IV, No. 34, and Vol. V, No. 40, of this Journal) have fairly exhausted the types of jewellery worn in the Madras Presidency.

THE JEWELLERY OF TRAVANCORE AND THE WEST COAST DISTRICT.—The inhabitants of Travancore State and the districts on the Malabar Coast, divided from the rest of the Madras Presidency by the high ranges of the Western Ghats, are as distinctly characteristic in their arts as they are in social customs and habits. I have, therefore, thought it best to illustrate the Western Coast jewellery apart from that of the Eastern Madras districts.

As regards race, the three chief divisions of the inhabitants are the Nayars, the Tiyars, and the Mappilas. The Nayars are the aristocracy and landlords of the country, descendants of the ancient feudal Rajas of the West Coast. The Tiyars were originally toddy-drawers, but under the British rule many of them have advanced to high positions in the Government service, or become prosperous landlords. The Mappilas are Muhammedans, but a mixed race, being descendants of Arab immigrants by Nayar women. They are nearly all traders, and, as a rule, extremely ignorant and fanatical. Besides the Nayars and Tiyars, who, as regards religion, are all strict Hindus, there is in Malabar a peculiar class of Brahmans known as Nambûris, or Malayâli Brahmans. They are mostly landlords, but live in strict seclusion and apart from European society. The Syrian Christians are also a community entirely peculiar to the West Coast, but they are not so much given to personal adornment as their Hindu and Muhammedan fellow-countrymen.

Plate 12 exhibits five gold *thâlis*, or marriage necklets, but in them the *thâli* proper, or the phallic emblem (see Vol. V, No. 40), ordinarily worn by Tamils and Telugus, does not appear. The pattern in fig. 1 is said to be derived from the flower of a plant called *Erukka*. This necklet, called the *Erukkilamptâ thâli*, is worn by females of Nambûri caste and by other castes intermediate between them and Sudras. The Nambûris assist in the temple *pûjas*, and perform such services as the making of garlands and the cleansing of the holy places near the god's shrine. Fig. 2 is derived from a seed of a fruit of the cucumber genus. It is called the *Chora-ari thâli*. Fig. 3 is a necklet, the chain of which is composed of beads in imitation of the myrabolan fruit; the larger beads represent the *Ruthracham* bead. The religious signification of these has been already alluded to. The pattern of fig. 4 will be easily identified as being derived from the cobra; it is called the *Nagapautti thâli*. Fig. 5, the *Arasili thâli*, is the leaf of the *Ficus religiosa*.

Figs 4, 5, 7, 8, and 9, Plate 13, are also gold *thâlis* worn in Malabar and Travancore; the pendant links in fig. 5 represent the cobra's hood. Figs. 1, 2, and 3, in the same plate are receptacles for sacred emblems or charms. They are worn round the neck by men and Hindu women alike in all parts of the Presidency. Fig. 6 is a *kammal*, or ornament thrust into a slit in the lobe of the ear, worn by Nayars and Tiyars. It is sometimes two inches in diameter. Figs. 6, 7, and 8 are *thâlis* worn by Sudra women.

The three gold *thâlis* in Plate 14 are especially characteristic of Travancore and Malabar. The long tubes in figs. 1 and 2 are receptacles for charms, which generally consist of some cabalistic device, together with a Sanscrit *mantram*, or prayer, either written on paper or engraved on thin plates of gold, silver, or copper. They are worn by the Nambûris and by Malayâli Sudras. Figs. 4 and 5 are ear ornaments worn by the same people. Plate 15, figs. 1 and 2, shows two more *thâlis*. The first seems to be derived from some shell form; the second is called *Palakka thâli*, as it represents the seed of a tree called *Palay*. Fig. 3 is an ear ornament called *Kathila* (meaning leaf for covering the ear), worn by the Syrian Christians. Fig. 4 is also an ear ornament, a variety of the *Koppu* previously described, worn by Syrian Christians and by Mappilas. Fig. 5 is a gold bracelet, and fig. 6 an anklet worn by all castes in Malabar, but not specially characteristic of the West coast.

The ornaments in Plates 16 and 17 are patterns of gold necklets drawn mostly from sketches taken during a tour through Malabar and South Canara. They are worn by Nayar and Tiayar women. Fig. 1, Plate 17, and figs. 1, 2, and 3, Plate 16, are fine examples of minute built-up work, which may be compared with the examples from the Madras Presidency, already described and illustrated. Fig. 2, Plate 17, is slightly curved in section; it is



another version of the oft recurring patterns derived from the cobra's hood. The illustrations are purposely drawn so as to show the details and construction of the built-up work; they consequently give little idea of the effect when worn on the person. In reality, the glitter and movement of the delicate fringes of golden tassels, changing with every motion, contrast admirably with the richness of the solid bands of built-up work. The details of the pattern in fig. 3 have a remarkable resemblance to the Etruscan work among the antique jewellery in the Louvre. The flat gold bands in fig. 4, Plate 16, are embellished alternately with emeralds and rubies.

CUSTOMS RELATING TO THE USE OF ORNAMENTS.—Male Hindus up to 18 years of age can wear arm and leg bangles of either gold or silver. After that age they dispense with them and wear only the *Ruthrachamalai*, on account of its supposed sanctifying virtues. Earrings and finger rings are worn by males of all ages. Females up to 30 or 35 years of age may wear all or any of the ornaments which have already been described as belonging to them, but after that age they generally wear only the *kammal* and *kappu*. Widows wear no ornament except the sacred *Ruthrachamalai*.

THE GOLDSMITHS' CASTE.—Goldsmiths belong to the *Viswagunya* caste, one of the subdivisions of the great artisan caste, which embraces all the Hindu handicraftsmen. They wear the sacred thread of the Brahmans, and socially are held in great respect. There are 120 *gotrams* or subdivisions in the goldsmiths' caste, the chief of which are:—(1) Vembanattar, (2) Malanattar, (3) Cholugar, (4) Ponnakarai. Among these some are vegetarians and some flesh-eaters. By the strict rule of their caste they are not allowed to eat together or intermarry, but the rule is not rigidly observed. Their customs and habits are similar to those of the Brahmans. Each sect worships a family god, which is one or other of the following:—(1) Ramachi, (2) Mariamman, (3) Angalamman, (4) Aiyyanar, (5) Maduraviran, (6) Palaniyandi, (7) Venkatachalapatti, (8) Payichiamman.

EARNINGS.—The Madras goldsmith is, on the whole, more flourishing than any of his brother castemen. The rate of pay varies considerably in different localities, but his earnings generally will range from 6 as. to Re. 1 per day, according to his skill or the position of his patrons. For ornaments without chasing work, the ordinary charges in Madras are 8 as. per pagoda weight; with chasing, Re. 1 per pagoda. For setting stones, the charge will be the value of the gold used in the setting; the gold, of course, is supplied by the customer.

TECHNICAL NOTES.

Most of the processes which are in common use in the Madras Presidency have been fully described in a Monograph on the Gold and Silver Works of the Punjab, by Mr. E. D. MacLagan, C.S., published by order of Government. Those which are peculiar to Madras are noticed below:—

GOLD.—The bar gold now used in the Madras Presidency is imported from Europe and Australia. Prior to the British rule *sanar kasu* and flower pagodas were made use of for making ornaments, the former weighing about Rs 5 and the latter Rs 3½. *Sanar kasu* is still current in the southern part of the Presidency. It was issued by one of the Chola Rajas in the name of a *sanar* (toddy drawer), who, having discovered gold, amassed great wealth thereby secretly. The fact was discovered and he was condemned to death, but before his execution he obtained from the Raja the consolation of having his name perpetuated by the issue of his gold as coin of the realm. Gold mohars are also used for making ornaments, but *sanar kasu* is always preferred, on account of its purity.

SILVER.—The imported silver is used, but the Muhammedan *Kandu* rupees are preferred because they contain no alloy.

TESTING OF GOLD AND SILVER.—There are only three tests—the touchstone, heating, and cutting. 1.—Touchstone test. The gold to be tested is rubbed on the stone, an impression is taken with beeswax, and compared with that of pure gold or silver. 2.—Heating test. The metal is simply heated in the fire; pure gold or silver will not change colour. 3.—Cutting test. Gold or silver without alloy may be cut easily. A mixture of alloy hardens them.

PURIFICATION OF GOLD AND SILVER.—For the purification of gold the process is the same as used in other parts of India. It is described in detail at p. 21 of Mr. E. D. MacLagan's Monograph. As regards the refining of silver, there is a process of purification by means of sheep's bones and black lead. The bones are burnt and ground into powder. The powder is first sprinkled with water. Then the silver is put in it and covered with live charcoal. By the aid of blow-pipe or bellows the silver is melted. The black lead is then added to the silver, and by continued blowing the impurities will either evaporate or adhere to the bone dust.

SOLDERING GOLD (Tamil process).—Melt together two parts by weight of silver and one part by weight of copper; then melt the mixture so formed with two parts by weight of gold. This alloy may be either beaten out into thin sheets, or drawn into wire and cut into small pieces. The pieces are mixed together in a composition of borax and water. This composition is placed over the joint and melted.

SOLDERING SILVER.—Take three parts by weight of silver and one part of copper. Make a composition in the same way as for soldering gold, and apply it to the joint.

33



KHATMANDU, THE CAPITAL OF NEPAL.

NEPAL* is said to have been distinguished during the Suthéo-joog, when the dynasty of Bhujjer-joogni are reported to have ruled over it, by the name of Siddoo-buttipoor. It is also called in some ancient books Decarie Tapoo, or the Southern Isle, in reference to its situation with respect to Himma-leh. It derives its present appellation, it is pretended, from the founder of the Nymuni dynasty, in whose possession this country is supposed to have remained during the Treta and Dwaper. The fables on which this etymology is built merit no attention; but it may be worth noticing that all the records of Hindoo antiquity concerning the Himma-leh mountains and the northern regions adjacent thereto, are affirmed to represent the present valley of Nepal as having been originally an immense lake, which, in the progress of ages, gradually retired between the banks of the Bhâgmuttery. Other accounts state, that the Bhâgmuttery remained without any outlet from the valley during three centuries, when Sree-kima, the last of the Nymunians, opened its present passage through the southern ridge of mountains. Major Rennell informs us, on occasion of a similar tradition regarding Cashmere, "that appearances have impressed a conviction of its truth on the minds of all those who have visited the scene, and contemplated the different parts of it;" and he afterwards reasons at some length, and with much ingenuity, in its support; nor is there a single argument advanced by our illustrious geographer on the subject, that does not apply with conclusive force to the valley of Nepal. The waving or broken nature of the ground, which resembles, in a striking degree, the bed of a large body of water, and the soil consisting to a considerable depth of a black, fat earth, manifestly the product of deposited mud, are particularly circumstances of the most demonstrative kind. In short, if any difficulty be here opposed to the theory in question, it presents itself solely in the character of the strata that formed the base of the mountains through which the Bhâgmuttery has forced a passage, it being perhaps doubtful whether these be of a hardness capable of resisting the attrition of the waters for any great length of time.

The northernmost part of Nepal scarcely lies in a higher parallel of latitude than twenty-seven degrees and a half; yet this valley enjoys, in certain respects, the climate of some of the southern countries of Europe. My knowledge on this point is, of course, almost entirely confined to the narrow limits of oral enquiry, our residence here having been too short to admit of our acquiring more satisfactory information. It is not to be doubted, however, that not only the tops of the surrounding mountains are sprinkled with snow for several days together during winter, but that it even sometimes falls in the valley below: a hoar frost, too, at this season, very commonly covers the ground: but though the cold is occasionally, for three or four months, severe enough to freeze the tanks and pools

The Purbutti Alphabet.

क स ग घ ङ व झ न र त्र ट ठ ड ण त प फ ध म य क ख

अस्य रत्नसूत्रं दृश्यते:

ॐ नमः सिद्धिदायक देवता त्रिपुरासुराक्षयिणी देवि नमः ॥

The Newer Alphabet.

क ख ग घ ङ व कृ श म नृ ङ० ङ र ल ऋ य द च न

ਪਰੁ ਰੁ ਸੁ ਪੁ ਨੁ ਅਸੁ ਆਨੁ ਨੁ

ॐ नमो भगवते वासुदेवाय ॐ नमो भगवते वासुदेवाय

The Koith Alphabet

सुखगाय उरकलकृत ६४ ५७१ गगयदध न पञ्च

वत्स म० १० वत्स वत्स ६३०

मा मा ऐ ऐ ऐ ऐ गी गी छ रे रे रे रे न न ऐ ऐ न न :



of standing water, yet the rivers are never frozen. Nepal would seem to be indebted for its favourable climate entirely to its great elevation; for though lying in the vicinity of a region eternally buried in snow, yet its temperature is probably little or nothing affected by this local circumstance, since, besides the shelter it derives from the interjacent mountains, it is affirmed that a north, or Himma-lehan wind never blows in this valley, except now and then in transient gusts. The height of Nepal above the level of the sea, if we may rely on the indication of the barometer, cannot be much under four thousand feet; but this elevation did not prevent the thermometer from rising once during our stay in this valley to eighty-seven degrees. Its usual height about noon varied from eighty-one to eighty-four degrees; a little after sunrise it commonly stood between fifty and fifty-four, but was once so low as forty-seven, and at nine in the evening generally fluctuated from sixty-two to sixty-six degrees, the mean temperature, from the 17th to the 25th of March inclusive, on an average of fifty-one observations, was sixty-seven degrees.

The seasons of Nepal are pretty nearly the same with those of Upper Hindostan; the rains commence a little earlier, and set in from the south-east quarter: they are usually very copious, and break up towards the middle of October. The torrents from the mountains being often extremely violent during this period, while the descent of the rivers through the valley is not so precipitate as to carry off the waters with much rapidity, the consequence is, that their banks, wherever they happen to be low, are very liable to be overflowed. The effect of these occasional inundations is sometimes very injurious to the husbandman; and is exhibited also, in the great number of ravines into which the plain is cut.

In describing the climate of Nepal, we ought not to confine ourselves to the valley, since a few hours journey enables its inhabitants to pass at pleasure, by ascending the sides and summits of the enclosing mountains, through a considerable variety of temperatures, and in three or four days one may actually exchange a heat equal to that of Bengal for the cold of Russia, by barely moving from Noakote to Kheroo, or even to Ramika; nor are, perhaps, the numerous gradations and quick succession of climates attainable from hence the least of the advantages to be derived from an unrestrained intercourse with this charming country, a short residence in which would, in most disorders arising from relaxation, probably answer every purpose of a voyage to Europe, by enabling a patient to remove, as circumstances might demand, from one temperature to another, though I am inclined to think that there are few cases of the nature in question that would require his seeking a higher one in winter than that of the valley of Chitlong, or, in summer, a more elastic and sharper air than he might breathe on the summit of Chandraghiri. Here, too, if we may judge by the spontaneous productions of the spot, among which are the peach, the raspberry, the walnut, the mulberry, and others, all the fruits and esculent vegetables of England might, with proper attention, be successfully raised. With respect to the salubrity of the more elevated valleys and situations, it would seem to be abundantly proved in the general looks of the inhabitants, among whom, if the Newar peasantry take the lead in point of robustness, it is to be attributed to their laborious, but invigorating occupations.

Nepal can boast of no gold mines, yet it doubtlessly contains most of the other metals, especially copper and iron. The iron of Nepal is not, perhaps, surpassed by that of any other country, and among its copper ores, of which there would seem to be several varieties, some are said to be rich, and of an excellent kind. Oude was formerly supplied with this metal from Nepal, but of late years the European copper, without appearing to be in any respect of a superior quality, has, by actually underselling, driven that of Nepal out of the Western markets, a phænomenon in commerce which ought not, probably, to be attributed entirely to the difficulty and expense of transportation through a mountainous tract, having no navigable rivers, since it is likely to arise in a great degree from the backwardness of the natives in the arts of mineralogy and metallurgy. In short, copper, the produce of Nepal, has been known to bear so high a price as a rupee and a half the seer, at the same time that European copper was procurable in Calcutta for a rupee the seer.

*BOUNDARIES.—The northern boundary of Nepal marches with Tibet. It runs along elevated regions, which are for the most part desolate and uninhabited. This circumstance probably accounts for the absence of any scientifically defined frontier between the two countries. On the west, the Kálí or Sardar river separates Nepal from the British Province of Kumáun; on the south-west and south the British Districts of Pilibhít, Kher Bahráich, Gonda, Basti, Gorakhpur, Champáran, Muzaffarpur, Darbhanga, Bhágalpur, and Purniah constitute the boundary, the line of frontier running through the plains at a varying distance (up to about 30 miles) from the foot of the Himálayas, except in the cases of the Dúndwa hills above Eastern Oudh, where the skirt of the hill is the boundary, and of the Sumesar hills, above north-western Champáran, where the watershed of the hills is the boundary. On the east, Nepal is bounded by the Mechi river, the Singatha ridge, and the hill principality of



Sikkim. Strictly speaking, the name Nepal applies only to the valley in which Khatmandu is situated. But throughout this account, the word is taken to represent the kingdom which the dominant race of Gúrkhalís has been gradually establishing, for the most part within the period of British rule in India, to the south of the Himálayan watershed, and between the rivers Sarda and M^echha.

Nepal lies, with an inclination from north-west to south-east, between the extremes of north latitude $26^{\circ} 25'$ and $30^{\circ} 17'$, and of east longitude $80^{\circ} 6'$ and $88^{\circ} 14'$. Its greatest length is about 512 miles. The breadth varies from 70 to 150 miles. The total area has been computed at about 54,000 square miles.

34 AGRICULTURE.—The products vary with the climate. In some parts rattans and bamboos, often of considerable dimensions, are seen, while other tracts produce only oaks and pines. In several hill valleys the pine-apple and sugar-cane ripen, whilst others yield only barley, millets, and similar grains. Kirkpatrick, from the spontaneous productions which he saw on the spot—namely, the peach, the raspberry, the walnut, the mulberry, and others—thought that all the fruits and esculent vegetables of England might with proper attention be successfully raised in the mountain valleys of Nepal. Later experience in the gardens of the British Residency tends to confirm his views, as, with the exception of September, there is not a month in which European fruits or vegetables of some kind cannot, with due care, be grown. In the warmer valleys the pine-apple is good and abundant; so too is the orange, which ripens in winter. Some fruits in the hills spoil owing to the excessive dampness of the rainy season. This moisture is, however, very favourable to the production of Indian corn, rice, and other summer crops. On many a piece of land three crops are grown in the year—wheat or barley, or buckwheat or mustard in the winter, radishes or garlic or potatoes in the spring, and Indian corn, rice, or pepper during the rains. The hills are terraced very high up their slopes; and the fields thus obtained are chiefly utilized for pulses and cereals, other than the transplanted rice, which is grown in the lower lands, and for mustard, madder, sugar-cane, and cardamoms. The latter require to be near running water. Ginger is a valuable product in the hill country between Nepal proper and the Kálí river.

34 Rice is everywhere the main food of the people. Various dry rices are cultivated in Nepal, under the general name of *ghya*, some of which, so far from needing hot weather to bring them to maturity, are actually raised in exposed situations; whilst others do not require, as in Bengal, to be flooded, but flourish in the driest and loftiest spots. Throughout the hills, scarcely a plough or a cart is to be seen, hand labour being the almost universal agent for the preparation of the soil. Great store is laid on the use of household and cattle manure, and also of a blue unctuous-looking clay which has remarkable fertilizing qualities. In the Taráí, the chief crops are rice, opium, rape, linseed, tobacco, and *ushur*. Irrigation is frequent throughout the country.

The most important of the forest trees in the Taráí are the *sál*, which is of great value for sleepers and house beams, owing to its durability, strength, straightness, and size; the *Mimosa*, from which the catechu of commerce is derived; the *sisu*; and the *bhanja*, the wood of which is in much request for cart-axes. Cotton trees, acacias, and fig trees are not unfrequent. The hill forests contain oak, holly, rhododendron, maple, chestnut, walnut, *champa*, hornbeam, pines, and firs in abundance; but the timber is of little use, except locally, owing to the inaccessible nature of the country. The cherry, the pear, and the tea tree, as well as the laurel, the alder, the willow, and the oleander, are all found wild. The spontaneous production of the soil include several edible roots and herbs, which form a considerable part of the sustenance of the poorer inhabitants. Several medicinal plants are known; and a rich variety of dyes is procured from bitter or aromatic woods, which are held in great estimation. The *jia* is a species of hemp, from the leaves of which is expressed a juice called *charas*, which is a potent narcotic, and possesses very valuable qualities, burning with a flame as bright as that of the purest resin. Its leaves are fabricated into a fibre, from which the Newars manufacture coarse linen, and likewise a very strong kind of sackcloth.

MINERALS.—The stones and ores, that have been collected, indicate the existence of a variety of minerals in the mountains of Nepal. Copper is found quite near the surface of the earth, the ore being dug from open trenches, so that the work is entirely stopped by the rainy season. These ores are found in several varieties, and are said to be unusually rich in metal. Iron-ore is also found near the surface, and is not surpassed in purity by that of any other country. Sulphur is likewise abundant, and procured in great quantities. Stone is found in great variety, particularly jasper and marble; but the houses are universally built of brick, because the use of stone is impracticable in a country where the roads do not admit of wheel-carriage, and where there is no navigation. A considerable mass of rock-crystal is said to exist near Gúrkha, and limestone as well as slate abounds everywhere; yet limekilns are scarce, mud being the cement preferred, because, as the natives assert, it answers better in their humid climate than mortar.

COMMERCE.—The external trade of Nepal falls under two heads—that which is carried on across the Himálayas with Tibet, and that which is conducted along the extensive line of the British frontier. Of the extent of the former trade, very little is positively known. The chief route runs north-east from Khatmandu, and following



up a tributary of the Kosi, passes the trans-frontier station of Kuti or Nilam at an elevation of 14,000 feet above sea-level. Another route, also starting from Khatmandu, follows the main eastern stream of the Gandak, crosses the frontier near the station of Kirang (9000 feet), and ultimately reaches the Sanpu river at Tadam. Both these routes are extremely difficult. The only beasts of burthen available are sheep and goats; and practically everything but grain and salt is carried by men and women. The principal imports from Tibet are *pashmina* or shawl wool, coarse woollen cloth, salt, borax, musk, yak-tails or *chauris*, yellow arsenic, quick-silver, gold-dust, antimony, *manjit* or madder, *charas* (an intoxicating preparation of hemp), various medicinal drugs and dried fruits. The majority of these articles pass through Nepal on their way to British territory. The exports into Tibet from Nepal include metal utensils of copper, bell-metal, and iron manufactured by the Newars; European piece-goods and hardware, Indian cotton goods, spices, tobacco, areca-nut and betel-leaf, metals, and precious stones.

The trade with India is conducted at various marts along the frontier line of 700 miles. The commercial policy of the Nepal Government, which is based on the requirements of the State treasury rather than on the principle of protection, subjects most articles of export and import to the payment of duty, which is heavy in the case of luxuries, and lighter in the case of necessities. At every mart and on every trade route a toll station is established; and the tolls are sometimes let by auction to a *thikadār* or farmer. A few articles, such as timber, ivory, copper *pice*, salt, cardamoms, and tobacco, are Government monopolies, which are usually granted to persons in favour at court. Trade in all other articles is free, subject to the payment of duties both on export and import. These duties differ greatly at different places; but the local tariff is always well known to the parties concerned, and is said to be not oppressively varied. On the main route to Khatmandu, duties are levied according to an *ad valorem* percentage on certain articles. But the more common system is to charge a certain sum by weight, by load, or by number, according to the character of the goods.

The principal route for through traffic is that which runs through the British District of Champāran, with Khatmandu and Patná for its two points of terminus. Starting from the military cantonment of Segauli, this route crosses the frontier near Rāksúl, and then proceeds through Samrabasa, Hataura, Bhimpheḍi, and Thánkot to Khatmandu; the total length being about 92 miles.

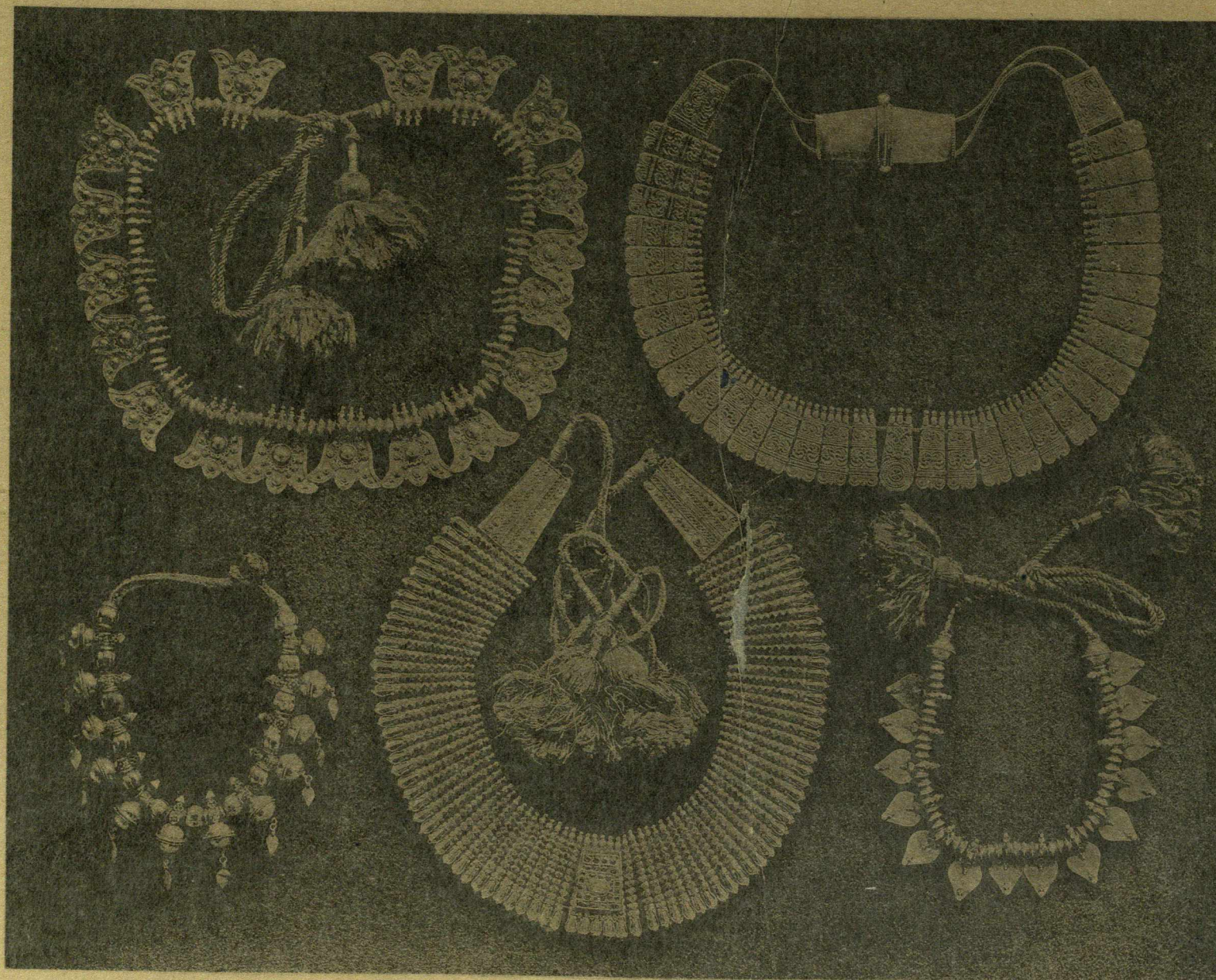
The principal articles of export from Nepal are the following:—Rice and inferior grains, oil-seeds, *ghí* or clarified butter, ponies, cattle, falcons for hawking, *mainás* as cage-birds, timber, opium, musk, *chireta*, borax, madder, turpentine, catechu or cutch, jute, hides and furs, dried ginger, cardamoms, red chillies, turmeric, and *chauris* or yak-tails. The chief imports are—raw cotton, cotton twist, and cotton piece-goods (both native and European), woollen cloth, shawls, rugs, flannel, silk, brocade, embroidery, sugar, spices, indigo, tobacco, areca-nut, vermilion, lac, oils, salt, a little fine rice, buffaloes, sheep and goats, sheet copper, copper and brass ornaments, beads, mirrors, precious stones, guns and gunpowder for sporting purposes, tea from Kumáun and Dárjiling. Of the aggregate value of this trade, it is difficult to form even an approximate estimate. Elaborate statistics have recently been compiled on the frontiers of Bengal, the North-Western Provinces, and Oudh; but with a trade that passes by so many channels, and consists in many cases of articles of small bulk and high value, registration necessarily omits much.

MANUFACTURES.—The Newars are almost the only artisans in Nepal. The Newar women, as well as the men of the hill tribe of Magars, weave two sorts of cotton cloth, partly for home use and partly for exportation. Those who are not very poor wear woollen blankets, which are manufactured by the Bhutias, who wear little else. The dress of the higher ranks is not manufactured at home, but is imported; it consists of Chinese silks and European muslins, calicoes, velvet, and broadcloth. The Newars are workers in iron, copper, brass, and bell-metal; the chief seats of the latter industry being Pátan and Bhatgáon. One bell manufactured at this last place measured 5 feet in diameter. The Tibet bells are superior to those of Nepal, though a great many bell-metal vessels of Nepal manufacture are exported to Tibet, along with those of brass and copper. The Newars have also a knowledge of carpentry; but it is remarkable that they rarely use a saw, dividing their wood, when of any size, by a chisel and mallet. They manufacture from the bark of a shrub (*daphne*) a very strong paper, remarkably well suited for packages. They distil spirits from rice and other grains, and also prepare a fermented liquor from wheat, *mahuá*, rice, etc., which they call *rukshí*. It is made somewhat in the manner of malt liquor, but is more intoxicating.

LIST OF ILLUSTRATIONS.

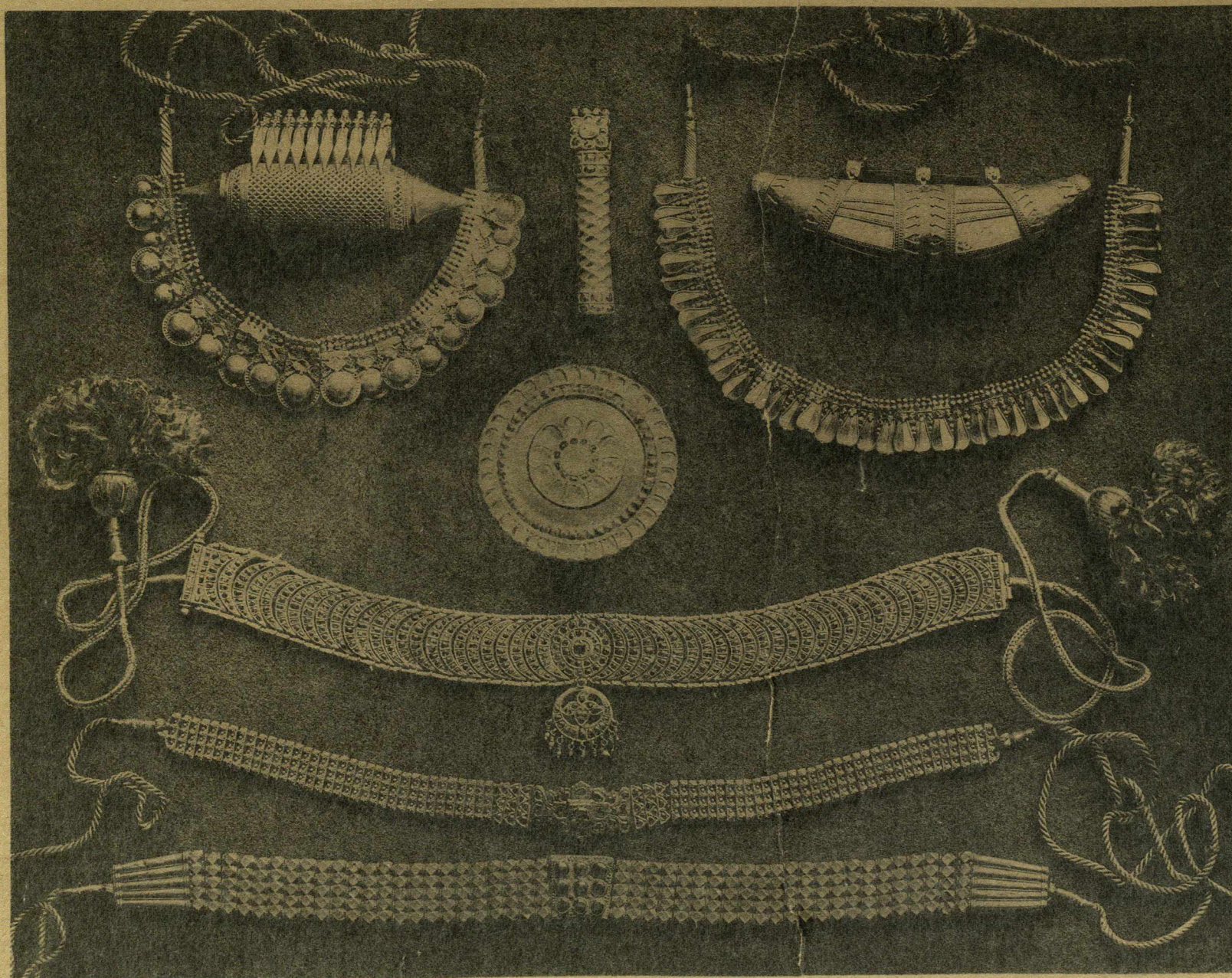
- 12 to 15.—Gold Jewellery of Travancore and Malabar. 16, 17.—Gold Necklets, Malabar and South Canara. 18.—Gold Head Ornaments, Madras. 19.—Gold Necklace, Calicut, Madras. 20.—Metal Worker. 21.—Metal Work, Jeypore. 22 to 29.—Metal Work, Nepal.

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12.—GOLD JEWELLERY OF TRAVANCORE AND MALABAR.

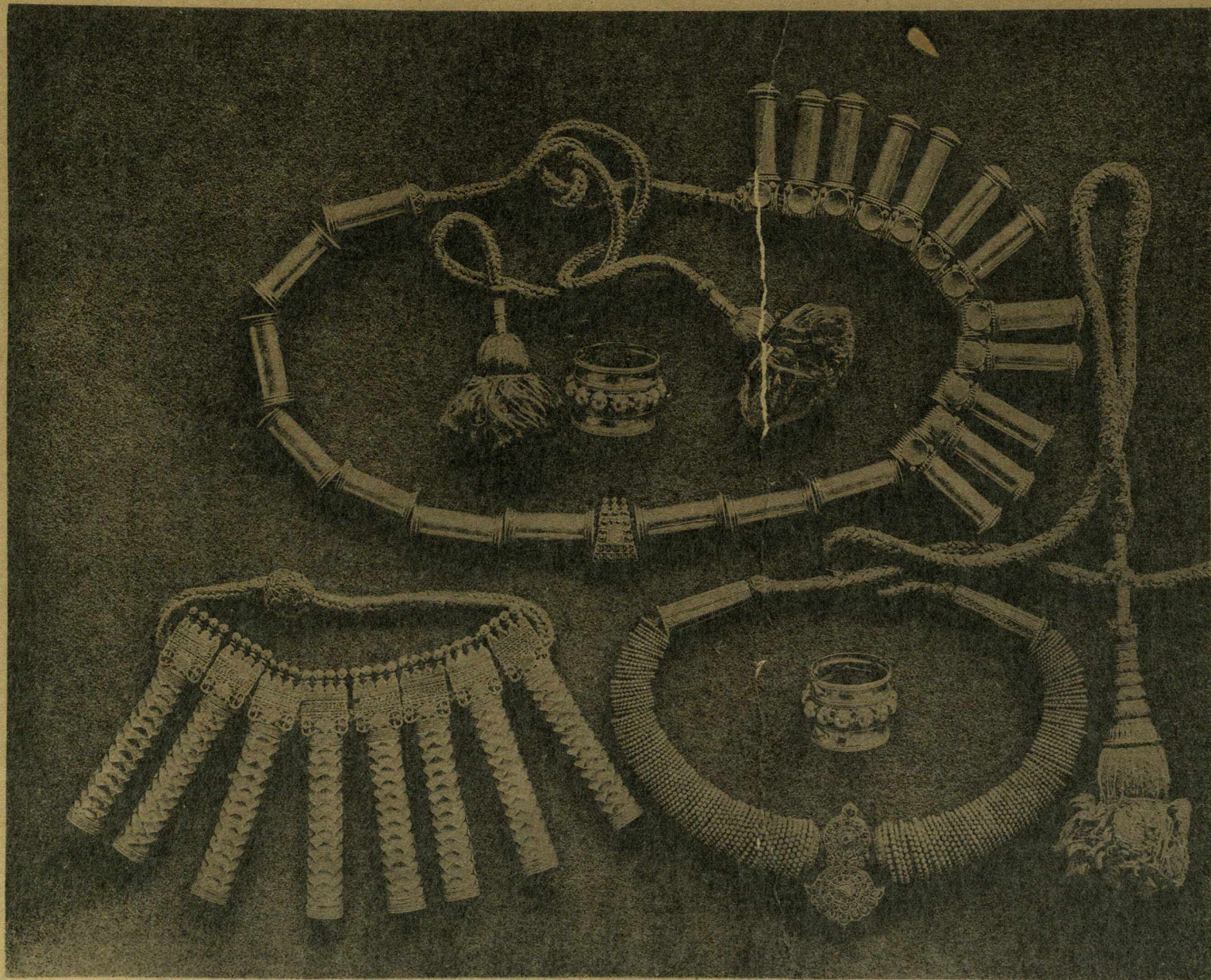


13.—GOLD JEWELLERY OF TRAVANCORE AND MALABAR.

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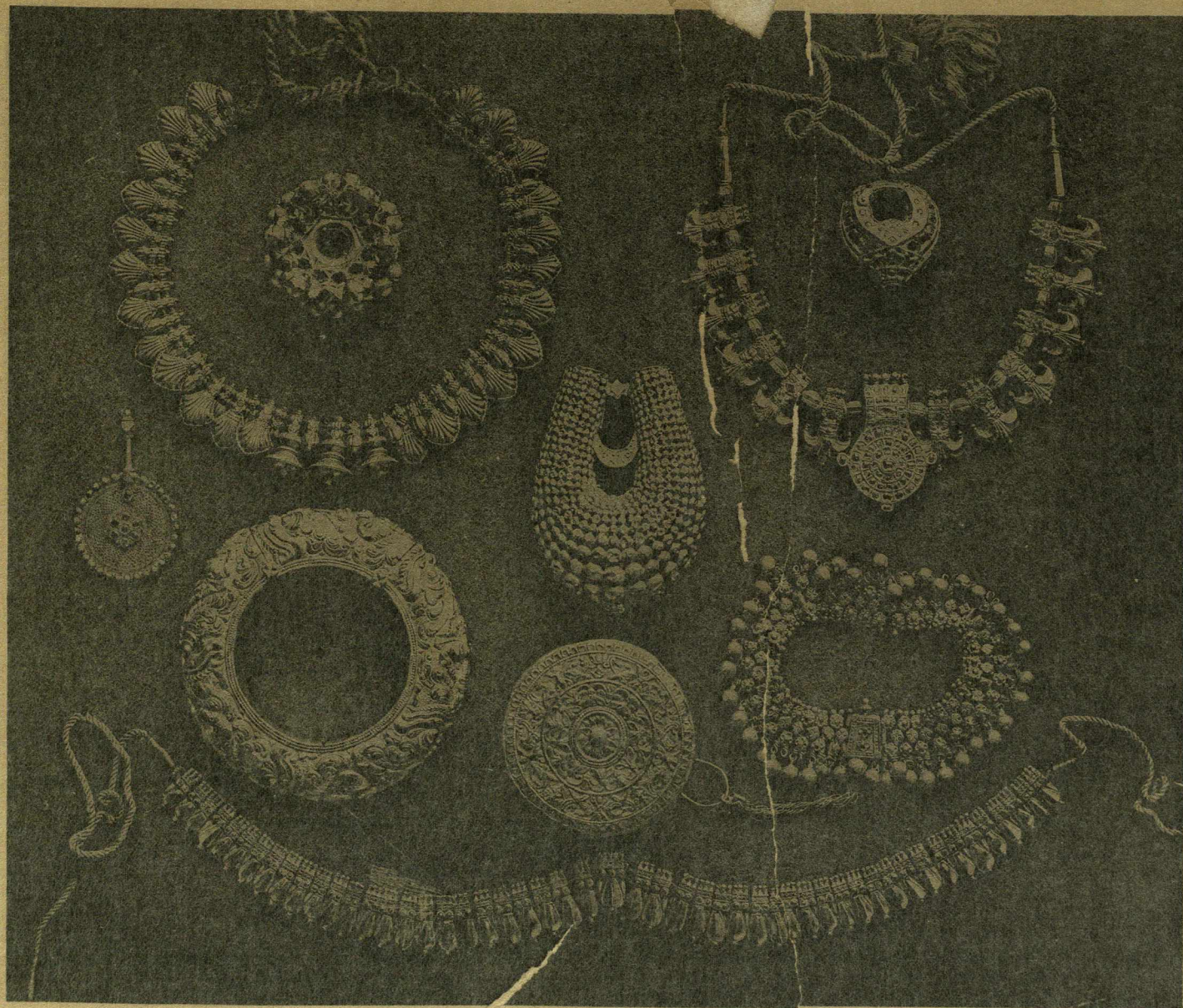
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14.—GOLD JEWELLERY OF TRAVANCORE AND MALABAR.

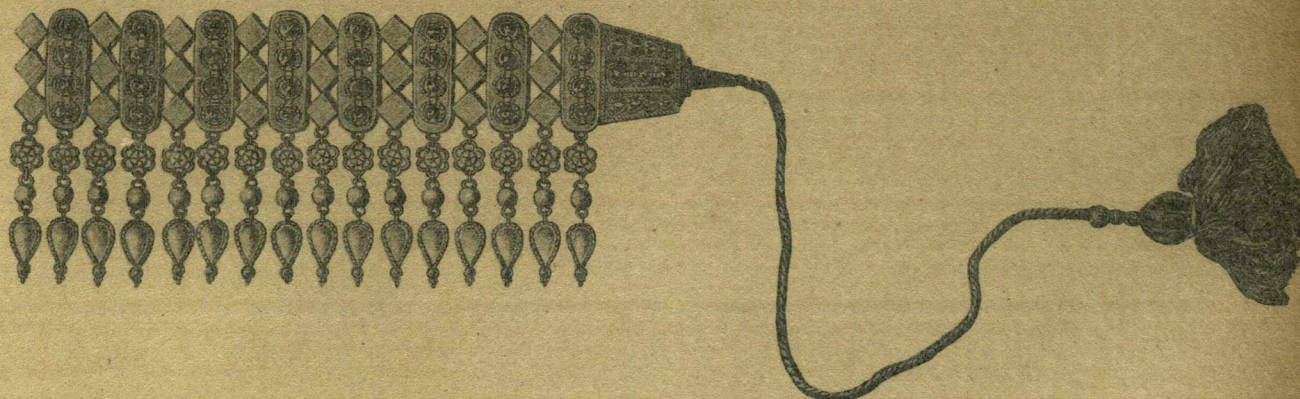
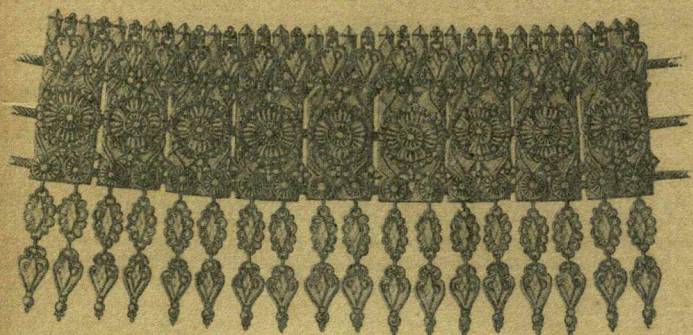
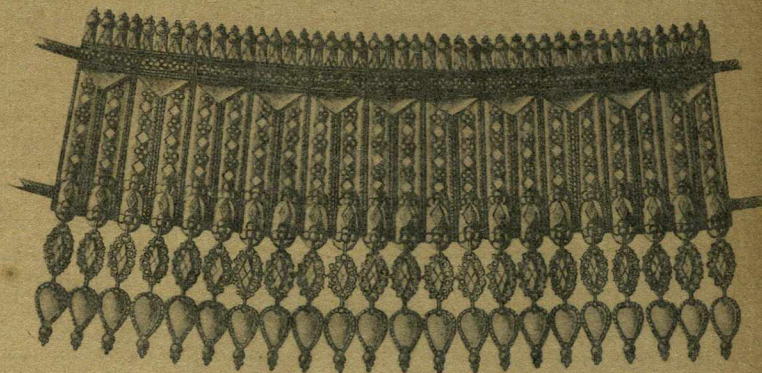
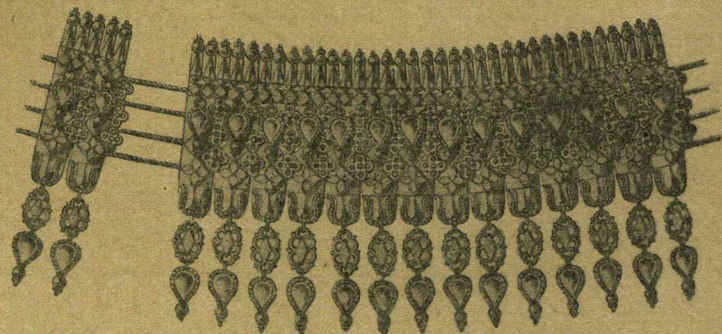
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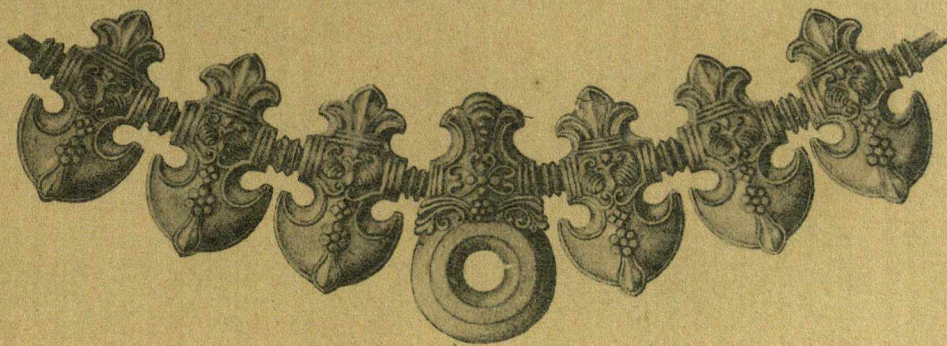
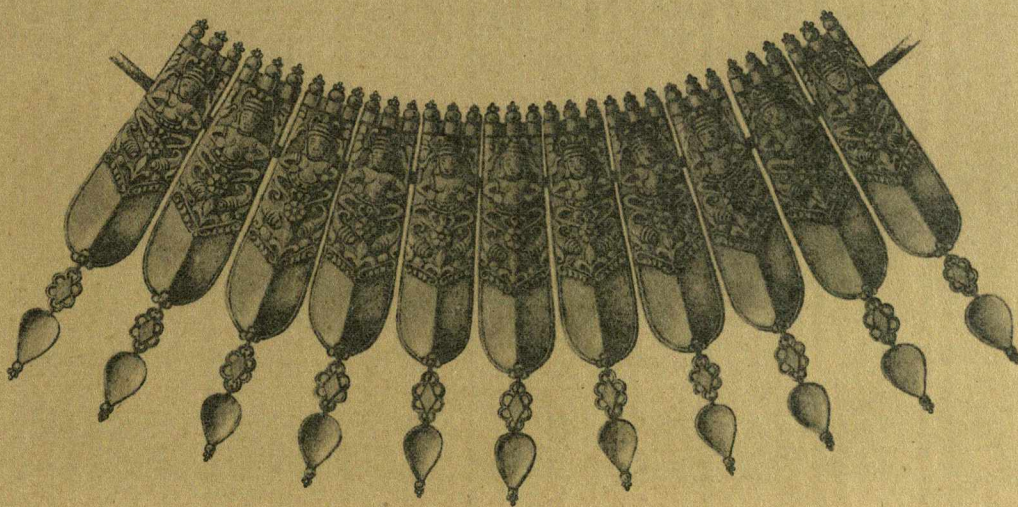
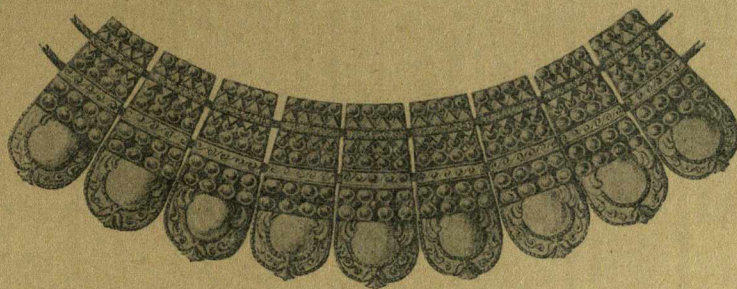
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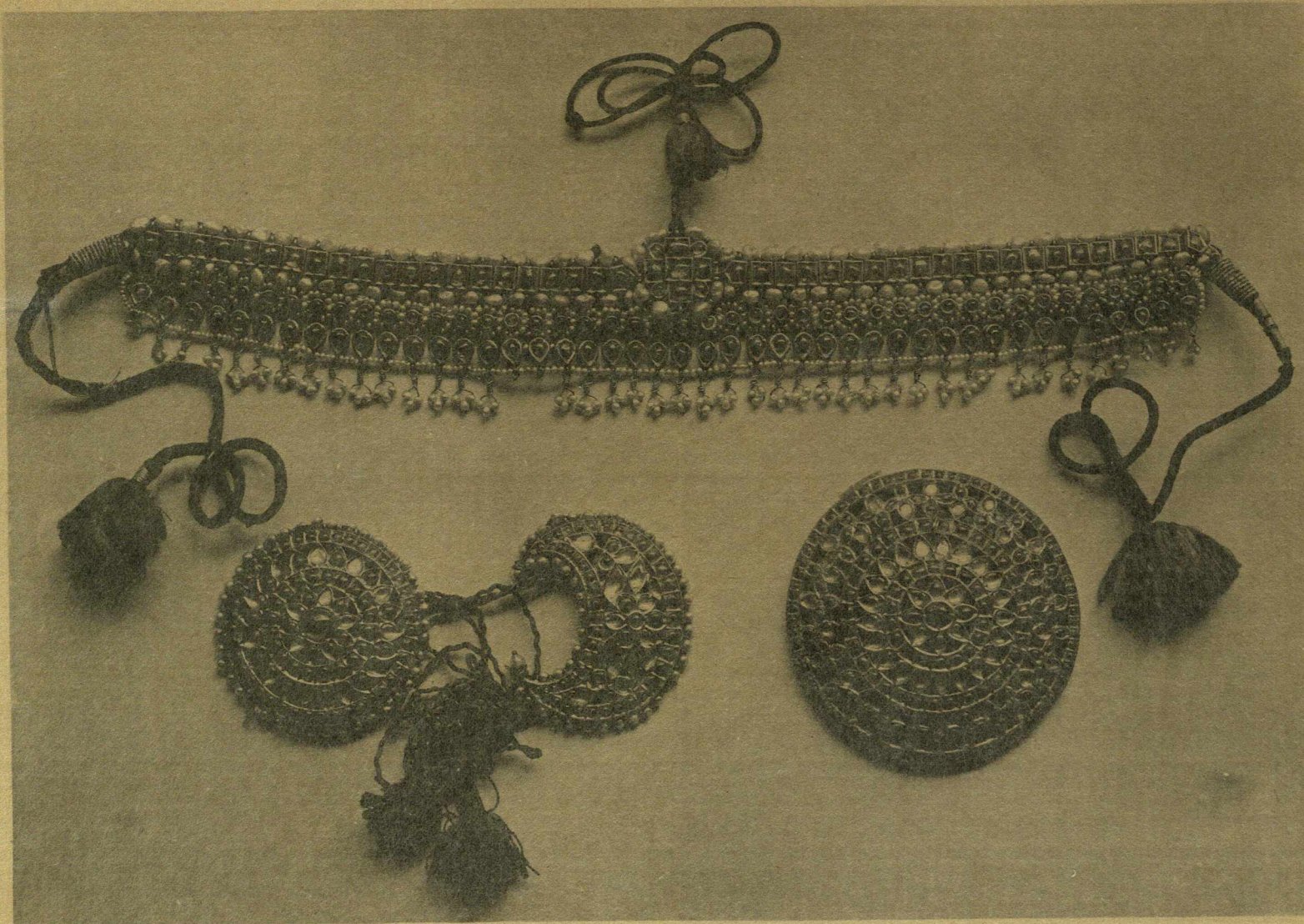
15.—CAND JEWELLERY OF TRAVANCORE MALABAR.



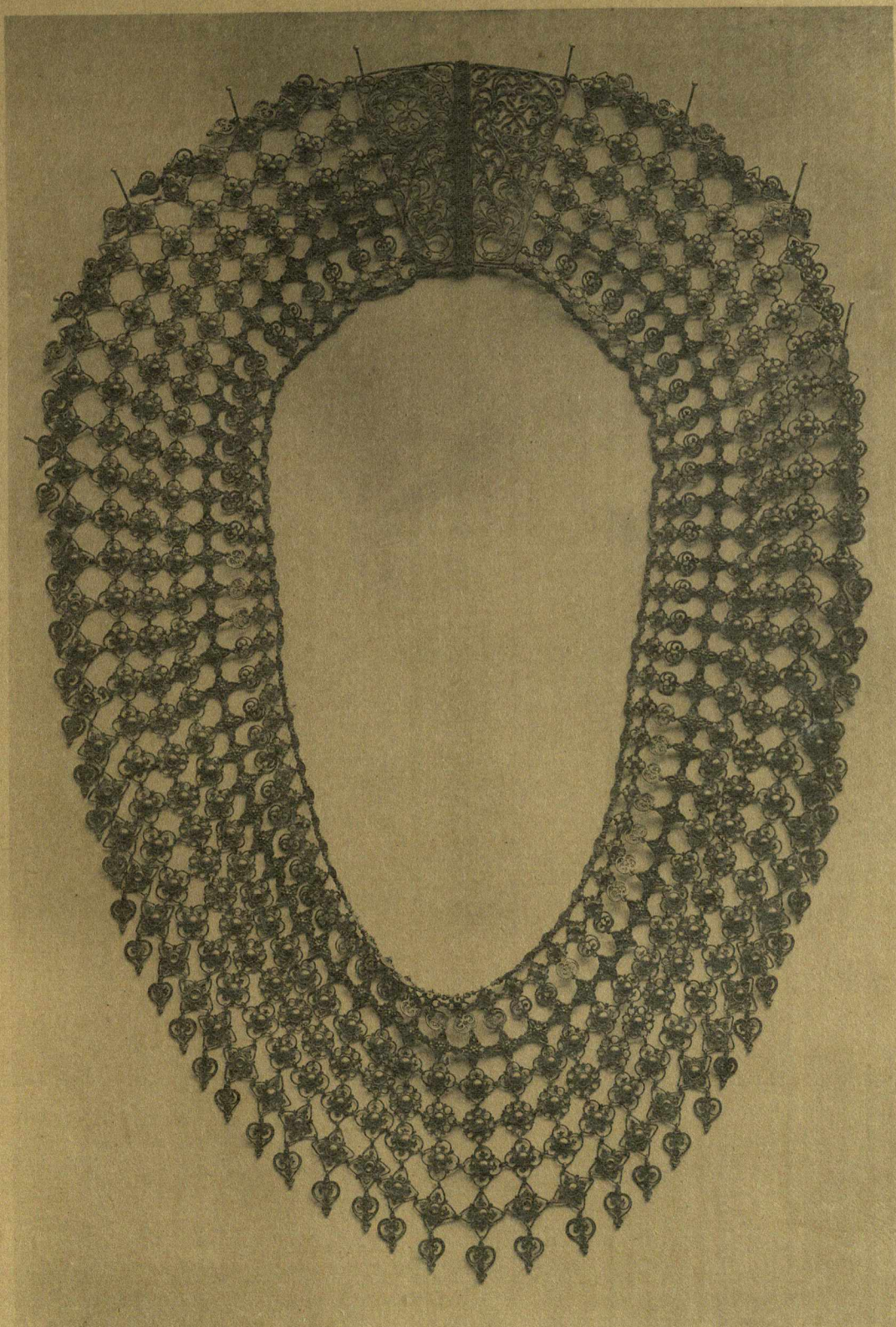
16.—GOLD NECKLETS. MALABAR AND SOUTH CANARA.



17.—GOLD NECKLETS. MALABAR AND SOUTH CANARA.



18.—GOLD HEAD ORNAMENTS. MADRAS.



19.—GOLD NECKLACE. CALICUT, MADRAS.



20.—METAL WORKER.



21.—METAL WORK. SCHOOL OF ART, JEYPORE.

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22.—METAL WORK. NEPAL.

From the collection of Lieut.-Col. Sir Edward L. Durand, Bart.



23.—METAL WORK. NEPAL.

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The Journal of Indian Art and Industry.

AKBAR'S TOMB AT SIKANDRA.

The accompanying plates are illustrative of the fresco paintings on the tomb of Akbar at Sikandra, a place about five miles from Agra. The mausoleum is described as one of the most characteristic of modern buildings. It was commenced by that monarch, and finished by his son Jahāngir in 1613.

Like that of Itmad-ud-daulah and other Indian mausoleums, it is placed in the middle of a splendid garden, enclosed by walls, and approached through grand and massive gate entrances. On the frieze round the main gateway are poetical inscriptions in the Persian language, setting forth the praises of the monarch and mausoleum. It is built of red sandstone, and is five storeys high, each floor being smaller than that below it. Like the Panch Mahal at Fathpur Sikri, the key-note of the design appears to have been taken from a Buddhist *vihara*, or monastery. The uppermost storey is open to the sky, and is of marble, and enclosed by lovely perforated screens of the same material. The inscriptions upon the architrave of the interior are from a Persian poem supposed to have been composed by Shekh Faizi, the brother of Abdul Fazl, on the virtues of his old patron the Emperor Akbar. In the centre is the cenotaph, the head and foot of which contain the salutations of the Emperor's faith or school—"Allaho Akbar! Illi Jalalihul" Ninety-nine titles of the Creator are said to be inscribed about it. At one end is a pedestal on which it is said the famous *Koh-i-Nur* was placed. The genuine tomb containing the remains of the great Akbar is in a vaulted crypt beneath the centre of the building, to which access is gained from the ground level through a vestibule and passage. The ceiling of the former is elaborately groined in stucco, and is richly ornamented in colour decoration.

The plates represent some of the paintings. The mortuary hall is nearly 38 feet square, and is surrounded by other chambers of smaller size, containing tombs of less distinguished members of the Imperial family. Round the sepulchre were originally placed the armour, raiment and books of the great Emperor, ready to his hand if he should rise. But the Jâts are said to have carried them off in the last century to Bharatpur, where it is possible that some relics of Akbar still survive in oblivion or concealment. The tomb has been lately provided with a sumptuous covering at the expense of Lord Northbrook.

*The epoch of Akbar is the one of greatest importance to English students of the history of India, for two reasons. It is the period when administration under native rule was best and most efficient, and it is, consequently, the one with which a comparison with British rule should be made. It is also the period of which the most detailed and exact accounts have been written and preserved; so that such a comparison will be reliable and useful.

Akbar was the third Indian sovereign of the House of Timur. Hindustan had been ruled by Afghans for two centuries and a half when Baber crossed the Indus and founded the Mughal Empire in 1525. Mahmud of Ghazni, the first Muhammadan invader of India, reigned from A.D. 997 to A.D. 1030. His dynasty lasted until 1183. The Ghori dynasty lasted from A.D. 1192 to 1289. The Khilzi dynasty, from 1289 to 1321. The dynasty founded by Tuglak Shah, from 1321 to 1393. Then followed the inroad of Timur and subsequent anarchy; and the Afghan Lodi dynasty lasted from 1450 to the invasion of Baber in 1526. Baber died in the Charbagh at Agra, on December 26th, 1530, and his son and successor, Humayun, was defeated and driven out of India by the able and determined Afghan chief, Shir Shah, in 1540. Shir Shah died on the throne, and was succeeded by a son and grandson, while Humayun took refuge with Tahmasp, the Shah of Persia. The restored Afghans kept their power for fifteen years.

The story of Humayun's flight is told by his faithful ewer bearer, named Jauhar, who accompanied him in his exile. Jauhar tells us that, in October 1542, a little party of seven or eight horsemen and a few camels was wearily journeying over the sandy wastes of Sind, worn out with fatigue, and famished with thirst. The fugitive Prince Humayun, his wife the youthful Hamida (Humayun met this young lady, when on a visit to his brother Hindal's mother; she was a daughter of a Seyyid, a native of Jami in Khurasan), the ewer bearer Jauhar, an officer named Rushen Beg, and a few others, formed the party. Extreme misery had destroyed alike the differences of rank and the power of concealing the true character. When Rushen's horse was worn out, he insisted upon taking one which he had lent to the Queen, a young girl of fifteen within a few days of her confinement. Humayun gave his own horse to his wife, walked some distance, and then got on a baggage camel.

few hours afterwards the forlorn wanderers entered the fort of Amarkot, near Tatta, which is surrounded by a dreary waste of sand-hills. Here, under the shade of an *arka* tree, young Hamida gave birth to a prince, who afterwards became the most enlightened thinker, and the ablest administrator of his age. Akbar was born on the 14th of October 1542. Jauhar, by Humayun's order, brought a pod of musk, which the fugitive king broke and distributed among his followers, saying, "This is all the present I can afford to make you on the birth of my son, whose fame, I trust, will one day be expanded all over the world, as the perfume of the musk now fills this room."

The fugitives then fled up the Bolan Pass, and the little Akbar remained for some time in the hands of his turbulent uncles at Kandahar and Kabul, while his parents took refuge at the court of Persia. Then the wheel of fortune turned. Assisted by Bhairam Khan, a very able general and a native of Badakshan, Humayun fought his way back into military possession of Lahore and Delhi, and died in 1556, leaving his inheritance, such as it was, to his young son.

At the time of his father's death, Akbar was only in his fifteenth year. He was then in the Punjab, with Bhairam Khan, putting down the last efforts of the Afghan faction. Bhairam Khan became Regent, and remained in power until 1560, when the young King assumed the sovereignty.

In order to appreciate the full extent of Akbar's achievements, it must be considered that he had to conquer his dominions first, before he could even think of those great administrative improvements which signalized the latter part of his life and immortalized his name. In the first year he possessed the Punjab, and the country round Delhi and Agra; in the third year he acquired Ajmir; in the fourth, Gwalior and Oudh; and in 1572 he conquered Gujrat, Bengal, and Bihar; but it took several years before order could be established in those countries. Orissa was annexed to Akbar's empire in 1578, by Todar Mall, who made a revenue survey of the province in 1582. In 1581 Kabul submitted, and was placed under the rule of Akbar's brother, Mirza Hakim. Kashmir was annexed in 1586, Sind in 1592, and in 1594 Kandahar was recovered from the Persians. Kashmir was ruled by Hindu princes until the beginning of the fourteenth century, when it was conquered by the Muhammadans. Owing to distractions in the reigning family, Akbar sent an army into Kashmir in 1586. The king then submitted, and was enrolled among the Delhi nobles. In 1595 Akbar commenced a long war with the Muhammadan Kings of the Dakhin, ending in the acquisition of Berar. These wars, which were spread over nearly the whole of Akbar's reign, need not further engage our attention. But in contemplating the reforms of this admirable prince, it must be borne in mind that their merit is enhanced by the fact that most of them were effected during troublous times, and at periods when there must have been great pressure on his finances. He was a renowned warrior, skilled in all warlike exercises, and an able and successful general. But it is not these qualities which raise Akbar so far above the common herd of rulers. His greatness consists in his enlightened toleration, in his love of learning, in his justice and magnanimity, and in the success with which he administered a vast empire. The excellence of his instruments is one striking proof of his capacity and genius.

The commencement of Akbar's intellectual revolution dates from the introduction to him of Faizi and Abú-l Fazl, the illustrious sons of Mubarak. Their father, Shaikh Mubarak, traced his descent from an Arabian dervish, of Yemen, who settled in Sind. The Shaikh was a man of genius and great learning, and, having established himself at Agra, gave his two sons excellent educations. Faizi, the eldest, was born in 1545. He first went to court in 1568, at the age of twenty-three, and soon became the Emperor's constant companion and friend. In 1589 he was made Poet Laureate, and he was employed on several diplomatic missions. He was a man of profound learning and original genius. He was loved by the Emperor, who was thrown into the deepest grief at his death, which took place at the age of fifty, on October 5th, 1595. "Shaikh Jío," he exclaimed, "I have brought Hakim Ali with me, will you not speak to me?" Getting no answer, in his grief he threw his turban on the ground, and wept aloud.

Shaikh Abú-l Fazl, called Allami, the younger son of Mubarak, was born on January 14th, 1551, at Agra. He zealously studied under the care of his father; and in his seventeenth year, towards the end of 1574, he was presented to the Emperor Akbar by his brother Faizi.

Owing to the birth of his eldest surviving son Salim, at Sikri, in 1570, Akbar had made that place a royal abode. He built a palace and other splendid edifices there, and it became one of his favourite places of residence. It was called Fathpúr Sikri. Thither Akbar went after his campaign in Bihar in 1574, and there his intimacy with Abú-l Fazl commenced. It was at this time that the memorable Thursday evening discussions began. Akbar's resolution was to rule with even hand men of all creeds in his dominions, and he was annoyed by the intolerance and casuistry of the *Ulamas*, or learned men of the predominant religion. He himself said, "I have seen that God bestows the blessings of His gracious providence upon all His creatures without distinction."



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Ill should I discharge the duties of my station were I to withhold my indulgence from any of those committed to my charge." But he invited the opinions of others on religious points, and hence these discussions arose. Akbar caused a building to be erected in the royal garden of Fathpūr Sikri for the learned men, consisting of four halls, called *aiwān*, where he passed one night in the week in their company. The western hall was set apart for Seyyids, the south for Ulamas, the north for Shaikhs, and the east for nobles and others whose tastes were in unison with those of the Emperor. The building was called *Ibadat-Khana*, and here discussions were carried on, upon all kinds of instructive and useful topics.

Besides Faizi and Abū-l Fazl, there were many learned men in constant attendance on the Emperor. Their father, Shaikh Mubarak, was a poet and a profound scholar. Mulla Abdul Kadir, called El Badauni, was born at Badaun, in 1540, and studied music, astronomy, and history. He was employed to translate Arabic and Sanscrit works into Persian; but he was a fanatical Muhammadan, and in his "Tarikh-i Badauni," a history brought down to 1595, he always speaks of Faizi and Abū-l Fazl as heretics, and all references to the speculations of Akbar and his friends are couched in bitter and sarcastic terms. He, however, temporized, and did not allow his religion to interfere with his worldly interests. His history contains much original matter. He also translated the great Hindu epic "Mahabharata"* in 1582, and the "Ramayana" between 1583 and 1591. Of the former poem he says, "At its puerile absurdities the eighteen thousand creations may well be amazed. But such is my fate, to be employed on such works! Nevertheless, I console myself with the reflection that what is predestined must come to pass." The Khwaja Nizamud din Ahmad was another historian of Akbar's court. He also was a good, but not a bitter Musalman. His "Tabakat-i Akbari" is a history of the Muhammadan Kings of Hindustan from Mahmud of Ghazni to the year 1594, which was that of his own death. Other historians of the reign were Shaikh Illahdad Faizi Sirhindi, whose "Akbar-nama" comes down to 1602; Maulana Ahmad, of Tatta, who compiled the "Tarikh-i Alfi," under the Emperor's own superintendence, and Asad Beg, who related the murder of Abū-l Fazl and the death of Akbar, bringing his narrative down to 1608. The greatest settlement officer and financier of Akbar's court was Todar Mall. There were also poets, musicians, and authors of commentaries who were encouraged by the liberality of the Emperor.

Professors of all creeds were invited to the court of this enlightened sovereign, and cordially welcomed. Among these were Maulana Muhammad, of Yazd, a learned Shiah; Nuruddin Tarkhan, of Jam, in Khurasan, a mathematician and astronomer; Sufi philosophers, fire-worshippers from Gujrat, Brahmans, and the Christian missionaries Aquaviva, Monserrato, and Henriquez.

The Thursday evening meetings at the *Ibadat Khana*, near the tank called *Anúptalao*, in the gardens of Fathpūr Sikri, were commenced in 1574. Akbar was at first annoyed by the intolerance of the Muhammadan Ulamas, and encouraged the telling of stories against them. Quarrels were the consequence. On one occasion Akbar said to Badauni, "In future report to me any one of the assembly whom you find speaking improperly, and I will have him turned out." Badauni said quietly to his neighbour, Asaf Khan, "According to this a good many would be expelled." His Majesty asked what had been said, and when Badauni told him, he was much amused, and repeated it to those who were near him. Decorum was, however, enforced after this, and the more bigoted Muhammadans had to curb their violence. But their feelings were very bitter when they saw their sovereign gradually adopting opinions which they looked upon as more and more heretical, and at last embracing a new religion.

El Badauni says that Akbar, encouraged by his friends Faizi and Abū-l Fazl, gradually lost faith, and that in a few years not a trace of Muhammadan feeling was left in his heart. He was led into free thinking by the large number of learned men of all denominations and sects that came from various countries to his court. Night and day people did nothing but inquire and investigate. Profound points of science, the subtilties of revelation, the curiosities of history, the wonders of nature, were incessantly discussed. His Majesty collected the opinions of every one, retaining whatever he approved, and rejecting what was against his disposition, or ran counter to his wishes. Thus a faith, based on some elementary principles, fixed itself in his heart; and, as the result of all the influences that were brought to bear on him, the conviction gradually established itself in his mind that there were truths in all religions. If some true knowledge was everywhere to be found, why, he thought, should truth be confined to one religion? Thus his speculations became bolder. "Not a day passed," exclaims El Badauni, "but a new fruit of this loathsome tree ripened into existence."

At length Akbar established a new religion, which combined the principal features of Hinduism with the sun-worship of the Parsís. He was also much interested in the gospels as explained to him by Christian missionaries; and, as Colonel Yule says, he never lost a certain hankering after Christianity, or ceased to display an affectionate reverence for the Christian emblems which he had received from his Jesuit teachers.

* See Surgeon-Major T. H. Hendley's "Razm Namah" and "Mahabharata," 1883.

The good parts of all religions were recognized, and perfect toleration was established. The new faith was called *Tauhid-i Ilahi*, divine monotheism. A document was prepared and signed by the Ulamas, the draft of which was in the handwriting of Shaikh Mubarak. The Emperor, as *Imam-i Adil* (just leader) and *Mujtahid*, was declared to be infallible, and superior to all doctors in matters of faith. Abú-l Fazl was the chief expounder of the new creed.

Had Akbar, as a private individual, avowed the opinions which he formed as an Emperor, his life would not have been worth a day's purchase; but in his exalted station he was enabled to practise as a ruler the doctrines which he held as a philosopher. Or, as Abú-l Fazl puts it: "When a person in private station unravels the warp and woof of deception, and discovers the beautiful countenance of consistency and truth, he keeps silence from the dread of savage beasts in human form, who would brand him with the epithets of infidel and blasphemer, and probably deprive him of life. But when the season arrives for the revelation of truth, a person is endowed with this degree of knowledge upon whom God bestows the robes of royalty, such as is the Emperor of our time." The disputations came to an end in 1579, and Akbar held the new creed to the end of his life.

Meanwhile Akbar's learned men were engaged in compilations and translations from Arabic and Sanscrit into Persian. The history called "*Tarikh-i Alf*" was to be a narrative of the thousand years of Islam from the *Hijrah* to 1592 A.D. Akbar held that Islam would cease to exist in the latter year, having done its work. The "*Tarikh-i Alf*" was intended to be its epitaph. It was chiefly written by Maulavā Ahmad, of Tatta, but Abú-l Fazl and others assisted. Faizi translated the Sanscrit mathematical work called "*Lilawati*"; and, as has already been said, Badauni, with the aid of others, prepared translated versions of the two great Hindu epics.

But the most famous literary work of Akbar's reign was the history written by Abu-l Fazl, in three volumes, called the "*Akbar-namah*." The first volume contains a history of the House of Timur down to the death of Humayun; the second is a record of the reign of Akbar, from 1556 to 1602; and the third is the "*Ain-i Akbari*," the great Administration Report of Akbar's Empire.

The first book of the "*Ain-i Akbari*" treats of the Emperor, and of his household and court. Here we are introduced to the royal stables, to the wardrobe, and kitchens, and to the hunting establishment. We are initiated into all the arrangements connected with the treasury and the mint, the armoury, and the travelling equipage. In this book, too, we learn the rules of court etiquette, and also the ceremonies instituted by Akbar as the spiritual guide of his people.

The second book gives the details of army administration, the regulations respecting the feasts, marriage rites, education, and amusements. This book ends with a list of the *Grandeess* of the Empire. Their rank is shown by their military commands, as *mansabdars* or captains of cavalry. All commands above five thousand belonged to the Shah-zadahs or Emperor's sons. The total number of *mansabs* or military commands was sixty-six. Most of the higher officers were Persians or Afghans, not Hindustani Muhammadans, and out of the four hundred and fifteen *mansabdars* there were fifty-one Hindus, a large percentage. It was to the policy of Hindu generals that Akbar owed the permanent annexation of Orissa.

The third book is devoted to regulations for the judicial and executive departments, the survey and assessment, and the rent-roll of the great finance minister. The fourth book treats of the social condition and literary activity of the Hindus; and the fifth contains the moral and epigrammatic sentences of the Emperor.

It is to the third book, containing the details of the revenue system, that the modern administrator will turn with the deepest interest. Early in his reign Akbar remitted or reduced a number of vexatious taxes. His able revenue officers then proceeded to introduce a reformed settlement based on the indigenous system, as matured by Shir Shah. The greatest among Akbar's fiscal statesmen was Todar Mall, who settled Gujrat, Bengal, and Bihar, and introduced the system of keeping revenue accounts in Persian. Next to him was Nizam Ahmad, the author of the "*Tabakat-i Akbari*," who spent his life in the Emperor's service.

From time immemorial a share in the produce of land has been the property of the State in all eastern countries. From this source the main part of the revenue has been raised, and the land tax has always formed the most just, the most reliable, and the most popular means of providing for the expenditure of the government. In Muhammadan countries this land tax is called *khiraj*, and is of two kinds, the one *mukasimah*, when a share of the actual produce was taken, and the other *wazifa*, which was due from the land whether there was any produce or not.

In Hindu times, and before the reign of Akbar, the *khiraj* in India was *mukasimah*. The Emperor's officers adopted the system of *wazifa* for good land, and carried the settlement into effect with great precision and accuracy in each province of his dominions. Bengal and part of Bihar, Berar, and part of Gujrat, however,

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appear to have been assessed according to the value of the crops, the surveys of the land not being complete. Akbar took one-third of the estimated value, and he left the option of payment in kind to the farmers, except in the case of sugar-cane and other expensive crops.

The "Ain-i Akbari" of Abú-l Fazl is rendered valuable not only by the varied information it contains, but also by the trustworthiness of the author. Mr. Blochmann says that Abú-l Fazl has been too often accused by European writers of flattery, and of wilful concealment of facts damaging to the reputation of his master. He bears witness that a study of the "Akbar-namah" has convinced him that the charge is absolutely unfounded. Abú-l Fazl's love of truth, and his correctness of information are apparent on every page of his great work.

The last years of the reign of Akbar were clouded with sorrow. His eldest son, Salim, was dissipated, ungrateful, and rebellious, and bore special hatred against his father's noble minister. The two younger sons died early from the effects of drink. "Alas," exclaimed Abú-l Fazl, "that wine should be burdened with suffering, and that its sweet nectar should be a deadly poison!" Many Muhammadan princes died of *delirium tremens* before the introduction of tobacco, which took place towards the end of Akbar's reign. Asad Beg says that he first saw tobacco at Bijapur. He brought a pipe and a stock of tobacco to Agra, and presented it to the Emperor, who made a trial. The custom of smoking spread rapidly among the nobles, but Akbar never adopted it himself.

In 1597 Abú-l Fazl left the court, and went for the first time on active service in the Dakhin. He had been absent for more than four years, when the rebellious conduct of Salim, the heir apparent, induced Akbar to recall his trusty minister. His presence was urgently needed. Abú-l Fazl hurriedly set out for Agra, only accompanied by a few men. Salim thought this an excellent opportunity of getting rid of his father's faithful friend, and bribed Rajah Bir Singh, a Bundela chief of Urchah, through whose territory he would have to pass, to waylay him. On the 12th of August 1602, at a distance of a few miles from Narwar, Bir Singh's men came in sight. The minister thought it a disgrace to fly, which he might easily have done. He defended himself bravely, but, pierced by the lance of a trooper, he fell dead on the ground. The assassin sent the head of Abú-l Fazl to his employer; and Akbar, with all the diligence of his officers and troops, was never able to secure and punish the murderer. His own son was the greater criminal of the two, and in his memoirs Salim confesses his guilt with unblushing effrontery.

Mr. Blochmann thus sums up the career of Abú-l Fazl. "As a writer he is unrivalled. Everywhere in India he is known as the great Munshi. His letters are studied in all Madrasahs, and are perfect models. His influence on his age was immense. He led his sovereign to a true appreciation of his duties, and from the moment that he entered court the problem of successfully ruling over mixed races was carefully considered, and the policy of toleration was the result."

The great Emperor did not long survive his beloved and faithful minister. Akbar died on November 10th, 1605, in his sixty-third year, and was buried in the magnificent tomb at Sikandra, near Agra. There his bones still rest, and his tomb is treated with all honour and respect by the present rulers of the land. A new cloth to cover the actual tomb was presented by the Earl of Northbrook, after his visit to Sikandra in November 1873, when he was Viceroy of India.

His children were Hasan and Husain, who died in infancy; Salim, his successor; Murad and Danyal, who died of drink in the lifetime of their father, and three daughters. Akbar is described by his son Salim as a very tall man, with the strength of a lion, which was indicated by the great breadth of his chest. His complexion was rather fair (*color de trigo* is the description of a Spanish missionary who knew him), his eyes and eyebrows dark, his countenance handsome. His beard was close-shaved. His bearing was majestic, and "the qualities of his mind seemed to raise him above the denizens of this lower world." The Emperor Akbar combined the thoughtful philosophy of Marcus Aurelius, the toleration of Julian, the enterprise and daring of his own grandsire Baber, with the administrative genius of a Monro or a Thomason. We might search through the dynasties of the East and West for many centuries back, and fail to discover so grand and noble a character as that of Akbar. No sovereign has come nearer to the ideal of a father of his people.

Akbar was the contemporary of Queen Elizabeth. He began to reign two years before her, and outlived her for two years, but he was nine years younger than the great Queen. He was succeeded by his son Salim, under the name of Jahanghir, who reigned from 1605 to 1627.

The native sources whence the story of Akbar's glorious reign are derived, have already been indicated. To a considerable extent they are accessible in an English form. The translation of the "Ain-i Akbari," by Gladwin, was published in 1800, and that of the historian Ferishta, by General Briggs, in 1829. Elphinstone gives a brief account of Akbar's reign in his history of India. In 1873 Blochmann's admirable translation of the two first

books of the "Ain-i Akbari" was printed at Calcutta, for the Asiatic Society of Bengal. The work also contains many extracts from El Badauni and the "Akbar-namah," and a perfect mine of accurate and well arranged information from other sources.

Ralph Fitch is the only English traveller who has written an account of a visit to the court of Akbar. Accompanied by Mr. John Newbery, a jeweller named William Leedes, and James Story, a painter, he reached the court at Agra with a letter of introduction from Queen Elizabeth, in the year 1585. Thence Newbury started to return overland. Leedes entered the service of Akbar, settling at Fathpūr; and Fitch went on to Bengal, eventually returning home.

Abū-l Fazl tells us, casually, that, through the negligence of the local officers, some of the cities and marts of Gujrat were frequented by Europeans. Two centuries and a half after his master's death, these intruders held undisputed sovereignty not only over the whole of Akbar's empire, but over all India, a vast dominion which had never before been united under one rule. They approached from the sea, the base of their operations is their ships, and not, as in the case of Akbar's grandsire, the mountains of the north-west frontier.

If the balance of administrative merit is in favour of the English, it in no way detracts from the glory of the great Emperor. Yet we may claim that the islanders who now occupy the place of Akbar are not unworthy to succeed him. The work that is before us is more prosaic than was the duty of the puissant sovereign. The charm of one central glory, round which all that was great and good in India could congregate; the fascination of one ruling spirit, combining irresistible power with virtue and beneficence; the pomp and circumstance of a brilliant court—all these are gone for ever. We have instead the united thought and energy of many sound heads and brave hearts, working without ostentation, and achieving objects of a magnitude and endurance such as no single brain of any despot, how great soever, could even conceive.

LIST OF ILLUSTRATIONS.

Nos. 30 to 40.—Eleven full-page Plates of Coloured Details from Akbar's Tomb at Sikandra.





30.—TOMB OF AKBAR, SIKANDRA.

Border round panel, Vestibule.

Scale full size.

CHROMO-LITH. BY W. GRIGGS, LONDON.



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31.—TOMB OF AKBAR, SIKANDRA.
Dado and panel on right of entrance passage.

Scale 1 1/2 inches to 1



32.—TOMB OF AKBAR, SIKANDRA

Dado and panel, Vestibule

Scale $1\frac{1}{2}$ inches to 1 foot.

CHROMO-LITH. BY W. GRIGGS, LONDON.





34.—TOMB OF AKBAR, SIKANDRA. Detail, Vestibule.

Scale full size.

CHROMO-LITH. BY W. GRIGGS, LONDON.



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35.—TOMB OF AKBAR, SIKANDRA. Panel over door of passage, Vestibule.

Scale 2 inches to 1 foot.

CHROMO-LITH. BY W. GRIGGS, LONDON.



36.—TOMB OF AKBAR, SIKANDRA. Detail of border in alcove, Vestibule.

Scale 3 inches to 1 foot.

CHROMO-LITH. BY W. GRIGGS, LONDON.



37.—TOMB OF AKBAR, SIKANDRA. Cornice below springing of vault, Vestibule.

Scale full size.

CHROMO-LITH. BY W. GRIGGS, LONDON.

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38.—TOMB OF AKBAR, SIKANDRA. Detail of soffit of arch, Vestibule.

Scale 2 inches to 1 foot.

CHROMO-LITH. BY W. GRIGGS, LONDON.

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39.—TOMB OF AKBAR, SIKANDRA. Border round spandril of arch, Vestibule.

Scale 8 inches to 1 foot.

CHROMO-LITH. BY W. GRIGGS, LONDON.



40.—TOMB OF AKBAR, SIKANDRA. Goffering in ceiling, Vestibule.

Scale 6 inches to 1 foot.

CHROMO-LITH. BY W. GRIGGS, LONDON.



EMPIRE OF INDIA EXHIBITION, LONDON, 1895.

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The Directors of The Empire of India Exhibition, to be opened at Earl's Court, Kensington, in May next, desiring to make it as useful and instructive as possible, have decided to form a Loan Collection of Relics and other Historical Memorials of the late Honourable East India Company.



The Directors have been much gratified by the warm approval the proposal has received. A number of distinguished Anglo-Indian officials have already kindly consented to act as an Honorary Committee of Advice, to assist the Directors in their efforts to secure a collection which shall recall to the minds of the present generation of Englishmen the remarkable achievements of the great Merchant Company of the City of London, to which we owe our Indian Empire, and shall be worthy of the heroic record they fill in the pages of our National history.

The Directors will be glad to receive particulars of any proposed Loan Exhibits from the owners of objects connected with the history of the Honourable East India Company, such as Portraits, Drawings, Sketches, Maps and Plans, Original Commissions, Arms, Medals, Coins, Old Plate, China and Glass, or other Historical Relics associated with the H. E. I. C., in India or in this country. For all approved Exhibits the Company will provide free carriage to the Exhibition, and ample exhibiting space, and they will return the same at the close of the Exhibition at their own cost.

Every reasonable protection will be afforded in the way of safes, show cases, police supervision and fire insurance by the Company.

The Directors further beg to state that the Loan Collection will be suitably installed in the Imperial Palace, in one of the finest glass and iron structures in the world, now in course of construction.

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Empire of India Exhibition,
LONDON, 1895.



LOAN EXHIBITION
OF
RELICS & MEMORIALS
OF THE LATE
Honourable East India Co.

Honorary Committee of Advice.

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The Journal of Indian Art and Industry.

BRASS AND COPPER WARE OF THE MADRAS PRESIDENCY.

By EDWIN HOLDER, AG: SUPERINTENDENT MADRAS SCHOOL OF ARTS.

I had hoped to make a tour through the several districts of this Presidency, where brass and copper ware is manufactured, chiefly with the intention of ascertaining the difference (if any) in the modes of work, and in the class of work turned out in different places; but this project was found impracticable. Owing also to a misunderstanding on my part, the preparation of this monograph was considerably delayed, and to make up for the loss of time, I have been obliged to do what I could, together with my usual work, within the short period of one month. It will therefore, I hope, be easily understood that the illustrations herewith submitted do not by any means represent the best specimens of Madras work. For the first part of the report, viz., "A brief account of the artisan class in South India," I am entirely indebted to Dr. Pulney-Andy, who, I think, deserves special thanks for his very interesting contribution; and to the Collectors of the several districts I am indebted for the information which they kindly sent me regarding the principal places of manufacture. The drawings of the various utensils, and photographs of men at work, &c., were executed under my supervision by students of the Madras School of Arts. Plate 48 (illustration of a brass and copper ware stall) is taken from a photograph by Messrs. Wiele and Klein, of Madras.

School of Arts, Madras.

EDWIN HOLDER, Ag: Superintendent.

PART I. A BRIEF ACCOUNT OF THE ARTISAN CLASS IN SOUTH INDIA.

The class of artisans known in the Tamil language as *Kammalars*, in the Telugu as *Kamsalas*, and in Sanskrit as *Panchalas*, are the descendants of a race of Aryans who entered India by crossing the Panjab long before Vyasa began the collection and arrangement of the Vedas, which period has been fixed by European oriental scholars as about fifteen centuries B.C. This tribe of Aryans was known in early times under the designations *Visva Brahmins*, *Deva Brahmins*, and *Deva Kammalars*, in contradistinction to the modern Brahmins, who are the descendants of Vasishta, and who were known as *Go-Brahmins*, on account of their custom of receiving cows as gifts. After entering India, this tribe of Deva Kammalars travelled gradually downwards to the south of India, from whence many families are said to have emigrated to other parts of the world. During this period they built many of the famous temples which are still in existence in India; they are also supposed at that time to have occupied the position of spiritual guides and preceptors to the people, as may be understood from the common parlance current in South India that "*Kammala is Jagat Guru*."

The present families of Kammalars, or artisans, are, as I have said, descendants of this ancient tribe of Deva Kammalars, and following the example of the modern Brahmins, they also ascribe to their forefathers a mythic origin from the face of Visva Karma, who is considered by Hindus as the great Architect of the universe. But the most rational conclusion that one can arrive at from various sayings current amongst these people is that the progenitor of their tribe had five sons. The first-born, named *Manu*, was taught to work in iron; the second, named *Maya*, to work in wood; the third, *Twastra*, in brass, copper, and other alloys; the fourth, *Silpi*, to work in stone; and the fifth and last, named *Visvajna*, in gold and silver, and to set precious stones in jewels. From this, and from the fact that amongst the Kammalars of the present day the hereditary follower of the blacksmith's trade is socially allowed to take the precedence amongst the artisan class, it may be inferred that the ancient Hindus attached more importance to iron, as a useful metal, than to gold and silver, which they considered as merely ornamental.

Though these five orders of hereditary artisans form the chief portion of the mass employed in the various handicrafts, viz., blacksmiths' work, carpentry, metal work, stone work, and jewellery, there are also men of other castes who, having been in the service of Kammalars, have learned their trade, and have set up business on their own account. These in some places have been wrongly included amongst the purely Kammalar class, and thus the social status of the original artisan has to a certain extent been lowered. However, in vindication of their right to higher social position the "Kammalars have always maintained an animated fight for precedence in Hindu society." (*Vide Manual of the Administration of the Madras Presidency*, vol. I, chap. i, page 67).

As regards religion, the majority of the artisans are Sivites, or worshippers of Siva; the others are either Lingyets or Vishnuvites. They go through the ceremony of *upanayanam* for the investiture of the *Sacred thread. Their marriage ceremony is performed as amongst the Brahmins. Their dead are buried in an erect posture, cremation being resorted to by a very small portion of the community. No instance of the re-marriage of a widow has yet taken place, and in this respect the Kammalars seem to be more strict than Brahmins, amongst whom of recent years there have been instances of widow marriages. The Kammalars do not recognise the modern Brahmins as their priests; those they have are of their own class.

In former times the artisans had their own guilds, which protected the interests of their own trades, and endeavoured to maintain them in a prosperous condition; but as these institutions gradually declined, the Kammalars were obliged to seek the aid of capitalists of other castes, and now they are, in the majority of instances, reduced to mere paid workmen, earning daily wages at the following rates:—

Blacksmiths	... from 8 as. to Re. 1 per day.	Stone masons or	} ... from 12 as. to Rs 1½ per day.
Carpenters	... „ 6 „ to „ 1 „	Sculptors	
Braziers	... „ 12 „ to „ 1½ „	Goldsmiths	... „ Re. 1 to Rs 3 „

The five different occupations, though followed amongst many families as a hereditary calling, are not in any case compulsory; for example, the son of a blacksmith may, if he likes, become a goldsmith, carpenter, or mason, or *vice versa*. The five sects form one compact community. They associate and also intermarry, except in cases where there is a difference of language; for example, Telugu and Tamil-speaking families do not intermarry with each other. They are by their religious doctrines forbidden to have food with men of other castes, and even to partake of food which has been prepared by the Brahmins of the present day.

Madras: 29 May, 1894.

(Signed) S. PULNEY-ANDY, M.D., F.L.S.

PART II. LOCALITY.

Brass and copper articles, chiefly domestic and sacred, are manufactured in more than 200 towns and villages in the Madras Presidency. Chief amongst these are Kumbakonam, renowned for its beaten brass and copper utensils; Tanjore, for chased ornamental work; and Madura, for cast brass and bell metal ware. The town of Madras itself, where the latest European improvements have been introduced, and where almost every class of metal work is done, from cast iron machinery down to tin pots, is not distinguished for any special class of work.

The following list, which has been drawn up from information given by the Collectors of the several districts, shows approximately the number of towns and villages in each district where copper and brass ware was manufactured during the year 1893:—

1. Godavari district	... 41 towns and villages.	10. Cuddapah district	... 8 towns and villages.
2. Tinnevely „	... 30 „	11. Chingleput „	... 9 „
3. Trichinopoly „	... 29 „	12. Bellary „	... 2 „
4. Ganjam „	... 28 „	13. Coimbatore „	... 2 „
5. S. Canara „	... 22 „	14. Malabar „	... 2 „
6. Vizagapatam „	... 17 „	15. Madura „	... 5 „
7. S. Arcot „	... 16 „	16. Nellore „	... 7 „
8. N. Arcot „	... 4 „	17. Madras „	... 4 „
9. Salem „	... 13 „		

N.B. Brass and copper work does not seem to be done in any of the other five districts.

PART III. TOOLS AND METHOD OF WORK.

In Plate 54 are illustrated some of the principal tools necessary for forming an ordinary-sized vessel out of sheet copper or brass, the first stage in the manufacture of which is to cut the sheet metal in a circular form with the scissors (fig. 4), and then to form it into a rough bowl by placing it on one of the hollows in the stone die or mould (fig. 11) and beating it into the hollow with the large hammer (fig. 8). If the vessel is to be simple in form (like figs. 3, 8, and 11, Plate 43), this bowl is placed successively on the broad ends or heads of the irons (figs. 1, 2, and 3, Plate 54), and is beaten or tapped into shape with hammers of different sizes, which vary chiefly as regards the form of the lower or striking ends. Large vessels with narrow necks and bases are generally made in three parts, viz., neck, body, and base, which are afterwards soldered together (see Plates 56 and 57, “Madras

* The Sacred thread is a thin cord tied loosely across the body over the left shoulder, next to the skin. It is never removed. See Plates 41, 56, and 57.



Copper-smiths at work.") Some experts, to show their skill, often make vessels of almost any intricate shape, provided the base be flat, out of a single piece of sheet metal. To watch the smith gradually closing in the upper part of the bowl or half-formed vessel, and then expanding it again to form the neck and mouth, all by mere tapping, is highly interesting.

The process of casting in brass or bell metal, as done in Madras, is very simple. To cast a vessel like the one shown in Plate 43, fig. 10, a solid model of infusible clay is made to correspond with the inside of the vessel; when dry, this is covered over with a layer of prepared wax and is turned on a lathe, a metal rod having been previously driven through the centre of the mass. The whole is then covered over pretty thickly with the infusible clay, and when dry a hole is bored in this outer layer of clay, through which the wax is expelled by heating, and into which the liquid metal is poured. The rod previously inserted keeps the inner and outer masses of clay in position, and thus allows the liquid metal to run freely into the space between them; the clay is then removed, and the vessel finished on a lathe. Fig. 1, Plate 55, is an illustration of the common lathe used by Madras workmen, and fig. 2 is an illustration of the ordinary furnace for melting brass and copper. Bells, images, lamps, ornaments, and a large number of vessels, especially those with spouts, are cast in brass or bell metal. Some articles are said to be cast in pure copper, but this is not true; native workmen have assured me that it is impossible to use the copper quite pure, as the metal has the defect of cooling too rapidly to allow of its running freely into every part of the mould; but a very slight admixture of zinc or lead seems to counteract this defect, while it does not much affect the colour of the copper.

Owing to its costliness, high-class repoussé or chased ornamental work has never been done to any great extent on articles of brass or copper; it has been chiefly confined to silver ware, which is preferred by the rich. In Tanjore, brass and copper utensils are largely ornamented with patterns in pretty high relief, but the work is done chiefly by means of dies; the designs are, in consequence, wanting in vigour and originality when compared with the old repoussé work on copper door-panels, sword-sheaths, &c., or even with the present ornamental silver work. The process of executing this repoussé work is as follows:—The article to be decorated is made of sheet metal of the softest quality; it is filled up with a composition of sandarach, brick dust and oil mixed together, heated, and poured into it while hot; when cold this composition becomes as hard as ordinary sealing wax. The surface to be ornamented is then smeared over with chalk or any other pigment mixed with water, and the pattern is carefully drawn on it with a sharp tool. To raise the ornament, the ground or space round the figures is tapped or beaten in with a hammer and a set of small chisel-shaped tools made either of steel or bell metal. When the ornament is thus roughly embossed, the wax is heated and poured off, all irregularities in the shape of the vessel that may have resulted during the course of the work are set right, the wax is again poured in, and the details in the ornament are carefully worked up in the same manner by tapping with a finer set of tools. On trays, panels, or other flat articles the ornament can be brought out in greater relief than on round vessels, by reversing the article and beating the ornament out at the back. In any case, the composition of wax must be placed on the opposite side to serve as a support during the course of work.

Sheet brass and copper have been imported into India for many years past; the workmen of the present day have no recollection of having used anything else for the manufacture of their wares. Some of the older men say that during the time when imported sheet metal was scarce, Nagapatam copper coins were melted and beaten out into sheets; but as trade improved, the necessity for this gradually ceased. For casting work, cuttings and filings from the sheet, and all old and useless brass and copper articles are utilised.

PART IV. DESCRIPTION OF THE IMPORTANT ARTICLES ILLUSTRATED.

The articles illustrated here are chiefly those used by the natives of Madras. They were all made in the Madras Presidency, and are purely South Indian in style. A few were taken from the collection at the Madras School of Arts; the rest were borrowed for the occasion.

Plate 42 represents a group of the principal vessels in use in an ordinary Hindu family for cooking and serving up food. The most important of these is the *degcha*, or rice boiler (fig. 10); it is always made of copper, and is tinned inside; the other vessels are made either of brass or copper. Fig. 3, a perforated plate, is used for draining off the water from the boiler after the rice is cooked; figs. 9 and 16 are rice coolers; figs. 7, 11, 12 and 18 are vessels for cooking; figs. 15 and 17, for serving freshly prepared sauce; fig. 4 is a betel tray; fig. 8, a tray for confectionery and fruit; fig. 6, a sieve for cleaning raw rice; and fig. 14, a bowl which serves the purpose of a plate for eating out of; this latter is not very common, as leaves are generally used by all Hindus as plates, food being placed in them with the spoons (figs. 1, 2 and 5).

Plate 43 is an illustration of various kinds of water vessels, some of which are used for placing water or milk in, and some for drinking out of. Fig. 2, a vessel with spout, is used in temples for sacred purposes only, when water has to be poured on the offerings. This and figs. 7, 9 and 10 are of cast brass or bell metal; the others are all of beaten work.

Fig. 1, Plate 45, is the ordinary lamp used in Hindu houses; it is called *kudavillaku*, meaning "pot lamp." The pot or reservoir in the centre contains the oil; the cap with a funnel-shaped head, into which the wick is passed, is removable; the lamp rests on a three-legged stand, and is of beaten brass work. Fig. 2, a camphor burner, and fig. 3, a lamp with many wicks, are used in temples and on special occasions, such as marriage ceremonies. Fig. 4 is called a *shadagopam*; it is placed on the heads of those who come to the priest for a blessing, and is only used in Vishnu temples.

Fig. 1, Plate 46, is the ordinary lamp used in Travancore. It is of cast brass or bell metal; the wick is placed at one end, and in the centre is the oil reservoir, with a spoon for taking out the oil when required; it is far more elegant and substantial than any of the Madras lamps. Fig. 2 is an ornament of cast brass usually attached to the end of the yoke in a chariot or car drawn by bulls.

Plates 47 and 48 represent various kinds of cast brass lamps used at marriage ceremonies and other grand occasions; each burner is made to hold five wicks. The figures of birds and other animals have no particular signification; they are merely ornamental.

Plate 49. A bronze image of Siva, the third in order of the Hindu triad, in the character of destroyer or reducer of things to their primitive atoms. He is here shown as dwelling in light, the flame-like pieces representing the rays; his foot is placed on one of the *Ganthiruvans* (a class of celestials inhabiting Swarga or Indra's heaven), whom he has conquered. The images in Plate 50 are of cast copper, not pure copper, but as I have mentioned in Part III, with a slight admixture of zinc or lead.

Plate 51 is from a plaster cast of a copper repoussé panel which was executed in the Madras School of Arts during the time of Mr. E. B. Havell, late Superintendent of the institution, who made a great effort to revive this bold style of ancient repoussé work on copper. At first sight the Madras work might appear grotesque, and perhaps somewhat stiff in the arrangement of lines; but when compared with the repoussé work done in other parts of India, its superiority as regards composition, bold relief, and modelling of details will become apparent. The same may be said of the South Indian wood carving, which could well be compared with the best Italian work, were it not for the excessive amount of conventionality in the treatment of details, especially as regards animals and human figures; the latter are represented in the most grotesque and unnatural forms; and for this reason the modern Tanjore ware, which is full of hideous Swamy figures, is so repulsive to the eye of a true artist. But in all ornamental work in relief, whether on wood, stone, or metal, there is always a considerable degree of understanding and appreciation of form shown, which is wanting in North Indian work, especially of the Muhammadan style. By form I do not mean outline form, but modelling.

Fig. 1, Plate 52, represents an ancient sword-sheath and shield purchased by Mr. E. B. Havell, to whom I have had no time to refer for details. I cannot, therefore, vouch for the articles being of Madras manufacture. The shield is of leather with iron fittings; I have introduced it here merely to correspond with the sword-sheath, which is of copper. The ornamentation on this, in repoussé, is more like the Mysore and Hyderabad ware than like the Madras work. The next illustration on the same page shows a group of Tanjore copper ware embossed and inlaid with silver and brass.

Plate 53 is from a photograph of a screen with copper repoussé panels, executed at the Madras School of Arts for Messrs. Dymes & Co. of Madras, who exhibited it at Glasgow in 1888. Plate 53a is an illustration of a group of copper repoussé jars and a panel, also executed at the Madras School of Arts; some trays from Mysore and Tanjore, and a brass flower vase from Travancore.

School of Arts, Madras.
16th June, 1894.

EDWIN HOLDER,
Ag: Superintendent.



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CSL

ANALYSIS OF SPECIMENS OF ORIENTAL METAL-WORK.

The following extract is from a Report on the analysis of various examples of Oriental metal-work in the South Kensington Museum and other collections, made under the direction of Professor W. C. Roberts-Austen, C.B., F.R.S., by Arthur Wingham, F.I.C.

This report is the result of an investigation undertaken at the suggestion of Prof. Valentine Ball, C.B., F.R.S., with the view to ascertain whether any marked characteristic existed in the composition of Oriental brass from different localities, or from the same locality but of different ages, and it was hoped that it would be possible by the aid of an analysis to name the locality or to assign the time of production to a brass of uncertain origin, or at least to support any existing idea as to the date of a doubtful specimen.

It was necessary that the analyses should be as complete as possible, as a comparatively rough estimation of the principal metals only would be of little or no use. It was considered that a few exhaustive analyses would be more likely to yield definite results than a larger number of incomplete ones. Every specimen was therefore subjected to a rigid examination, and the greatest care was bestowed, at times under considerable disadvantages, on each analysis, so that every particle of metal could be accounted for and the quantity determined wherever there was sufficient present to admit of this being effected. The chief of the disadvantages referred to was the small quantity of the material at the analyst's disposal, which rendered the estimation of the metals present in small quantity a task of great difficulty, and one requiring special knowledge and skill.

Unfortunately very few brass or bronze objects in the Indian Section could be found whose authenticity as to date was beyond question, and these were nearly all comparatively speaking modern. A few brass specimens of doubtful age but of known locality were therefore chosen, as well as some objects of individual interest. Better fortune was met with in the Persian Court, where there are many authentic objects of various dates during the last ten centuries. These analyses show that the early Persian brasses and bronzes were indefinite mixtures, that the constituent metals were often impure, and further, that no definite composition was persistently aimed at at any one time, except perhaps in the specimens of the 19th century, which appear to be purer than the older ones, and which were probably worked up from imported English sheet brass. No regularity in composition could be traced. THESE RESULTS LEAD TO THE VIEW THAT IT WOULD BE IMPOSSIBLE TO JUDGE WITH CERTAINTY THE AGE OF AN ALLOY FROM ITS COMPOSITION, WHICH WOULD, HOWEVER, RENDER IT POSSIBLE TO DISTINGUISH BETWEEN ANCIENT AND QUITE MODERN EXAMPLES.

The question as to the possibility of determining the locality of specimens is not entirely disposed of. It would probably be difficult to name the province in which a brass was made, but a complete analysis might often help to decide between one of two districts. This would apply more particularly to the ancient specimens which would probably have been prepared from ores found in the locality, before communication with other countries was as easy as it has been of late years, but a much more extended series of complete analyses, including all traces of metals, would have to be made before definite conclusions could be arrived at.

These analyses do not support the opinion that the Eastern metal-workers prepared and employed exceptionally pure metals.

ANALYSIS OF SPECIMENS TAKEN FROM THE INDIAN COURT OF THE SOUTH KENSINGTON MUSEUM.

24. BURMESE GOLD. Taken from various objects in the Royal Treasure from Mandalay, now in the India Museum.

ANALYSIS.				
Gold	...	...	...	90.70
Silver	...	...	...	6.92
Copper	...	...	...	.92
Iron	...	...	...	.33
Platinum and other rare metals	...	...	...	1.12
				<u>99.99</u>

25. THRONE, octagonal, on eight feet; gold plates chased and repoussé with bold floral and foliated ornament, mounted on wood; with three red and yellow velvet cushions. Made for Runjeet Singh after his accession to Lahore in 1799 A.D. Height 3 ft. 1½ in., diam. 2 ft. 5 in.

ANALYSIS.				
Gold	...	...	...	97.75
Silver	...	...	...	1.11
Copper	...	...	...	1.01
Iron	...	...	...	Nil.
				<u>99.87</u>

26. GOLD COIN. Moghul. 16th century.

Analysis showed that it is of pure gold, as not a trace of any other metal could be detected.

Specially tested for silver, platinum, copper, iron, and lead.

Specific gravity of coin ... 19.265

27. GOLD COIN (Indo-Scythian).

Specific gravity ... 18.698

ANALYSIS.				
Gold	...	...	...	96.96
Silver	...	...	...	2.41
Copper	...	...	...	.64
				<u>100.01</u>

28. RELIC SHRINE. "Stupa," in four parts (incomplete). Gold repoussé and chased with conventional ornament in bands. Burmese. Discovered in levelling a Buddhist Temple at Rangoon in April, 1855.

ANALYSIS.				
Gold	...	...	...	72.02
Silver	...	...	...	22.96
Copper	...	...	...	5.24
				<u>100.22</u>



29. RELIC CASKET, cylindrical; gold, repoussé, set with two rows of rubies, and surrounded by an arcade containing figures of saints, the spandrels filled by birds with out-stretched wings; on the base a conventional lotus. Found in Afghanistan. Buddhist. 1st century B.C.

ANALYSIS.				
Gold	...	...	...	90.85
Silver	...	...	...	5.63
Copper	...	...	...	3.65
				<u>100.13</u>

30. RELIC SHRINE. "Stupa." Gold repoussé and chased with conventional ornament in bands, surmounted by a finial terminating in a bud; set with 38 rubies and one emerald. Burmese. Discovered in levelling a Buddhist Temple at Rangoon in April, 1855.

ANALYSIS.				
Gold	...	...	...	94.72
Silver	...	...	...	2.72
Copper	...	...	...	2.75
				<u>100.19</u>

31. TASSEL. 16 stems, gold plates held by spirals of gold wire. Burmese. Discovered in levelling a Buddhist Temple at Rangoon in April 1855.

ANALYSIS.				
Gold	...	...	...	87.42
Silver	...	...	...	8.44
Copper	...	...	...	3.97
				<u>99.83</u>

32. RELIC SHRINE. "Stupa," in three parts (incomplete). Gold repoussé and chased with conventional ornament in bands. Burmese. Discovered in levelling a Buddhist Temple at Rangoon in April 1855.

ANALYSIS.				
Gold	...	...	...	98.01
Silver	...	...	...	1.57
Copper	...	...	...	.38
				<u>99.96</u>

33. BOWL. Gold, unornamented, containing calcined bones and ashes. Burmese. Discovered in levelling a Buddhist Temple at Rangoon in April 1855.

ANALYSIS.				
Gold	...	...	...	83.07
Silver	...	...	...	10.36
Copper	...	...	...	6.43
				<u>99.86</u>

34. HELMET, MODEL OF; probably a votive offering. Gold, with a double pin, and 62 jewels set in a border of repoussé ornament. Discovered in levelling a Buddhist Temple at Rangoon in April 1855.

ANALYSIS.				
Gold	...	...	...	83.75
Silver	...	...	...	12.22
Copper	...	...	...	4.24
				<u>100.21</u>

35. ANCIENT GREEK SILVER PATERA. Found by Dr. Lord in Badakshan. 4th century, A.D.

ANALYSIS.				
Silver	...	...	...	93.63
Gold	...	...	...	1.04
Copper	...	...	...	4.94
Iron	...	...	...	.27
				<u>99.88</u>

36. EWER with COVER. Oxidised metal, damascened with silver. Indian, modern.

ANALYSIS.				
Lead	...	...	...	1.298
Copper	...	...	...	3.510
Iron	...	...	...	.049
Silver	...	...	...	Nil.
Zinc, by diff.	...	...	...	95.143
				<u>100.000</u>

37. BUDDHA, seated, praying; zinc.

ANALYSIS.				
Copper	...	...	...	2.890
Tin	...	...	...	.267
Lead	...	...	...	.172
Iron	...	...	...	.429
Nickel	...	...	...	Nil.
Silver	...	...	...	Nil.
				3.758 Impurity
Zinc, by diff.	...	...	...	96.242
				<u>100.000</u>

38. BOTTLE with COVER. Metal, with raised chasing of flower and leaf pattern, covered with gold and silver foil. Hungarian or Indian. Latter half of 17th century.

ANALYSIS.				
Lead	...	...	...	.956
Tin	...	...	...	.346
Iron	...	...	...	.084
Copper	...	...	...	Nil.
				1.386
Zinc, by diff.	...	...	...	98.614

- 38A. VASE. Oxidised metal, damascened with silver. Indian, modern.

ANALYSIS.				
Lead	...	...	...	1.437
Tin	...	...	...	Trace.
Iron	...	...	...	.039
Copper	...	...	...	6.905
				8.381
Zinc, by diff.	...	...	...	91.619

39. WATER BOTTLE. Zinc, or a composite metal resembling it, of elongated form, with flowers and animals in silver inlay, and a foot and two bands of chased silver originally filled in with cloisonné enamel. Resembling the Bidri work of India. Persian? 17th or 18th century.

ANALYSIS.				
Lead	...	...	...	.901
Tin	...	...	...	3.587
Iron	...	...	...	.476
Copper	...	...	...	.830
				5.794
Zinc, by diff.	...	...	...	94.206

40. VASE with Handle and Cover, "Phuldan." Perforated brass; the cover surmounted by a knob; the handle formed by two dragons. Nepal.

ANALYSIS.				
Copper	...	...	...	78.580
Arsenic	...	...	...	Trace.
Antimony	...	...	...	2.037
Tin236
Lead	2.721
Bismuth070
Iron140
Nickel and Cobalt068
Zinc	15.849
				<u>99.701</u>



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42. PARESNATH, the twenty-third *Tirthankar*, or Saint of the Jains; impure brass. The figure has conventional features and hair, is nude except a girdle, and seated cross-legged on a triangular base, the front of which has conventional ornament in compartments, and is faced with copper and inlaid with silver. Madras.

ANALYSIS.			
Copper	...	...	69.960
Tin	...	...	Nil.
Lead	...	...	3.415
Bismuth	...	...	Trace.
Iron	...	...	.504
Nickel	...	...	Trace.
Zinc, by diff.	...	...	26.121
Silver	...	...	Trace.
<hr/>			
100.000			

43. SHRINE FOR A JAIN SAINT, in three portions; brass with bronzed surface. A semi-circular arch supported by two subordinate ornamental shrines, each with a figure of an attendant bearing a chowrie. The bases and crown of the arch have each a small Jain temple enclosing the representation of a Saint. The arch bears a row of seated musicians, and within it is a star-shaped halo, and two elephants bearing musicians and worshippers. Madras.

ANALYSIS.			
Copper	...	...	75.830
Tin	...	...	Trace.
Lead	...	...	3.169
Bismuth	...	...	Trace.
Iron	...	...	.196
Nickel	...	...	Trace.
Zinc, by diff.	...	...	20.805
Silver	...	...	Cons. trace.
<hr/>			
100.000			

No. 42 was considered to be copper or bronze, but on scraping was found to be brass. In scraping, a fine red dust came off which consisted largely of copper oxide, then the surface became more metallic with copper, on the removal of which the brass was exposed. The brass contained veins and blotches, apparently of copper.

No. 43. Brass, with bronzed surface, somewhat similar to above, but the metal was cleaner, softer, and better made.

These figures appear to have been originally all brass, from the surface of which the zinc has by some means been removed (by burning or by acid), and during which process the copper has become partly oxidised.

44. LOTAH, with Ribbed Bowl. Brass. Calcutta.

ANALYSIS.			
Copper	...	...	53.260
Arsenic	...	...	.205
Antimony	...	...	.126
Tin	...	...	2.312
Lead	...	...	3.983
Bismuth	...	...	Trace.
Iron	...	...	1.482
Nickel and Cobalt	...	...	.212
Zinc, by diff.	...	...	38.420
<hr/>			
100.000			

45. GOGLET. Brass. Travancore.

ANALYSIS.			
Copper	...	...	76.700
Arsenic	...	...	.063
Antimony	...	...	Nil.
Tin	...	...	22.020
Lead	...	...	.839
Bismuth	...	...	Trace.
Iron	...	...	.196
Nickel and Cobalt	...	...	Nil.
Zinc	...	...	Nil.
<hr/>			
99.818			

46. TANJORE BRASS STAND for offering betel in temples.

ANALYSIS.			
Copper	...	...	71.390
Arsenic	...	...	.078
Antimony	...	...	Trace.
Tin	...	...	9.565
Lead	...	...	7.186
Bismuth	...	...	Trace.
Iron	...	...	.952
Nickel and Cobalt	...	...	.091
Zinc	...	...	10.459
<hr/>			
99.721			

47. BULL, brass, on a base with incised ornament; a representation of the Nandi, the sacred bull of Shiva. Benares. 18th century.

ANALYSIS.			
Copper	...	...	66.090
Arsenic	...	...	Trace.
Antimony	...	...	Trace.
Tin	...	...	5.789
Lead	...	...	5.082
Bismuth	...	...	Trace.
Iron	...	...	.476
Nickel and Cobalt	...	...	.197
Zinc, by diff.	...	...	22.366
<hr/>			
100.000			

48. BELL, brass, handle surmounted by a group of figures. Tanjore, Madras.

ANALYSIS.			
Copper	...	...	77.140
Arsenic	...	...	.136
Antimony	...	...	Trace.
Tin	...	...	20.830
Lead	...	...	.410
Bismuth	...	...	.048
Iron	...	...	.093
Nickel	...	...	Trace.
Zinc	...	...	.398
Gold and Silver	...	...	Nil.
<hr/>			
99.055			

50. BELL, without clapper. Burmah.

ANALYSIS.			
Copper	...	...	69.550
Arsenic	...	...	Trace.
Antimony	...	...	Trace.
Tin	...	...	16.090
Lead	...	...	12.610
Bismuth	...	...	.054
Iron	...	...	.098
Nickel	...	...	.083
Zinc	...	...	1.556
Gold	...	...	Nil.
Silver	...	...	Trace.
<hr/>			
100.041			

INSCRIPTION (translation).

"In the month of Tabohdwe (February) on the fifth of the waning moon, in the year 1204 (1842 A.D.) on a Sunday at about 4 p.m. this bell was cast and moulded of pure copper. Its weight is 594,049 kyats (an obvious mistake). There are four lions on the hanging apparatus. Its height is nine fingers' breadths, the diameter five inches, the circumference fifteen, the thickness twenty-four. It is called the "Mahahtee Thadda Ganda" (the great sweet sound).

"The man who had this royal bell moulded was the Burman King, Tharrawahdy, Kohn Boun Min."

51. BELL; dragons in relief and incised inscription. Burmah.

ANALYSIS.			
Copper	...	...	78.120
Arsenic	...	...	.221
Antimony	...	...	Nil.
Tin	...	...	19.180
Lead	...	...	1.913
Bismuth	...	...	.097
Iron	...	...	.105
Nickel	...	...	.114
Zinc	...	...	Nil.
Silver	...	...	.090
Gold	...	...	Nil.
<hr/>			
99.840			

52. Bell, bronze. Swinging shackle ornamented with two grotesque lions. With inscription, dated 1828 A.D. Burmese.

ANALYSES of TWO SAMPLES, the first taken from the lip, the other from the top.

Copper	...	78.500
Arsenic	...	.205
Antimony	...	.198
Tin	...	12.730
Lead	...	5.520
Bismuth	...	.215
Iron	...	.322
Nickel	...	Trace.
Zinc	...	1.749
Silver	...	.263
Gold	...	Nil.
		<u>99.702</u>

Copper	...	78.050
Arsenic	...	.154
Antimony	...	.229
Tin	...	12.850
Lead	...	6.292
Bismuth	...	.251
Iron	...	.210
Nickel	...	Trace.
Zinc	...	1.524
Silver	...	.218
Gold	...	Nil.
		<u>99.778</u>

These two samples of the same object were taken to ascertain whether the metal was the same at one end of such a heavy and large Oriental casting as at the other, this being of especial interest, as the amount of metal in the bell is very much more than could be melted in one pot, such as the Indian metal-workers could obtain. Weight, about 9 or 10 cwts.

It is well known that the Indians, when casting a large object, divide their metal into lots, which are placed and melted in small pots heated by separate fires, situated all round the foundry. When everything is ready each pot is taken out of its fire in turn and its contents poured into the mould. Consequently, a large casting may have a very different composition at its opposite ends, especially if the alloy be a complex one. From the above analyses the metal in this instance appears to be more homogeneous than would have been expected.

A curious point about the analyses also is the tendency shown by the heavier metals (lead, bismuth, antimony, and tin) to predominate in the sample from the top, and *vice versa* in that from the lip, distinctly pointing to separation. This would seem to suggest that the metal was cast in a hot mould and an attempt made to mix the various additions in the mould itself, with the consequent slow cooling, and, as a result, partial separation of the metals.

It would also tend to show that the bell was cast upside down, lip uppermost. This bell contains a most interesting inscription full of pious sentiments.

53. BURMESE GUN, in form of a dragon.

ANALYSES of TWO SAMPLES, the first from the mouth end, the other from the tail or breech end.

Copper	...	89.490
Arsenic	...	Trace.
Antimony	...	Trace.
Tin	...	4.893
Lead	...	2.118
Bismuth	...	Trace.
Iron	...	.238
Nickel	...	Trace.
Zinc	...	3.049
Gold	...	Nil.
Silver	...	Nil.
		<u>99.788</u>

Copper	...	85.930
Arsenic	...	Trace.
Antimony	...	Trace.
Tin	...	7.654
Lead	...	4.748
Bismuth	...	Trace.
Iron	...	.210
Nickel	...	Trace.
Zinc	...	1.501
Gold	...	Nil.
Silver	...	Nil.
		<u>100.043</u>

54. HANUMAN, the monkey ally of Rama; copper and brass, cut through to show process of casting. Madras. Modern.

This specimen of art metal work is of peculiar interest, inasmuch as it was apparently a compound casting showing on its surface two distinct metals, viz., bronze and brass, very much interspersed. The figure was not of one metal altered in colour in parts by superficial treatment, as inspection showed the colour to be due to the metal itself. Owing to the intermixture of the metals—the way in which they protruded one beyond the other at different points, and the small quantity at parts of one metal over the other, such as the bracelets, armlets for example—it was difficult to understand from outside examination how these figures were made. With the object of solving the question it was considered that some light might be thrown on the subject if the casting were cut in halves from top to bottom. This was done, and immediately the whole process was explained, as it is quite clear that a core of copper was originally cast, of a shape showing due regard to the result desired, and that the brass was cast round the copper.

From what is known in connexion with small Oriental castings, it is probable that the following process has been employed in the production of these double castings. First, a model has been carved in wax, of a shape and size necessary to bring out the copper where that metal is required at the surface, and leaving space where the yellow surface is desired for the future casting of brass. This wax model has then been moulded, the mould heated and the wax melted out, after which the copper has been cast in the mould. Then round this half figure, with its prominent parts, where necessary, more wax has been cast, and carved into the shape of the figure ultimately required. The whole has then been moulded, the wax removed as before, and the brass run into the mould, filling up the spaces existing between it and the copper core in the centre. The double casting has then been removed, the brass filed down, wherever it might accidentally and unnecessarily have covered the copper until the red metal was exposed, the whole being then chased and completed.

This casting is probably about 40 years old, and was made in Madras. The art of double casting, as represented by this figure, is very old (a thousand years or more), and has been practised at, and almost entirely confined to, the east coast of the Madras Presidency.

Mr. Havell, of the Madras School of Arts, who has been engaged on a survey of Art manufactures for the Government, reported in 1887 that these castings were no longer made.

LIST OF ILLUSTRATIONS.

Nineteen full-page Plates [41 to 58] illustrating "BRASS AND COPPER WARE OF THE MADRAS PRESIDENCY."



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EMPIRE OF INDIA EXHIBITION, 1895.

LOAN EXHIBITION OF RELICS AND MEMORIALS OF THE LATE HONOURABLE EAST INDIA COMPANY.

From the following letter by Sir George Birdwood, reprinted from *The Times* of the 5th February, it will be seen that it is proposed to make a collection of relics and memorials of the late Honourable East India Company in connection with the Empire of India Exhibition to be held at Earl's Court, Kensington, next May. We welcome the proposal with the utmost cordiality as a sign of the awakening interest, first aroused by Sir George Birdwood's Report on the Old Records of the India Office,* in the history of a great city company which did more than all the other institutions of the country put together to build up the gigantic fabric of the British Empire as it at present exists under the beneficent sway of the Queen-Empress of India. The success of the proposed exhibition is, we feel, assured by Sir George Birdwood's energetic letter, which will stir up enthusiasm in every family throughout the United Kingdom connected with the late Honourable East India Company. Sir George Birdwood's energy at his age is something truly remarkable; and whether it be Primrose Day, Cider, or the glory of the old East India Company, he seems gifted with the power of kindling that sober, abiding enthusiasm which at once leads to a practical result. We would particularly draw attention to paragraph A of his letter, which we hope will find an active co-operative response in tens of thousands of British hearts; probably, also, that parenthetic line referring to the submergence of "all the moonlit loveliness and lone melody of Philæ," will do more for the preservation of that sacred island than all that has yet been written on the subject.

We propose, with the approval of the owners, to illustrate all the more interesting objects that may be contributed to the Loan Collection in future numbers of the *Journal of Indian Art*, or in the form of a special publication.

COPY OF A LETTER FROM

SIR GEORGE BIRDWOOD, K.C.I.E., C.S.I., M.D., LL.D.,

Published in *The Times* of 5th February, 1895.

TO THE EDITOR OF THE TIMES.

Sir,—I would beg your indulgence in allowing me space to appeal through the columns of *The Times* to the public here and in India for contributions to the Loan Exhibition of Relics and Memorials of the late Honourable East India Company, to be opened in May next, in connection with the Empire of India Exhibition at Earl's Court.

The present year marks the completion of the third century since the Dutch, on the advice of Cornelius Houtman, formed their East India Company, and established a factory in Java and commenced furiously driving the Portuguese and Spaniards out of those Eastern seas the opulent trade of which they thus hoped themselves to monopolize.

Their wonderful successes at the very moment when Queen Elizabeth was obliged to recall her forces from France and Holland to defend her own shores against the Spaniards greatly excited the emulation of the now rapidly rising middle classes in England and gave the first practical stimulus to their long premeditated determination to participate in the commercial exploitation of the Indian Ocean, which five years later, namely in 1600, resulted in the charter granted to "The Governor and Company of Merchants of London trading into the East Indies," the earliest of the connected series of English East India companies.

This year is also the three hundredth from the capture, by the combined Austrian and Italian forces, of Gran from the Turks, which, following so soon after their defeat at Lepanto, and their expulsion from Persia, shook the Ottoman power to its basis, and laid Southern Asia bare to the most successful of the European merchant adventurers—who proved to be the English—competing for "the riches of Arabia, and the wealth of Persia and India."

* See Nos. 31, 33, and 34 *Journal of Indian Art*; also *Report on Old Records of the East India Company*, 3rd edition, Allen & Co., 1890; *The First Letter Book of the East India Company*, Quaritch, 1894.

The opening of an Industrial and Commercial and Spectacular Exhibition of the Indian Empire during the ensuing summer seemed to me, therefore, to afford an appropriate opportunity for organizing a temporary loan collection of relics and memorials of the East India Company, which is sure to prove generally interesting and attractive, but which will, in my hope, be chiefly valuable in providing a rehearsal of the literary celebration of the tercentenary of the company's first charter in 1600—the date fixed, as I understand, for the completion of Sir W. Wilson Hunter's projected history (1600–1857) of British India. The directors of the Empire of India Exhibition at once accepted my suggestions on the subject, and have invited a number of specialists to advise them in detail in regard to it; and they have undertaken every reasonable responsibility for the reception, custody, insurance against fire and other injuries, and return, at the close of the exhibition, of the objects lent to it. The honorary committee of advice includes, among others, the names of Mr. F. C. Danvers, Sir Joseph Fayrer, Mr. George Forrest, Sir W. Wilson Hunter, and Mr. Clements R. Markham.

The following are the principal classes of relics and memorials, the loan of which it is most desirable to obtain:—

A.—Portraits, which will chiefly be engravings, of notable members of the company, or of servants of the company and other persons who distinguished themselves in the company's service. Portraits are particularly wanted of William Hedges, William Gyfford, William Fytche, Harry Verelst, and John Cartier, and Warren Hastings; of Sir William Langhorn, Streynsham Master, Elihu Yale, Thomas Pitt, Sir Thomas Rumbold, Lord Harris, Lord Clive, Sir Thomas Munro, and Lord Elphinstone, and of Sir Abraham Shipman, Sir Gervase Lucas, Sir George Oxenden, Gerard Aungier, Sir John Child, Sir Josiah Child, Sir Nicholas Waite, Richard Bouchier, William Hornby, Sir William Meadows, Sir Robert Abercromby, Jonathan Duncan, Evan Nepean, Mountstuart Elphinstone, Sir John Malcolm, Sir Robert Grant, James Farish, Sir William H. Macnaghten, Sir George Arthur, Lestock Robert Reid, Sir George Clerk, and Viscount Falkland; and among the more famous directors of the company, of Sir George Wombwell, Robert Gregory, Sir Henry Fletcher, Sir Stephen Lushington, John Travers, Charles Grant, Sir James Carnac, Sir J. Weir Hogg, William Butterworth Bayley, Sir Richard Jenkins, Colonel Sykes, and Captain Eastwick.

B.—Paintings, drawings, sketches, or engravings of buildings, or scenes, connected with the company's history; or of memorable events, or actions, or episodes, connected with the same; or illustrating life in India under the company's rule, particularly its romantic side. Most welcome would be any sketches or photographs of the early English tombs at Surat, of the many old English buildings still standing which had their importance in the company's days, such as Bombay Castle, the factory at Rajapur, where Sir John Child spent many years, and which was twice sacked by Sivaji's merry men; and of the old factory sites of Anjengo and Masulipatam, imperishably associated with the name of Eliza Draper. And, again, photographs or sketches of the churches and mansions erected by, or the monuments erected to, members and servants of the East India Company in this country.

C.—Original maps and plans of battles and manuscripts, particularly letters of special interest relating to India, by distinguished Anglo-Indians.

D.—Seals, and impressions of seals, when these are distinct, and naval and military flags and colours, and stamps and impressions of the company's "bale-mark."

E.—Medals given by the company, and coins issued by them prior to 1858.

F.—Naval and military uniforms of the company; and arms, particularly those bearing the company's "arms" or their "bale-mark"; the silver badges of their boatmen; and the truncheons of their constables. Of these three last classes of objects an immense number are to be found among the descendants of the subordinate servants of the company, and in the unconsidered holes and corners of old East-end curiosity shops and pawnshops along the Ratcliff-highway.

G.—Swords of honour and presentation plate.

H.—Furniture and marble bas-reliefs and statuary, from the old East India House, removed from it in cartloads to "the four imagined corners of the world" when the company which for 200 years had been the glory of East London, and made its prosperity, was, to the ruin of the "East-end," broken up, and the administration of its sequestrated assets, the Indian Empire, transferred to the "West-end" of London.

The transfer was effected with a brutal disregard of historical susceptibilities of which only Englishmen—who to-day would callously submerge all the moonlit loveliness and lone melody of Philæ—are capable, and which made the gap in the monumental representation of the great East India Company in the city of its rise, culmination, and extinction everyone now deploras, or affects to deplore, and which the proposed exhibition is an attempt to, in some measure, repair.

I will only add that those having any relics or memorials of the late Honourable East India Company, which they would wish to lend to the exhibition, should address themselves to William Foster, Esq., honorary secretary to the H.E.I. Co.'s Loan Collection, Empire of India Exhibition, Earl's Court, S.W.

I have the honour to be, Sir, your most obedient, grateful servant,

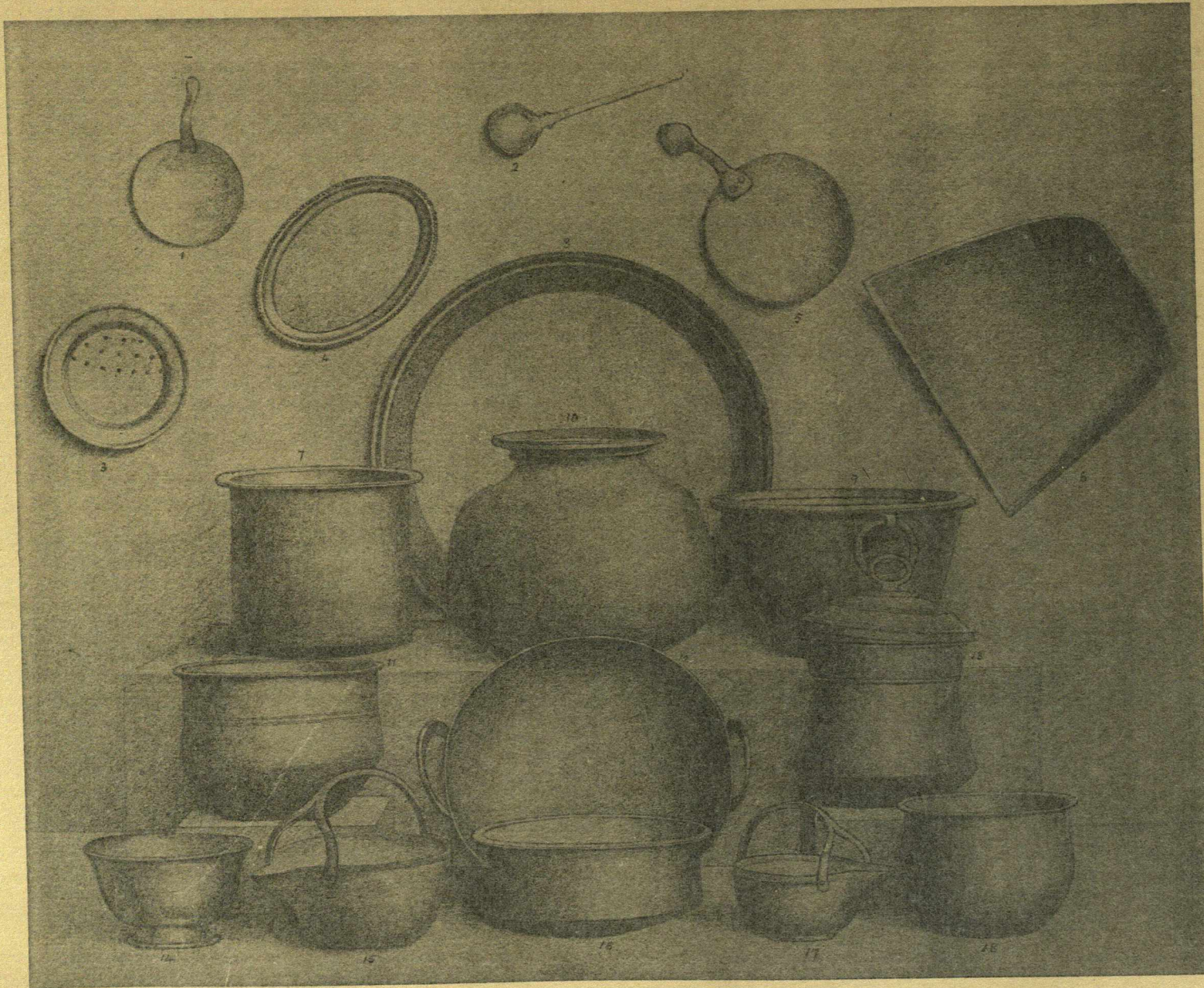
GEORGE BIRDWOOD.



41.—A SILVERSMITH AND MANUFACTURER OF BRONZE IMAGES.

Madras.

Photographed by H. A. Wilkins, Student Madras School of Arts.



42.—UTENSILS FOR COOKING AND SERVING UP FOOD.

Drawn by C. Gangatharen, Student Madras School of Arts.

SCALE ONE-SIXTH FULL SIZE.



43.—VESSELS FOR WATER AND MILK.
 Drawn by C. Gangatharen, Student Madras School of Arts.
 SCALE ONE-FOURTH FULL SIZE.



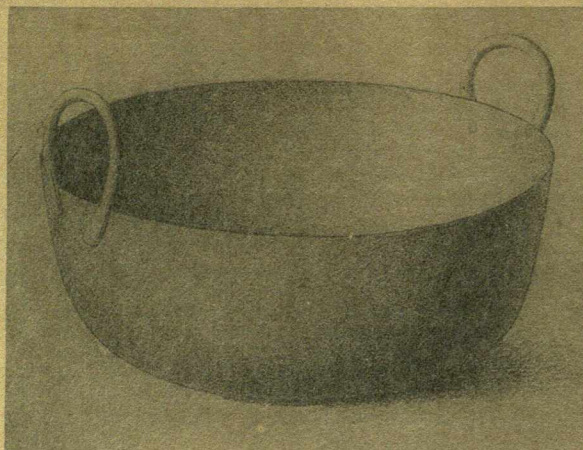
1.



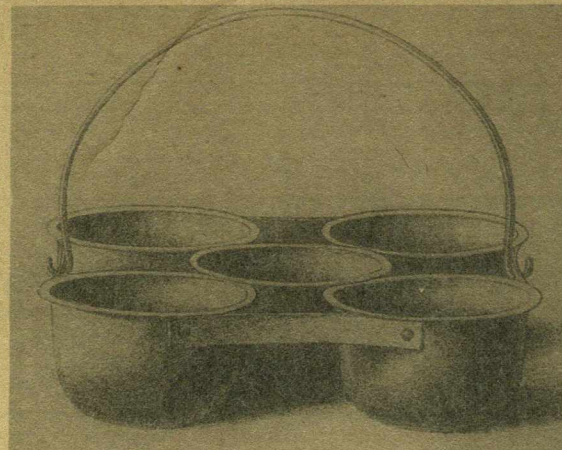
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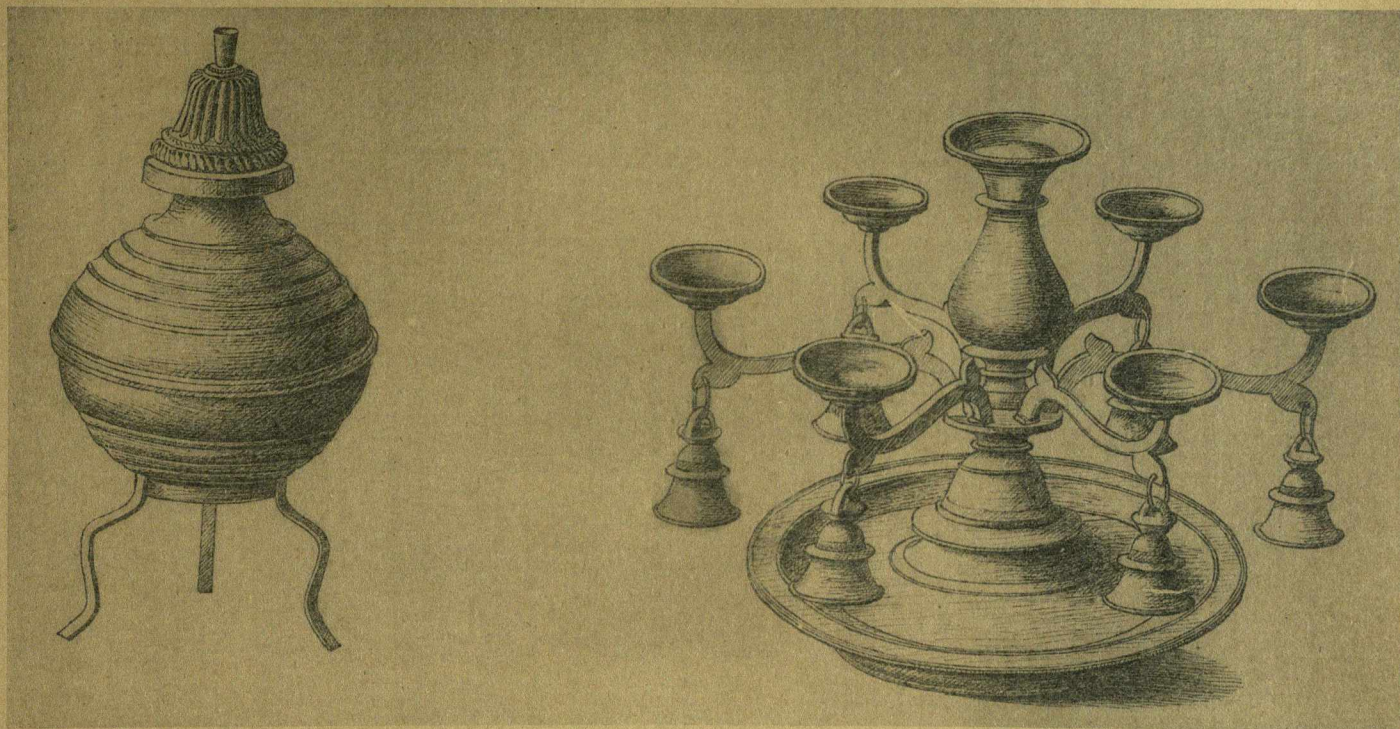
5.

44.—BRASS AND COPPER VESSELS.

1. Copper vessel for keeping water for baths. SCALE ONE-SIXTH.
2. Brass vessel for carrying water. SCALE ONE-FOURTH.
3. Copper vessel for boiling water. SCALE ONE-SIXTH.
4. Brass vessel for cooking. SCALE ONE-FOURTH.
5. Brass cups for different kinds of curry or pickle. SCALE ONE-FOURTH.

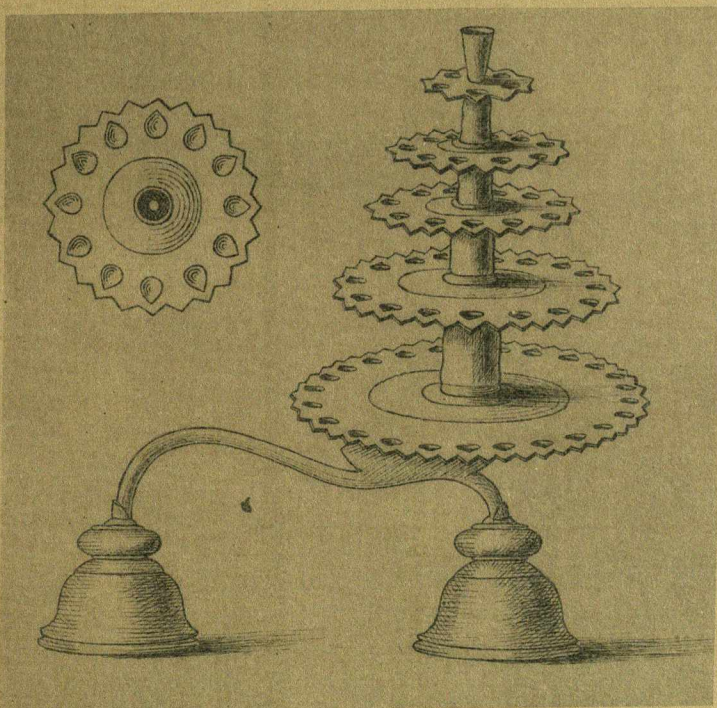
Drawn by C. Gangatharen, Student Madras School of Arts.

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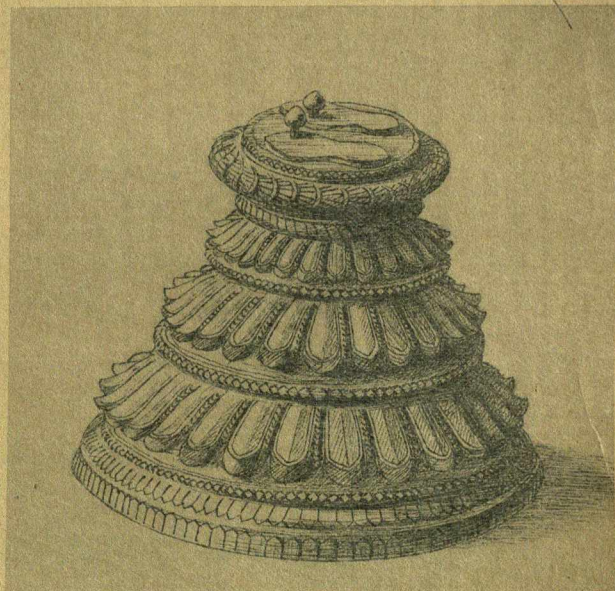


1.

2.



3.



4.

45.

1. Lamp with single wick on stand.

2. Camphor burner.

SCALE ONE-THIRD.

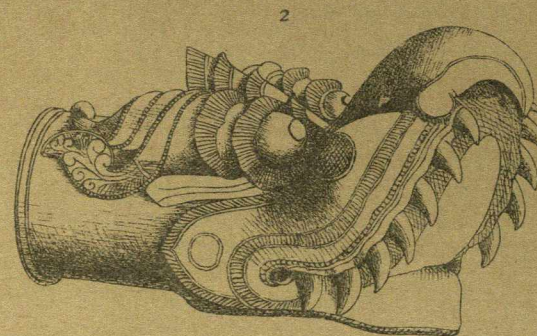
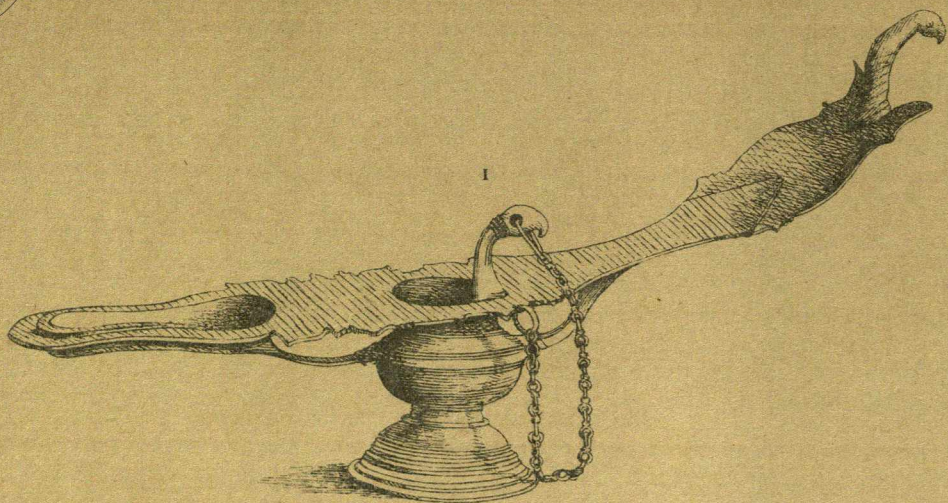
3. Brass lamp with five movable plates, each containing a number of hollows for wicks.

SCALE ONE-FOURTH.

4. *Shadagopam*, a sort of cap of beaten copper used in Vishnu temples for benediction.

SCALE ONE-THIRD.

Drawn by C. Gangatharen, Student Madras School of Arts.



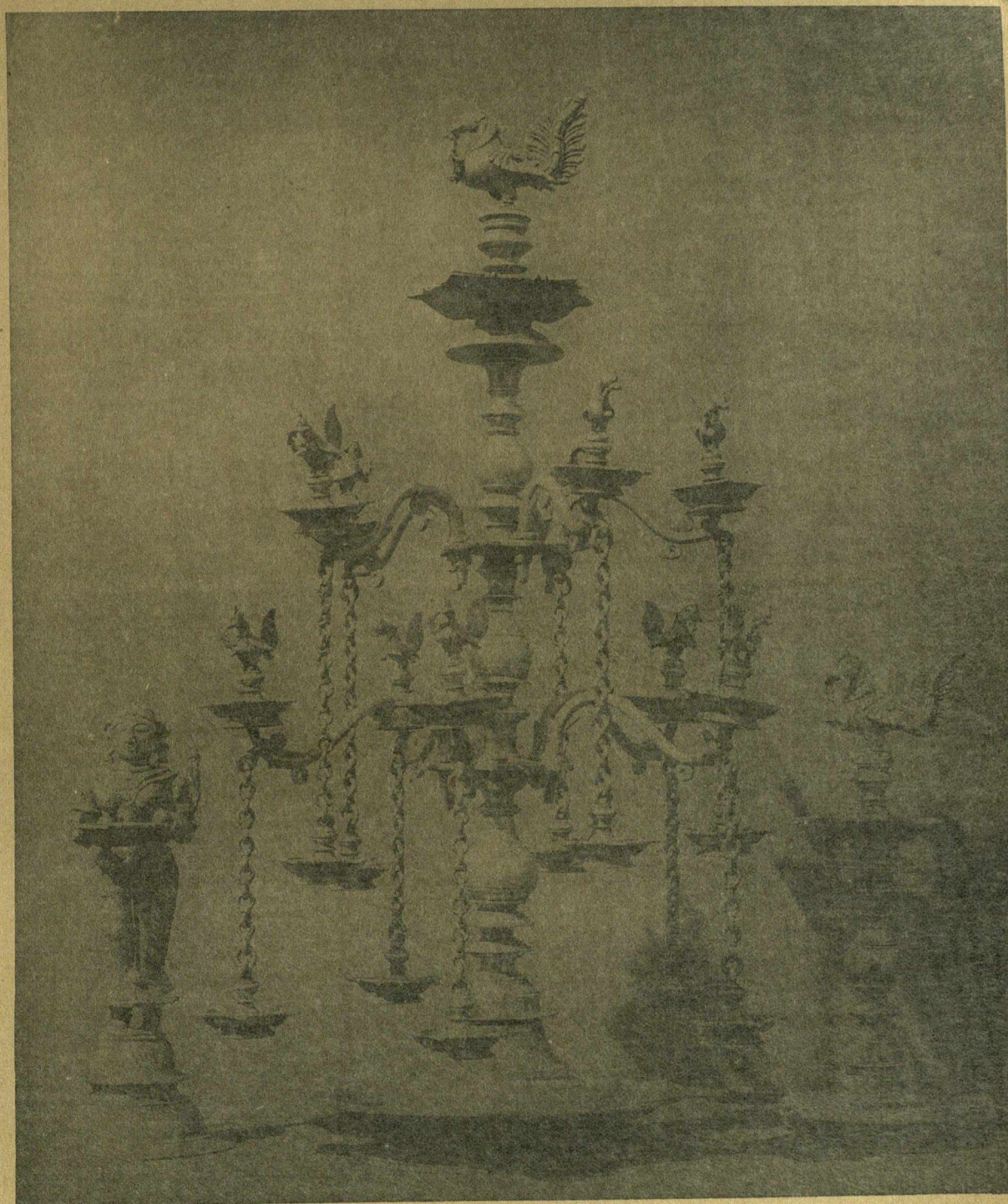
- 46.
1. Cast brass lamp from Travancore. 2. Cast brass ornament fixed to the end of a yoke.
 3. Camphor burner. 4. Incense burner.

SCALE ONE-THIRD FULL SIZE.

Drawn by C. Gangādharen, Student Madras School of Arts.



47.—CAST BRASS OR BELL-METAL LAMPS. Madras.
From a negative in the Madras School of Arts.



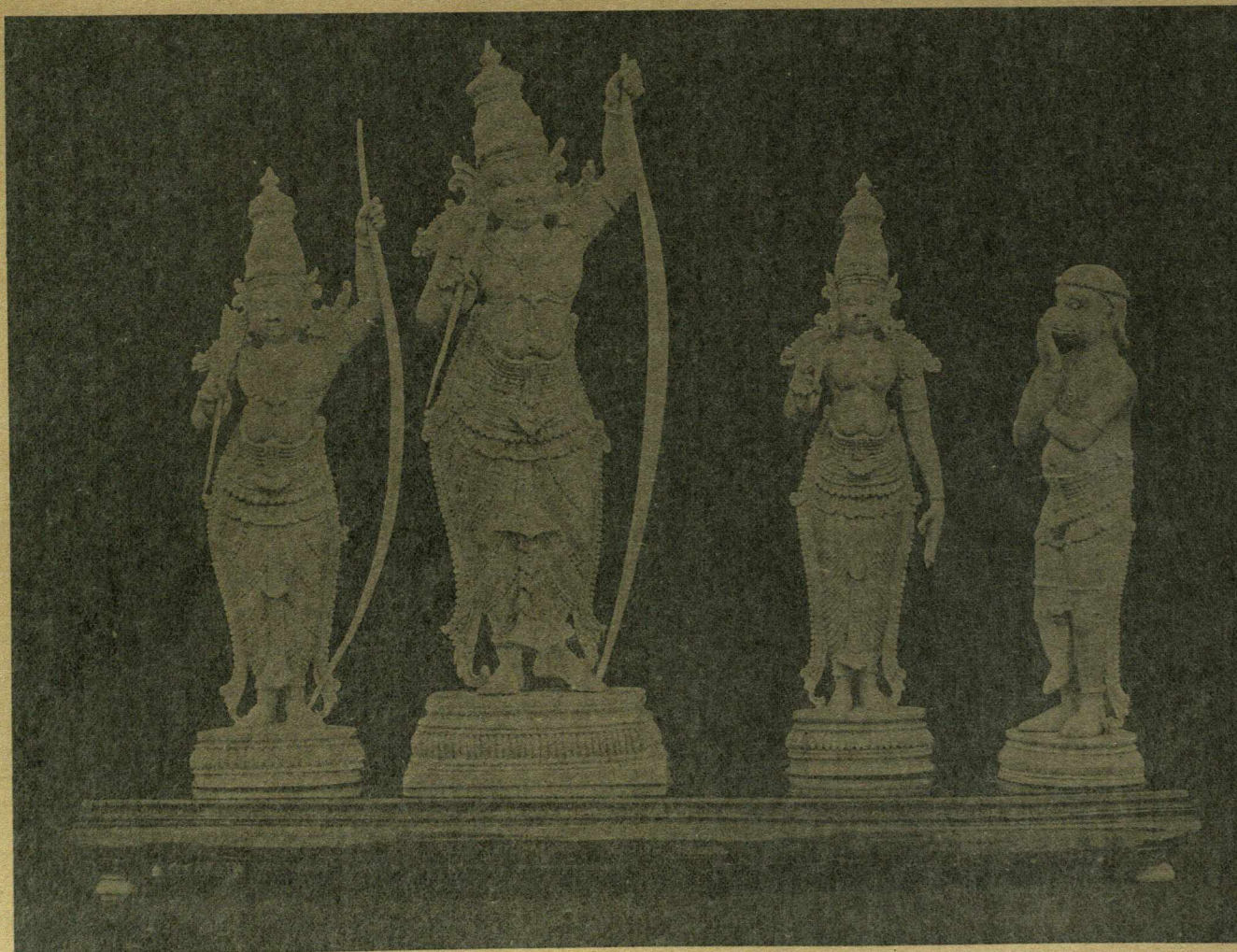
48.—CAST BRASS OR BELL-METAL LAMPS. Madras Presidency.
From a negative in the Madras School of Arts.



49.—BRONZE FIGURE OF SIVA.

From the collection in the Government Central Museum, Madras.

Photographed by H. A. Wilkins, Student Madras School of Arts.



Lutchmana.

Rama.

Sita.

Hanuman.

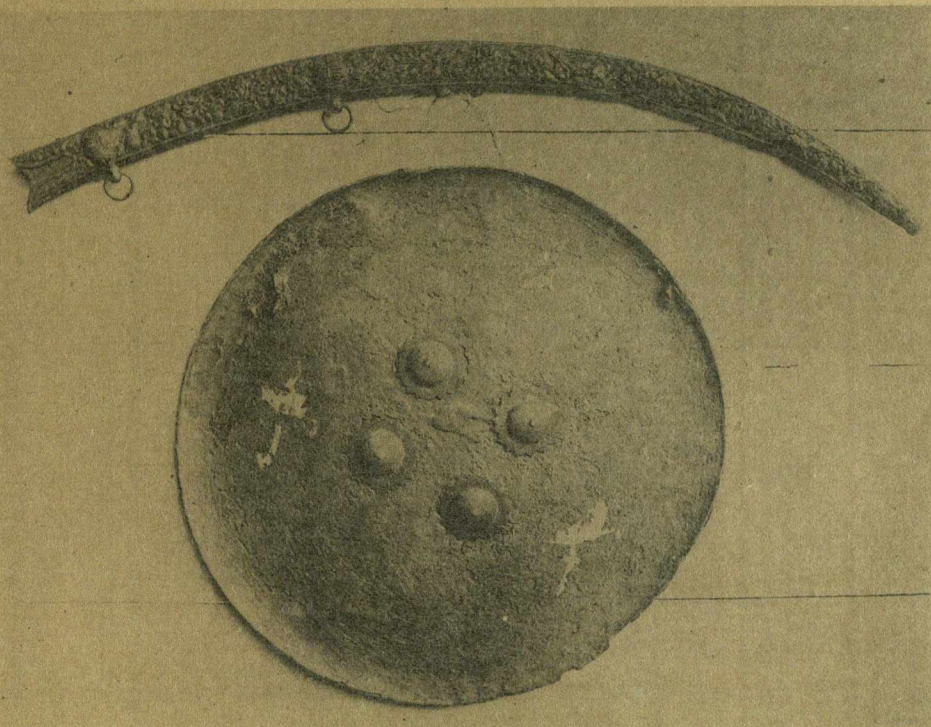
50.—FOUR BRONZE FIGURES.

From a negative by Messrs. Newman and Co., Madras.



51.—Copper Repoussé Panel executed at the Madras School of Arts.

Photographed by H. A. Wilkins, Student Madras School of Arts.



1

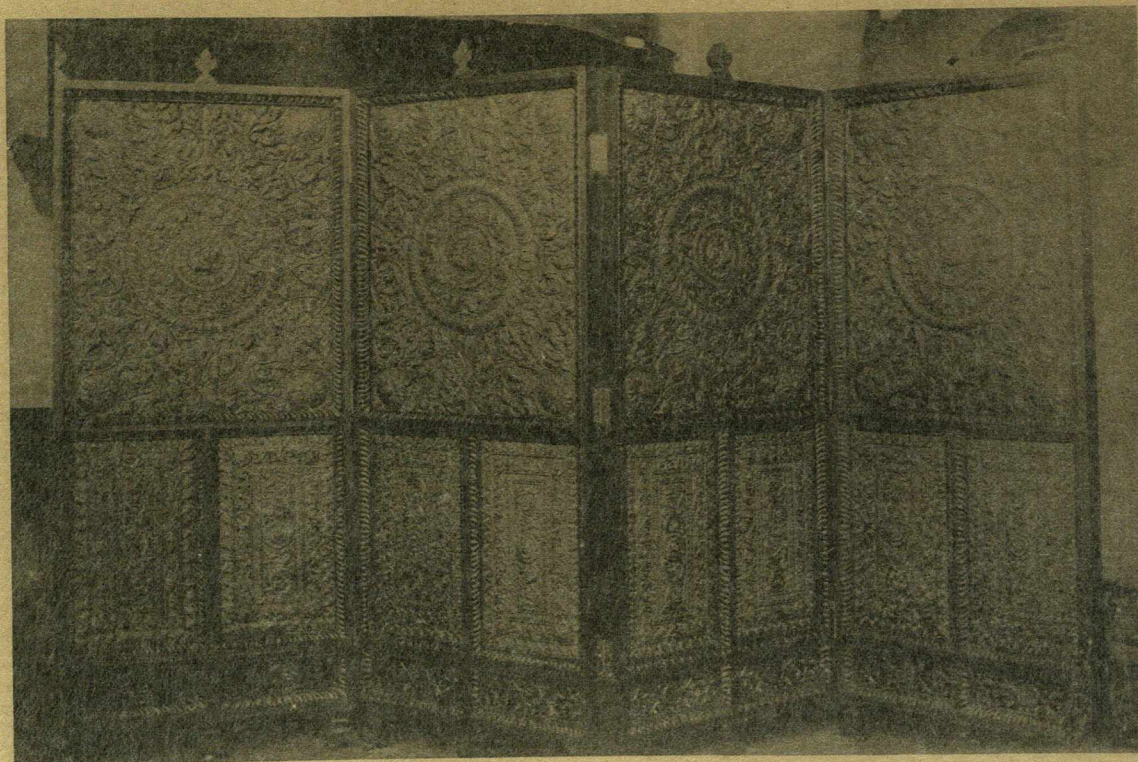


2

52.

- 1.—COPPER SWORD SHEATH and LEATHER SHIELD. Very old.
- 2.—GROUP OF MODERN TANJORE WARE.

Photographed by H. A. Wilkins, Student Madras School of Arts.



53.—SCREEN with copper repoussé panels, executed at the Madras School of Arts.

Photographed by H. A. Wilkins, Student Madras School of Arts.



53a.—GROUP OF ORNAMENTAL BRASS AND COPPER WARE.

Photographed by H. A. Wilkins, Student Madras School of Arts.

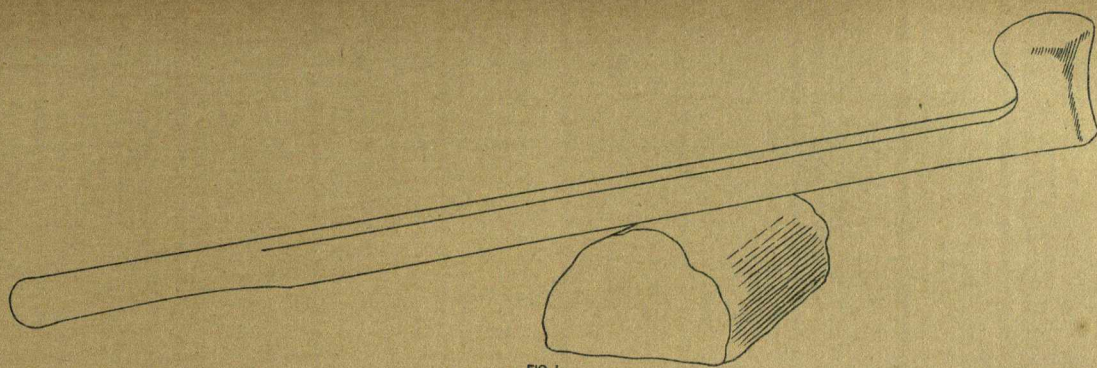


FIG. 1.

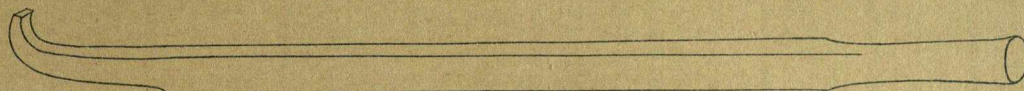


FIG. 2.

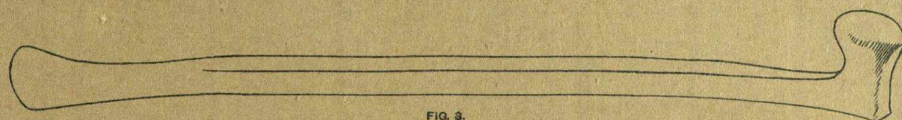


FIG. 3.

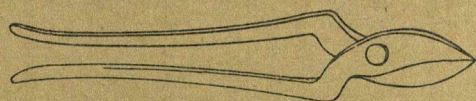


FIG. 4.

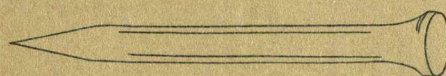


FIG. 5.

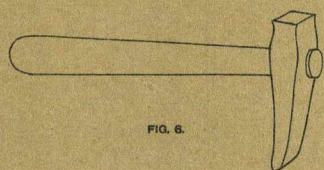


FIG. 6.

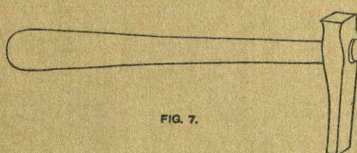


FIG. 7.

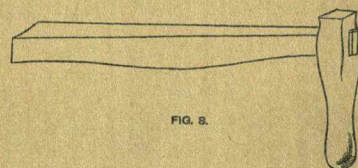


FIG. 8.

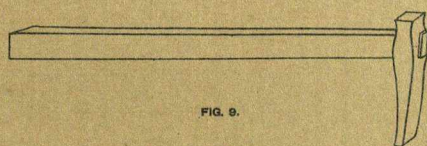


FIG. 9.

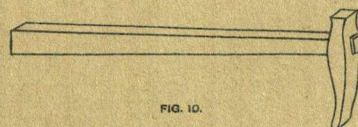


FIG. 10.

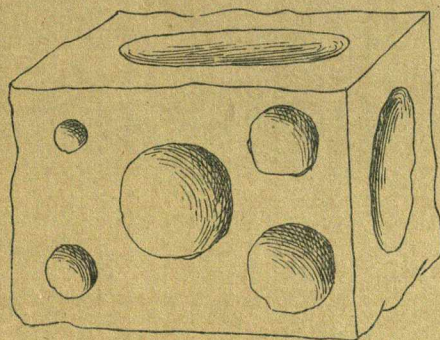
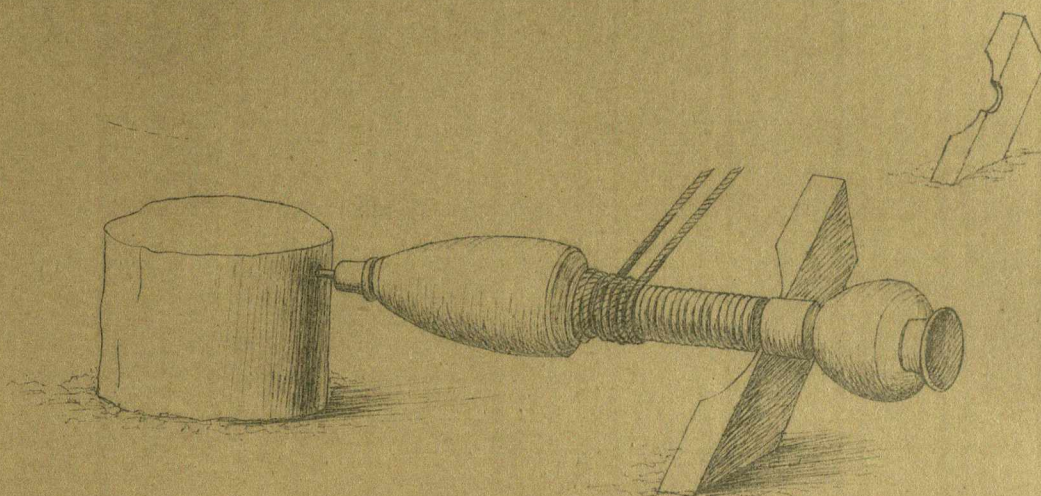


FIG. 11.

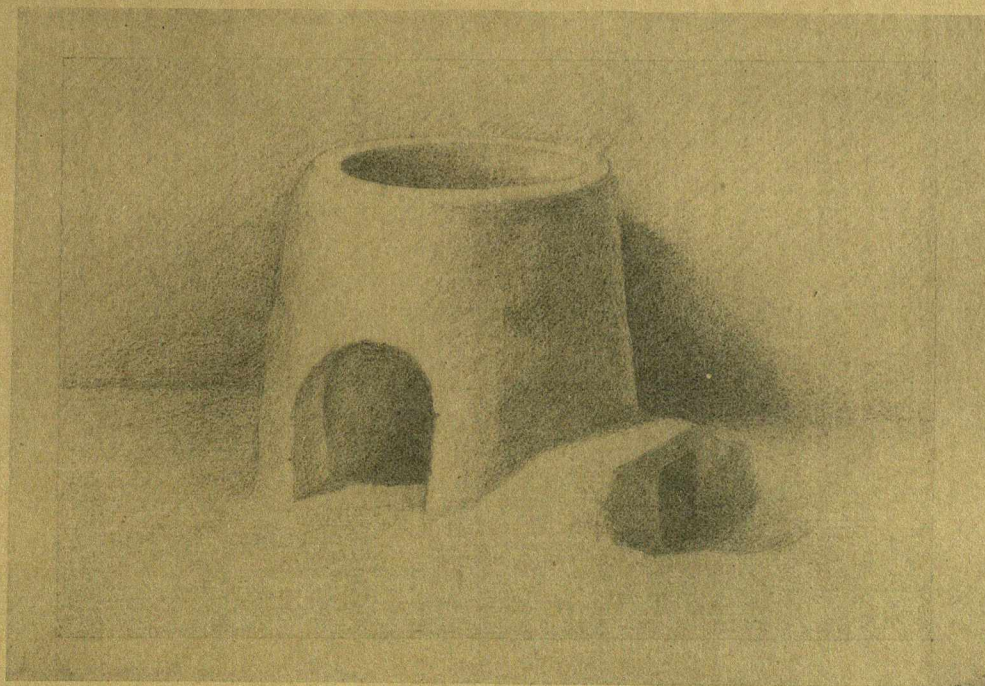
54.—SOME OF THE TOOLS USED IN THE MANUFACTURE OF BEATEN BRASS AND COPPER WARE.

Drawn by T. Krishnaswamy, Madras School of Arts.

SCALE 2 INCHES TO 1 FOOT.



1



2

55.—1. Lathe for finishing vessels of cast metal. Scale one-sixth full size.
2. Furnace for melting brass. Scale $\frac{3}{4}$ inch to 1 foot.

Drawn by C. Gangatharen, Student Madras School of Arts.

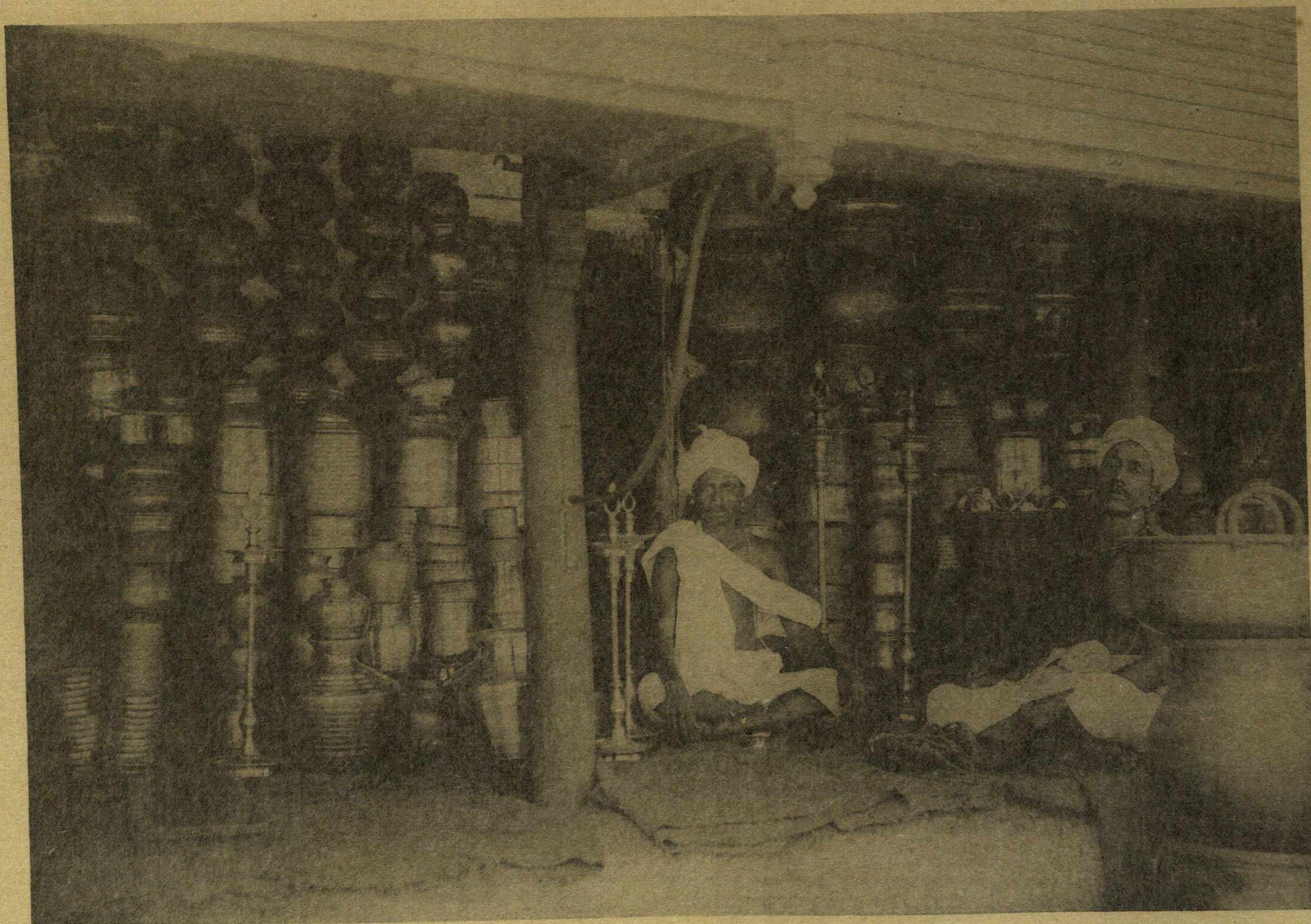


56.—A BRASS OR COPPER SMITH AT WORK.
Photographed by H. A. Wilkins, Student Madras School of Arts.



57.—MANUFACTURE OF BRASS VESSELS. A native workshop. Madras.

Photographed by H. A. Wilkins, Student Madras School of Arts.



58.—A BRASS AND COPPER WARE STALL. MADRAS.

Photographed by Messrs. Wiele and Klein, Madras.



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The Journal of Indian Art and Industry.

DECORATIVE PAINTINGS FROM THE TOMB OF ITMAD-UD-DAULAH AT AGRA.

By EDMUND W. SMITH, ARCHAEOLOGICAL SURVEYOR N.W. PROVINCES.

Plates 59—66 are from the tomb of Itmad-ud-daulah, which stands on the banks of the Jumna, and was erected to the memory of her father by Nûr Jahân, wife of the emperor Jahângîr, and the sister of Asaf Khân, whose daughter Mumtâz Mahall, the wife of Shâh Jahân, lies buried in the Taj. Professor Blochmann, in his translation of the Ain-i-Akbarî, tells us that the name of Nûr Jahân's father was Ghiâs-ud-dîn Muhammad, styled Ghiâs Beg, and that after the death of his father he fled from Tahrân in Persia, with his family, to seek his fortune in India; and after having been introduced to the Court of Akbar at Fathpûr Sîkrî, rose by his ability and industry to a small command of three hundred horse, and afterwards to that of a thousand, and eventually was promoted to the position of *Itmad-ud-daulah*, or High Treasurer, and on the marriage of his daughter with Jahângîr he became *Vakil-i-Kul*, or Prime Minister. Professor Blochmann also tells us that "Ghiâs-ud-dîn was a poet, and imitated the old classics. He was generally liked, had no enemies, and was never seen angry; chains, the whip, and abuse were not found in his house. He protected the wretched, especially such as had been sentenced to death. He was never idle, but wrote a good deal, his official accounts were always in the greatest order. But (observe) he liked bribes, and showed much boldness in demanding them!" His daughter Mihrunnisa, the future Nûr Jahân, was celebrated for her great beauty, and as the wife of 'Alî Qulî styled Khân, Shêr Afkhan, *tuyıldar* of Bardwân, was courted by Prince Salîm, afterwards Jahângîr. This ultimately led to his ruin, and he was treacherously slain, and his lovely wife captured and sent to Court as a prisoner. For some years she remained under restraint, but eventually listened to the importunities of Jahângîr, acquiesced to his wishes, and became queen under the title of Nûr Jahân. She was a highly gifted and talented woman, and possessed immense power during her husband's life-time; but her influence ceased with his death, and on the accession of Shâh Jahân she retired from the cares and worries of state affairs, and was allotted a liberal pension of two lakhs per annum. Her father, Itmad-ud-daulah, died in 1622, and his daughter set about building his mausoleum, which was completed about 1628 A.D. It stands in a spacious garden, and is square in plan, with an octagonal tower at each angle surmounted by a marble kiosque. It is built upon a stylobate veneered with marble inlaid with mosaic work.

It consists of nine rooms: a large central chamber, four oblong ones, and four square apartments at the corners. The walls are massive and pierced by openings filled in with stone *jali* or screen work. They are lined with marble inlaid with costly arabesques in mosaic, but the upper portions of the interior walls are finished off in stucco and painted. Ghiâs-ud-dîn and his wife are buried beneath two plain red marble tombs in the central apartment, and in a room over are two white marble cenotaphs similar, but not quite so plain in conception as those below. The ceilings of the smaller rooms are flat at the top and alcoved at the sides, whilst the central chamber is vaulted over and elaborately coffer-panelled in stucco, and richly ornamented with paintings, selections from which are given.

The upper room containing the cenotaph is constructed chiefly of marble, including the roof. In the walls are openings filled in with exquisite screens of the same material, the tops of which are arched and the spandrels ornamented with mosaics. The floors are of marble, and are worked in most elaborate patterns; whilst the walls and ceilings of the minor chambers are, like the central apartments which they surround, enriched by paintings, specimens of which are given.

The plates represent some of the paintings, and afford a clear insight into the style of decoration in vogue at this period of Moghul architecture. Without a careful examination, it is somewhat difficult to say how they were executed, whether in fresco or tempera, but probably both systems were employed. The art of mural painting has been practised in India from the very earliest times, and to what an extent, any one who has visited the Ajanta or Bagh caves will know.

Of all the various forms of wall decoration, fresco painting is the earliest and the most prevalent. It has been defined as "the art of mural painting upon freshly-laid plaster lime whilst it remains damp, with colours capable of resisting the caustic action of the lime with which they are mixed and brought into contact." In genuine fresco

work it is therefore a *sine qua non* that at the time of painting the plaster should be damp, and to obtain this "it is essential that a given amount of plaster be laid on for the painter at a time, and therefore frescoes are readily recognised by the joinings in the plaster most frequently following the outlines of the figures or other objects. It is sometimes confounded with tempera or distemper painting," a method of painting in which "solid pigments are employed, mixed with water as a medium, in which some kind of gum is dissolved to prevent the colours scaling off." The latter system is much easier to work than the former, but it is not suitable for external decoration, as it will not stand exposure to the weather; as the colours being surface deep, do not become part and parcel of the stucco. In the preparation of walls intended for fresco painting, great precautions have to be taken to get them perfectly even, as inequalities are not only unsightly, but allow dust to accumulate to the detriment of the painting. Lime and sand, and lime and marble dust, were and are still frequently used in the preparation of what is technically termed the intonaco, or finishing coat, upon which the fresco is painted.

The Romans were most particular in the preparation of their walls, and we are told that "they faced their walls to be painted with a lining of brick on edge, separated by a small space from the main structure, to which it was attached, secured by leaden clamps, as a precaution against damp; and that three preparatory coats were laid on this brick facing, the first consisting of lime, powdered brick, and pozzolano. The finishing coat was frequently composed of lime and powdered marble, after which it was painted over by a durable process, the secret of which is now lost." Fresco painting was for a time superseded by mosaic decoration, but was resuscitated in the 13th century. In the present day it is extensively practised by the Italians, and in Germany there is a good modern school; and although England has not produced any great school of mural painters, she has made a struggle on behalf of the art, as may be seen from the painting lining the corridors and other walls of the Houses of Parliament.

During the Middle Ages a mean was arrived at between tempera and fresco painting. The walls were finished off as for fresco painting, and each day, before work commenced, the surface was soaked with water, and thus, to an extent, the colours were absorbed into the walls.

In India at the present day, mural painting is in vogue, and a quantity of modern work is to be seen on the walls of the Jeypore Museum. Two kinds of walls are used for the purpose, and are known as the "glazed" and the "rough or dull." The first is prepared with marble dust mixed with lime in equal parts, which, when dry, is slightly and gently moistened with water and polished with a fragment of stone or burnt brick. A solution of stone lime is then applied, and the whole polished; and when this is done, a third solution is laid on, of cocoa nut, prepared by grinding with water the inside of a dry nut on a stone. The entire surface is then again polished, but this time with a soft pad of cloth in lieu of stone. The "dull or rough surface" consists of ordinary lime plaster coated with *khamir*, a mixture of gum and chalk. If a monochrome background is to be used, the colour is washed in before commencing to paint the fresco, but if the subject requires one in polychrome, the surface is left white and the tints filled in afterwards. The beautifully coloured polished walls one so often sees in India are a species of fresco work, and the colours are applied whilst the stucco is damp, and then polished as above described. A number are to be seen in the baths at Fathpūr Sikrī and about the Agra buildings.

Before an artist commences to colour in fresco he most carefully studies out his designs, prepares a cartoon of it, which when correct he pricks through, and transfers it to the wall by means of a bag containing powdered charcoal, or by the use of a stylus. The lines thus made are carefully gone over with a fine brush containing ink or some other colour. The principal and most ancient colours used by Indian artists in mural decoration are:—Chalk, lamp black, *gaw-goli* (Indian yellow), which when prepared produces what is known as *saudhira*, a lovely yellow with a tinge of red in it; *hirmizi* (Indian red), *ingur* (vermilion), *lajward* (ultramarine), *nil* (indigo), *sindur* (red lead), white lead, green stone, yellow stone, pink stone, and *mohawar*, which is used in the place of crimson lake and is prepared from lac. These are gradually being superseded by English colours, and the native pigments are, I am told, becoming obsolete; notwithstanding, the artist of Hindustān firmly believes they are more lasting and durable than those prepared in Europe. Many of the pigments, if not very finely ground, are well washed in water. The *gan-goli*, or Indian yellow, contains uranic salt, and this, before grinding, must be eliminated by thorough washing; if not, its colour will change, and in time fade altogether. A simple way of purifying it is to bind the colour in a cloth and immerse it in water for a night. In the morning this is changed, and the process repeated two or three times, after which it is fit for use.

The colours are generally prepared in a solution of gum, but sometimes in water only, in which case the gum is added afterwards, practice determining in what quantity. Most of the colours are ground on a smooth stone, but some are merely mixed with water and afterwards filtered through a cloth. Two assortments of gum are employed, the white and the *khair*. The former can be mixed with all colours, with the exception of indigo, lamp black, and red lead, in the preparation of which it is customary to use the latter only. The native artist generally makes his own brushes as he requires them, and for ordinary work prepares them from the hair of the goat and deer; whilst for subjects requiring a high finish, squirrel's hair bound in pigeon's quills is brought into requisition. These brushes are beautifully made, and from experience the writer knows that they are quite equal,



if not superior to those manufactured in Europe. Personally, he is not practically acquainted with the art of mural painting as practised in India, and is indebted to an experienced native artist for information; whilst in preparing the paper the *Encyclopædia Britannica* has been consulted.

The illustrations were prepared in the office of the Curator of Ancient Monuments in 1883.

*On the left bank of the Jumna is the tomb of Ghiâs Beg, called by Sir W. Sleeman, Khwâjah Accas, a Persian, who was the father of Nûr Jahân, and her brother, Asaf Khân, and became high treasurer of Jahângîr. This mausoleum is 69 feet 2 inches square. It is entirely encased with white marble externally, and partly internally, the interior being beautifully inlaid with mosaic work. There is an octagonal tower at each corner, of which seven sides are visible, and project from the building; each side being 4 feet 9 inches broad. It contains nine chambers, four of them 23 feet 4½ inches long, and 13 feet 1¾ inches broad. The four corner chambers are 13 feet 1¾ inches square, and the central chamber is 22 feet 1 inch square. The outer walls are 5 feet 6 inches thick; the side partition walls, 4 feet 2½ inches, and the central partition walls, 4 feet 9¾ inches. In each of the four sides there is an arched entrance 7 feet 8 inches broad. On each side of each of these entrances is a window 3 feet 10 inches broad, filled with exquisite marble lattice-work. Between these and the corner towers are arched window recesses 6 feet 6 inches broad externally, and 3 feet 10 inches internally. In the centre of these windows is perforated marble lattice-work. Each chamber has a door leading into the next, but the central has only one open door, the other three being filled with marble lattice-work. The actual door in this chamber is on the south side. In the central chamber are two marble tombs of Ghiâs Beg and his wife, on a platform of variegated stone 6 feet 6 inches by 5 feet 5 inches. The husband's tomb is a little to the west.

There are seven tombs altogether in the mausoleum—two in the north-east corner chamber, and one in each of the three other corner chambers. The tombs lie north and south, according to the usual custom. The sides of the central chamber are lined with marble, inlaid with mosaics, representing flowers, but the roof is lined with stucco, adorned with flowers and other devices in gilding. The side chambers are panelled to 4 feet 4 inches from the floor with slabs of marble inlaid with mosaic work, but the upper part of the walls and the ceiling are lined with plaster, ornamented with paintings of flowers and long-necked vases. In the thickness of the outer walls of the south chamber there are two flights of stairs, which ascend to the second story, on which is a marble pavilion, 25 feet 8 inches square, on a platform 38 feet square. The roof is canopy-shaped, with broad sloping eaves, and marble slabs. The sides are of perforated marble lattice-work, and divided into twelve compartments by marble pillars. In the centre of the chamber are two marble cenotaphs, counterparts of those below. The whole of the flat roof of the lower story is paved with marble. The octagonal towers, faced with marble, at each corner of the mausoleum spread out into balconies supported by brackets at the level of the roof. Above, the towers become circular, and rise until they again spread out into graceful balconies supported by brackets, and surmounted by marble domed cupolas, each supported on eight slender marble pillars. There was a marble railing along the platform of the roof, which has been destroyed, probably by the Jâts, who are also said to have stolen the inlaid stones of the mosaic.

The mausoleum is on a raised platform of red sandstone, 150 feet 10 inches long, and between 30 and 40 feet broad. It is surrounded by a walled inclosure, except towards the river or west front. In the centre of the east side is a gateway 64 feet long and 30 feet broad. The walled inclosure is 540 feet long on each side, and has towers of red sandstone at the corners.

†There is one building—the tomb known as that of Itmad-ud-daulah—at Agra, however, which certainly belongs to this reign [Jahângîr's], and, though not erected by the monarch himself, cannot be passed over, not only from its own beauty of design, but also because it marks an epoch in the style to which it belongs. It is situated on the left bank of the river, in the midst of a garden surrounded by a wall measuring 540 feet on each side. In the centre of this, on a raised platform, stands the tomb itself, a square measuring 69 feet on each side. It is two storeys in height, and at each angle is an octagonal tower, surmounted by an open pavilion. The towers, however, are rather squat in proportion, and the general design of the building very far from being so pleasing as that of many less pretentious tombs in the neighbourhood. Had it, indeed, been built in red sandstone, or even with an inlay of white marble like that of Humayun, it would not have attracted much attention. Its real merit consists in being wholly in white marble, and being covered throughout with a mosaic in "pietro duro"—the first, apparently, and certainly one of the most splendid, examples of that class of ornamentation in India.

* Edward B. Eastwick, Murray's "Handbook for Bengal."

† Fergusson's "History of Indian and Eastern Architecture."

It seems now to be ascertained that in the early part of the 17th century Italian artists, principally, apparently from Florence, were introduced into India, and taught the Indians the art of inlaying marble with precious stones. No instance of this mode of decoration occurs, so far as I know, in the reign of Akbar; but in that of Shâh Jahân it became the leading characteristic of the style, and both his palaces and his tombs owe their principal distinction to the beauty of the mode in which this new invention was employed.

It has been doubted whether this new art was really a foreign introduction, or whether it had not been invented by the natives of India themselves. The question never, probably, would have arisen had one of the fundamental principles of architecture been better understood. When we, for instance, having no art of our own, copy a Grecian or Roman pillar, or an Italian mediæval arch in detail, we do so literally, without any attempt to adapt it to our uses or climate; but when a people having a style of their own wish to adopt any feature or process belonging to any other style, they do not copy but adapt it to their uses; and it is this distinction between adopting and adapting that makes all the difference. We would have allowed the Italians to introduce with their mosaics all the details of their Cinque-cento architecture. The Indians set them to reproduce, with their new material and processes, the patterns which the architects of Akbar had been in the habit of carving in stone or of inlaying in marble. Every form was adapted to the place where it was to be used. The style remained the same, so did all the details; the materials only were changed, and the patterns only so far as was necessary to adapt them to the smaller and more refined materials that were to be used.

As one of the first, the tomb of Itmad-ud-daulah was certainly one of the least successful specimens of its class. The patterns do not quite fit the places where they are put, and the spaces are not always those best suited for this style of decoration. Altogether I cannot help fancying that the Italians had more to do with the design of this building than was at all desirable, and they are to blame for its want of grace. But, on the other hand, the beautiful tracery of the pierced marble slabs of its windows, which resemble those of Salim Chishti's tomb at Fathpur Sikri, the beauty of its white marble walls, and the rich colour of its decorations, make up so beautiful a whole, that it is only on comparing it with the works of Shâh Jahân that we are justified in finding fault.

The city of Lahore, formerly "*Lohawar*," was founded between the first and seventh centuries of the Christian era by a Rajput colony. No Hindu remains have been discovered in evidence of the architectural pretensions of this period. The present buildings are those of the reigns of Humayun, Akbar, Jahângîr, Shâh Jahân, and Aurangzib.

During Akbar's residence at Lahore (1584-1598 A.D.) he enlarged the fort, and round it and the city built a wall, portions of which still exist. The Akbari Mahal shown in the plan (see Plate 67) in the east portion of the fort was a work of his time, but now demolished. He also built a Throne-room. The present hospital occupies an old Hammam and part of a hall, which is probably a portion of the Throne-room. The gateway leading from the Huzuri Bagh is also of Akbar's time.

Jahângîr fixed his court at Lahore in 1622 A.D., and built the Greater Khwâbgâh on the north face of the fort. It consisted of a large quadrangle, with a colonnade on three sides, of red sandstone columns, carved with bracket capitals of the figures of elephants, griffins, and peacocks, resembling the ornamentation of the Jahângîr Mahal in the Agra Fort. On the centre of the fourth side, which overlooked the river Ravi, was a lofty pavilion, and on each side, at the corners, two chambers, with elaborate Hindu columns. The buildings have undergone complete alteration for military purposes. In the centre of the quadrangle was a garden, and beneath the pavilions and colonnades, underground apartments for refuge from heat. The Moti Masjid was Jahângîr's work, and, although of marble, has been converted into a Government treasury. The style of its architecture is plain, but of an interesting transitional period.

In the reign of Shâh Jahân the palace was enlarged. A smaller Khwâbgâh was erected, west of that built by Jahângîr. The building still exists, although altered to suit the purposes of a chapel. The garden and surrounding buildings also remain, but the latter have been converted into quarters, greatly to the detriment of their marbles. In front of the Khwâbgâh is the Arzghah, where the Omra assembled every morning to receive the Imperial commands. Left, or west, of the Khwâbgâh were erected two buildings known as the Shish Mahal (or Saman Burj) and Naulakka Pavilion. The Shish Mahal, with its sparkling mosaics of glass, is celebrated as the place where the British sovereignty of the Punjab was formerly recognised by Ranjit Singh. The Naulakka Pavilion is a costly marble erection, inlaid with "*pietro duro*." A new gate was opened into the Shish Mahal for the Emperor's private use, called the Hati Pul gate (or Hathiya Paur), now the only entrance to the fort. In the centre of the fort enclosure Shâh Jahân erected the Diwan-i-am; the columns of marble and stone, and throne of the interior, are *in situ*, and the rooms at the back (with their marble dados and coloured frescos, considerably



damaged by whitewash) are parts of the original structure. The northern front of the palace extended some 500 yards along the banks of the river, which in Shâh Jahân's time flowed under its walls. The whole wall surface was covered with elaborate designs in "Kashi," or tile mosaics, forming one of the most striking features of the fort. The designs include figures of men and animals, representations of the sun and zodiacal signs.

The Mogul buildings in the fort were used by Ranjit Singh: the Shish Mahal became a reception room, and he added a number of buildings, not improving its appearance. He also made the Huzuri Bagh outside to the west, and in its centre erected a marble pavilion, which was originally the central feature of Jahângîr's tomb at Shahdara. Moorcroft visited Ranjit Singh at Lahore in May 1820, and his description of the fort runs as follows:—

"Lahore is surrounded by a brick wall, about 30 feet high, which extends for about 7 miles, and is continuous with the fort. The latter, in which the Raja resides, is surrounded by a wall of no great strength, with loopholes for musketry. A branch of the Ravi washes the foot of its northern face, but it has no moat on either of the remaining sides. The palace within this enclosure, called the Saman Burj, which is of many storeys, is entirely faced with a kind of porcelain enamel, on which processions and combats of men and animals are depicted. Many of these are as perfect as when first placed in the wall. Several of the old buildings are in ruins; others are entire, and throw into shade the meaner structures of more recent date. Ranjit Singh has cleared away some of the rubbish, and has repaired or refitted some of the ruined temples of Jahângîr and Shâh Jahân, but his alterations have not always been made with good feeling or taste."

The number and extent of the ruins which surround the present walled city show that Lahore and its environs covered a circle with a radius of about three miles. The whole area between the Shahlimar gardens and the river Ravi is filled with the remains of tombs, mosques, and numerous gardens, which during the reign of Shâh Jahân must have formed a vast and picturesque group worthy of an imperial city.

The Shahlimar Bagh, or Imperial Garden Palace, some six miles east of the Lahore Fort, was designed and built in 1637 A.D. for Shâh Jahân by Ali Mardan Khan, in development of Jahângîr's Shahlimar gardens on the city lake at Srinaggar in Kashmir. This latter well-known summer retreat, measuring 500 by 207 yards, is enclosed by a masonry wall 10 feet high, and arranged in four terraces. A mountain stream traverses the water channels and cascades of the garden. There are various pavilions, the uppermost being the best and surrounded by fountains.

The Lahore garden, measuring about 520 by 230 yards, is shut in by a masonry wall 20 feet high, and arranged in three terraces with a number of alcoves, gateways, and isolated pavilions; on the east side there is a Turkish bath, or hammam. Water from the Bari Doab Canal traverses the channels, cascades, and fountain tanks from south to north.

The disturbed state of the Punjab in the eighteenth century placed the palaces and buildings at the mercy of Afghans and Sikhs. The invading army of Nadir Shah encamped in the gardens in A.D. 1738. Ten years later Ahmed Shah's camp was fixed in the vicinity. Shortly after, 1799, Ranjit Singh restored the gardens, which had gone to ruin during the troublous times of Ahmed Shah, but he removed the marble pavilions and substituted plaster structures in their place.

As will be seen from Plate 68, the arrangement of the Shahlimar Gardens follows the usual formal plan of the Muhammadans. On entering the gateway to the south, there are four square plots separated by water channels and a row of fountains down their centre. Each plot is alike, arranged as shown at O. Between the west and east enclosure walls are two pavilions, one now used for natives, the other for European visitors. The latter was probably the women's apartments, as it is shut in from outside by a small projecting garden (not shown on the plan). Passing up the centre avenue, one reaches the principal pavilion and large tank, L, filled with fountains and surrounded by ornamental flower beds. South-east of this pavilion is a building called the Khwâbgâh, or sleeping room, and in the centre of the east boundary wall of the grounds a Hammam, consisting of various domed rooms, fitted with brightly painted doors. The terraces flanking the large central tank east and west are 14 feet below the upper garden, and 4 feet 6 inches above the lower garden. The tank and its walks are raised some 4 feet 6 inches above this intermediate terrace, forming, with its fountains and pavilions, the chief attraction of the place. The lower garden is broken up into four square plots, each arranged as at B, and separated by water channels and walks. The gateways at D and E are decorated with tiles. The

brick-on-edge walks are damaged by the overflow of the water from the channels, and the trees and shrubs closely packed present a jungly appearance.

Writing on 6th May 1820, Moorcroft says: "I started at three, and at nine reached Shahlimar, the large garden laid out by order of Shâh Jahân, where I took up my abode in a chamber erected by the Raja close to a well, and a reservoir which it supplies, and from which jets-d'eau are made to play so near to the apartment as to cool the air at its entrance. Ranjit Singh has to a considerable extent put the garden in repair. It is said to contain 100 bigahs, the whole enclosed by a wall, in the course of which are several buildings. The grounds are intersected by canals, and the walks are formed of bricks laid edgeways. In the middle of the garden is a large square basin for holding water, furnished with copper tubes for fountains, and a white marble slope, carved into a surface of leaves and shells, divided into compartments by lines of black marble. There are some open apartments of white marble of one storey on a level with the basin, which present in front a square marble chamber, with recesses on its sides for lamps, before which water may be made to fall in sheets from a ledge rounding the room at top, while streams of water spout up through holes in the floor. This is called "Sawan Bhadon," as imitative of the alternation of light and darkness with clouds and heavy showers in the season of the rains. The ground is laid out in platforms and is covered with fruit trees."

Plate 69 shows the marble details of the fountains, &c., in the great tank at L on the General Plan.

Much has been done to improve the condition of the grounds and prevent their being flooded, but the flow of water through the channels is still out of control, and the lower terraces get frequently swamped, thereby causing deterioration of the masonry walls and walks. Repairs have also been applied to some of the pavilions, &c., but a good deal remains to be done before the place can be said to be in proper preservation.

Muhammadan princes all over the world showed as much taste in their dwellings as in their mosques and tombs, but as the conditions of climate, custom, and religion necessitated a special type of building, their palaces were not compact masses like those in Europe, but consisted of a number of detached pavilions, reception rooms of great and little state, sleeping and other apartments, scattered over large spaces and separated by trees and gardens; they were therefore more liable to succumb to the ravages of time and weather, or to mutilation by invaders and conquerors.

Among the numerous Mogul Palaces known in India during the present century, only a few exist. Those in the Lahore Fort have been altered so utterly as to attract little attention. The Delhi Fort palaces have given way to barracks, only some of the more precious buildings having escaped destruction. The Agra Palace has remained in some degree intact. A special pass from the Commissary of Ordnance admits the visitor to the Palace of Akbar in the Allahabad Fort, but it is unrecognisable, except as a depôt for ordnance stores. All these were originally highly ornamental structures, with court-yards, gardens and fountains, special halls for interviews with the Emperor and public durbars, women's apartments, galleries and cloisters, guard-rooms, &c. Old Indian miniatures, most of which have been acquired for foreign collections, give an idea of princely domestic life. Ladies of rank are represented performing their toilets in little courts with fountains and trees; their husbands are shown seeking rest and repose in gardens of the seraglio. To counteract the heat and glare of the fierce tropical sun was the aim of Indian architects, who well understood the value of enclosed courts with their cool shade, pleasant shrubs and flowers, running water, and splash of fountains.

LIST OF ELEVEN ILLUSTRATIONS.

TOMB OF ITMAD-UD-DAULAH, AGRA. 59.—Band above alcove. 60.—Ornament on ceiling. 61.—Detail of fresco painting. 62.—Detail in central chamber. 63.—Centre-piece in dome. 64.—Detail of ceiling. 65, 66.—Details in central chamber. 67.—Plan of Lahore Fort. 68.—Plan of Shahlimar Gardens. 69.—Details of fountains, &c.



59.—TOMB OF ITMAD-UD-DAULAH, AGRA.
Band above alcove, east oblong room, ground floor.

tb



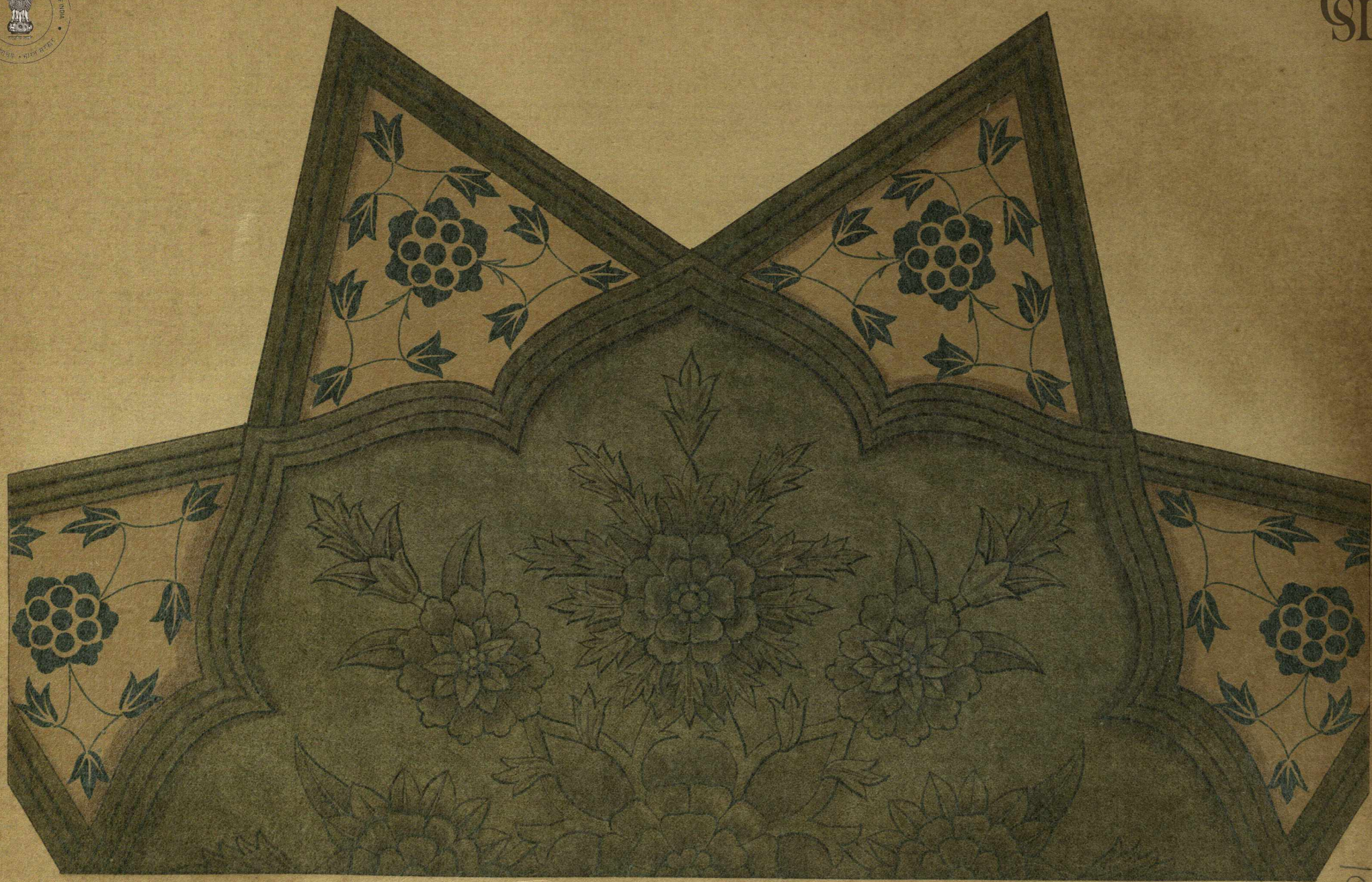
60.—TOMB OF ITMAD-UD-DAULAH, AGRA.

Ornament on ceiling, oblong room.



61.—TOMB OF ITMAD-UD-DAULAH, AGRA.

Detail of fresco painting.



62.—TOMB OF ITMAD-UD-DAULAH, AGRA.

Detail in central chamber, ground floor.



63.—TOMB OF ITMAD-UD-DAULAH, AGRA.
Centre-piece in dome, central chamber, ground floor.



64.—TOMB OF ITMAD-UD-DAULAH, AGRA.
Detail of ceiling in central chamber.



103

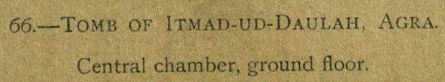
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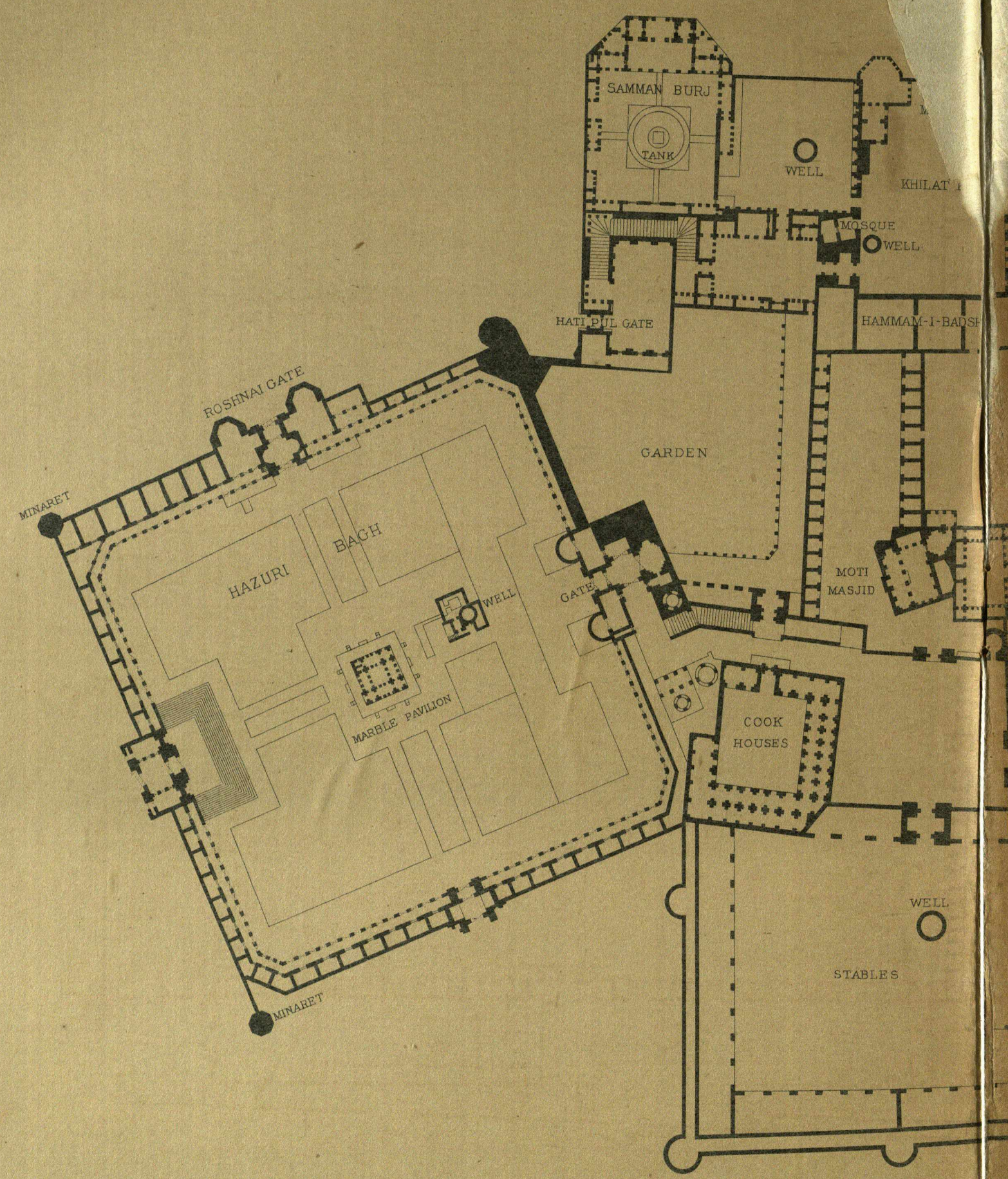


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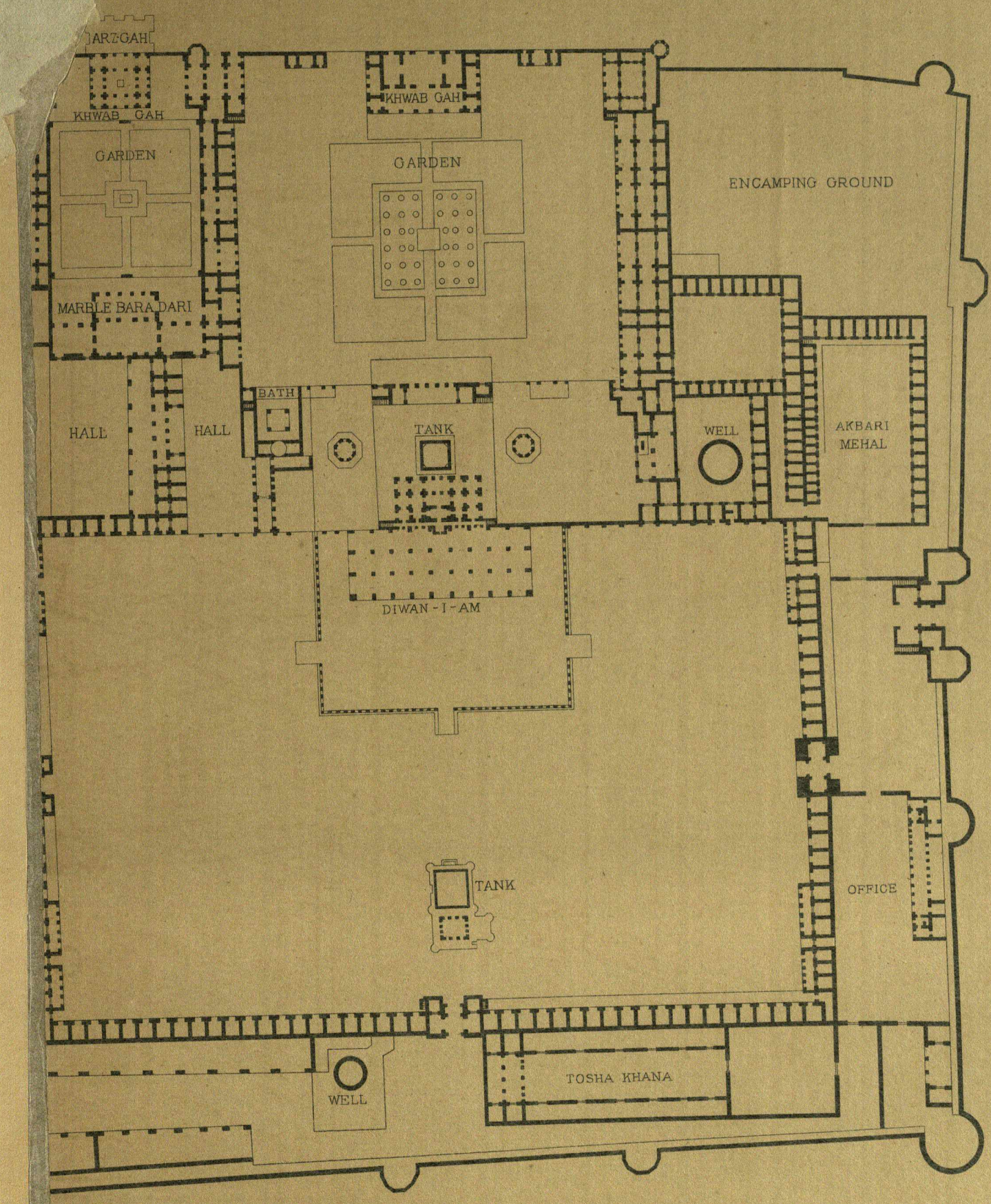
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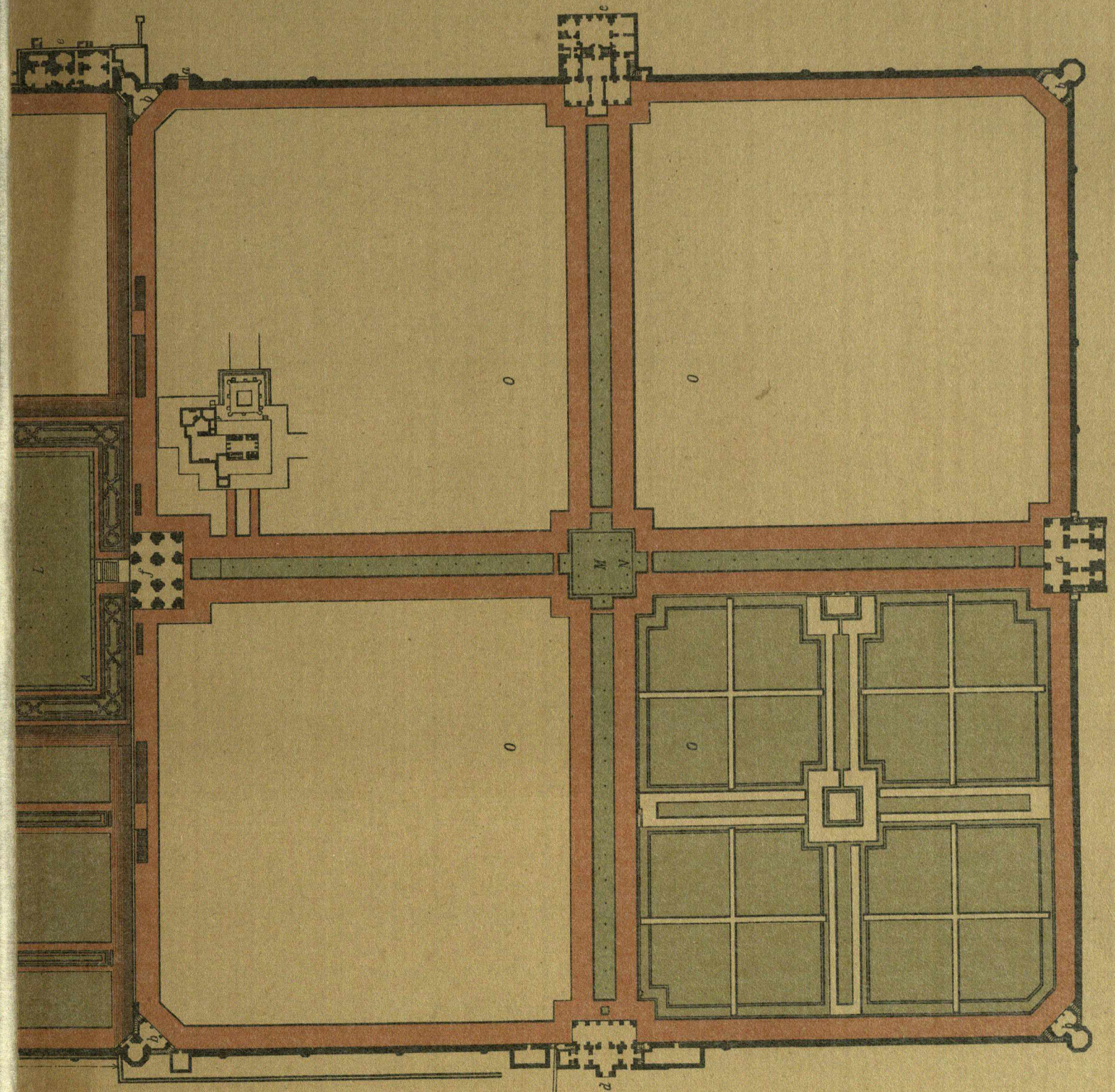
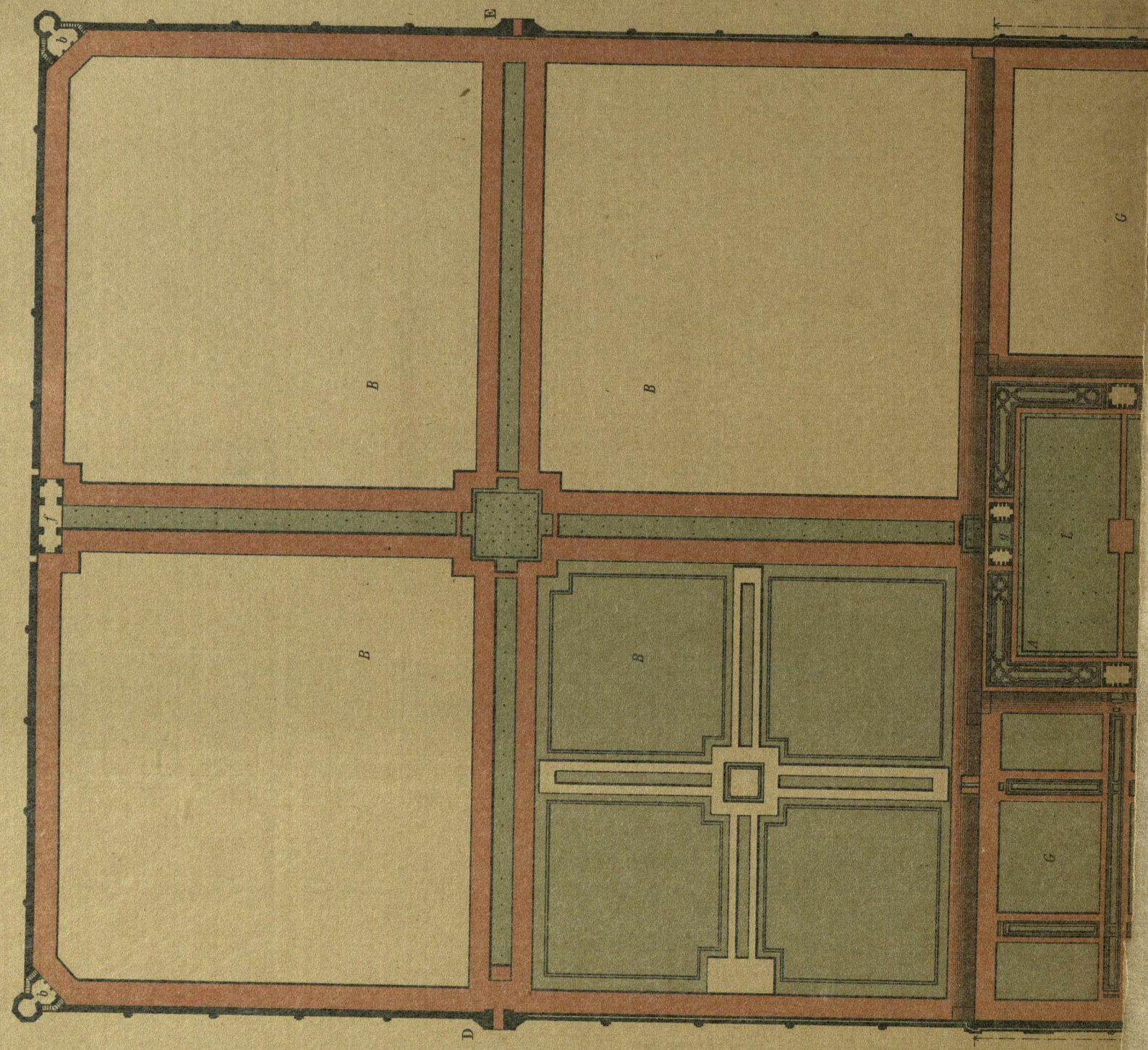
66.—TOMB OF ITMAD-UD-DAULAH, AGRA.
Central chamber, ground floor.



SCALE 40 FEET TO
PLAN OF LAHO



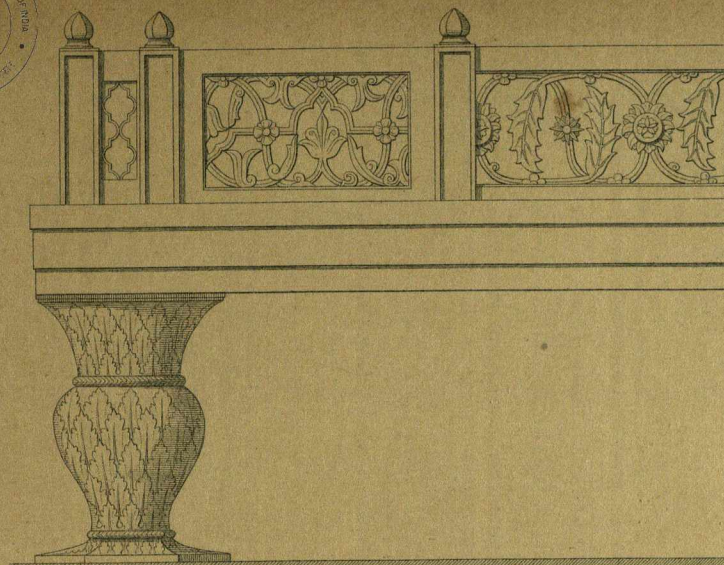
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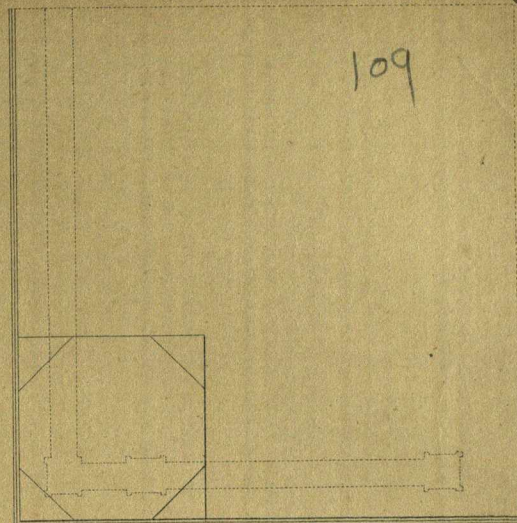
D, E Gateways with tile work (see Pls. 79 and 80)
 B, G, O Gardens
 a Gateway
 b Alouie
 c Pavilion used by Europeans
 d " " Natives
 e Hammam or bath

68.—SHAHILMAR GARDENS, NEAR LAHORE.
 General Plan.

Houses tinted grey.
 Pavilions, edge " red.
 Gardens " green.
 Streets " buff.



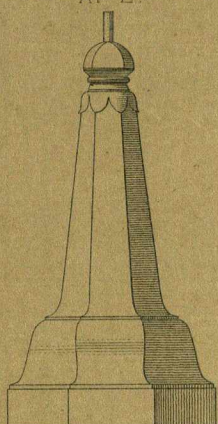
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SCALE $\frac{1}{2}$ FULL SIZE

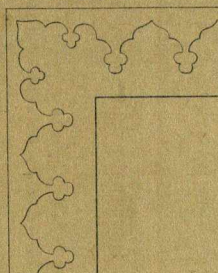
DETAILS OF MARBLE BORDERS AND FOUNTAINS IN GARDEN

AT L.

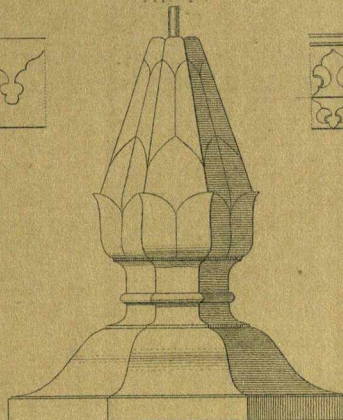


SCALE $\frac{1}{2}$ INCH TO 1 FOOT

AT F.

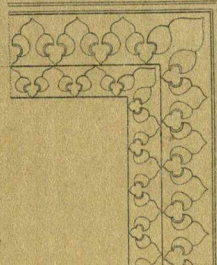


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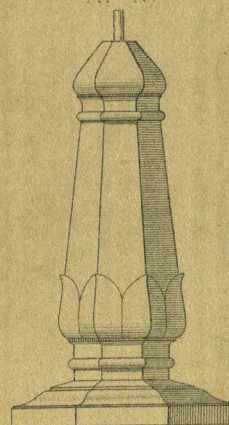


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AT H.

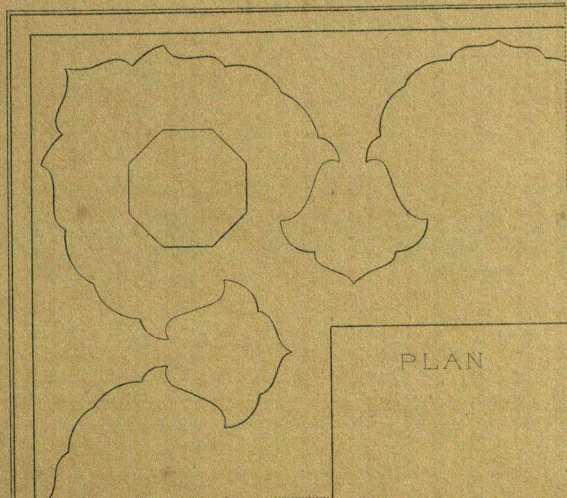


AT N.



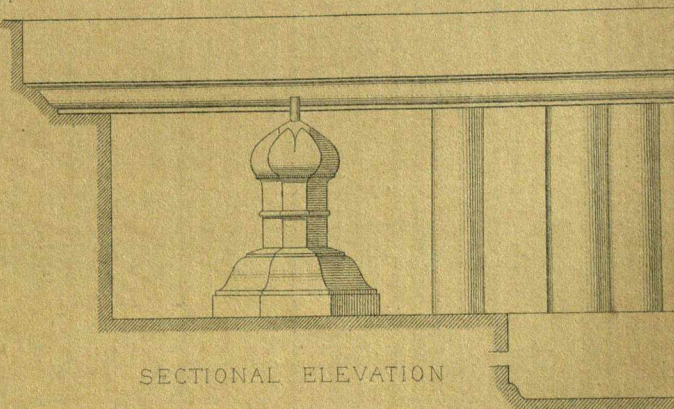
SCALE $\frac{1}{12}$ FULL SIZE

AT A.



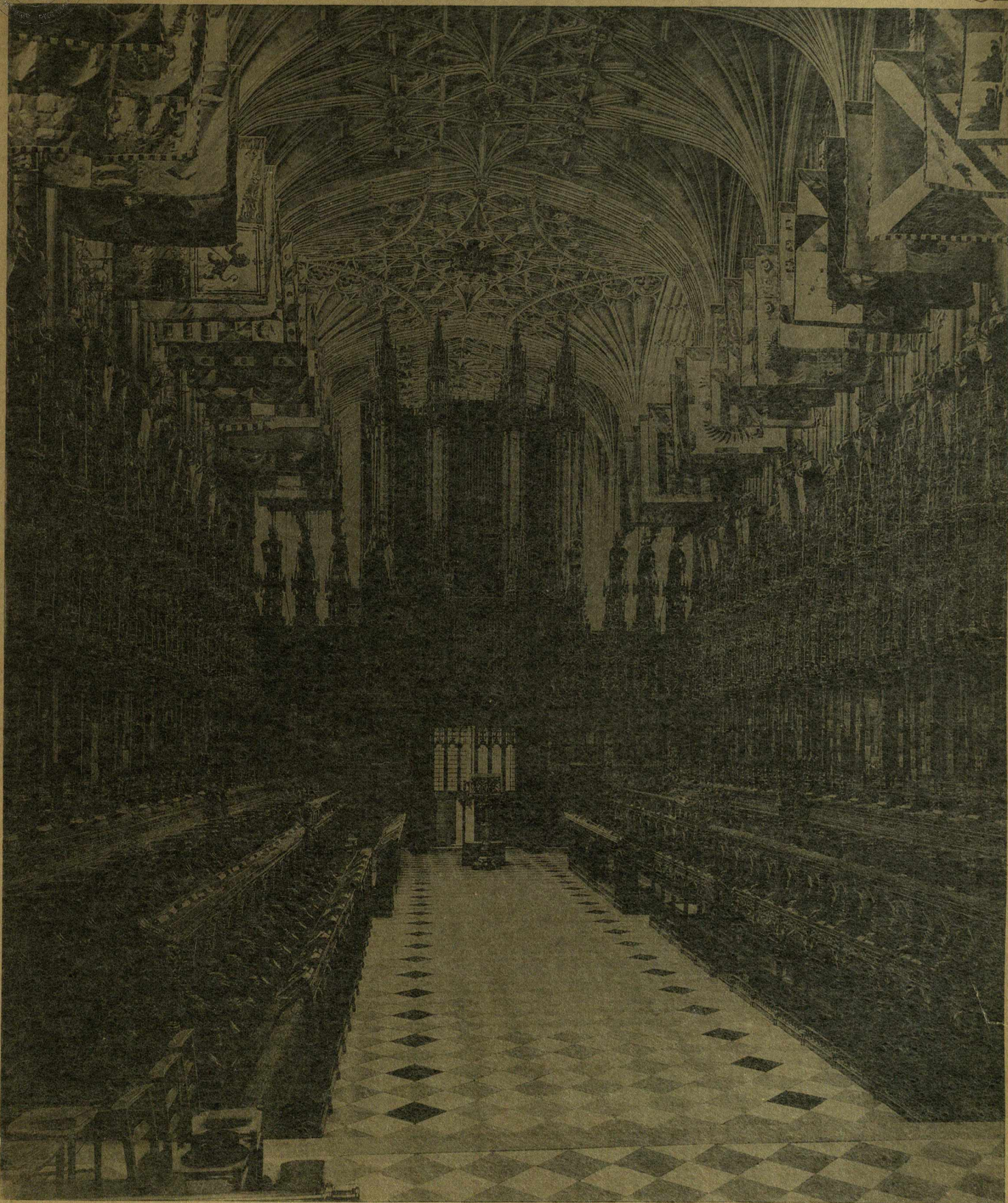
PLAN

SCALE $\frac{2}{3}$ TO 1 FOOT



SECTIONAL ELEVATION

SCALE $\frac{1}{2}$ FULL SIZE



ST. GEORGE'S CHAPEL, WINDSOR.

Taken on Thomas's Anti-Halation Plate (Oakley's Invention).

The Journal of Indian Art and Industry.

DADA HARI'S WELL, MOSQUE AND TOMB, AHMEDABAD.

Only those who have lived in the tropics know what a blessing and a boon water is. It is, therefore, not surprising to find in India that wells and tanks should, from time immemorial, be treated with veneration; and one of the greatest benefactions that could be bestowed on a community was the making of a well or tank; and all the thought and skill that human ingenuity could devise was bestowed on their construction, so that they became objects of art. In the city of Bombay are to be seen innumerable tanks and wells, the result of these benefactions, and many of them bear tablets on which are engraved the names of the donors. A donor of one of the wells on the Esplanade, between the Elphinstone High School and the School of Art, preferred that his name should not be known, as the inscription reads: "The charitable gift of a respectable native, 1822."

The scene round a well in the early morning or evening is one of the most picturesque sights to be seen in India. The well is usually sheltered by a "tope" of sacred pipal or banyan trees, round which crowd men, women, and children; the women always attractive in their simple garments, falling in graceful folds and brilliant in colour, followed, or clung to, by little nude children, who are wonderfully picturesque with their black shining eyes and softly moulded lithe figures. Nearly all carry pots of sorts—the rich have vessels of copper and brass, the poor of earthenware—of every shape and size; all beautiful, none ugly. Some are engaged in cleaning their metal vessels with the dust scraped from the roadside; others are vigorously plying their ropes in drawing water from the well; others are coming and going with a swinging gait, with their pots piled one above the other on their heads; while cattle and goats are quenching their thirst from the stone troughs attached to the well for their special use. One man sits lazily on a rope, to which is attached a large water skin (*mussak*), driving a pair of white humped bullocks, often 17 hands high, who slowly draw water that irrigates the surrounding fields. The friction of the rough wooden appliance as it turns on its axis over which the rope attached to the *mussak* passes, makes a low, penetrating, sing-song sound, which may be heard for a long distance, and it is one of those strange weird, familiar, Indian sounds which cannot be heard without recalling a host of associations and a bright picture of the animated scene round a tree-shaded well. Pigeons and doves are billing and cooing, and the fussy erratic little striped squirrel is fidgeting about, uttering its sharp whistling cry; while the green parrot flits by with lightning rapidity, and the pea-fowl—the males displaying their gorgeous plumage—are feeding close by; all these varied incidents form a pastoral scene which once witnessed can never be forgotten.

Wells for supplying drinking water both for man and beast, and wells for irrigating purposes are to be seen all over the country; many of them, especially those in Gujārat and Kathiawar, being of great architectural beauty. One of these, Dāda Hari's at Ahmedabad, with its adjoining mosque and tomb, forms the principal subject of the illustrations in the present number.

"At the village of Asārva, about a mile east of Hatising's temple, are two wells, Dāda Hari's and Māta Bhavani's. Dāda Hari's well, also known as Nurse, or Dhāi, Hari's well, was built in 1485 by a lady of the household of Mahmud Begada, at, it is said, a cost of £30,000 (Rs300,000). At the level of the ground it is 196 feet long by 40 feet wide. At the east end, from a domed canopy, a descent of eight steps leads to a covered gallery. A second flight of nine steps leads to another gallery, and a third of eight steps to the lowest gallery two or three feet above the level of the water. At each landing a corridor runs along the sides and leads to other galleries that cross the well at intervals. At the west end is the well, octagonal in shape, its walls richly carved, with, on each side, small cupolas, and under them spiral stairs leading down to the water. Behind the main well is a second well twenty feet in diameter, used for watering land. The whole is far more elaborate than the Māta Bhavani well close by, and has no equal in Gujarāt, except the well at Adāraj built about the same time by a Hindu lady Rudbāi, wife of Rājā Virsing. According to another story, the Adāraj well was built by the sister of Bāi Hari. Mr. Briggs translates the inscription as if the builder was a man, not a woman, and Captain Lyon

DADA HARI'S WELL, MOSQUE AND TOMB, AHMEDABAD.

says, 'whether man or woman is doubtful.' Close by the well the nurse built a mosque and a tomb in which she was buried. The well bears two inscriptions, one in Sanskrit on the south, and one in Arabic on the north wall of the first gallery. The Arabic writing runs:—'This holy and wholesome water; the splendid travellers' rest house enclosed on four sides by carved and painted walls, and a grove of fruit trees with their fruit, a well, and a pool of water for the use of man and beast, were built in the reign of the Sultan of the Sultans of the age, established by the grace of God and of the faith, Abul Fath Mahmud Sháh, son of Muhammad Sháh, son of Ahmad Sháh, son of Muhammad Sháh, son of Muzaffar Sháh the Sultan, may God keep his kingdom. Dated the metropolis of the kingdom of the 2nd of Jamádi-ul-awal in the 26th year of the reign.' This gives 1485 A.D. The Sanskrit inscription, according to one account, gives 1500 (1556 S.) as the date of the well.¹ According to another, it gives 1421.² Mr. Forbes (*Oriental Memoirs*, 1781) gives the following account of the well:—'About a mile from Shahi Bág is a large well or rather a noble reservoir, constructed by a nurse to one of the kings of Gujarát, and still called the "Nurse's Well." A grand flight of steps leads to the water through double rows of pillars and pilasters elegantly furnished far below the surface of the earth. This reservoir is all of hewn stone surrounded by galleries, ascended by circular steps, and a dome supported by large columns over each; these galleries communicate with the principal stairs and add to the general magnificence. Upwards of thirty thousand pounds were spent on this magnificent work, which some attribute to the nurse and others to a rich dancing girl, who erected it with the produce of one of her ankle jewels; the other she is reported to have thrown into the water to reward the search of the diver.'"³

JOHN GRIFFITHS.

NOTE.—The illustrations of Dáda Hari's well are executed by students of the Sir Jamsetji Jijibhai School of Art, Bombay, from sketches and measurements taken on the spot, and are a continuation of those given in No. 46 of this Journal.—J.G.

LIST OF ILLUSTRATIONS.

DADA HARI'S MUSJID, AHMEDABAD. 70.—Details of Caps and Columns. 71.—Details of Stone Balcony. 72.—Details (various). 73.—Details of Mihrab. 74.—Elevation, Section and Plan. 75.—Side Elevation and Section. 76.—Sections and Plan. DADA HARI'S WELL. 77.—Sections. 78.—Details of Chowk. 79, 80.—Details of Carved Panel in Chowk. 81.—Details over Carved Panels in Chowk. 82.—Details. 83.—Details of Parapet.

¹ Briggs' *Cities of Gujaráshtra*, p. 218.

² Captain Lyon, p. 14.

³ Mr. J. M. Campbell's *Bombay Gazetteer*, Ahmedabad, pp. 282-283.



POTTERY AND GLASSWARE OF BENGAL.

By MR. TRAILOKYA NATH MUKHARJI, F.L.S., INDIAN MUSEUM, CALCUTTA.

I.—POTTERY.

THE FIRST POT OF THE WORLD.—The want of a pot was felt almost from the very beginning of things,—since there was a keeper and since there was anything to keep. The necessity for such a thing was felt even in the very nebulous stage of the world, when the gods and demons combined to churn the ocean for its wealth. That fierce churning yielded many precious things, among which was the nectar to make the gods immortal for all time. Something was now needed to hold the nectar. Viswakarmá, the celestial artificer, pondered and took out from each of the assembled gods a bit of the *Kalá* or spirit with which their bodies are made, and moulded it into a pot, perhaps the first of its kind in the world. From *Kalá* came the Sanskrit word *Kalasa* or water-pot.

CREATION OF POTTERS.—But the manufacture of a single pot from a handful of spirit subscribed by the gods was by no means calculated to satisfy the needs of the world. The demand was universal, and what was required was a regular, organised caste with the exclusive privilege of making pots. Siva, ever thoughtful for the happiness of the world, at length removed this long-felt want. It so chanced that on the occasion of his marriage with Sati, the manifested Primordial Energy, no pot could be had for the requisite ceremonies. The moment was critical, and there could be no delay. So the bridegroom god took out a bead from his necklace, and out of it created a man and out of another he created a woman, and bade them forthwith to prepare a *Kumbha* or water-pot. This was the origin of our Kumbhakár or potter caste, abbreviated into Kumar in Bengal, and Kumhar in Upper India. The Kumars to this day are not wanting in gratitude to the creator of their progenitors. They call themselves Rudrapál, which was the name given to the first potter, consider themselves the *protégé* of Rudra or Siva, place his image on the middle of their wheel, leave it unturned for the whole of the first month of the Bengali year, and finally on the last day they worship the idol and throw it into the water. Nor are they unmindful of the originator of their craft, the god Viswakarmá, who made the first pot of the world to keep the nectar in. Him they worship on the day the sun enters the sign of Capricorn, his symbol being the implements of the craft, before which they present sweets, fruits and other delicacies. Rudrapal himself is also worshipped by the potters of Orissa. They place his image between those of Radhá and Krishna, and on the sixth day of the new moon in the month of November, fried paddy, plantains, cocoanuts and other offerings are presented to him. Various other accounts are given in the sacred books about the origin of the potter caste, but that related here is the one best calculated to raise this class of artisans in the estimation of the world.

THE POTTER'S WHEEL.—At any rate, the manufacture of earthenware was practised in India from a time quite beyond the memory of man. The facility with which clay can be kneaded into dough, turned into any shape and hardened by baking, could never escape the notice of even the most unobserving of primitive men. Nor was the work of making pots beyond the intelligence of the rudest savage. But to do it with the aid of a horizontally revolving wheel was decidedly a great advance in the art. In a comparatively modern age the Greeks might claim for Corœbus of Athens, Hyberbius of Corinth, or Talamus, the nephew of Dædalos, the honour of inventing the potter's wheel, but nevertheless long before that period it went on revolving in the humble cottage of the Indian artisan, even at so remote a time when the nomadic Aryans tended their flocks, and sitting around their camp-fires drank the *soma* and sang the sacred hymns of the earliest Vedas. Nor was its use unknown among the other ancient nations of the East. "Then I went down to the potter's house and he wrought a work on the wheels," so sang Jeremiah, the Hebrew prophet.

WANT OF MATERIAL.—But, though the manufacture of household earthenware was practised from the most remote antiquity, in Bengal at least the industry never attained to the position of a sumptuary art. The early Aryan hamlets that step by step descended down the sacred waters of the Ganges and clustered on the fertile plains of Bengal, found no hint or encouragement in the alluvial soil to develop the manufacture of ware like the hard porcelain of King-te-chin in China, or the translucent vases of Imali in Japan. Materials like the Kaolin of China or the Keramos-substance of Greece might lie further west, among the freebooting savages whom, in a later age, Cleveland won over by love, or in the then unexplored and inaccessible hills and jungles where the wild men struggled with the wild beasts for dominion over the land, but they hardly ever came within the reach of the ingenious Aryan hand.

CASTE-RULES IN THE WAY.—Caste-rules again have stood in the way of the development of Bengal pottery into an ornamental art. The abundance of the raw material and the ease with which it can be manipulated into

vessels, have rendered earthenware of so little value that even the poorest can afford to throw the old ones away from time to time and to replace them with new. Indeed, of so little value is the potter's stock-in-trade, that there is a proverb about him in Behar: *Nichint sute kumhra, matiya naele jay chor*—"The potter sleeps secure, for none will steal his clay." So earthenware has come to be looked upon as things peculiarly susceptible of defilement. All the cooking-pots in use must be thrown away on a death occurring in the house or of a near relative. The same rule is also observed on the occasion of an eclipse, be it of the sun or the moon. As plates or dishes for eating cooked food, or cups for drinking water, they cannot be used more than once, and so they are seldom made or employed for such a purpose, except by the Muhammadans, who have no such prejudices. To lavish ornamentation on so temporary and insecure an article would be but waste of time and labour, and, indeed, with very few exceptions, no ornamentation whatever is attempted. Thus the art of pot-making in Bengal never got beyond the coarse redware of the ancient Egyptians, or at best the smooth blackware of the Etruscans.

GLAZING NOT KNOWN.—As to glazing, it is all but unknown to the potters of Bengal. Even the use of oxide of copper, which gave the beautiful blue tints to the ancient Egyptian porcelain, exported to decorate the graves of Greece and the sepulchres of Etruria; or of common salt, which glazed the celebrated Bellarmine bottles of Holland, has never been attempted by the potters of Bengal. Glazing would perhaps be impracticable with the ordinary potter's clay found in the country, owing to its unrefractory character from the presence in it of a large proportion of oxide of iron and carbonate of lime, and more often for the admixture with it of large quantities of organic matter. Where good clay is likely to be found, no alchemist Bottcher has yet appeared to wring the secrets of nature, no Madame Darnot to make a discovery, and no Wedgwood by untiring zeal and unabating patience to revolutionise the household industry of a country.

THE SEWAN POTTERY.—Almost the only pottery in Bengal, which can affect the least pretension to artistic merit, is that made in Sewan, in the District of Sâran. But even this is an inferior imitation of that made in Azamgarh, in the North-Western Provinces. Sir George Birdwood speaks of this pottery as "generally feeble and ricketty in form, and insipid and meretricious in decoration, defects to which its fine black colour gives the greater prominence." The Sewan pottery has, however, some reputation outside the place of manufacture; but the demand for it is so small that it does not give employment to more than four families of potters. The ware is either white, red, or black, the last being the most admired. The vessels to be made black are baked within earthen jars to prevent their coming in contact with the flames. Sewan blackware resembles in some respects the Roman black pottery of later times, the colour of which was produced by confining the smoke in the furnace, and throwing it down upon the heated vessels. They are partially glazed with a mixture consisting of a kind of clay found in the district, Fuller's earth, and mango bark. The mixture is first dried in the sun, then powdered, and lastly dissolved in water before being applied. Black colour is produced in other places by burning a quantity of oil-cake in the kiln along with the earthenware. The Sewan red and blackwares are either left plain or have silvery floral or geometrical patterns. The decoration is produced by etching the patterns on the surface and rubbing into them an amalgam of mercury and tin. Powdered mica is also used to produce similar patterns. The articles usually made are surâhis or water-goblets, farsi or smoking bowls, chhilam or tobacco-pipes, and abkhorâ or drinking vessels. The art has also been adapted to meet the requirements of European customers, for whom flower-vases, plates, cups and saucers, milk jugs, butter-pots, spittoons, and other articles are made. The patterns for the decoration of these are mostly copied from designs supplied by the European customers themselves. The shape of some of the flower-vases of Sewan resemble those of Greece in style and form.

KHULNA POTTERY.—A black pottery without any kind of ornamentation is made at Khanja, a village in the District of Khulna. The articles made here justly deserve praise for their high polish and elegant shapes, fully illustrating the meaning of Sir George Birdwood's remarks that "nothing can be worse in taste, nor, in an æsthetic sense, more wasteful, than to hide a lovely form under an excess of foreign ornament." The articles usually made are betel-holders, oil-pots, smoking bowls, &c. The betel-holders of Khanja somewhat resembles in style the vase of Henry II. ware.

DINAJPUR POTTERY.—Water-pots, betel-boxes, oil-pots, smoking bowls, ink-pots, incense-burners, and other articles are made at Dinajpur with some degree of finish, so as to raise them to a certain extent to the position of ornamental art. The shapes are also good.

POVERTY OF BENGAL IN FANCY POTTERY.—But the poverty of Bengal in the matter of art pottery is best illustrated by the contributions made to the different exhibitions held within the last few years. The late Mr. H. H. Locke, Principal of the School of Art, Calcutta, and himself an artist of considerable merit, in collecting articles for the Melbourne Exhibition of 1880, considered the Sewan pottery as the only one in the Province worth sending to a foreign country. At the Calcutta Exhibition of Indian Art Manufactures, 1882, which



specially concerned the Province, only 91 specimens were received to represent the industry in Bengal, Behar and Orissa. Of these 34 were from Sewan, 30 from Khanja, 12 from Gaya, 5 from Kantalia, in the District of Murshidabad, 5 from Barisal, 2 from Kodalia, in the District of 24-Parganas, 2 from Manjha, in the District of Saran, and 1 from Balasore. Even many of these can only be classed as works of art more from compliment than from actual merit. In the Calcutta International Exhibition of 1883-84, the industry of the Province was represented by 2 goblets, 2 cups and 3 smoking-pipes from Tipperah, 55 specimens from Sewan, a tea-pot and a butter-pot from Sitamarhi, 10 pieces of earthenware from Murshidabad, one rupee worth of pots and plates from Chittagong, $3\frac{1}{2}$ annas worth of smoking-pipes from Patna, 10 pieces from Muzaffarpur, and Rs2 worth of cups, dishes, and pots from Satkhira in the District of Khulna. The collection sent to the Colonial and Indian Exhibition of London, 1886, was equally poor, consisting of a few pieces from Sewan, Khanja, Dinajpur, Murshidabad, Patna, and the 24-Parganas. In the Economic and Art Section of the Indian Museum, only eight places are represented, viz., Sewan 88 specimens, Khanja 13, Birbhum 57, Dinajpur 5, Gaya 11, Tipperah 3, Chittagong 3, Hooghly 4, and Muzaffarpur 2.

BIRBHUM POTTERY.—The unglazed terra-cotta ware of Birbhum deserves mention. The articles mostly made are suráhis or water-goblets, drinking cups, spittoons, plates, smoking bowls, and lamps. The shapes are good, and a rude attempt is sometimes made towards ornamentation. This consists in tracing on the soft unbaked vessel floral and other patterns with a sharp tool, and afterwards filling the narrow incisions with some white substance. Birbhum also makes a kind of blackware, but not so good as those of Sewan or Khanja. Some of the black flower vases of Birbhum resemble in shape those of Tyg of Staffordshire ware.

NAWADA POTTERY.—Fancy pottery is also made in Nawada in the Gaya district, but the articles are of very poor quality.

HOOGHLY POTTERY.—The pottery of Hooghly deserves notice, as it presents the only examples of Bengal *faience* in the museum collection. The specimens consist of two flower-tubs and two water-goblets. The body of the ware is the usual red clay, coated over with a semi-vitrified green glaze. This seems to be an attempt to introduce the manufacture of glazed pottery in the country, but the industry does not appear to have made much of an advance.

RANIGANJ POTTERY.—The manufacture of glazed ware according to modern methods has been successfully introduced into the country by Messrs. Burn & Co. in their pottery works at Raniganj. Besides bricks, tiles and drainage pipes, large quantities of terra-cotta ornamental ware are also turned out from these pottery works, but they can hardly be included in an account of indigenous Indian art.

MODE OF MANUFACTURE.—The potters of Bengal generally use two kinds of clay: the black earth or the sandy alluvial earth brought down as a silt by the rivers. The best pottery is made in the Burdwan District on the banks of the river Bhagirathi, where the clay is specially suited for the manufacture of durable earthen vessels. In Dacca red laterite earth is imported from Bhowál for the manufacture of ordinary red vessels, the colour of the rim being deepened by coating it with a mixture of catechu and Fuller's earth. In Eastern Bengal the earthenware made at Ráibázár in Dacca has a great reputation for its durability. In the cold weather, boats laden with cocoanuts come from Noakhali, Sandip, and other places, returning with earthenware made at Ráibázár. Bijaypur in Tipperah is also famous for its pottery. The appliances used by the potter are extremely primitive. Beneath the same thatched roof are his kiln, storehouse, and dining and sleeping rooms. He prepares his clay at his door, which is simply done by mixing it with water and throwing away all objectionable articles found in it. Flat vessels that are not turned out of the wheel are fashioned by beating with a small wooden mallet, the clay being spread upon a vessel of the same kind to serve as a mould. The wheel is the Roman rota, a disc of clay weighted along the rim, revolving on a pivot made usually of tamarind wood. The necks and shoulders of all round vessels are fashioned on the wheel, the body being made by hand, often by women. The potters have very great reverence for their wheel. Whatever their occupation be, they consider it as the symbol of their caste. In Orissa, where some of the potters have turned agriculturists, they brand their cattle with a rude representation of the wheel. The whole caste in Orissa abstain from eating *sal* fish, and even worship it, because the rings on its scales resemble the wheel. The kiln is called *pan*, and is divided into two compartments, in which the vessels to be baked are carefully arranged, loose earth being heaped on the top, and the whole coated with a thick layer of clay. It is lighted generally in the evening, the potter sitting the whole night, feeding the fire by a little hole kept open on one side for the purpose. The fuel used is plantain leaves, grass, reeds, and other light articles. A section of the potter caste, known as the Rajmahalia Kumars, thatch their drying-houses with green grass, not tying it, but keeping it down by weights. In course of time when the grass dries, they use it as a fuel for the kiln. This section of the caste make cooking pots for vegetables, milk-pans, and salvers on which sweets

and other delicacies are handed round at wedding feasts. They are prohibited to make idols or platters used at religious ceremonials. Although the potters do not turn their wheel for the whole of the first month of the Bengali year, they are permitted to dig and store clay. Some potters also consider it not unlawful to bake the pottery in that month.

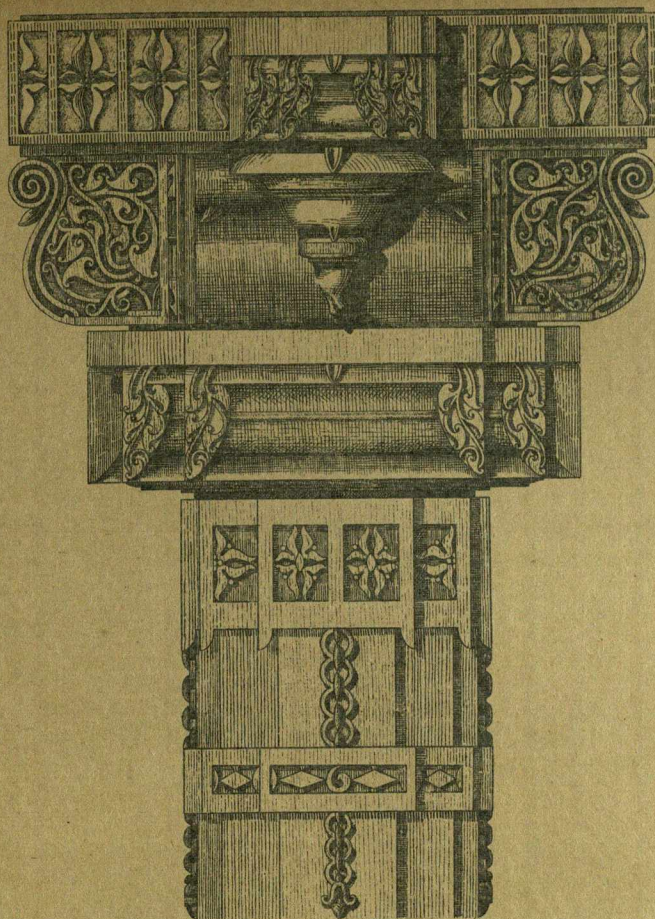
GLAZING.—As stated before, the potters of Bengal do not know how to glaze their ware or to fix the colours upon the vessels. At Monghyr they sometimes put a coating of fine clay upon the vessels, but no attempt is made to fuse it to the point of vitrification. Fine black clay, mixed with river sand containing mica grains, is also similarly used. They also impart a whitish colour to some of their ware by washing it with a kind of porcelain clay before baking. In Burdwan, a clay called *Belutti* is used as a glaze without fusion.

PAINTED WARE.—Some of the fancy pottery of Bengal is hand-painted with colours after they have been baked. The work is done by potters as well as by the women of the Patuás—a half Hindu half Muhammadan caste,—whose business is to make toys and idols and to paint pictures. Red colour is produced from red lead, yellow from arsenic, green by mixing yellow arsenic and indigo, and black with lamp-black, charred rice or reeds. The colours before application are mixed with a mucilage obtained from the kernel of tamarind seeds or the gum adhering to the seeds of the *Bel* fruit (*Aegle Marmelos*). After being painted, the pots are varnished with the *Garjan* (*Dipterocarpus*) wood oil, or with the white of ducks' eggs. Images of deities made by the potters are further improved by powdered mica being sprinkled over them while the paint is still wet. The painting on earthenware, as done in Bengal Proper, is, however, so roughly executed as scarcely to deserve to be called a work of art. The pots of Gaya are, however, painted with some artistic skill. The ground is generally red, upon which yellow and green floral patterns are drawn, interspersed with figures of birds and other animals. These pots are mostly used by tobacco sellers to decorate their shops, as well as to store materials with which the tobacco paste, called *Guráku*, is perfumed.

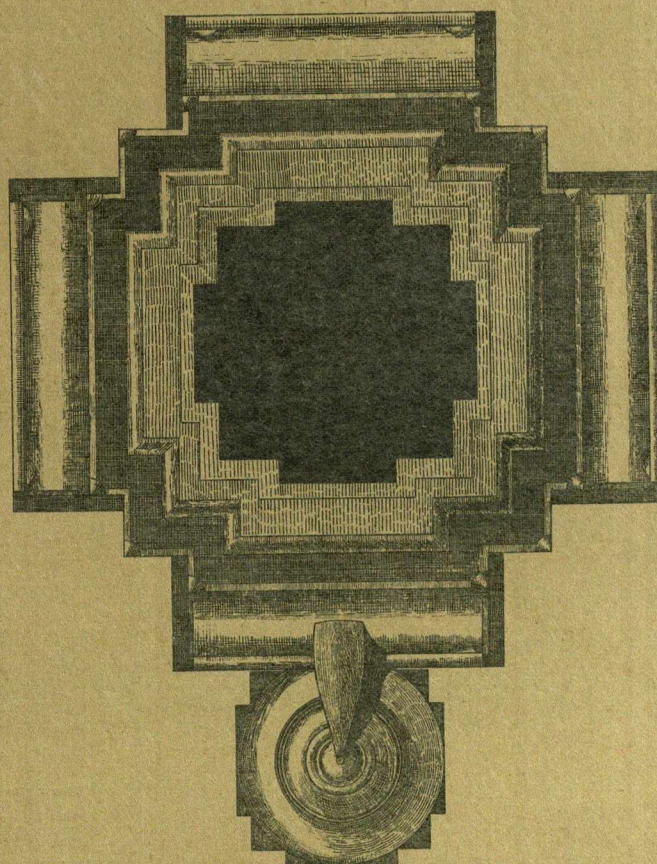
II.—GLASSWARE.

GLASSWARE.—Of glassware in Bengal there is very little to speak. Thin flimsy bottles to keep perfumery, kerosine lamps, ink-bottles, and bangles are made in Calcutta, Patna, and other places. The material used is old broken imported glass, which is melted down and blown into new shapes. Pure white glass is not made in Bengal, except at the factory of the Pioneer Glass Co. of Titagarh, near Barrackpur, where medicinal bottles and other articles are manufactured with European appliances under European supervision. A green and opaque glass is made in Behar out of Son river sand mixed with carbonate of soda. This is used in the manufacture of glass bangles. At Bhagalpur, a coarse glass for the manufacture of bangles and bracelets is made of *Khari* or impure carbonate of soda. This is first melted, then thrown into cold water, powdered, again melted, formed into cakes, and finally melted into rings. The result is a black glass. Green glass is produced by adding peroxide of copper, prepared by putting salt and turmeric into a moistened copper plate. Blue glass is produced by adding an oxide of tin.

PATNA GLASSWARE.—The only glassware in Bengal which possesses some pretension to art is that made in Patna. The articles made are suráhís or water-goblets, bottles, lotas, flower-vases, baskets, jugs, ábkhóras or drinking vessels, cups, saucers, pots, &c. The material used is old broken glass. The articles are sometimes coloured yellow or blue, and adorned with golden patterns. Coloured glass is produced by the addition of indigo blue, sulphate of copper, or other ingredients. The shapes of the Patna glassware are extremely elegant, but the industry is on the point of extinction for want of demand. Only two or three families are engaged in it, but they make no fancy glassware without order.



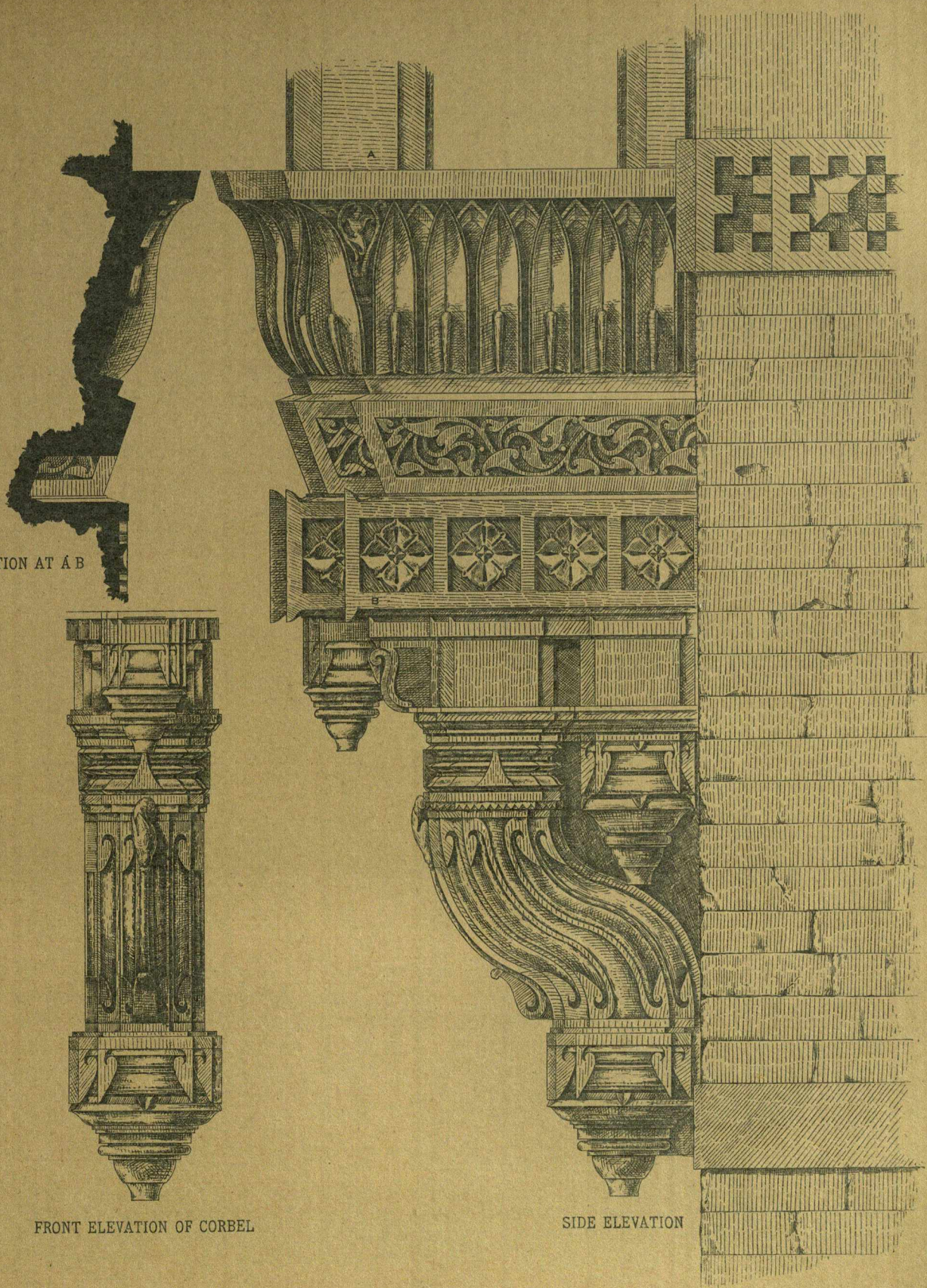
ELEVATION



PLAN LOOKING UP

SIR J. J. SCHOOL OF ART,
BOMBAY, 1893.

MEASURED AND DRAWN BY
OHHOTALAL DOLATHAM SHAH.



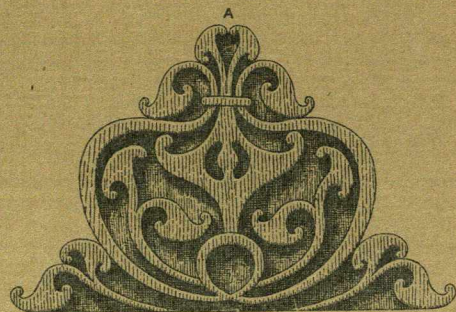
SIR J. J. SCHOOL OF ART,
 BOMBAY, 1895.

MEASURED AND DRAWN BY
 S. J. FONSECA.

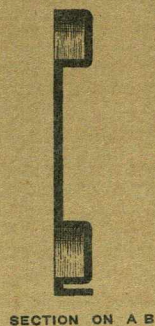
71.

DETAILS OF STONE BALCONY, DADA HARI'S MUSJID, AHMEDABAD.

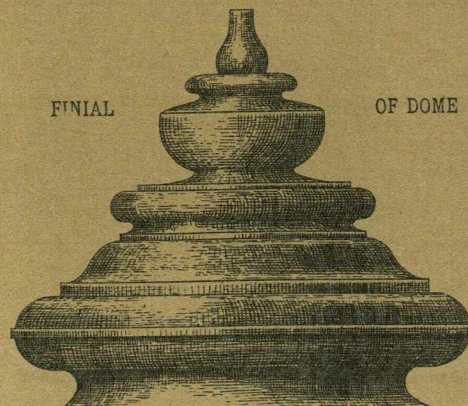
ONE-SIXTH FULL SIZE.



STOPS IN CORNICE
 HALF FULL SIZE



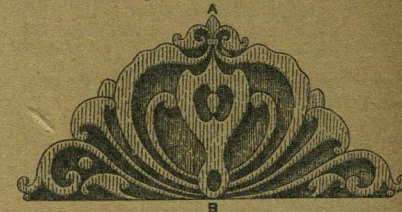
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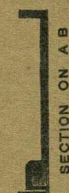
FINIAL

OF DOME

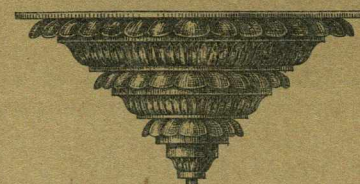
ELEVATION



STOPS IN CORNICE
 QUARTER FULL SIZE

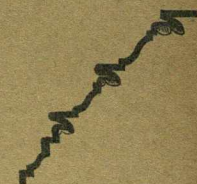


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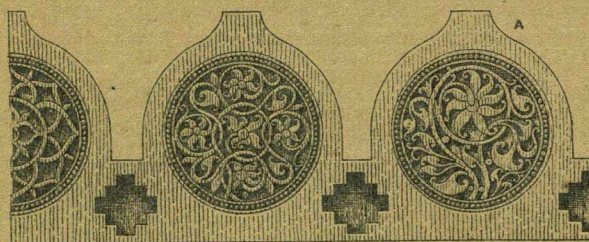


PENDANT IN DOME

ELEVATION



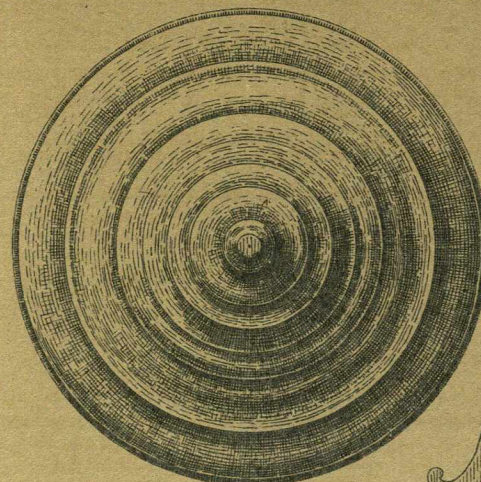
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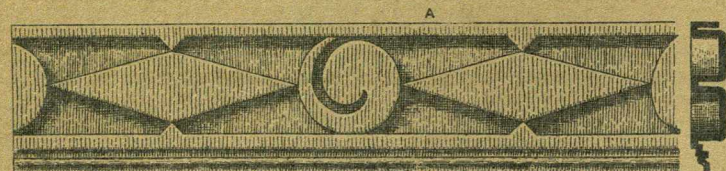
UPPER PART OF PARAPET
 ONE-EIGHTH FULL SIZE



SECTION ON A B



PLAN
 1 INCH SCALE



CARVING UNDERNEATH CHAPARI
 HALF FULL SIZE

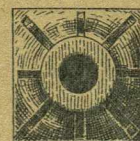
SECTION ON A B



CARVING IN PARAPET
 HALF FULL SIZE

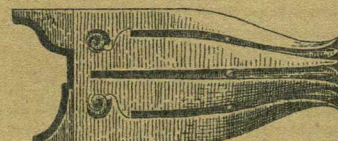


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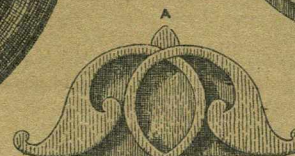


FRONT ELEVATION

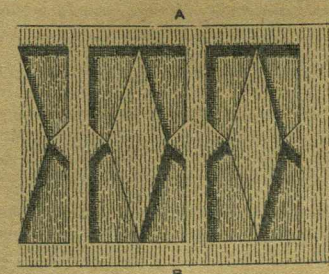
GORGOL IN CORNICE
 ONE-EIGHTH FULL SIZE



SIDE ELEVATION



STOPS IN CORNICE
 HALF FULL SIZE

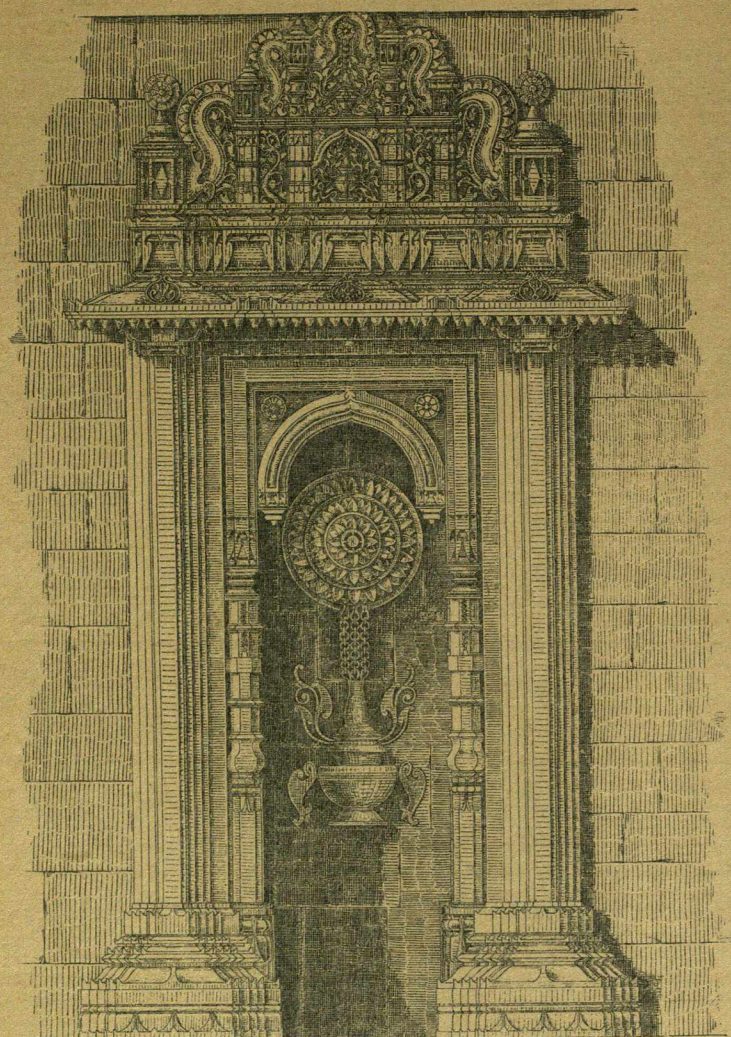


LOWER PART OF CORNICE
 QUARTER FULL SIZE

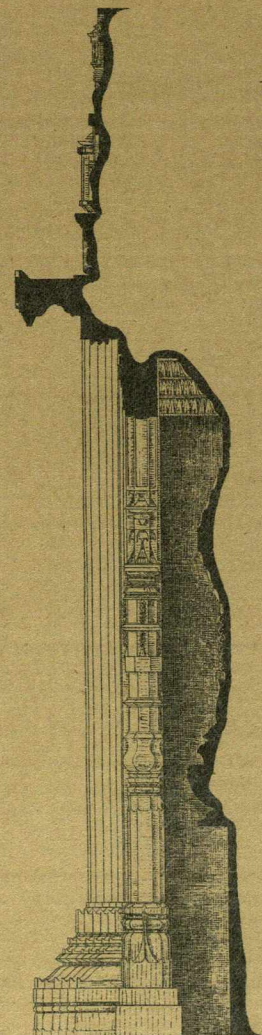
SECTION ON A B

DETAILS FROM UPPER PART OF THE MIHRAB.

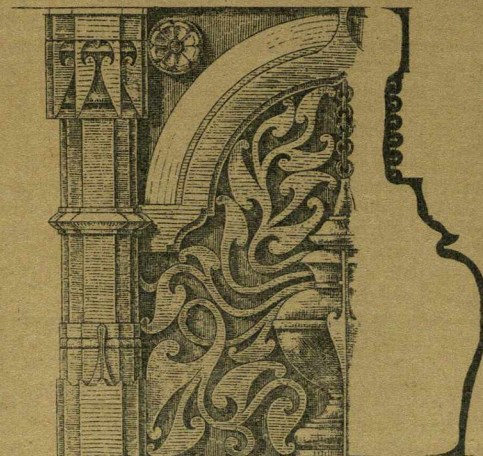
ONE-THIRD FULL SIZE.



ELEVATION



SECTION

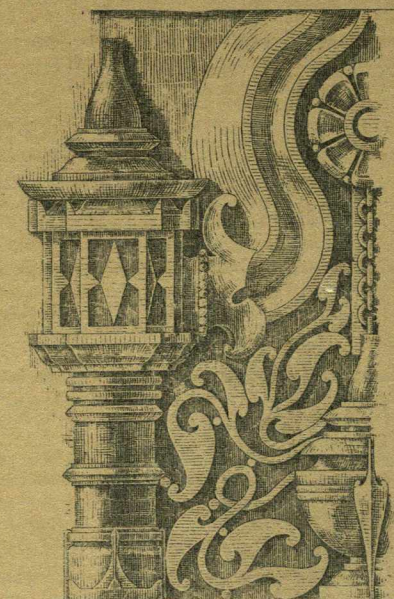


ELEVATION

SECTION



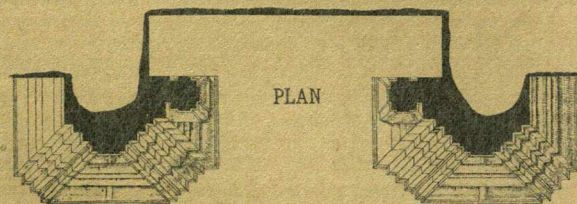
ELEVATION



ELEVATION

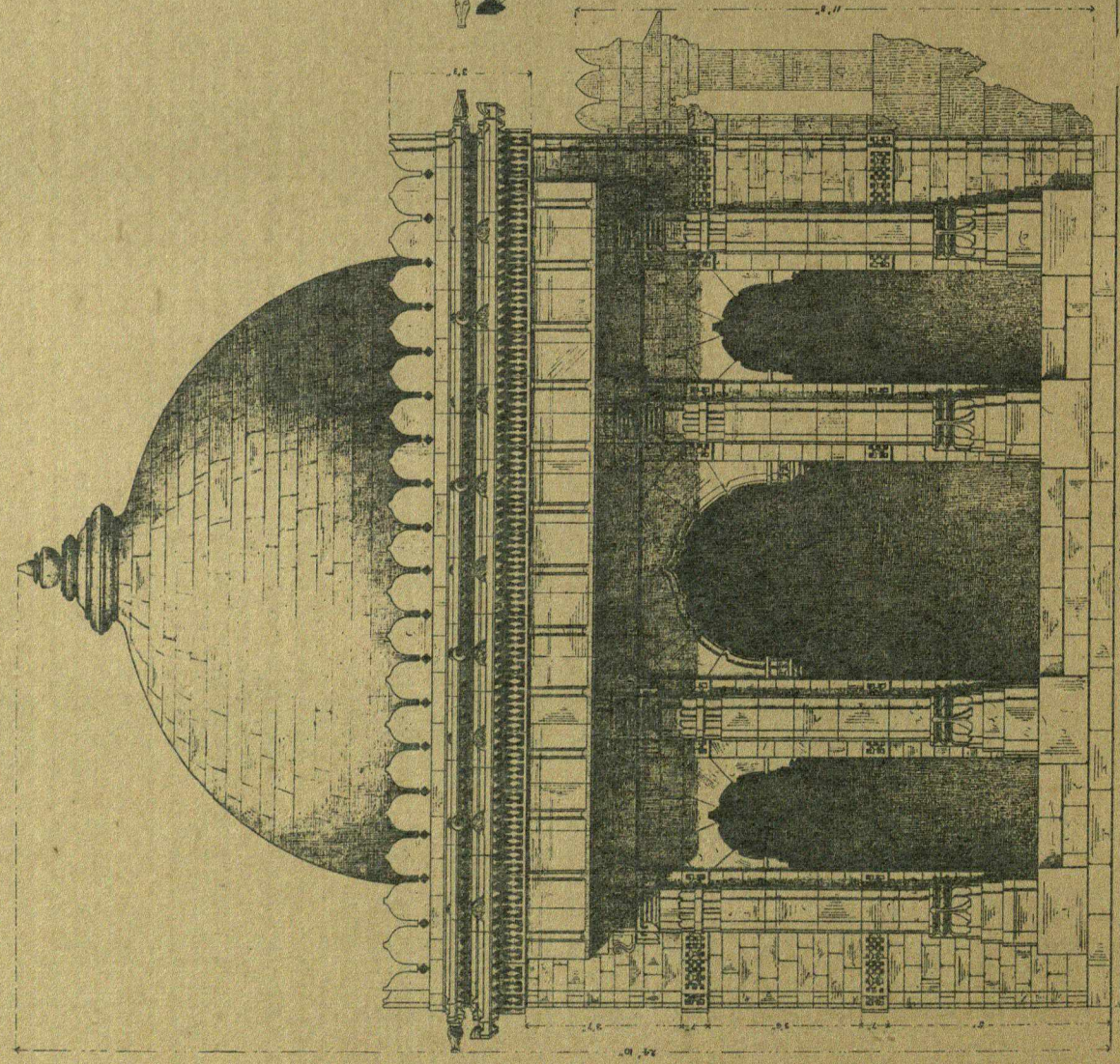


SECTION

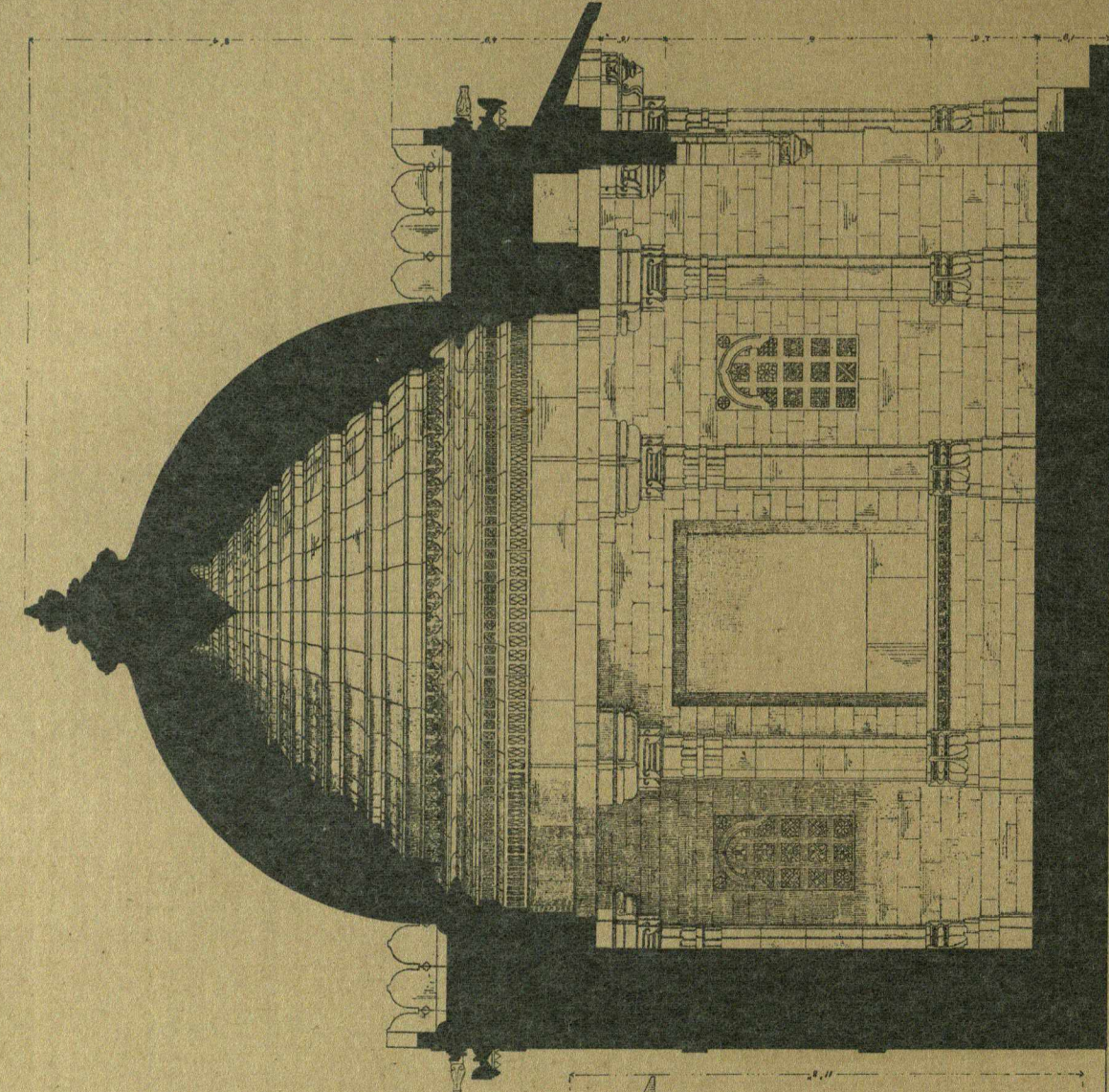


PLAN

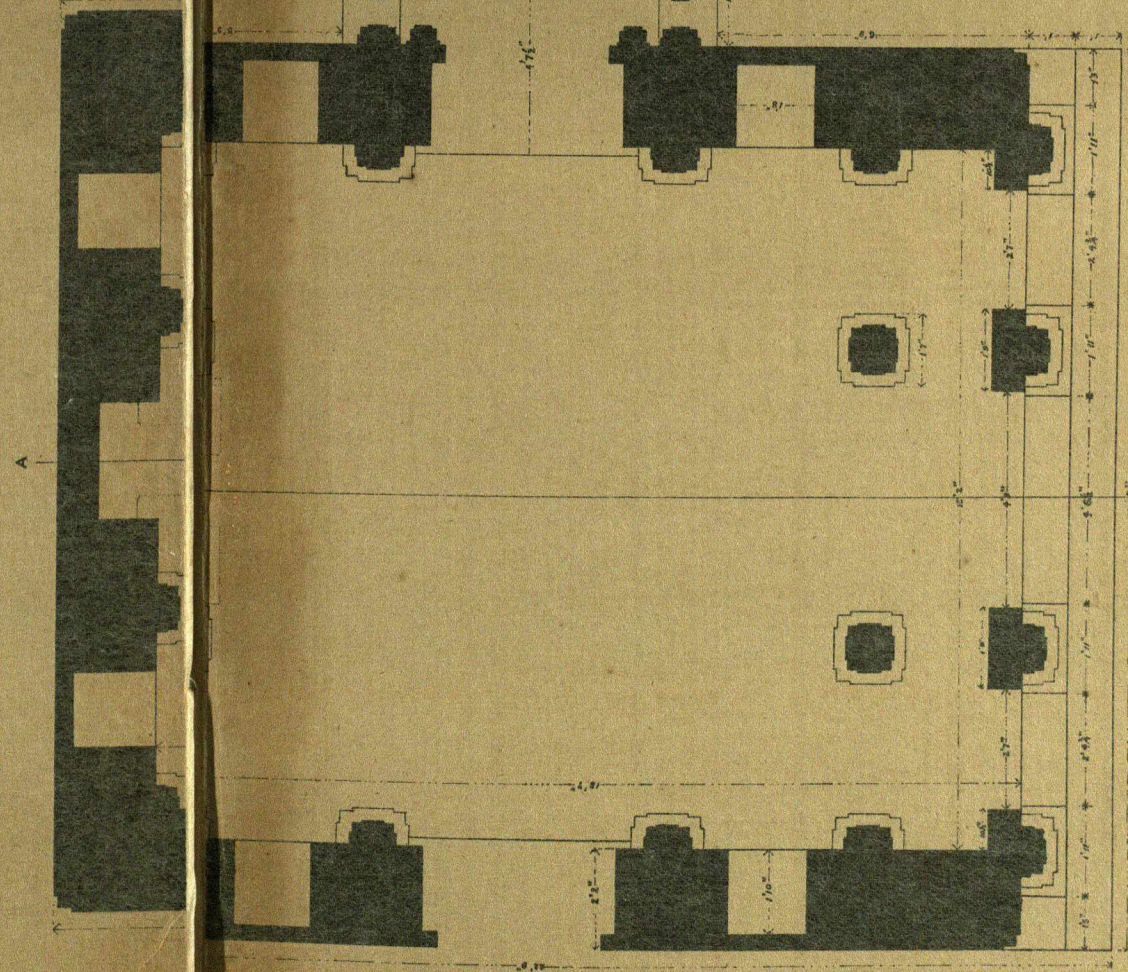
117



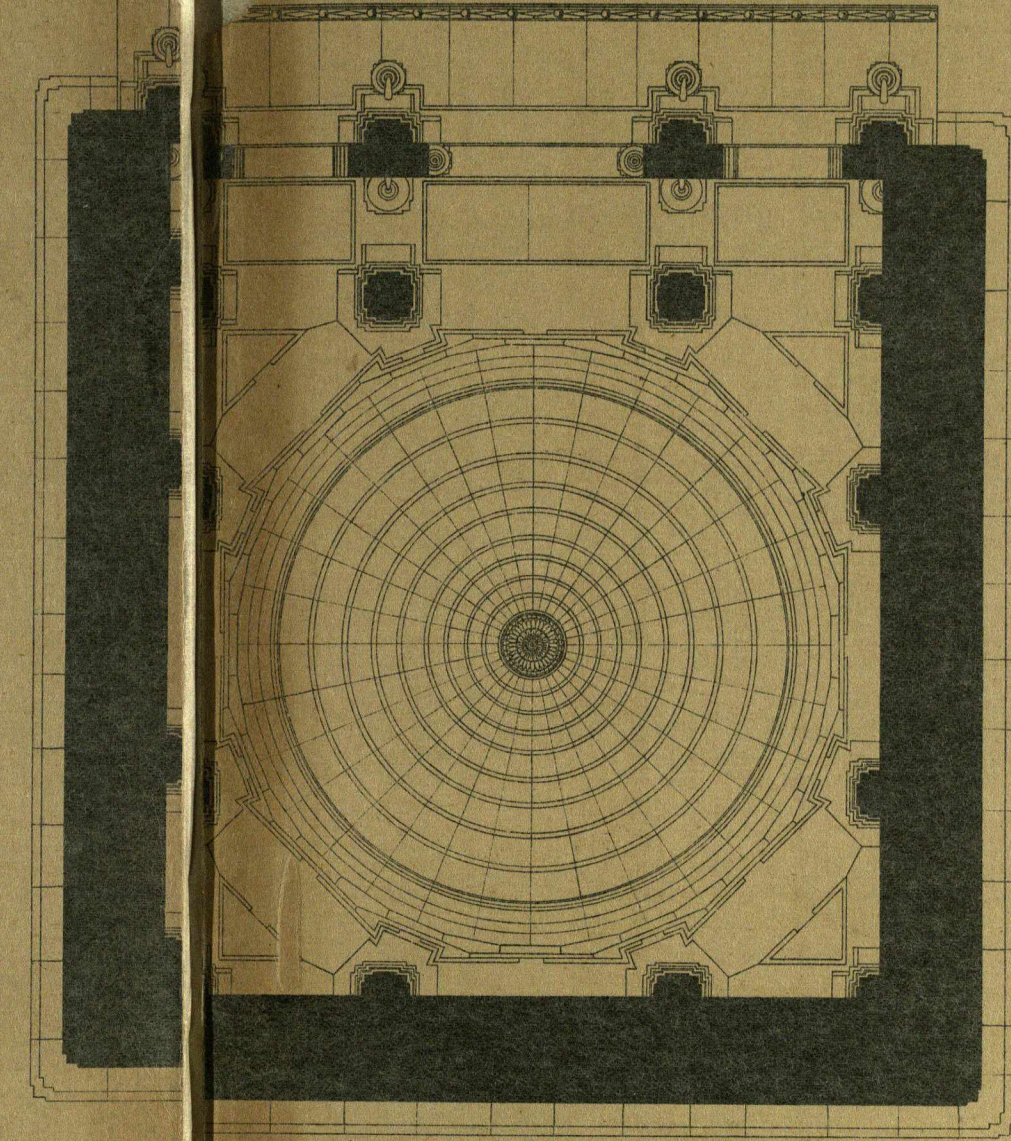
FRONT ELEVATION



SECTION ON LINE A.B.



GROUND PLAN

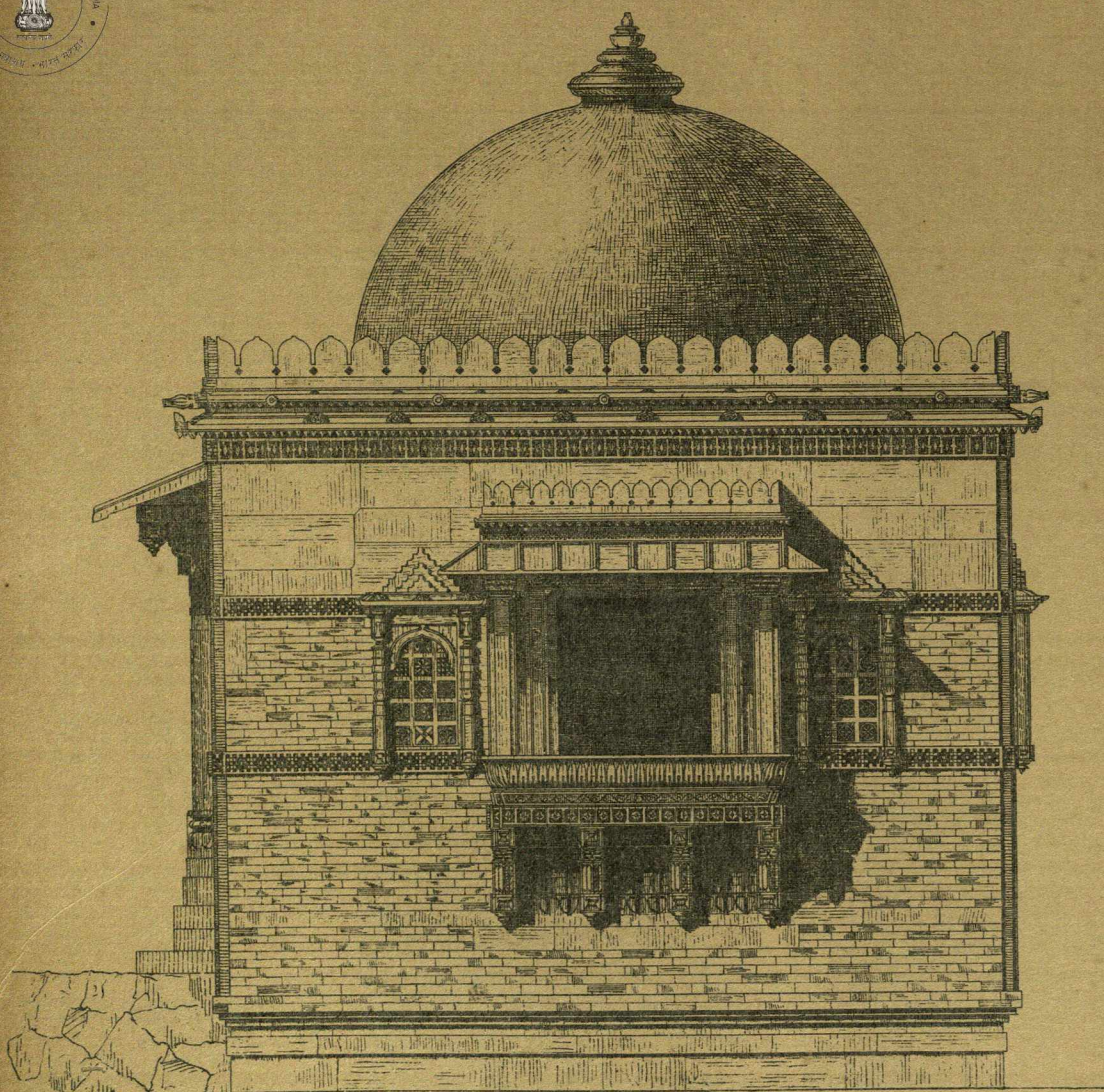


PLAN LOOKING UP

SCALE OF 1" = 10' FEET.

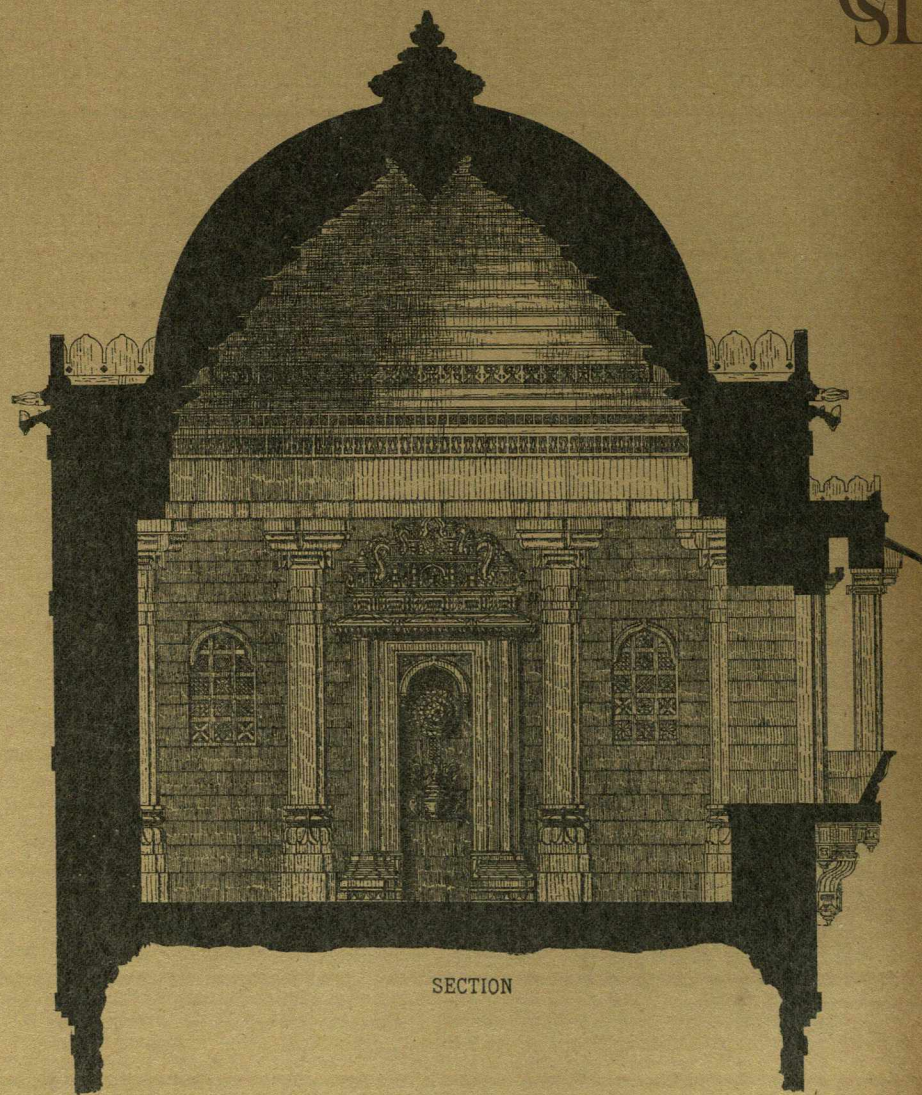
SIR J. J. SCHOOL OF ART,
BOMBAY, 1882.

MEASURED AND DRAWN BY
N. N. DESAI.



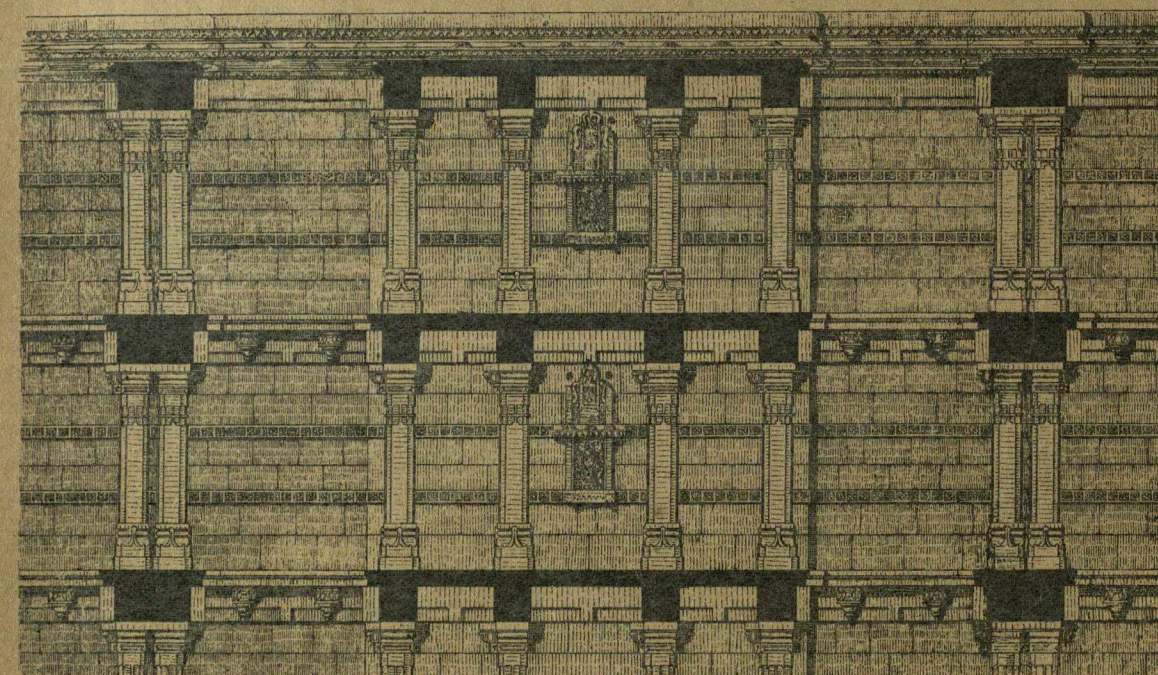
SIDE ELEVATION

SCALE OF 1" = 10' FEET

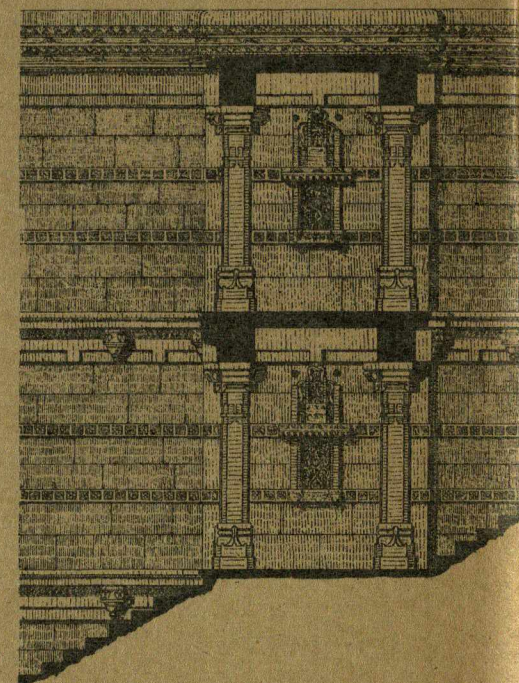


SECTION

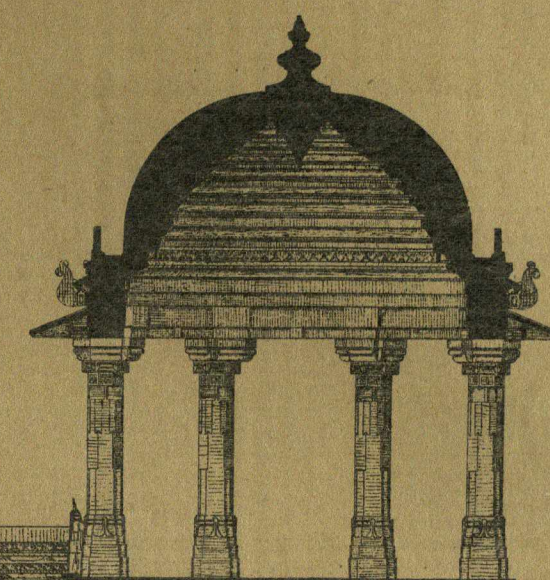
120



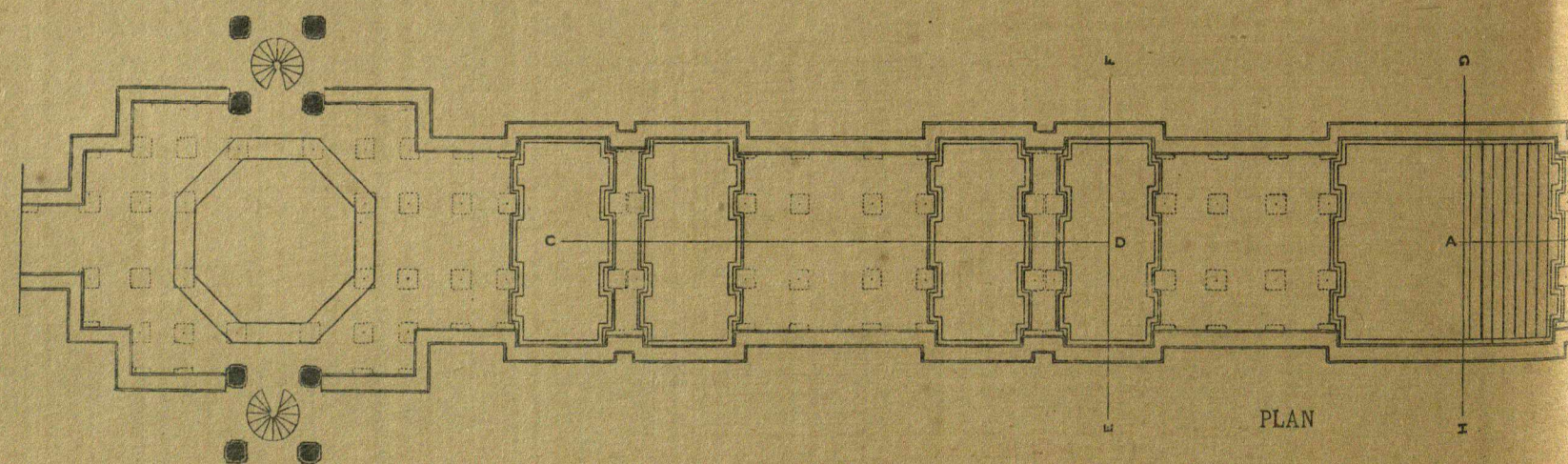
SECTION ON LINE C.D.



SECTION ON LINE A.B.

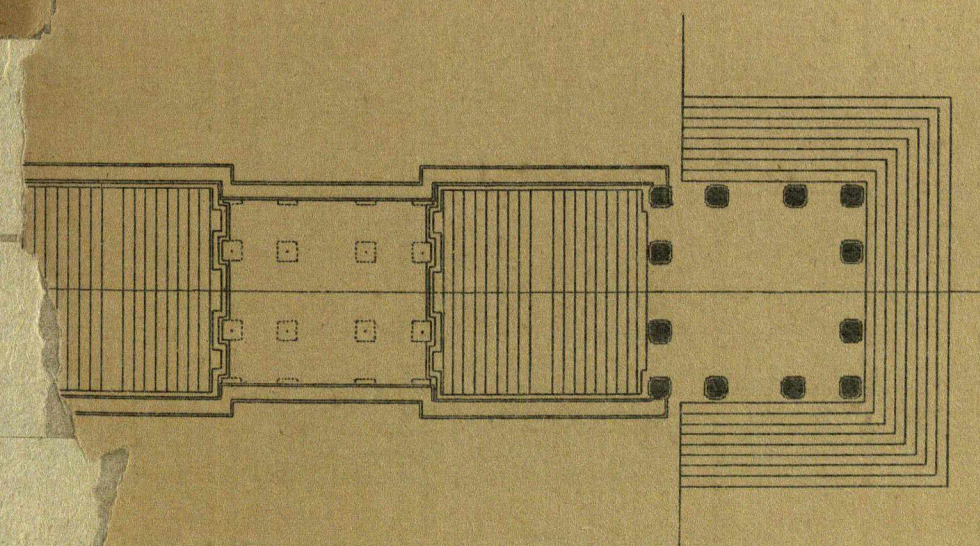


SCALE OF 1/4" = 1' FEET



PLAN

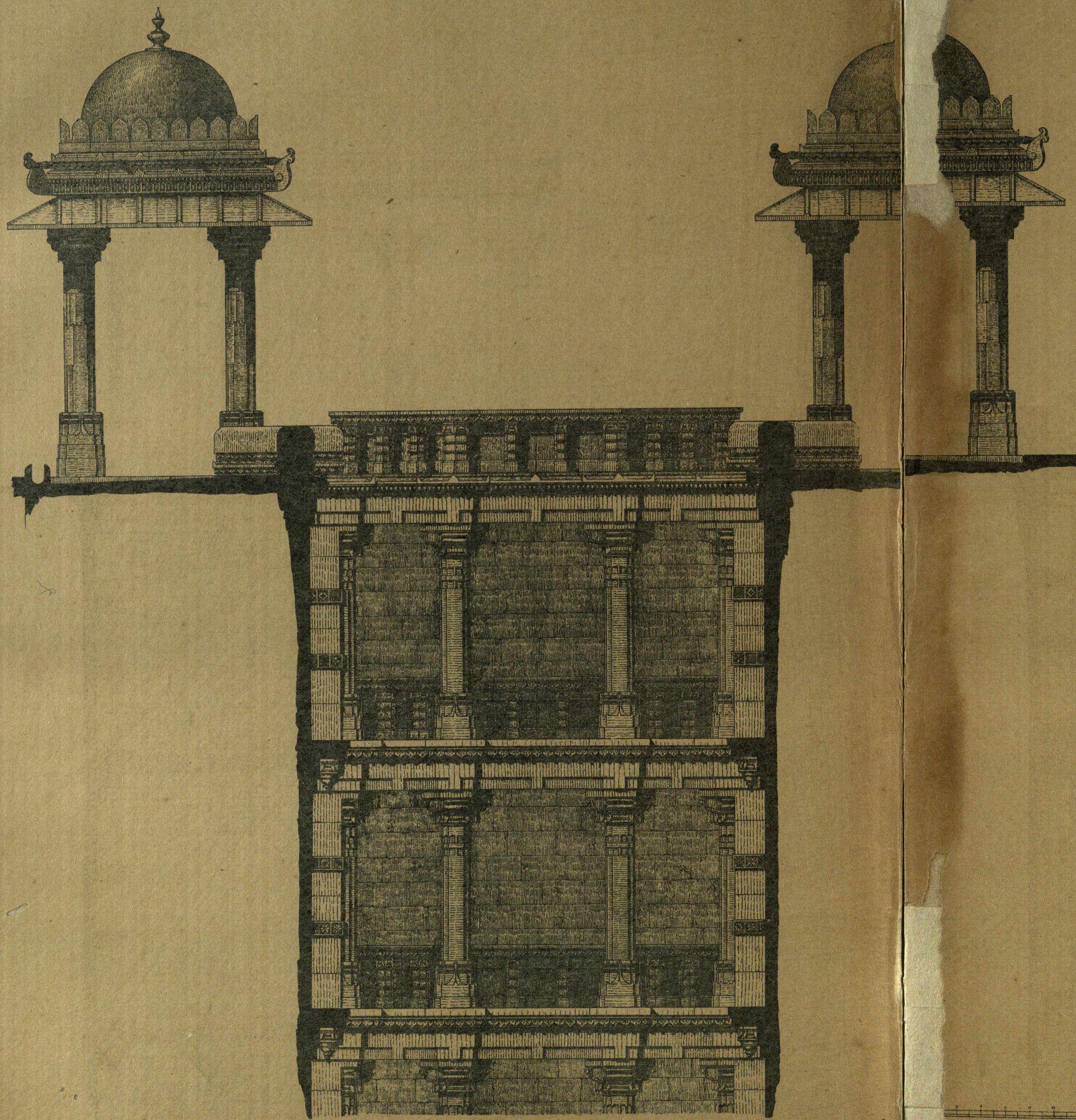
SCALE OF 1/4" = 1' FEET



B

SIR J. J. SCHOOL OF ART,
BOMBAY, 1884.

MEASURED AND DRAWN BY
N. N. DESAI.

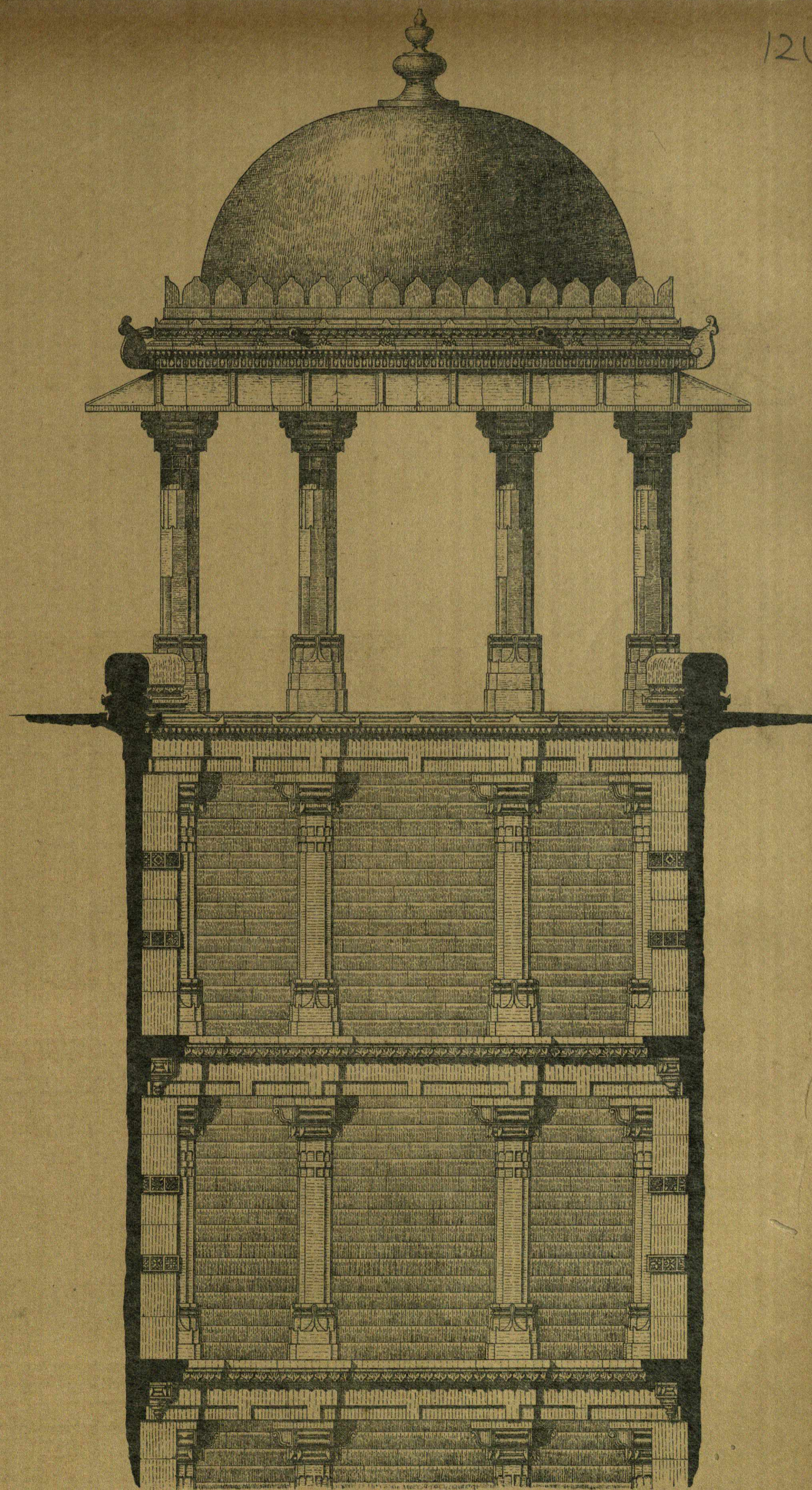
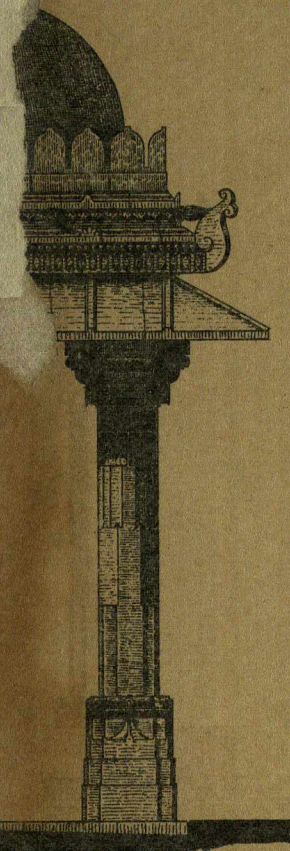


SIR J. J. SCHOOL OF ART,
BOMBAY, 1894.

SECTION ON LINE E.F.

SCALE OF

DETAILS FROM DADA HA



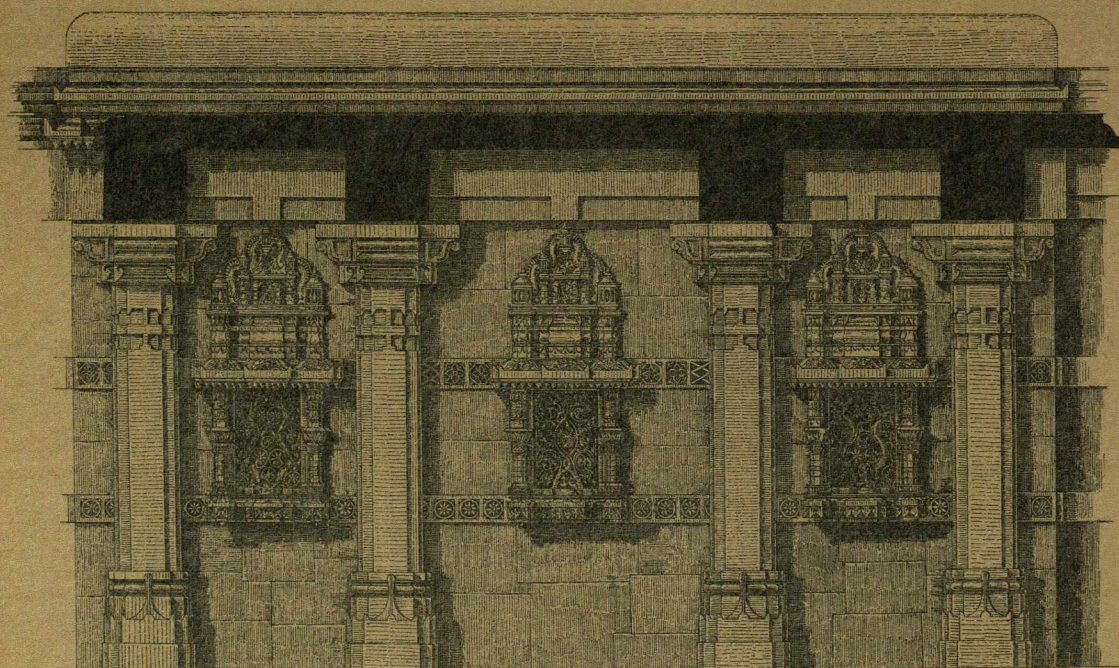
SECTION ON LINE G.H.

MEASURED AND DRAWN BY
RAMJEE JEEWN LOHAR.

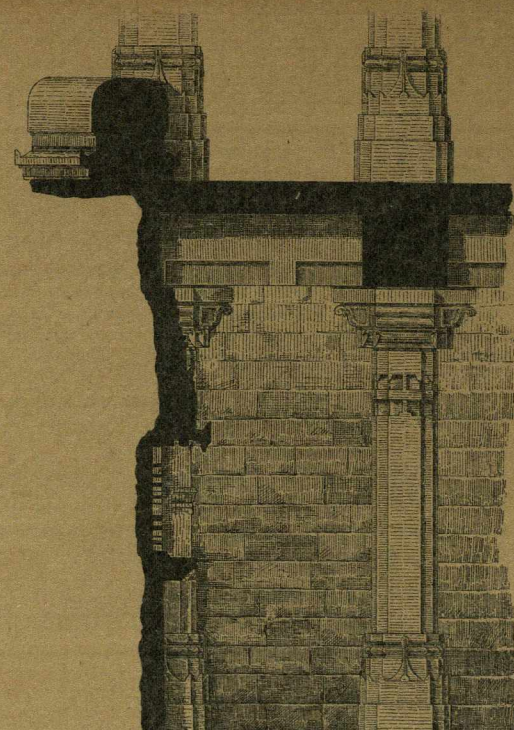
VELL, AHMEDABAD.



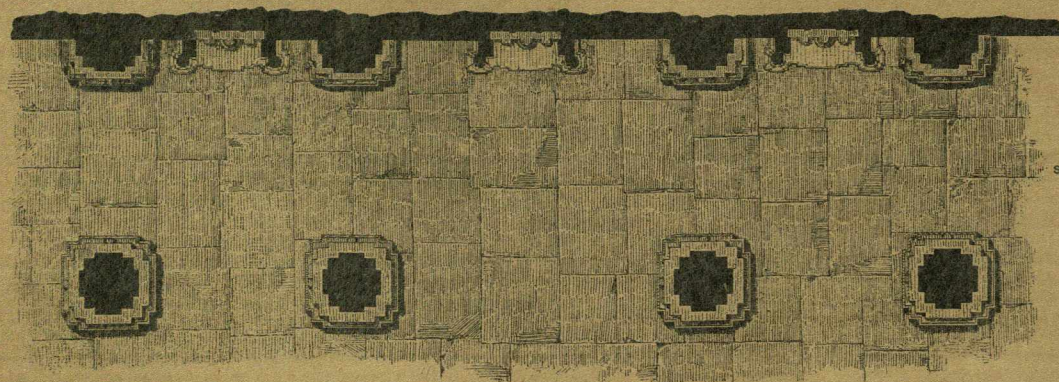
CSL



ELEVATION



SECTION



PLAN

SCALE OF 1:100 FEET

SIR J. J. SCHOOL OF ART,
BOMBAY, 1894.

78.

DADA HARI'S WELL, AHMEDABAD. Details of Chowk (Resting Place).

MEASURED AND DRAWN BY
S. J. FONSECA.

125



126 SL



SCALE OF 0 1 2 3 4 5 6 7 8 9 10 FEET

SIR J. J. SCHOOL OF ART,
BOMBAY, 1894.

79.

MEASURED AND DRAWN BY
J. COUTINHO.

DADA HARI'S WELL, AHMEDABAD. Details of Carved Panel in Chowk.

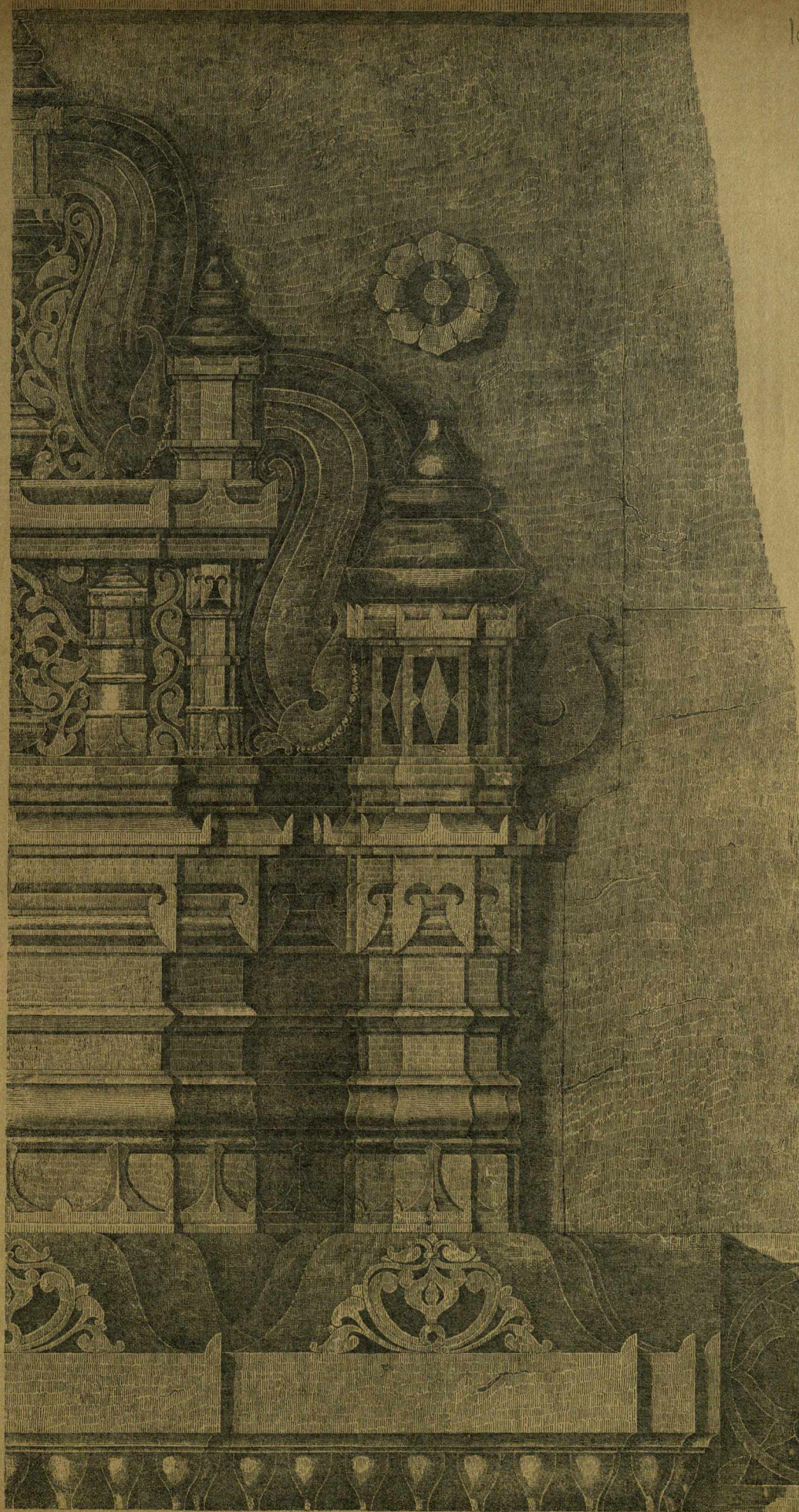


SCALE OF 1 FOOT



128

CSL



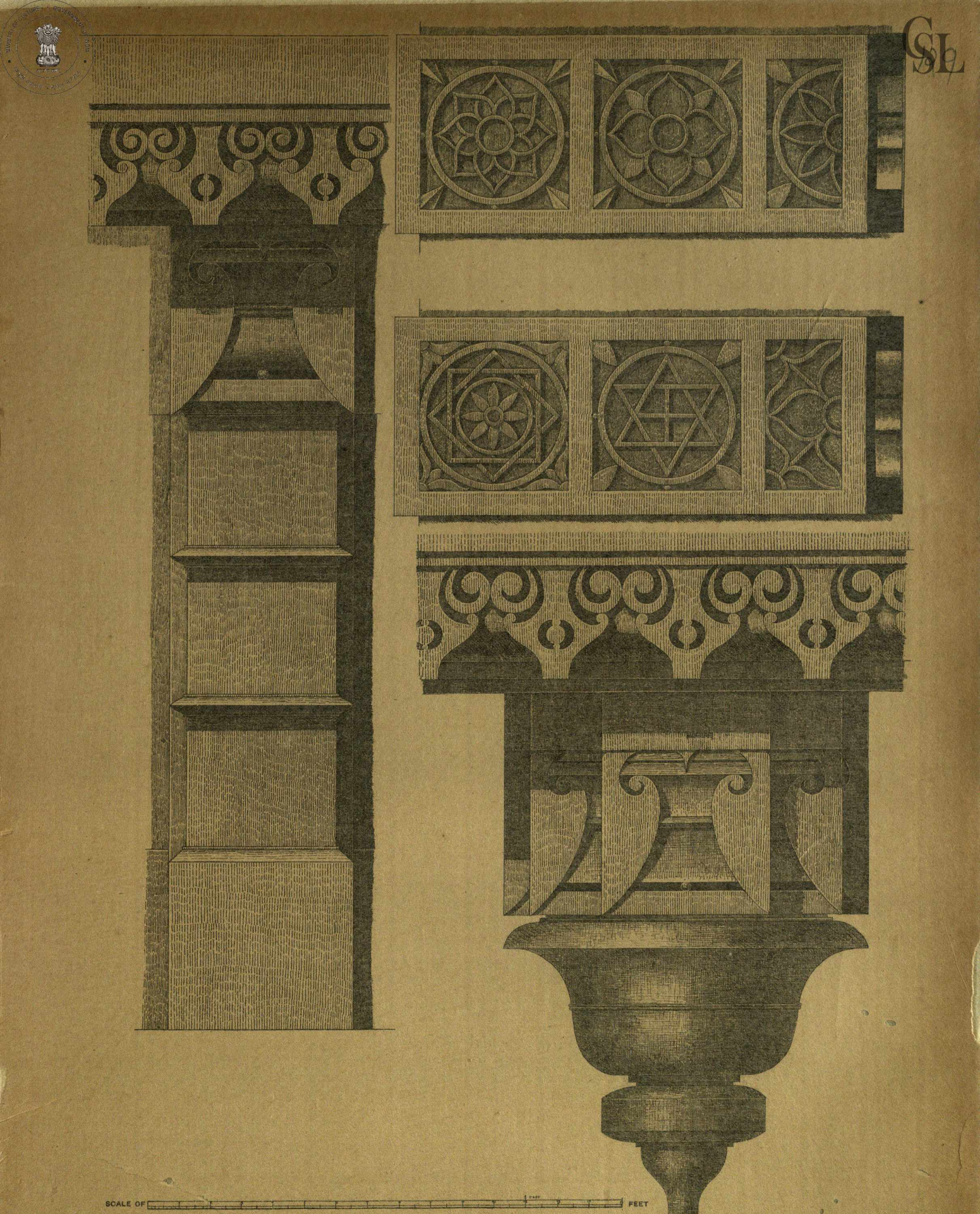
SCALE OF 1 FOOT

81.

SIR J. J. SCHOOL OF ART,
BOMBAY, 1894.

DADA HARI'S WELL, AHMEDABAD. Details over Carved Panels in Chowk.

MEASURED AND DRAWN BY
N. N. DESAI.





The Journal of Indian Art and Industry.

INDIAN ARMS AND ARMOUR.

In introducing to the reader's notice the series of plates of Indian swords, daggers, and other weapons, with some samples of defensive armour, to which the present number is devoted, it would serve no useful purpose to attempt anything like a complete account of the forms and history of Indian weapons, or of the technical processes still followed in their manufacture. There is already much available information on the subject. First and foremost is the excellent Handbook to the Indian Museum Collection, prepared by the Hon. Wilbraham Egerton, M.P. (now Lord Egerton of Tatton). There is also an interesting notice in Sir G. Birdwood's *Industrial Arts of India*. Some remarks of a general character will accordingly suffice.

The subject of Indian arms is full of interest; it involves so many peculiarities of native and perhaps very ancient custom, and takes us to so many different races and historical periods. Thus we have weapons of non-Aryan races which may be of great antiquity; and there are the varied and sometimes fantastic forms, which, however, are all based on a few simple, original patterns, which have been in use since the days of the first Moslem invasions, and have been but slightly modified among Rajputs, Sikhs, Mahrattas, and the Southern Muhammadans.

It is chiefly in the non-Aryan weapons that we see a general divergence of style from the later types. And we can mark the distinction between the weapons of the different ethnic groups which are generally recognized. Thus, in the north-east, we find the province of Assam with its little-known hill frontier to the north and east, and again on the south, and with an extensive central range of hills also; here the weapons of the TIBETO-BURMAN stock, to which the population belongs, are more or less distinctive. This same stock furnished, centuries ago, the basis of the Himalayan population, extending not only through Nepál to Kumáon but up to the far western end of the range. The Nepálese weapons are peculiar in form; but the people also are peculiar; the ruling caste is Aryan in origin, but there has been a great mixture of races, with some curious results described in the essays of the late Mr. Brian-Hodgson.

We have also relics of races conveniently distinguished by the term KOLARIAN (though the name in itself is open to objection). The Santhál tribes and the Hô and Mundá of Chutiya-Nagpur are ethnically distinct, although their peculiarities may be somewhat obliterated by mixture of race. The great Southern DRAVIDIAN races also produced special types of weapon, as they did of architectural and other ornament. A very ancient survival of this stock is the Khând tribe (Orissa States); and to it belong also the chief castes of Madras as well as the Coorgs and the Mysore people and the Malabár Náryars.

It will be observed that in some of the (non-Aryan) weapons there are traces of the savage cruelty of early warriors combined with the love of grotesque form,—which apparently indicates the idea of striking terror into the heart of the enemy. At the same time, many of these races are jungle-dwellers, and are continually under the necessity of cutting their way through bamboo thickets and dense undergrowth, as well as of clearing sites for dwelling or for cultivation; this necessity has gradually evolved different types of peculiarly shaped blades—often broad in the centre, or bill-hook headed, or loaded at the back,—especially adapted to jungle clearing. Not unnaturally, the fighting weapons have taken the same forms. Thus, in Plate 84, the square-ended Assam sword is very like the Burmese "dah" so largely used in cutting bamboo. To the same influences we may ascribe the broadened or loaded blades (see Plate 84, figs. 2, 3, 9, &c.). I even suspect the well-known Nepál "kukri" (Plate 84, figs. 4 and 6) to have had its origin as a lopping and jungle-clearing implement. The Nepálese had, it will be noticed, two striking forms of blade, both specially adapted to the "lopping" action, whether of heads and limbs or of branches! Compare the curiously curved "kukri" form with the swords on Plate 84 (figs. 10 and 13), where we have the upper end broadened and hooked; and notice the development into the still broader sacrificial sword or chopper, where the little round ornament of the blade becomes a completely drawn eye (Plate 85, fig. 32). A curious development of the principle of loading the back of a blade is seen on Plate 89, where the blade seems to be fixed on a heavy sort of bill-hook as a back piece.

Among the weapons of the more civilized warrior races, it will be observed that some are more for show than for anything else. The most deadly and cruel devices are to be found introduced into smaller hand daggers. A few remarks may be made on each main class of weapons of attack. We find them grouped under battle maces, battle axes, spears and halberds, swords and daggers.



The MACES are usually of heavy iron, the handle furnished with a thong to strengthen the grip, and sometimes with a hand-guard, which seems very inconvenient. The head consists of a series of blunt-edged radiating ribs, not for cutting but for a smashing blow. Sometimes the ribs are in a spiral form, and a spear point is added at the top (see good examples on Plate 88).

The BATTLE-AXES are sometimes heavy steel axes on the pattern of a wood-axe (Plate 89), others are sharp two-edged points, like ice-picks. Others are double-headed and with broad moon-like or crescent blades, behind which some beautiful open or incised metal work is introduced (Plate 91). Some of the heads are more or less grotesque. Very often the axe, or halberd, form, changes into that of a broad blade fixed on an iron stem (re-calling the scythes on poles used in peasant wars). In some cases this blade can be covered with an ornamental scabbard, and thus in a military procession, the weapon must have had a highly decorative effect.

SPEARS are not very numerously represented in the plates: the varieties appear chiefly among the savage races. In more chivalrous times, the type tended more to the uniform plain cavalry lance. Nothing resembling the heavy mediæval tilting spear of northern climates seems ever to have been used in India. In some cases there are two-pronged spear heads; and on Plate 93 is also a *trisul* or trident, which, I suspect, is rather a temple symbol than a real war weapon. Notice also the decorated spear heads on Plate 100.

SWORDS and DAGGERS.—By far the most artistic class of weapons (if we except, perhaps, the decorated matchlocks) are these. It may be observed that from very ancient times iron was known in most parts of India, from the Himalayas to Cape Comorin (see Watts' *Dictionary of Indian Products*, s.v. "Iron"). This iron is often of very superior quality, and being reduced (mostly without flux) slowly and at a low temperature, the result is a decidedly malleable iron, often naturally of a steely character. From ancient times the art of forging must have been considerably advanced, since we have great iron *lāths* or memorial pillars in several places¹ still intact. Indian iron blades can generally be tempered at the edge by plunging, while hot, into water. Steel is, however, locally produced: e.g., in South India, by cutting up small pieces of carefully hammered bar iron, and exposing them (with a proportion of a certain kind of wood cut small) in crucibles to a sufficient temperature. There is a detail of the process in the *Journal R. Asiatic Soc.* (V, 390). Indian steel has been called by the strange word *wootz*.² There is some confusion about the subject; no doubt "Indian" steel was early famous, but was it really "Indian," as distinct from Persian or Khurásán steel? Arrian speaks of *sideros indikos* as brought to the Abyssinian ports. Sir G. Birdwood remarks: "Indian steel has been celebrated from the earliest antiquity, and the blades of Damascus, which maintained their preeminence even after the blades of Toledo became celebrated, were, in fact, of Indian steel. Ctesias mentions two wonderful Indian blades which were presented to him by the King of Persia and his brother." The author goes on to explain that the *Ondanique* of Marco Polo's travels is a corruption of the Persian "*hindwāni*," i.e. Indian steel; and so the Spanish *alfinde* (alhinde), which now refers to the metal foil of a glass mirror, but originally meant polished steel. On the other hand, Mr. Purdon Clarke has proved as a fact, that European blades were largely imported into India during the Middle Ages, but the all *flexible* blades are probably really European. I believe that both accounts are true. Indian iron is of remarkably superior quality, and Beypur iron was used some years ago in the Menai Bridge and other works. But Indian steel or tempered iron is rigid, and never produces flexible blades. A glance at Plates 84 to 87 shows that Genoese (*Andrea Ferrara*), Solingen (German), and Toledo blades are found.

As to the general form—swords are usually slightly curved (*talwār*), or sometimes straight (*khirch*). Very large two-handed swords are found, but were used in athletic contests. The "gauntlet-sword" is peculiar to India. In one case the guard is quaintly fashioned into a tiger's head (Plate 86). These long blades are often of flexible German steel (one is inscribed as made by Abraham Stamm of Solingen). The collection includes a broad-bladed Rajput sword which has the traces of an inscription:—

...PRO-NOBI. | INTER-ARMA.
...NTRA-NOS. | SELENT-LEGES.

Some of the swords have slightly waved edges. The distinctly "flamboyant" blades are Malay, not Indian (Plate 85).

DAGGERS are of a few typical forms, but with many varieties in detail. There is the straight "Afghán" knife type; the blade has a rather broad back, with one sharp edge tapering to a point; some are small and can be used as daggers or as knives for ordinary use; others approach the dimensions of the sword. Straight daggers, or those with a very slight curve, are called *peshkabz* (Plate 87, figs. 25 and 26). Small daggers (often with guard handles) and curved (sometimes divided) blades, are called *bichhua* (or *bichhwa*), which means "scorpion." (Plate 87, fig. 19).

¹ That at Delhi is 16½ inches in diameter, tapering to 12 inches; the length is 23 feet 8 inches. The hand forging of this must have been no inconsiderable task.

² The origin of the evident corruption is unknown. Some suggest the Kanarese *wukku* (steel) or *uchhá* (used in Kanarese for "superior.")



The remaining typical form is a stout triangular blade, the handle consisting of two side-bars and a cross piece, which is grasped for a forward thrust. This form is always called *katár*. The type form is well shown on Plate 85, figs. 27 and 36.

These daggers often display very beautiful and tasteful workmanship, and sometimes very horrible devices to secure a deadly wound, as *e.g.*, the *katár*, of which the blade is made by a side spring to fly open, with three or five blades and points (Plate 84, fig. 16; Plate 85, fig. 13). In Plate 84, fig. 8, is a double *katár*, where the scabbard itself is a sharp dagger. In the Lahore Museum, I recollect a dagger in which along each side of the blade a groove had been cut out, and a row of small loose pearls inserted; this must have required very delicate workmanship. Sometimes daggers are attached to shields. In one case a pair of small antelope-horns, tipped with steel, have been connected with a handle, so as to give a dagger thrust right and left (bottom of Plate 97). A similar form, copied in steel, may be observed in the left-hand corner of Plate 99. Notice the cruel two-pronged *bichkwas* on Plate 97.¹

The scabbards of swords and daggers are usually of thin plates of soft wood, *sembal* (*Bombax Malabaricum*) or the *dhák* (*Butea frondosa*), and they are covered with leather or velvet; the covering is sewn not at the edge, but down the middle of one side, with ornamental stitches in gold and silver wire, &c. The hilt and point are often beautifully mounted into pierced gold and silver work, and ornamented with stones. The handles are made of metal, and sometimes of ivory, fish-bone, jade, &c., and more rarely of rock crystal or white clouded jade, decorated with inlay of gold and rubies. The blades are often beautifully "watered,"—strands of silver, gold, &c., being hammered in: damascene gold and incised ornaments are common. Hunting swords are often decorated with quaint figures of the chase, tigers, dogs, &c. (*shikárgáh*).

On Plate 101 (at the bottom) will be observed a horrible little implement, hardly to be called a dagger (of Mahratta origin); it is called "*wag-nakh*," or tiger's claw, being a series of sharp (and sometimes curved) blades attached to a bar, and held on the fingers by two rings, so that the weapon is hidden by the palm of the hand. With this weapon the founder of the Mahratta rule, Siváji, treacherously ripped up the Bijapur general, Afzal Khán, whom he had invited to a friendly interview, and whom he pretended to embrace on meeting.

A few words must be said about the FIRE ARMS, BOWS, and ARMOUR.

The more purely indigenous matchlocks are all very long-barrelled, and are fired with slow match and pan. Some have a curiously curved stock (these, I believe, are Bilúchi, or from the Western Frontier—see Plate 90). The barrels are often "watered," and sometimes beautifully damascened in gold. Sir G. Birdwood has figured in his *Industrial Arts* a specimen from the fine collection of H.R.H. the Prince of Wales, where the whole length of barrel is decorated with a singularly pleasing and suitable pattern of poppies and leaves, in gold.

I had the opportunity of seeing the curious production of the "watermark" in some barrels from Bajaur on the Frontier. Here a thin rod of soft iron (square in section) was first tightly twisted till it looked like a long screw. This was then coiled on to a mandrel, and another similar rod was coiled over that again, only in the reverse direction; the whole being heated, was slowly and carefully hammered together. The hammered surface showed a complicity of waves or wrinkles, the result of the various twist-edges of the rods. In another case I saw a barrel made out of a smooth, flat bar (about 1½ inches broad), which was slowly bent round into a close spiral tube—like a long wood-shaving—and this without the aid of any central shaft or mandrel. Over the tube thus formed, another coil (of thinner rod) was laid, and the whole being enclosed in a sort of ochre-clay matrix, was heated and hammered into a solid tube. These thick tubes are often lightened in weight and improved in appearance by being filed away into facets outside (*pahludár*). A rude, but not inefficient, process of "rifle-boring" is known (described in my "*Panjab Manufactures*," 1878). The collection here illustrated does not include the *arquebuss* form—a short-barrelled weapon with trumpet mouth, which scatters the charge of slugs, &c. This is appropriately called *sher-bacha*, or "tiger's cub."

Bows and ARROWS play a great part in ancient literature, and there is even a *Dhanus Veda*—a sort of supplementary "Veda" on the subject of the bow and its use (*Dhanus*, Sansk:=bow).

I have seen bows in one piece, and of a simple arc form like our own; but the commoner form is that of the "Cupid's bow" (Plates 96 and 100). This is made by the "*Kumángar*" in several pieces. A centre piece (sometimes of horn or other hard material) is taken, and into each end a shaped piece of mulberry wood, carefully and neatly tipped with horn, is inserted; the parts are strongly joined together with bindings of thin strips of raw hide or catgut, and the whole is painted and covered with little flower-patterns, and finally varnished. The string is of thick twisted crimson silk, ending in catgut loops. These bows are still presented on ceremonial occasions by the Chiefs of the Simla Hill States. The arrows are made by a special craftsman (*tírgar*). The shaft is a

¹ In Plate 94 will be noticed another instance of a natural object made into a weapon—the head bone of the saw-fish mounted as a sword. This, of course, is rather fanciful than for use.

light reed (*Saccharum*, sp.) tipped with a solid iron point (*phal*), and flighted with *four* wings of a close gray feather of a bird called 'ukáb.

The ARMOUR and SHIELDS naturally give the greatest scope for art display, but the general forms observed are very few. Chain armour (*sira*) is sometimes worn under the plate armour (presently noticed), but is often worn alone. Occasionally specimens occur of chain work strengthened with little bars and plates of iron (see Plate 88). Most of the chain work (interwoven rings) is rather coarse, but Sir G. Birdwood mentions a suit as "fine as lace," made in Kashmir (in the Prince's collection). The work came from Persia and Circassia originally. Another curiosity is mentioned by Birdwood, being the adaptation of the horny scales of the Indian armadillo (*Manis pentadactyla*) to a coat of mail; the scales are here incrustated with gold, and decorated with garnets and turquoises.

The most ornamental form is the plate armour or *chára'ina* (=four mirrors); it consists of two larger oblong plates worn back and front, and two smaller side-plates, the upper edge curved downwards to allow for the movement of the arms; the pieces are attached with small leather straps and buckles. The suit is completed by armlets, which open with a long side-joint or hinge, and the hand is protected by a shaped flap of the chain work. The legs, if protected at all, were so by chain armour breeches. It is unfortunate that in this series there is no illustration of the remaining member of the armour, viz., the completely circular or pot-shaped helmet, sometimes fluted like a melon. On the top this is adorned by a small central tube (sometimes three of them) to hold the slender "onkár" plume of three black (metallic lusted) feathers brought from Kashmir. Sometimes artificial "egrets," made up with pearls, &c., are used. The sides are protected by a curtain of chain-armour, and a curious nose-guard—a thin bar, terminating in a triangular piece—is fastened in front, and so contrived as to slip up and down at the wearer's pleasure. Common soldiers wore simpler skull-caps, surrounded by chain-armour (Plate 88). The plates, gauntlets, and helmet are all beautifully damascened with inlaid gold work (*koft*) (Plate 103).

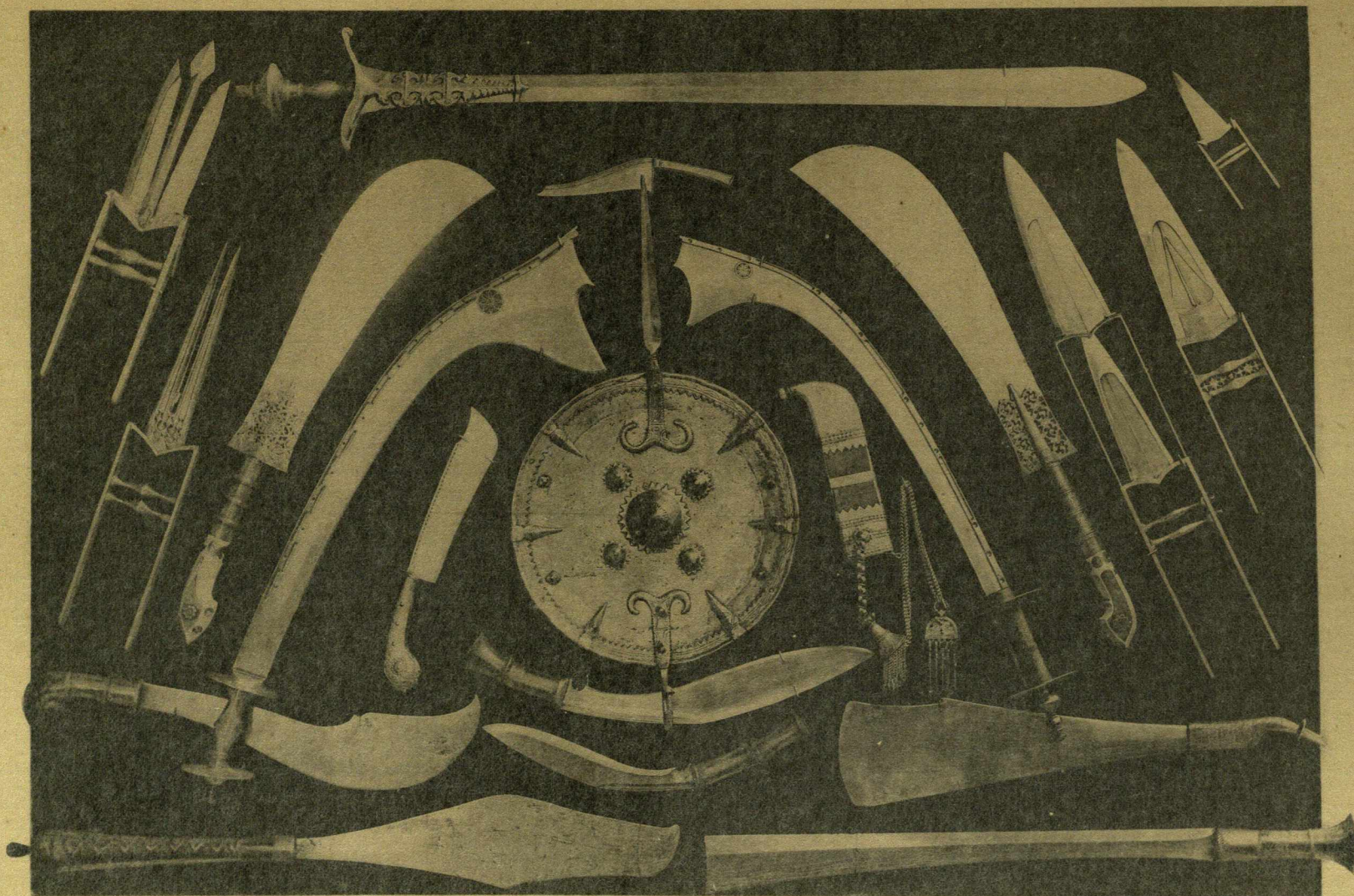
SHIELDS are nearly always circular. Some tribes (*e.g.* Bilúchis) use quite small and light leather (brass studded) shields, the rapid and adroit use of which along with the sword is part of the art of fence. The larger shields (*dhál*) are as much for ornament as anything else. They have always one or more central bosses, or raised studs, sometimes of gold and jewelled. Shields are either of black polished hide, or more rarely of a beautiful translucent material of a golden brown colour, which is said to be rhinoceros hide prepared in a peculiar manner and varnished. These are now very difficult to get. In Ajmer, painted (leather) shields are made (see a drawing in colours from Ajmer, *Journal of Indian Art*, Vol. III). The polished iron (or blue-coloured) and damascened shield is the most usual for ceremonial or ornamental use. Plate 104 shows two shields of this kind of Northern work (Gujrát and Sialkot in the Panjáb). One of them is rather spoiled by an attempt at a raised gold ornament in a modern and non-Indian style; a much better design is that on Plate 103.

It will be interesting when, some day, some antiquarian is found to reproduce the various *ancient* forms of weapon as they appear in the sculptures. The *Agni Purána* has an elaborate classified account of arms.

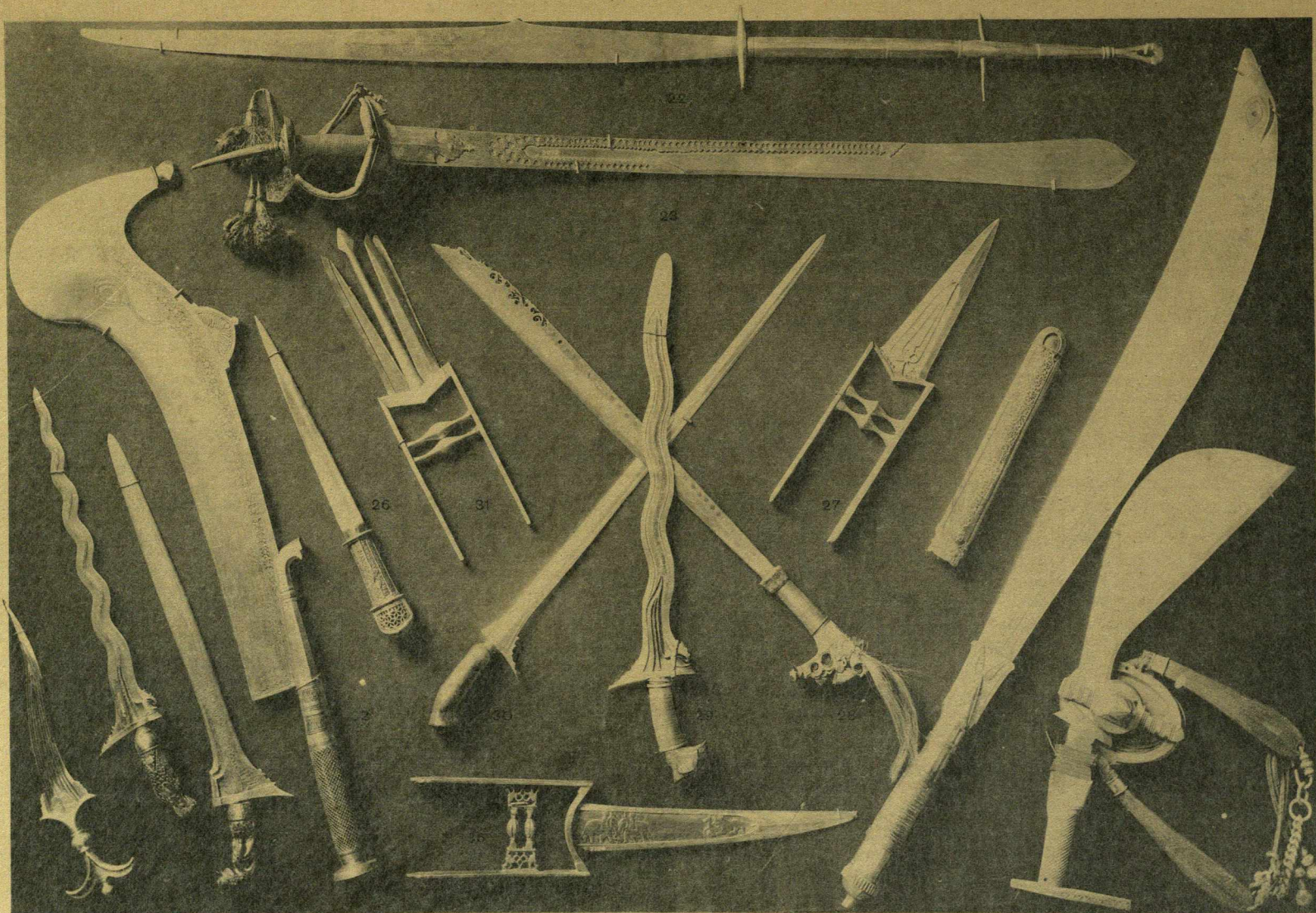
LIST OF ILLUSTRATIONS.

Twenty-one full-page Plates, illustrating INDIAN ARMS AND ARMOUR.

Plates 84—87 give, with the aid of attached numbers, the typical forms. The remainder (Plates 88—104) represent the beautifully grouped arms exhibited on shield-panels in the Indian and Colonial Exhibition of 1886. It is impossible to describe each weapon in these groups; but the most interesting forms will easily be identified by aid of the four plates of which the details are given. These were prepared by Mr. Purdon-Clarke for a loan Exhibition at the Armourers' Company.

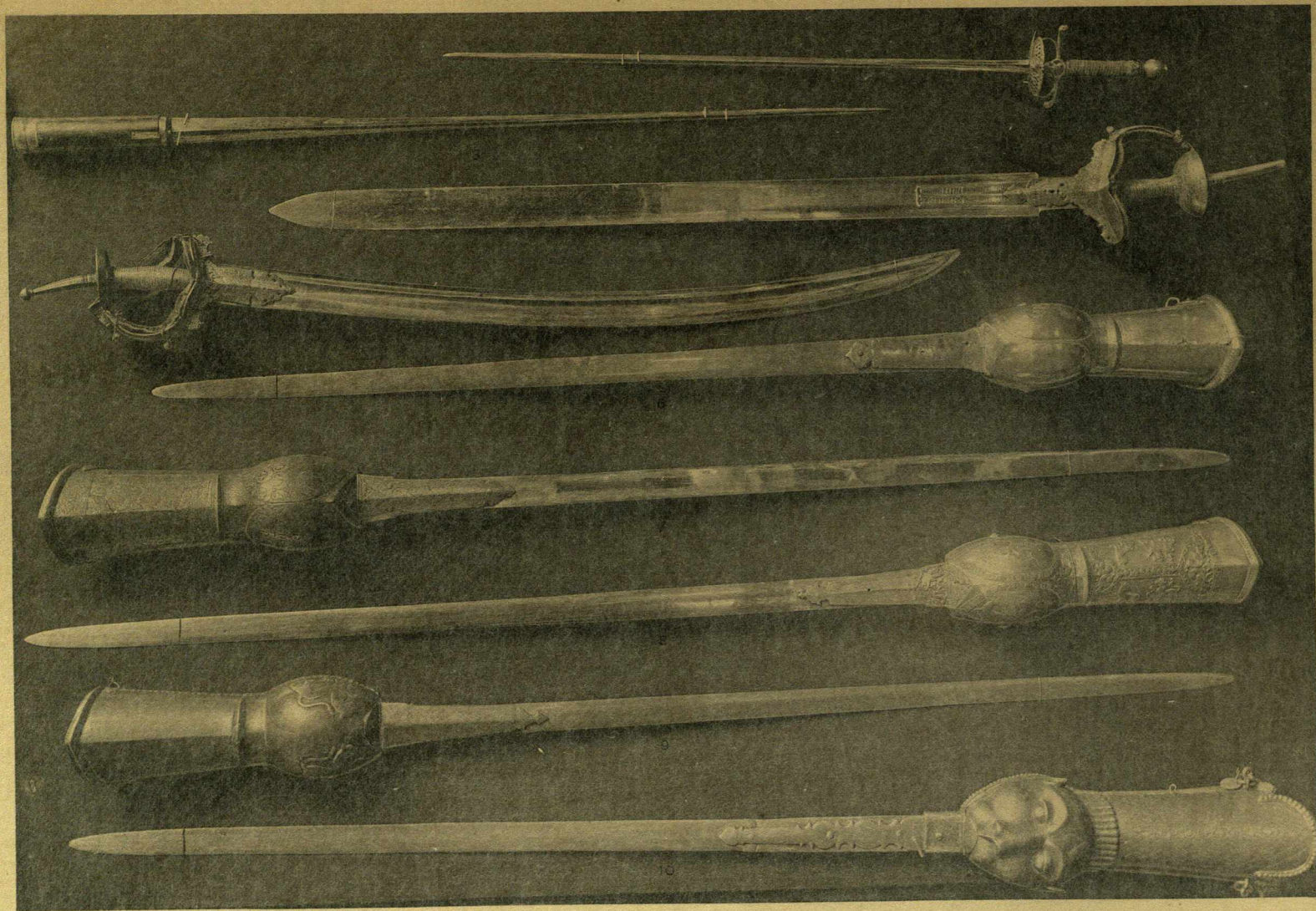


84.—1. SWORD, brass mount, plain square end. *Assam*. 2. SWORD, with broadened diamond-shaped blade. *Cachér, Assam*. 3. Another Cachér sword. 4. "KUKRI." Curved brass blade, with steel edge. *Naipál*. 5. Broad-bladed SWORD. *Burmese*. 6. Decorated steel "KUKRI." *Naipál*. 7. "KATAR." Blade chiselled and damascened. *Lahore*. 8. DAGGERS, "Katár." The upper one hollowed and forming a sheath for the lower. 9. SWORD. Broad blade, with open-work brass mount and ivory handle. 10. SWORD. Curved blade widening towards the end, grooved. *Naipál*. 11. SHIELD. Circular, hammered steel. *Santhal*. 12. DAGGER AND SHEATH. Broad blade, the handle and sheath of chased silver. *Kúrg*. 13. SWORD. Curved blade widening towards the end, back grooved. *Naipál*. 14. SWORD. Broad blade, with open-work brass mount and ivory handle. *Malabar*. 15. DAGGER. "KATAR." Deeply-forked grooved blade, handle damascened. *Jháláwár (Rajputana States)*. 16. DAGGER. "KATAR." Blade dividing into five portions with a spring. 17. KNIFE. White bronze. *Travancore*. 18. SWORD. Long double-edged Roman-shaped blade, handle and mount gilt. *Ancient Naipálese*. 19. DAGGER. "KATAR." Handle damascened.

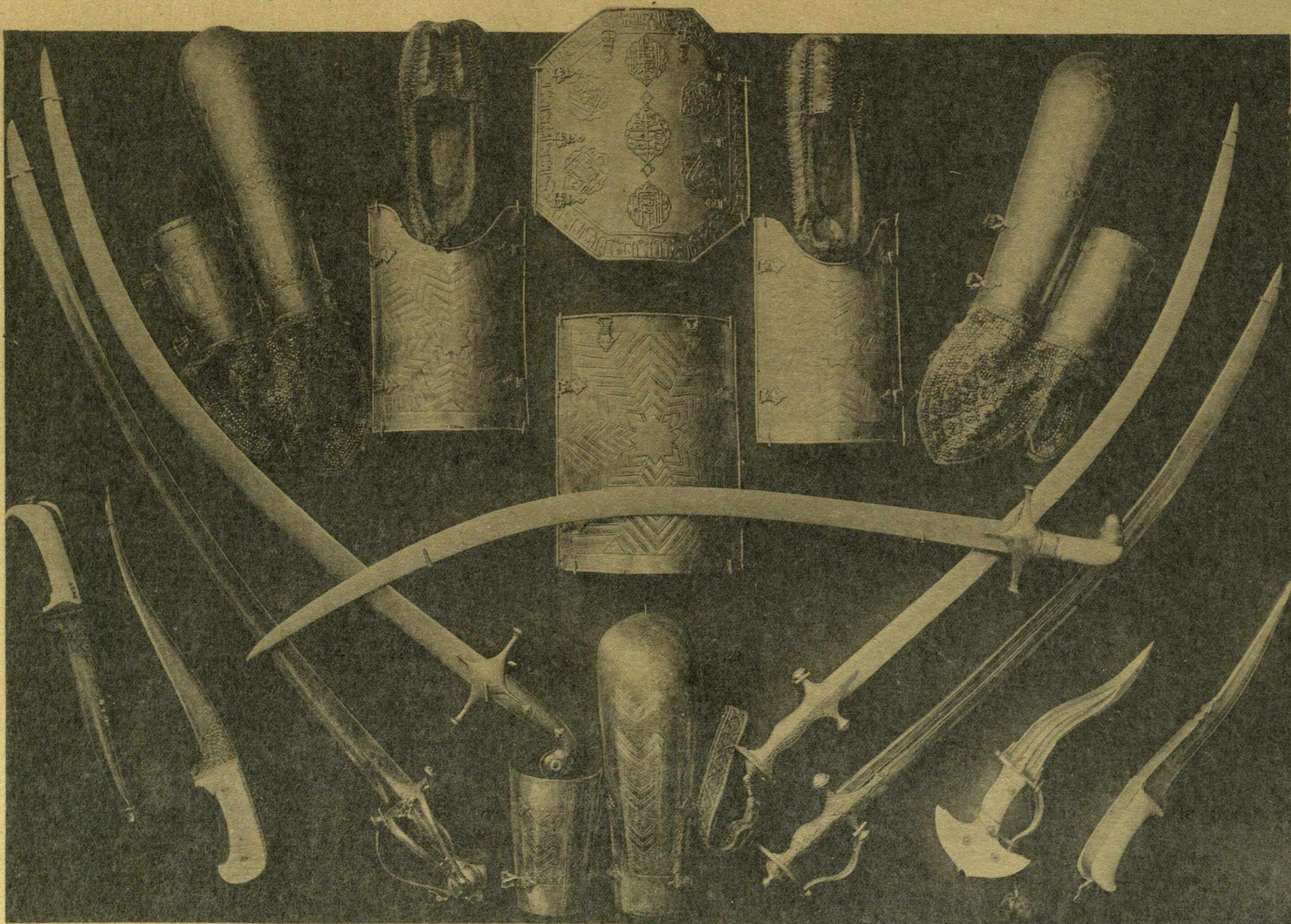


85.—22. SWORD, two-handed, of soft steel, with brass mounts. *Khasia Hills, Assam.* 23. SWORD. Damascus blade, with open-work damascened side-plates and basket-hilt. The National sword of Orissa. *Gwalior.** 24. SWORD. Broad curved blade, with belt, silver chains, and brass guard. *Kúrg.* 25. AXE, Sacrificial. Steel, inlaid with brass. *Naipál.* 26. DAGGER AND SHEATH. The sheath ornamented with silver open-work; brass hilt. *Darjeeling.* 27. DAGGER, "KATAR." Grooved steel blade. *Panjáb.* 28. SWORD. Blade ornamented with open-work; the handle of carved bone. *Assam.* 29. DAGGER, "KRIS." Undulating grooved blade. *Singapore.* 30. DAGGER, "KRIS." Straight narrow blade. *Malay.* 31. DAGGER, "KATAR." Blade dividing into five parts. *Patiála.* 32. AXE, Sacrificial. Broad curved blade. *Naipál.* 33. DAGGER, "KRIS." Straight watered blade. *Malay.* 34. DAGGER, "KRIS." Undulating blade. *Malay.* 35. DAGGER. Doubly curved blade, hilt silvered. *Vizianágram.* 36. DAGGER, "KATAR." Blade chiselled in low relief. *Lucknow.*

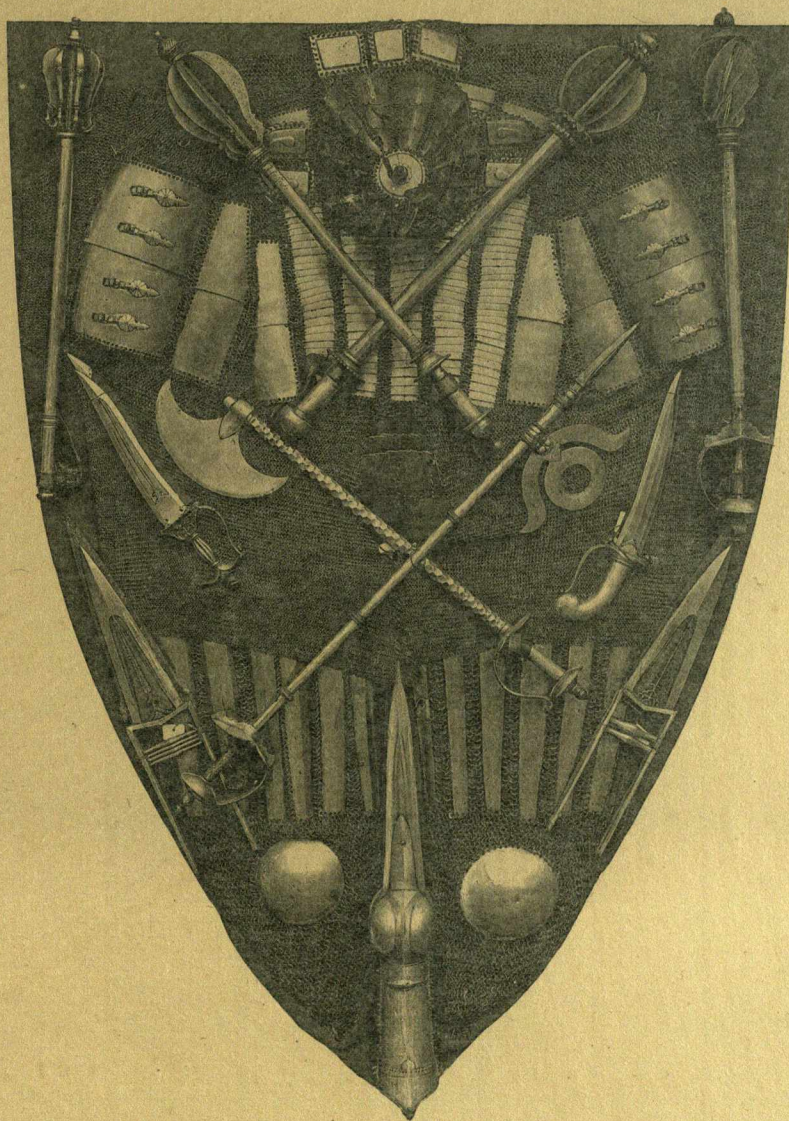
* This may be supposed to be a Rajput sword captured from Orissa, and taken to the fortress of Gwalior after one of the Mahratta raids.



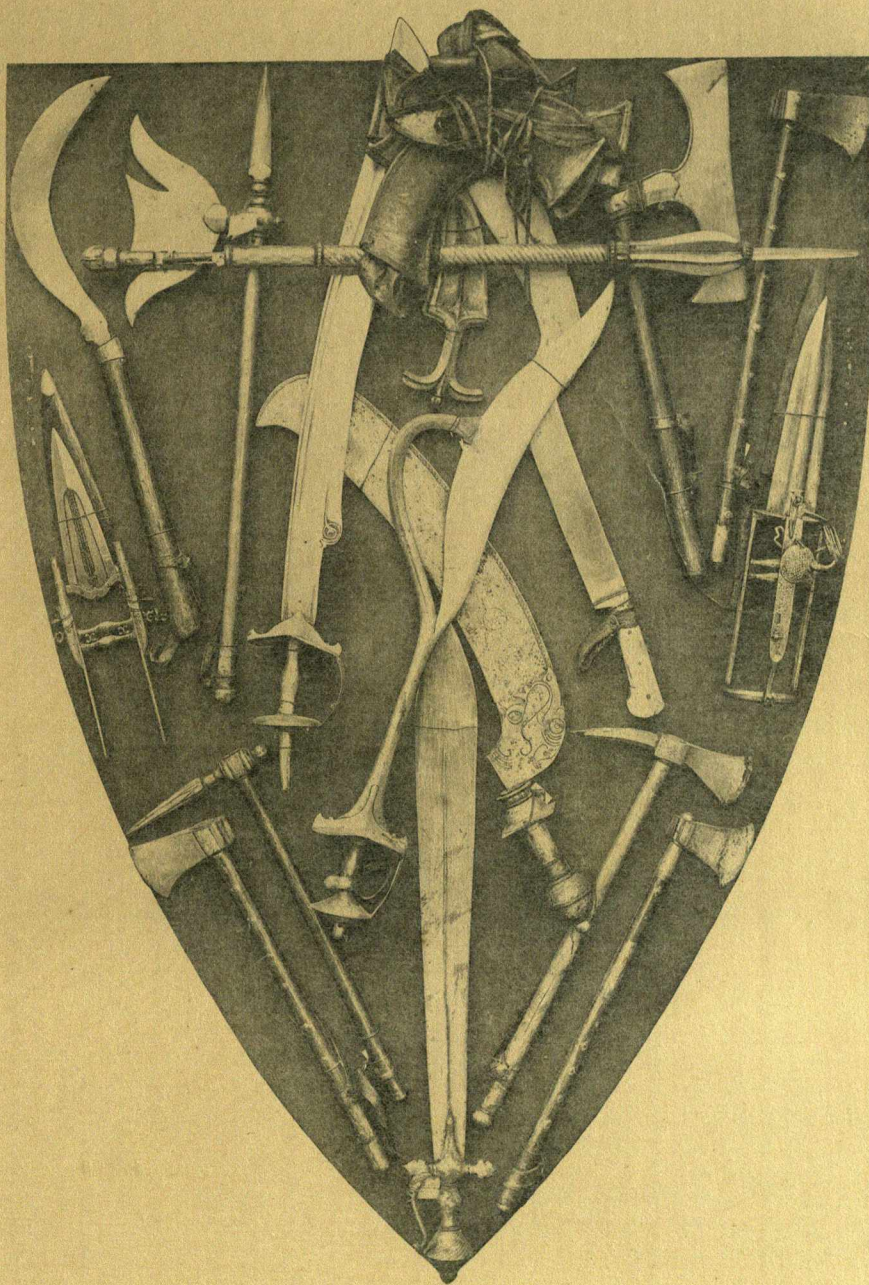
86.—2. RAPIER. Steel open-work hilt. Inscribed "FRANCISCO RUIS EN TOLEDO." *From Jeypore.* 3. SWORD-STICK. English rapier blade. *Delhi.* 4. SWORD. Broad blade, with inscriptions in Latin and German; hilt damascened. 5. SABRE, with broad fluted blade; hilt damascened. 6. GAUNTLET-SWORD, with flexible blade inscribed "ABRAHAM STAMM IN SOLINGEN." *From Indore.* 7. GAUNTLET-SWORD. European blade; gauntlet damascened. *Hyderábád.* 8. GAUNTLET-SWORD. European blade, with inscription; the gauntlet embossed and gilt. *Oudh.* 9. GAUNTLET-SWORD. European blade; the gauntlet chiselled with lions rampant. *Taken at Lucknow.* 10. GAUNTLET-SWORD, with European blade; gauntlets of brass, with the base in form of a tiger's head. *Oudh.*



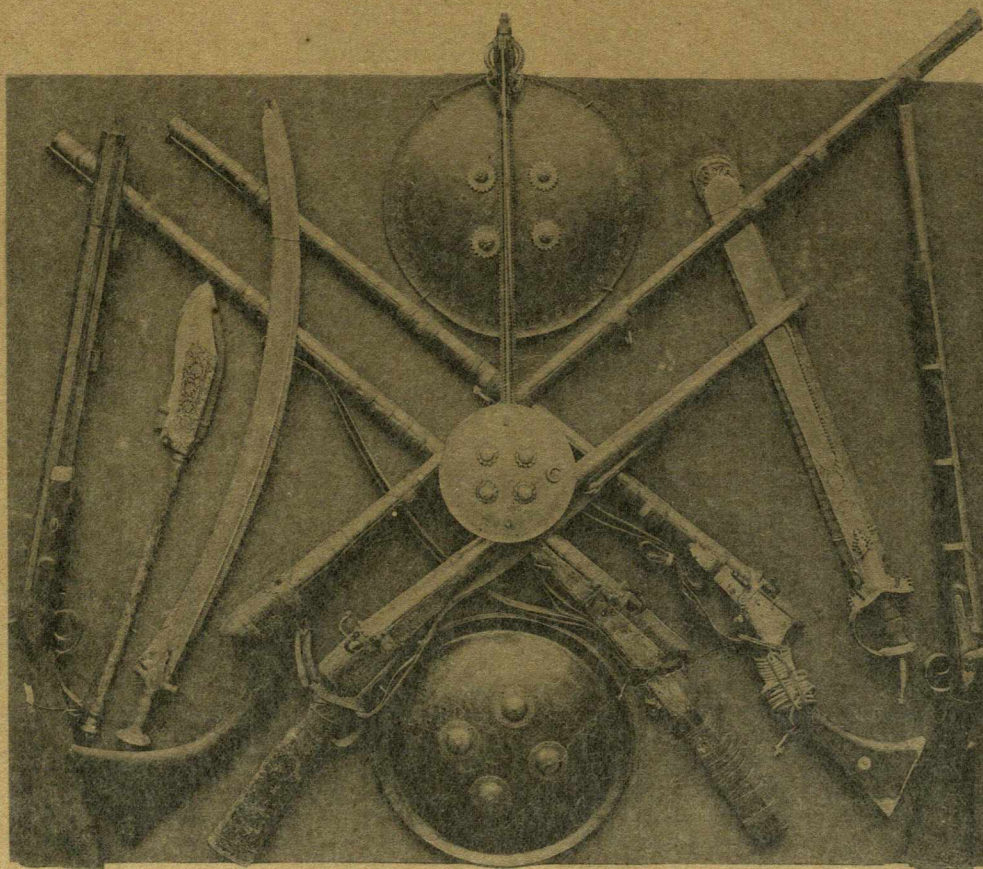
87.—14. GAUNTLETS, a pair. Chiselled steel, damascened. *Captured at Seringapatam.* 15. SHOES, pair of. Chain-mail, brass and steel. *Bhuj, Kutch.* 16. ARMOUR. One plate; steel, chiselled, with inscriptions. *Old Indian.* 17. ARMOUR. Three plates, chiselled steel. *Mahratta.* 18. DAGGER. Chiselled blade, damascened and enamelled. *Lahore.* 19. DAGGER. Blade curved and fluted; ivory hilt. *Vizianagram.* 20. SABRE, "Talwár." Damascus blade, fluted, hilt chiselled and gilt. *Lahore.* 21. SABRE, "Talwár." Khurásán watered blade, hilt thickly plated with gold. *Hyderábád, Sindh.* 22. ARM-GUARD. Chiselled steel. *Mahratta.* 23. SABRE. Watered blade. Presented by John Sobieski, King of Poland, to the Earl of Rochester, A.D. 1676. 24. SABRE, "Talwár." Damascus blade, damascened and jewelled hilt. 25. DAGGER. Blade curved and chiselled. 26. DAGGER. Blade curved, chiselled and gilt. 27. SABRE, "Talwár." Ivory hilt.



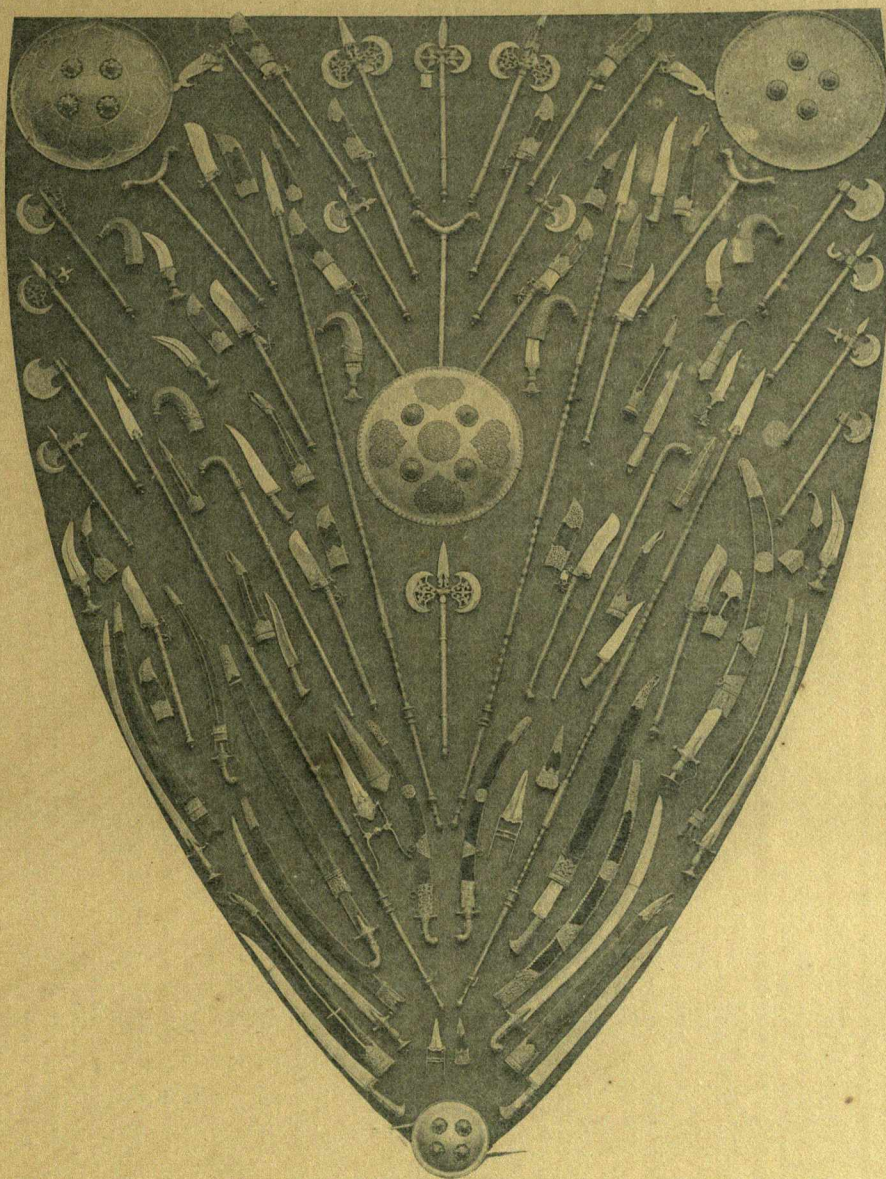
88.—ARMS AND TROPHIES
Shown in the Indian and Colonial Exhibition, 1886.



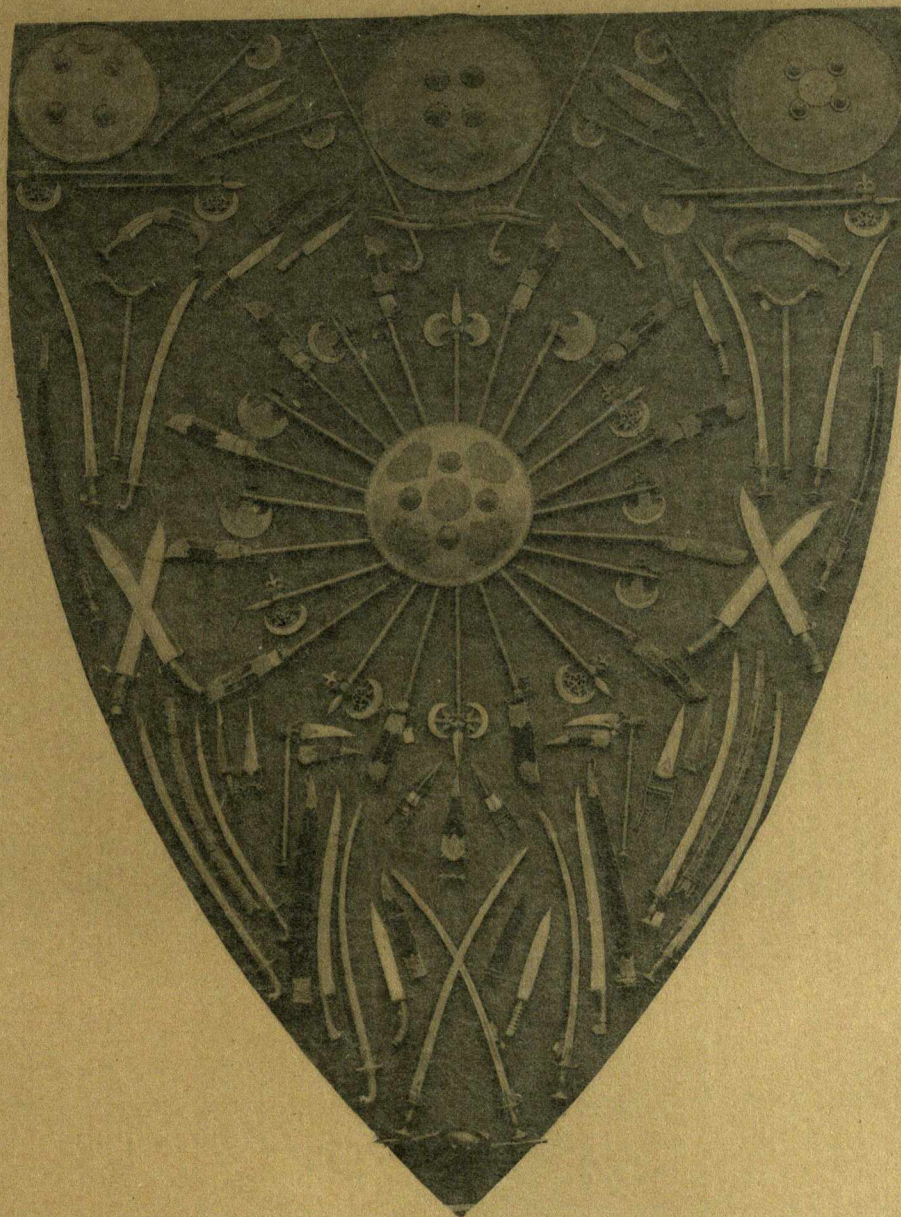
89.—ARMS AND TROPHIES
Shown in the Indian and Colonial Exhibition, 1886.



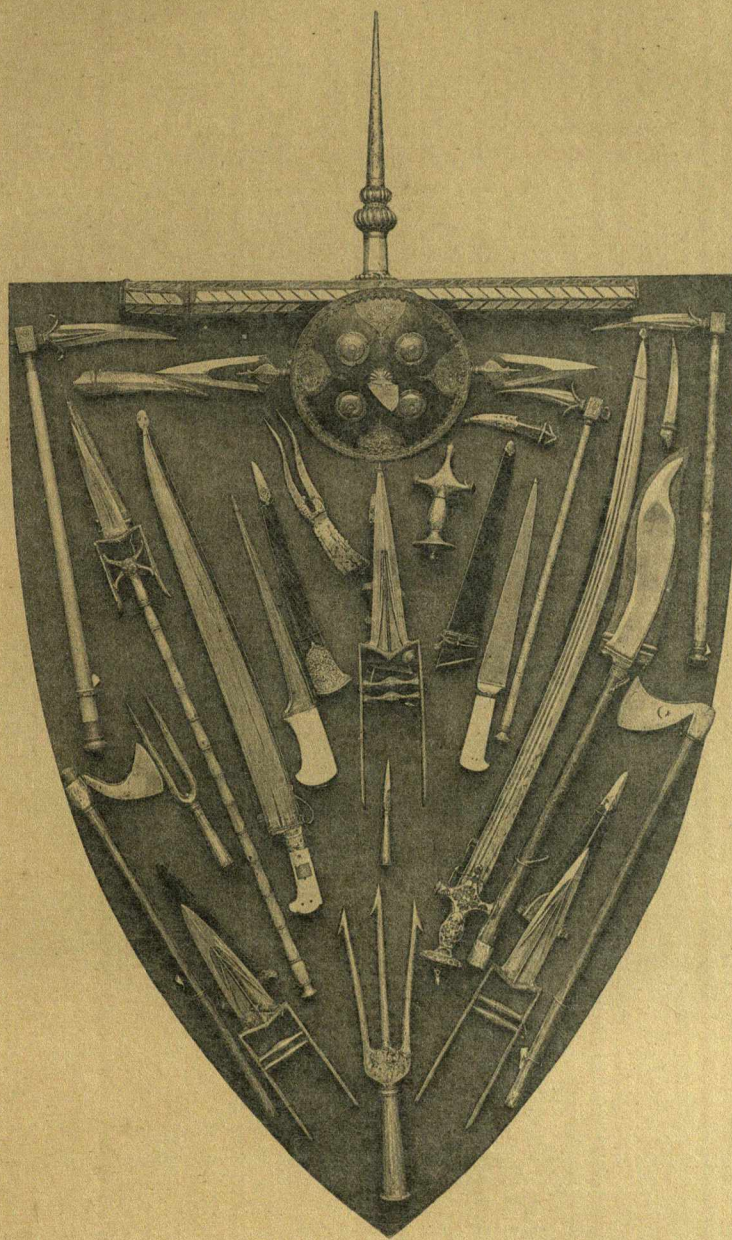
90.—ARMS AND TROPHIES
Shown in the Indian and Colonial Exhibition, 1886.



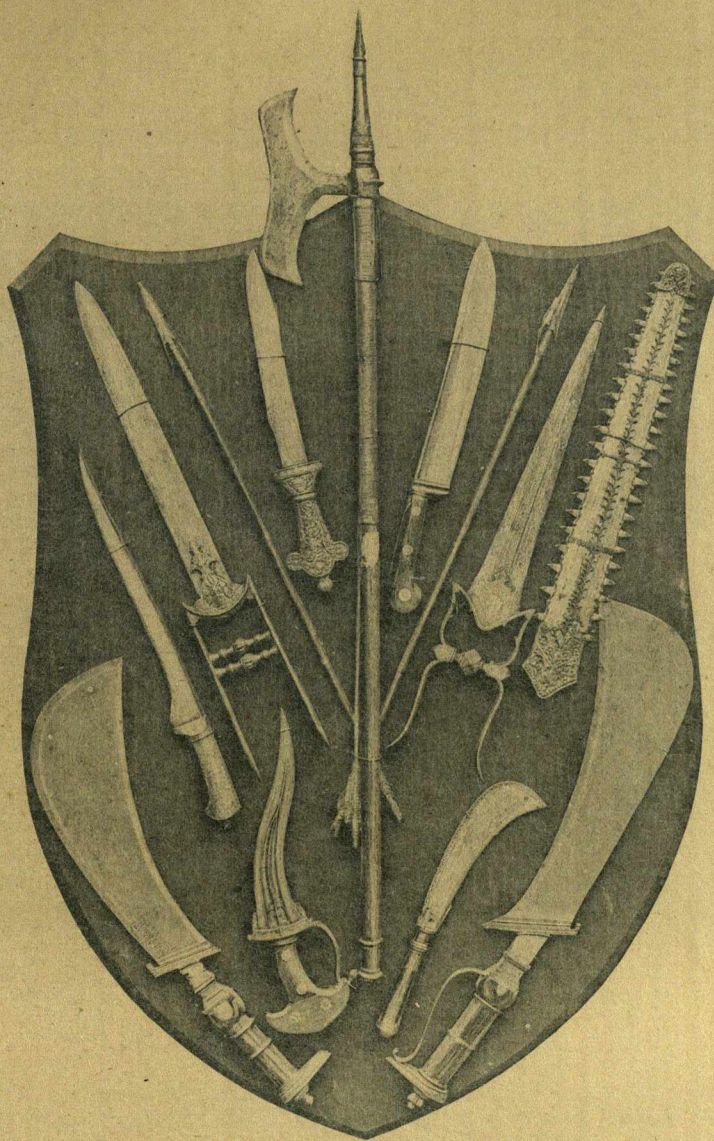
91.—ARMS AND TROPHIES
Shown in the Indian and Colonial Exhibition, 1886.



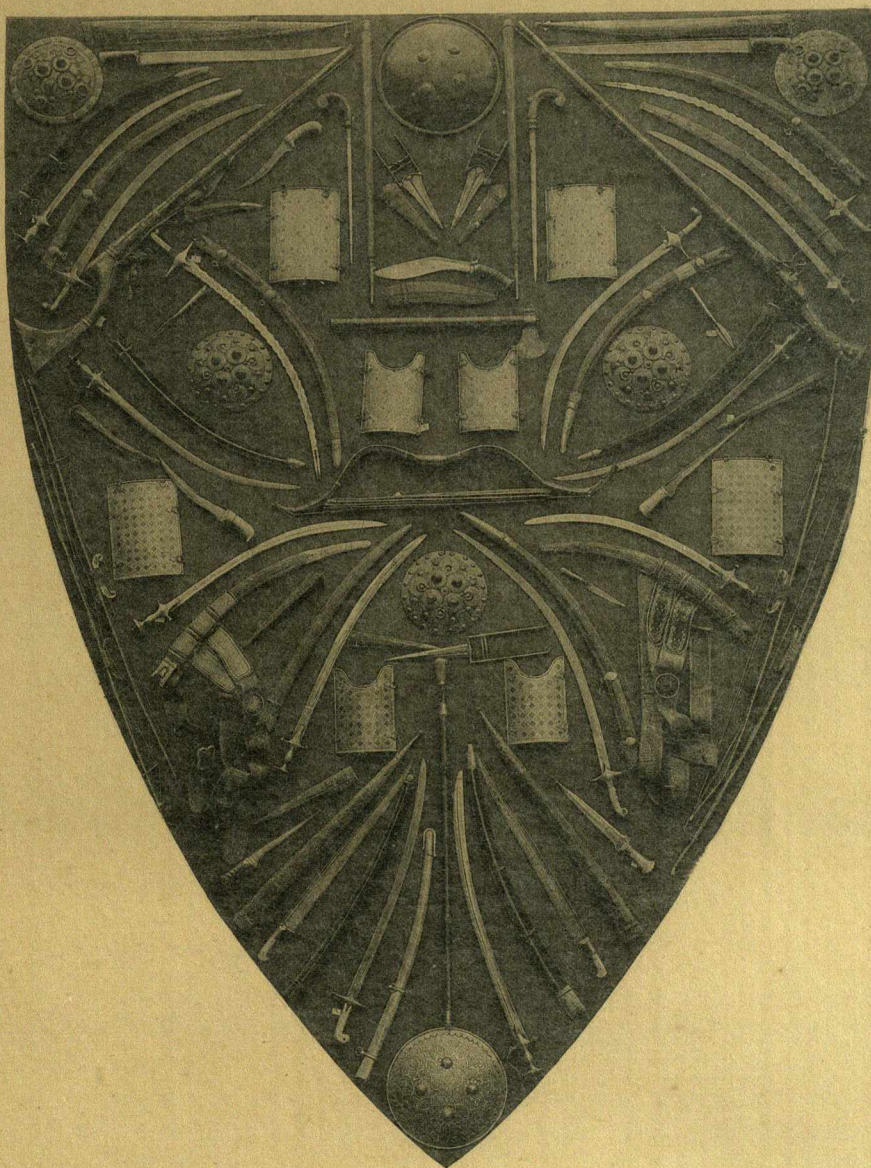
92.—ARMS AND TROPHIES
Shown in the Indian and Colonial Exhibition, 1886.



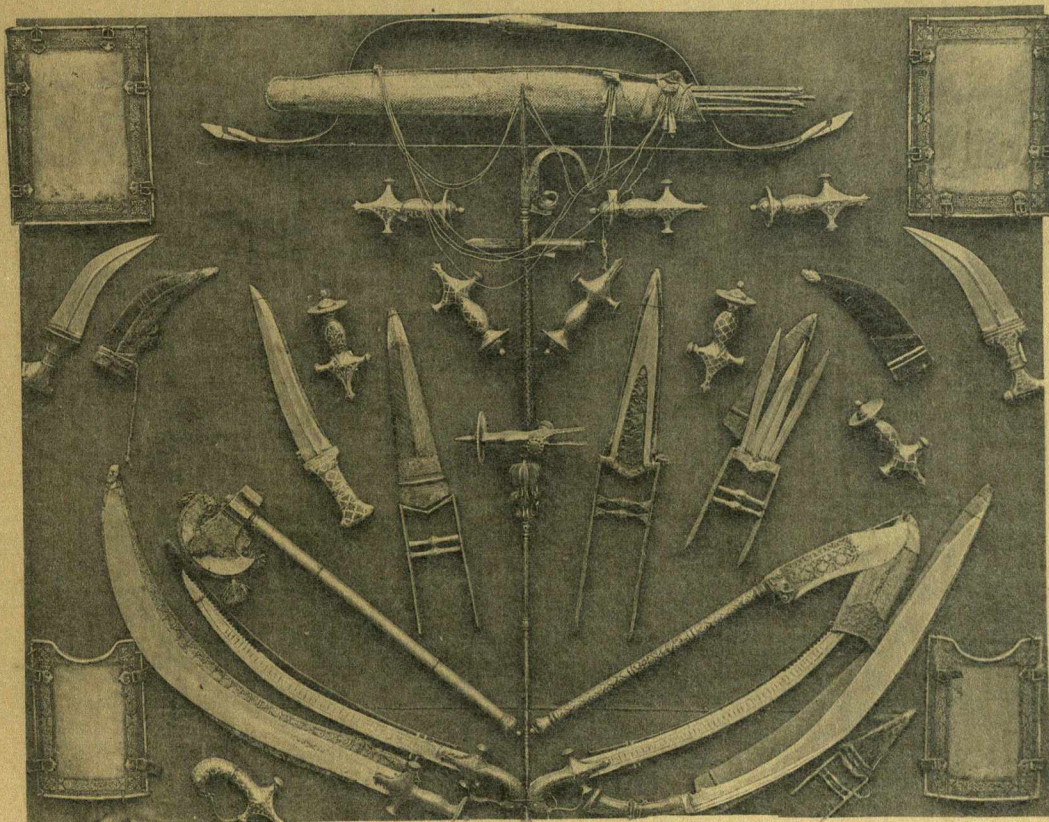
93.—ARMS AND TROPHIES
Shown in the Indian and Colonial Exhibition, 1886.



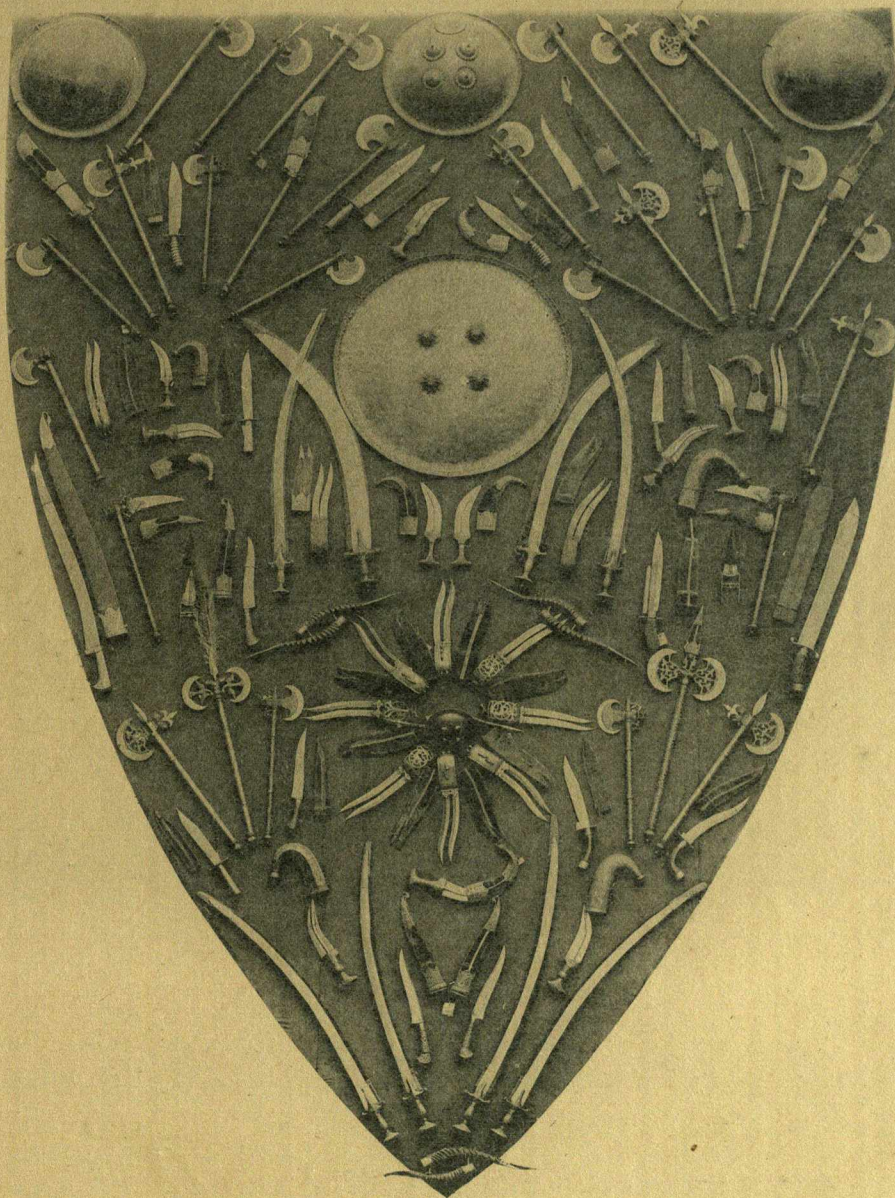
94.—ARMS AND TROPHIES
Shown in the Indian and Colonial Exhibition, 1886.



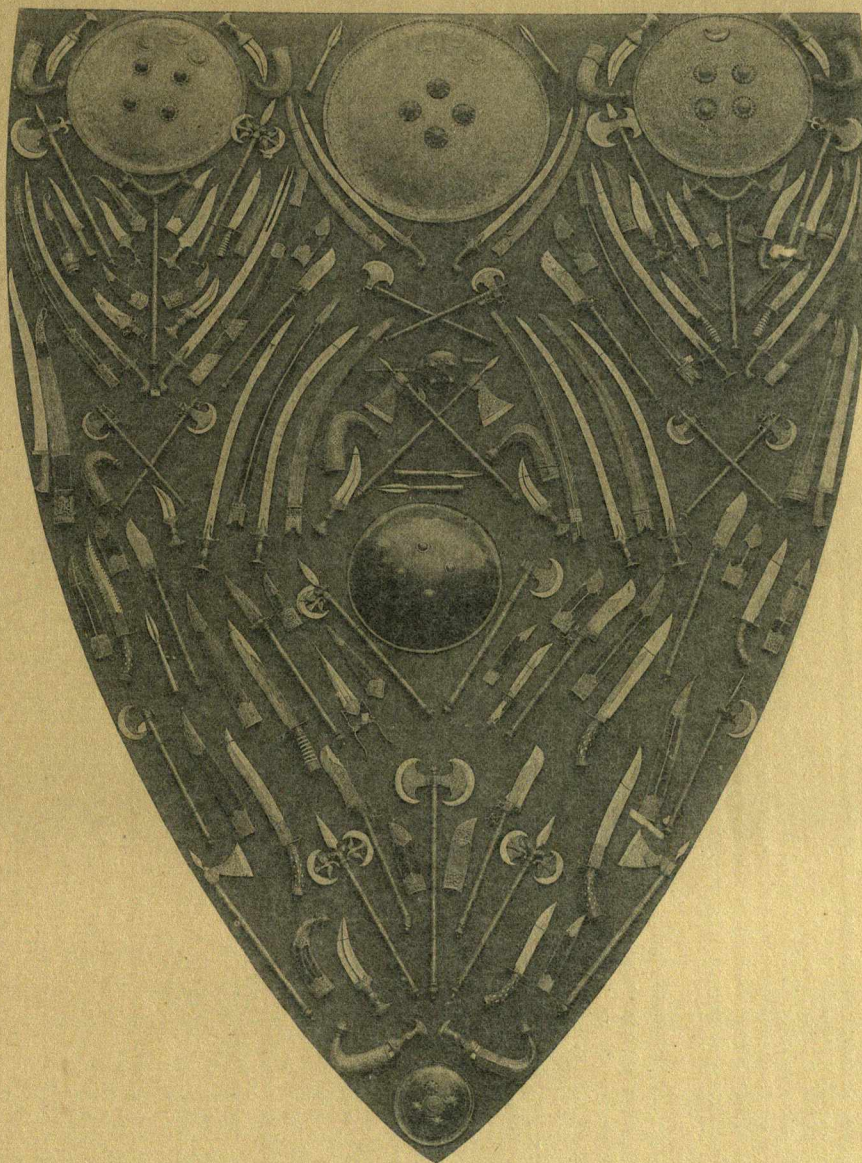
95.—ARMS AND TROPHIES
Shown in the Indian and Colonial Exhibition, 1886.



96.—ARMS AND TROPHIES
Shown in the Indian and Colonial Exhibition, 1886.

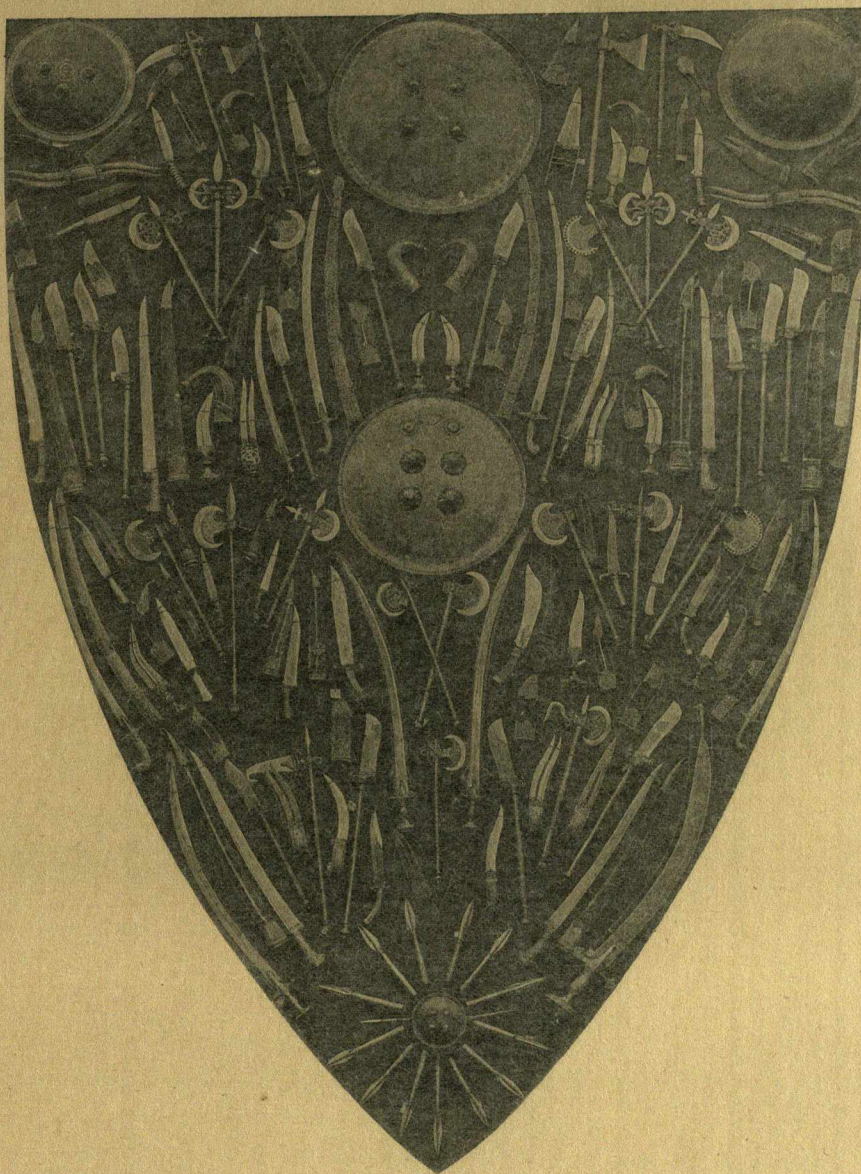


97.—ARMS AND TROPHIES
Shown in the Indian and Colonial Exhibition, 1886.

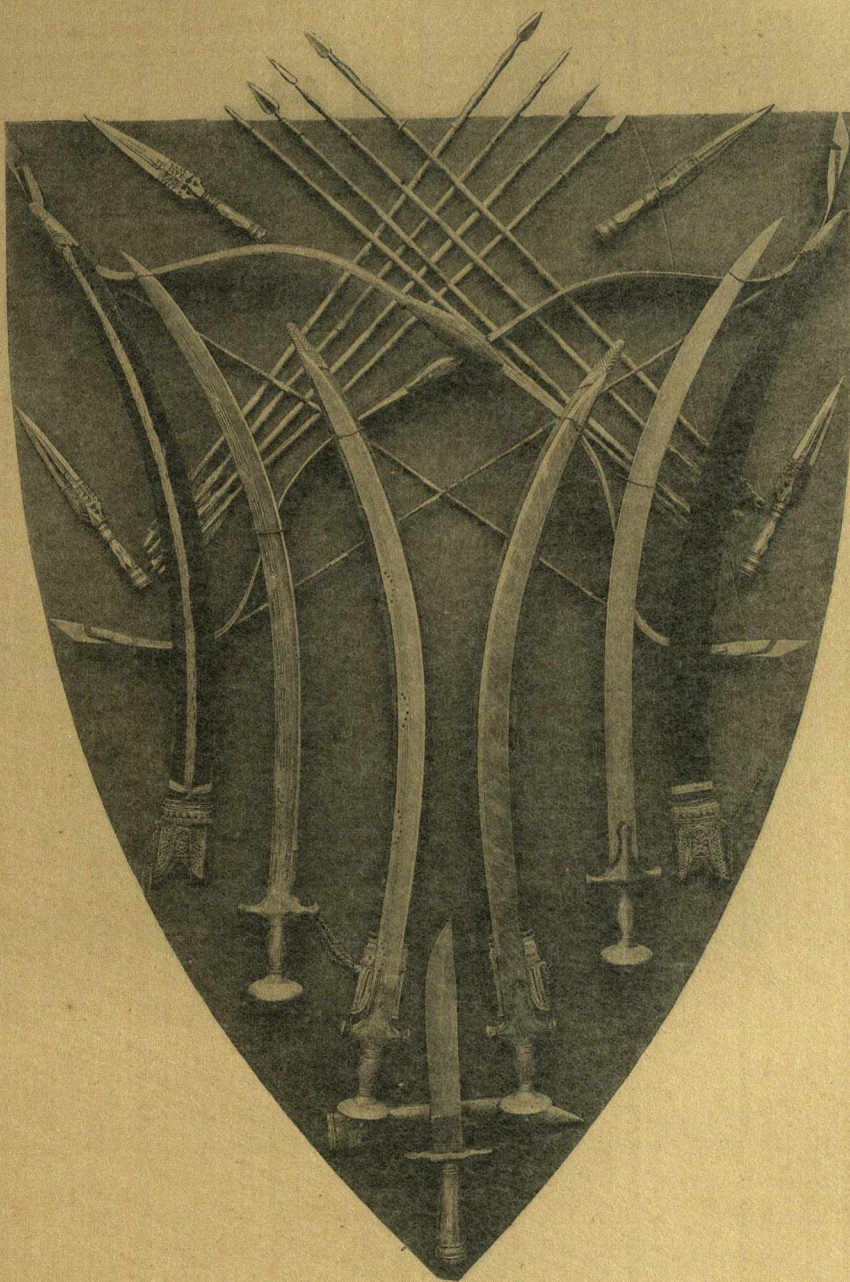


98.—ARMS AND TROPHIES

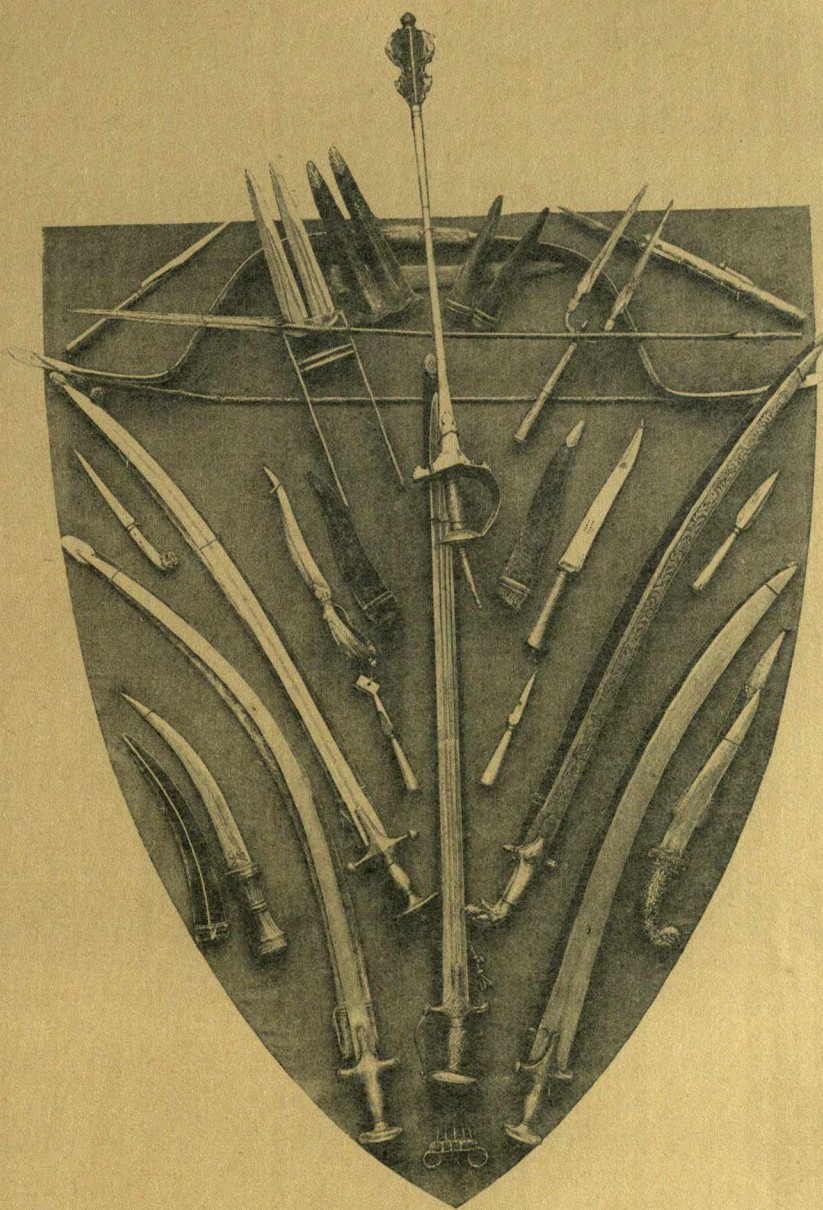
Shown in the Indian and Colonial Exhibition, 1886.



99.—ARMS AND TROPHIES
Shown in the Indian and Colonial Exhibition, 1886.



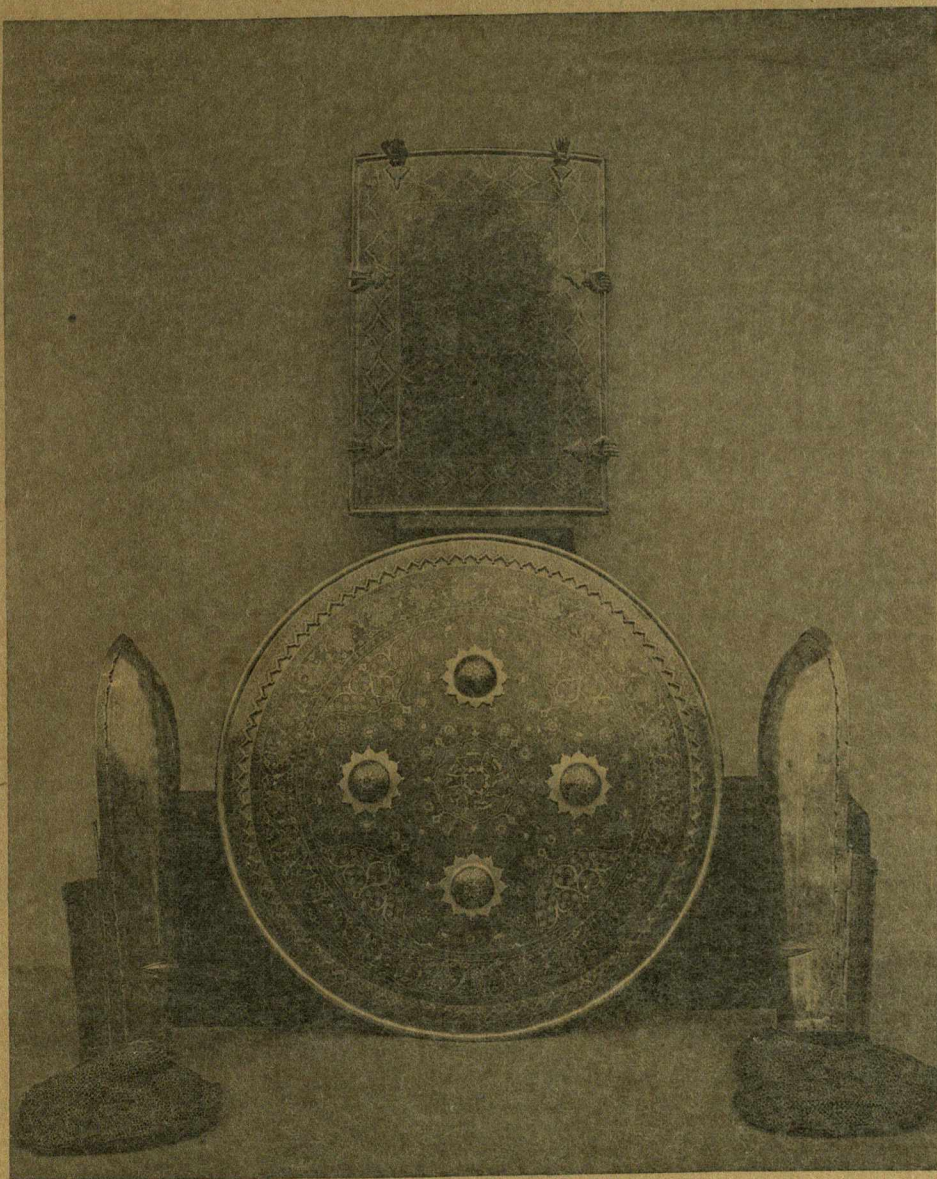
100.—ARMS AND TROPHIES
Shown in the Indian and Colonial Exhibition, 1886.



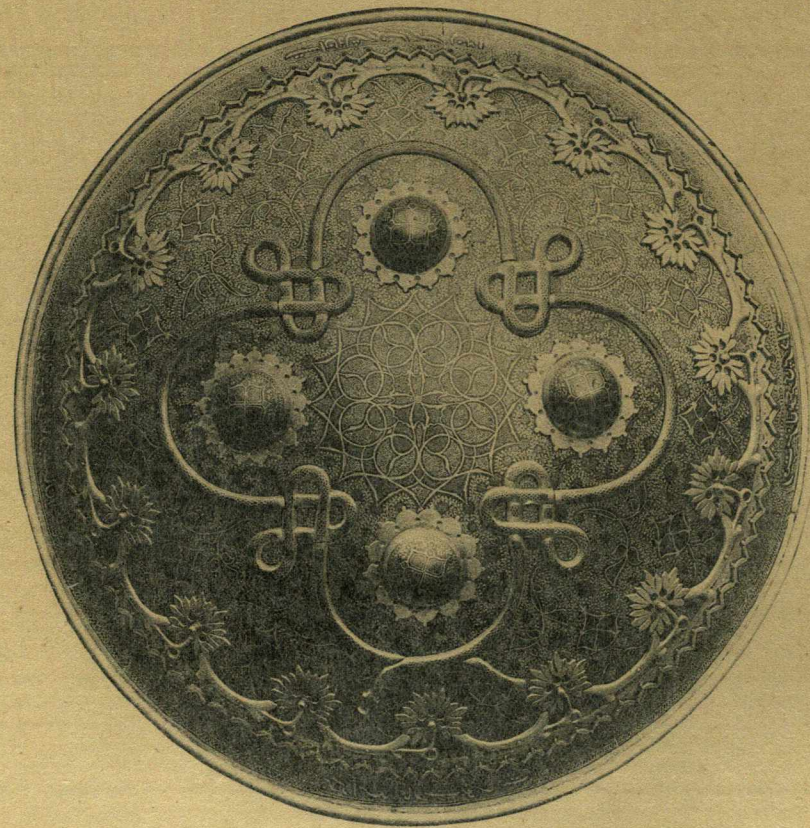
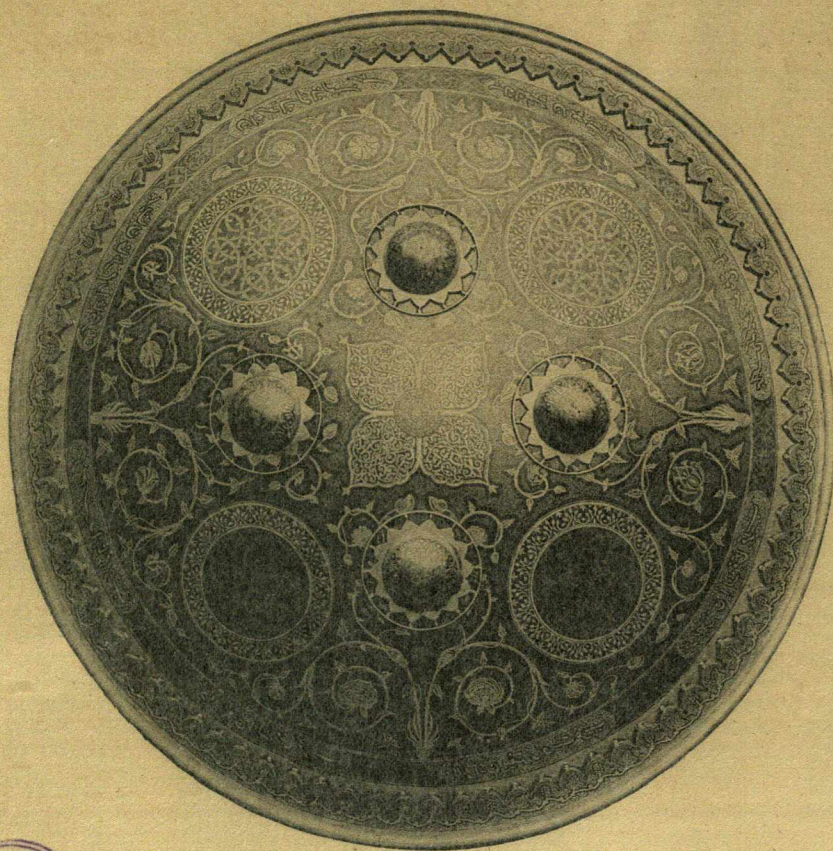
101.—ARMS AND TROPHIES
Shown in the Indian and Colonial Exhibition, 1886.



102.—ARMS AND TROPHIES
Shown in the Indian and Colonial Exhibition, 1886.



103.—Shield, and one of the (four) plates of a *Chāraīna*, and gauntlets.



104.—Two (modern) damascened Shields. (Panjáb).

