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JULY.

Archæology.

Recording the progress report of Superintendent, Archæological Survey.

No 2463 W 4/15 Sept 1891

*Communicated
to Suptg. Engineers
concerned for
information.*

(2d) J. P.

S. Es I, V + VI cudes.

Enclosure to Director General of Railways' Circular No. 16, dated the 30th
July 1891.

RATE LIST.

CLASS B.

ENGINEERS' PLANT

(Excluding Petty Tools)

FOR 1890.

G. C. Press, Simla.—No. 1565 P. W. D.—24-8-91—1,100.

ENCLOSURE.

TANJORE DISTRICT.

Oratunād.—This place is the first halting stage on the road from Tanjore to Avadaiyarkōil. There is a large temple here, but it is comparatively modern. The chief building of interest is the large chatram erected—originally as a palace—by the late Rāja of Tanjore. In one of the inner halls on the upper storey there are some finely carved piers and other work in teak-wood.

Avadaiyarkōil.—A small village in the extreme south of the district. The temple is a large and important one. It is kept in good order and is at present undergoing extensive repairs. The sthala purāna is an interesting one, and is being translated into Tamil for the benefit of pilgrims by the dharmakarta of the temple. It assigns the foundation of the temple to the time of the Pāṇḍyans. Whether this may have been the case or not, no building of that date now exists there. The greater portion is contemporaneous with the great temple at Madura. Even the inner shrine, which is usually the earliest portion, is of the same date as the temple of Ramēsvaram. The piers in the hall which encloses the shrine have statues of the Sētopatis who have made grants to the temple. There is some fine carved work in the entrance maṇḍapas, similar to that in the outer corridor of the Madura temple. One of the chief features of interest is a huge curved cornice on one of the maṇḍapas of the outer court. It is as thin as card-board, and the necessary strength is given by small ribs left at intervals. The thinness of the stone can be seen by means of a few round cleanly cut bullet holes. The priests relate that a good many years ago a visitor was being shown round, and, to test the story about the thinness of the stone, he took a pistol from his pocket and put a few shots through it. The temple has some fine vāhanas ornamented with silver work. They have a collection of jewels, a few of which are old, but the majority are modern.

TRICHINOPOLY DISTRICT.

Gaṅgaikondachōlapuram.—A village in the east of the Udaiyarpālaiyām taluk. The temple is enclosed in a single courtyard. It is one of the most important of the temples erected by the Chōlas in the 11th century. Though not as large as the great temple at Tanjore, it is of similar plan and design and of slightly earlier date. It has the same unique architectural feature of a lofty stone tower over the shrine. In this respect these two examples are distinguished from the majority of South Indian temples which are architecturally defective in having the most lofty structures over the gateways. As with Tanjore, the crowning member of the tower the śikara is formed of a single block of stone, said to have been placed in position by means of an inclined plane laid from the village of Paranam situated some miles to the westward in the Udaiyarpālaiyām Zemindari. Around the tower are numbers of archaic sculptures and inscriptions. In front of the shrine is an immense nandi cut out of a block of stone. In the courtyard is a large round well entered by an underground passage with a large figure of a vyali at the entrance. The water of the Ganges is traditionally stated to have flowed into the well, hence the name of the place. Another derivation is that the place was named after the Chōla who ruled here. The temple had at one time been fortified by bastions at the four corners of the courtyard, but the walls have been demolished.

About a mile to the south-west are a number of mounds. These are said to mark the site of the palace of the Chōla King who built the temple and who also had his residence here. Traces of a surrounding moat are at places visible. The mounds extend over several acres, and are too extensive for those of a palace only; they must also have included a town. The greatest of the mounds probably hides the ruins of the palace. It covers over an acre of ground, but traces of the building buried under it extend beyond this area. It is about ten feet in height. The foundations of the walls are about six feet below the present surface of the surrounding ground. The walls are four feet in thickness and built of large bricks similar to those found in Buddhist topes. Great numbers of these bricks were removed some time ago for the construction of a Jubilee tank at Jayankondachōlapuram. The excavators began at one end of each wall and worked along, removing the bricks to the foundations, without moving the surrounding earth. The trenches thus formed are still intact and show the position and size of the walls. The portion removed shows a long wall of the thickness and depth noted, with square piers in continuation of one end. The sandy earth on each side of these trenches is thickly mixed with broken pottery. In a pit which had been dug by some one in one side of the mound, four stone piers are visible, and quantities of iron wall bolts were found. This pit has not been dug deep enough to reach the ancient floor level; and as the walls have been removed in the manner indicated, no part of the space below occupied by the rooms has been explored. I could learn of no tradition in connection with the destruction of the palace. Possibly it may have been caused by a large breach visible in the great Ponnēri tank on some higher ground nearly a mile to the west. If this were so, the immense volume of water that would flow out would desolate the whole tract of country between it and the river Kalarūn, and thus possibly there may be treasure buried in the ruins.

The tank above referred to has an embankment of enormous size extending north and south for a distance of 16 miles. It commences towards the south-west, at the angle formed by the road leading north from Kumbakōnam and the Kalarūn river, runs north by east for half its length, takes a bend to the east, finally runs north and terminates about two miles beyond the ruins. The north portion of the embankment is in good condition, with the exception of a few large breaches, one of which is directly west from the palace ruins. The road running west from Gaṅgaikondachōlapuram is carried over the embankment. About half a mile on each side of the road are two ancient sluices. Both are of similar design. That on the south is in very good condition and is still to a certain extent used. On the side next the tank, it has two round towers with a covered escape channel passing through the bund between them. The north sluice stands in the path of a large jungle stream, through which a great body of water must pass at certain seasons. The water runs through a great breach in the embankment on one side of the sluice, and has dislodged masses of the masonry. All this water would be retained in the tank when the sluice was in perfect repair; at present it all passes through. The filling up of the breach would make this water available for irrigation; and very few repairs would suffice for the sluice. Several streams run into the bed of the tank, but very little of the water seems to be retained. Originally the tank must have covered an area of many miles; and, if repaired, would, I am told, irrigate a considerable portion of the adjoining district of South Arcot and bring in a large revenue. Some villages are now situated in the ancient bed of the tank, which would have to be removed if the water were raised to its original level, but they are principally composed of mud huts.

A short distance west of the above village is the temple of Karukaikāvalapparkōvil. It is a large building with several towers, almost entirely built of brick. It has a sthala purāna which ascribes the foundation to the 11th century, but the temple dates no earlier than the 17th century. A ruined maṇḍapa in front shows some fine examples of decorative brickwork.

Jayankondachōlapuram is the head-quarters village of the Udaiyarpālaiyām taluk. The name indicates the Chōla city where the Jains were oppressed. It is also known with the prefix of Jayam, or the city of the victorious Chōlas. In the village there are two Jaina images known as Ammanasvāmi, literally a naked god. The larger is seated on a sandstone pedestal near the Palupponēri tank on the south side of the village. The other is similarly placed in a lane in the village. This lane bears the name of the Jaina street and is occupied by வெள்ளாளர்கள் Vellālas who grazed the cows and who, it is said, were once Jains. They were persecuted by Brahmans and disguised themselves as cowherds to escape persecution. Though obliged to change their religion, they still at times stealthily worshipped their former gods. The legend is confirmed by the fact that these people, though Hindus, even now worship these images once a year. The ceremony takes place in the month of Thai—January. They bathe the statues with water, rub them with saffron and red-powder, decorate them with flowers, burn camphor and an aromatic resin (Tam. sāmbarāni), and make offerings of cocoanuts and raw rice mixed with water. After the worship is completed, these articles are distributed among the people there congregated. When there is a scarcity of rain, the Vellālas promise the images that they will worship them if rain should be sent. If by chance the rain should come, they believe their prayers are answered and they carry out the worship as described. They also believe that tears drop from the eyes of the larger image when rain is wanted.

The other antiquities in the village are fine small and unimportant shrines dedicated to the following deities:—Griddhagirēśvara, Amalakavanēśvara, Chennēśvara, Avēśvara and Chōlēśvara.

Kāmarasavalli is a small village in the south of the Udaiyarpālaiyām taluk. There are two temples in the place. The Vishnu shrine is a small modern brick building dedicated to Varādarājar, Sri Lakshmi and Bhūmitāyar. The Saivite temple of Sundarēśvara is an ancient building standing in a double court. Its walls are covered with vegetation, and the structure generally is in an advanced stage of decay. The main shrine is wanting in any architectural features of note. In the front court are the remains of a beautifully carved kalyāna maṇḍapa of the 17th century. With the exception of its porch, which still stands, the maṇḍapa is now a confused heap of broken columns and sculptured stones. Over the standing porch is a very deep cornice with the stone cut as thin as card-board. It resembles the one mentioned as being at Avadaiyarkōil. Though but the fragment of a ruin, the priests point with pride to its wonderfully delicate workmanship. Curiously too the material had been tested in a way similar to that of the other example, but with a more primitive weapon. In explanation of a few small holes in the slabs, the priests relate that "about a century ago," the Jaghirdār of Ariyalūr wished to satisfy himself as to the thinness of the stone and drove some five or six arrows through it from a bow.

Demon worship.—In the camping tope south of the village is a large tree with a thick chain about 25 feet in length hanging from its lower branches. The people believe the tree is the favourite abode of the spirit of a black demi-god named Saṅgali-Karuppannan who has a chain (Iam. saṅgali) for his emblem. The chain was presented to the spirit "over a century ago" by the inhabitants of the village in fulfilment of a vow they had made, conditionally on his freeing them of a disease with which they were troubled. The aid of this spirit is still invoked by worship made on the occasion of any one suffering from illness.

The sthala purāṇa of Kūmarāśavallī.—The mythological history, as related by the Brahmins of the village, is as follows :—

In early times, when the deities in heaven were oppressed by the rākshasas or giants on earth, they were unable to defend themselves and went to seek the aid of Siva. That deity could not be approached or made to hear their complaint. They therefore asked the aid of Kāma (cupid), who, accordingly, aimed and drove an arrow at Siva. Siva, in anger at being disturbed, turned the third eye in his forehead (pālanetram) on Kāma and burned him to ashes. Then the deities and Rati (Kāma's wife) being afraid, approached Vishnu as he lay on the sea of milk. He advised them to go to the Sarayu river and meditate on God. Rati was

* A large tank in front of the Siva temple, then surrounded by gardens named Kamakavanam.

† The tract of land between the river Krishna and Ramēsvaram.

Then Narayana assumed the form of a king, mounted on a horse, approached Rati and inquired the reason of her undergoing such penance. She replied that she was praying for the presence of the deity and requested the king not to interrupt her or she would commit herself to the flames. As she had been thus disturbed and her prayers seemingly unanswered, she went and consulted some rishis. They advised her to continue for two days more, and they also began to

‡ The third day after the new moon in the month of Chittiri (April).

§ Fourth day after the new moon.

pray for the fulfilment of her desires. That day is now known as Akshaya tritiya ‡ On the following day chaturthi, § the deity appeared in the form of a venerable sage and questioned her as to the reason for her meditation and penance. She informed him and said that if he did not then appear she would commit herself to the five sacred fires. Vishnu then manifested himself in his real form accompanied by the goddess Lakshmi, and restored to Rati her husband Kāma, decreeing, however, that he would be visible to her only and invisible (ananga—without body) to others. Rati prostrated herself before them and desired that they should permanently reside there, to fulfil the desires of those seeking after life partners, i.e., of a husband a wife and of a wife a husband. As the manifestation was made in a beautiful form, the Saivites named him Sundarēśvara and his consort Balāmbikē (a young maid). The Vaishnavas gave them the titles of Varādarājar (bestower of gifts) and Śrī Lakshmi. These are the names of the various images now in the temples.

A Village Festival.—During my visit to Gaṅgaikondachōlapuram, the villagers celebrated the Kāman pandiga. It is a festival held in honour of Kāman (Sans. Manmatha), the Indian cupid or god of love. The feast is observed by all classes of Hindus throughout India, but principally by the lower castes. As held here, it is more in the nature of a drama than an ordinary religious celebration. It has for its origin the following ancient Hindu mythology.

|| Daksha Brahmā had 60 daughters. Ten of these were given in marriage to Dharmā. Brahmā's mānasa putra is Dharmā. By this marriage one of these wives gave birth to Rati.

¶ The third eye on his forehead, which he only opens for purposes of destruction.

lation that he was visible to her only once a year and invisible to others.

The festival lasts for about a fortnight, the period which, by the foregoing mythology, Kāman is supposed to live with Rati.** It begins on the third day (tritiyā) after the new moon (amavasiyā) in the month of Māsi (February—March) and lasts till the third day after the following full moon (pūrṇa amavasiyā).

In Gaṅgaikondachōlapuram, on the north side of the Brihadēśvaraśvāmi temple, is a piece of ground, the north-east and north-west corners of which are used for the festival. The first-named plot has been in use for about ten years, and the other for about forty. At these two places two parties of the villagers raise a small mud pial, about three inches in height, and erect a pandal over it about four feet in height. In this they place a small conical object made of cow-dung or saffron, with some grass stuck in the top, intended to represent Gānēśa. As everything should be begun in his name, they worship the image with red powder, saffron and flowers and offer him cocoanuts and plantains. The image is then removed.

A kalasam (an earthen pot) is then placed in the spot lately occupied by Gānēśa and similarly worshipped. In the kalasam are a few copper coins, some betel leaves, nuts, flowers, and fruit. On its top a cocoanut painted with saffron is placed in the midst of a bunch of mango leaves. After worship this also is removed.

directed to go to the Sundara tirtham* on the north of the river Kaveri in the Dandaka Arāṇyam.† If she prayed there, she would have her desires accomplished. She went there, performed yagam in five sacred fires and underwent other penances for about forty days.

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penance. She informed him and said that if he did not then appear she would commit herself to the five sacred fires. Vishnu then manifested himself in his real form accompanied by the goddess Lakshmi, and restored to Rati her husband Kāma, decreeing, however, that he would be visible to her only and invisible (ananga—without body) to others. Rati prostrated herself before them and desired that they should permanently reside there, to fulfil the desires of those seeking after life partners, i.e., of a husband a wife and of a wife a husband. As the manifestation was made in a beautiful form, the Saivites named him Sundarēśvara and his consort Balāmbikē (a young maid). The Vaishnavas gave them the titles of Varādarājar (bestower of gifts) and Śrī Lakshmi. These are the names of the various images now in the temples.

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Kāma, son of Krishna, was married to Rati, || the Indian Venus, or goddess of love. Kāma's occupation is to aim his flower-tipped shafts at all mortals. While engaged on this duty, he observed Siva seated in meditation on the Himālayas and aimed one of his arrows at him. Siva opened his pālanetram ¶ and burnt cupid to ashes. He was restored to life at the intercession of his consort Rati, but with the stipu-

lation that he was visible to her only once a year and invisible to others.

The festival lasts for about a fortnight, the period which, by the foregoing mythology, Kāman is supposed to live with Rati.** It begins on the third day (tritiyā) after the new moon (amavasiyā) in the month of Māsi (February—March) and lasts till the third day after the following full moon (pūrṇa amavasiyā).

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KONTIAGODO.—GANJAM DISTRICT.
Śrī Botēśvara Mahāprabhu
temple.

Plate I.

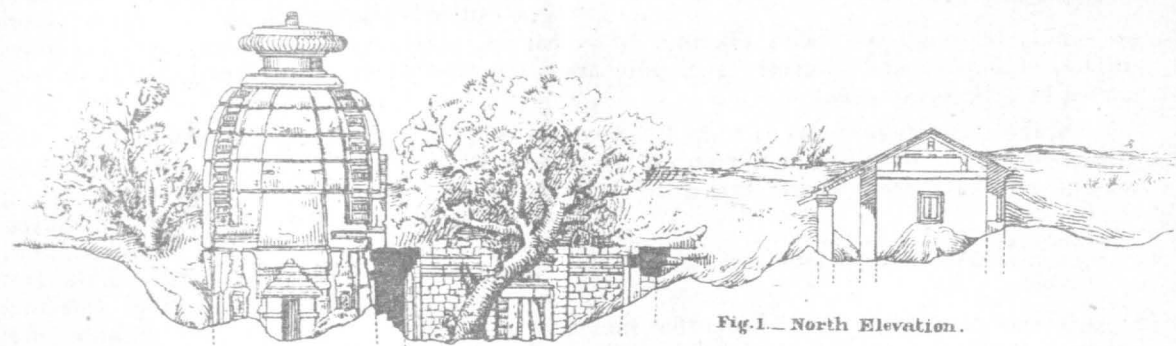


Fig. 1.—North Elevation.

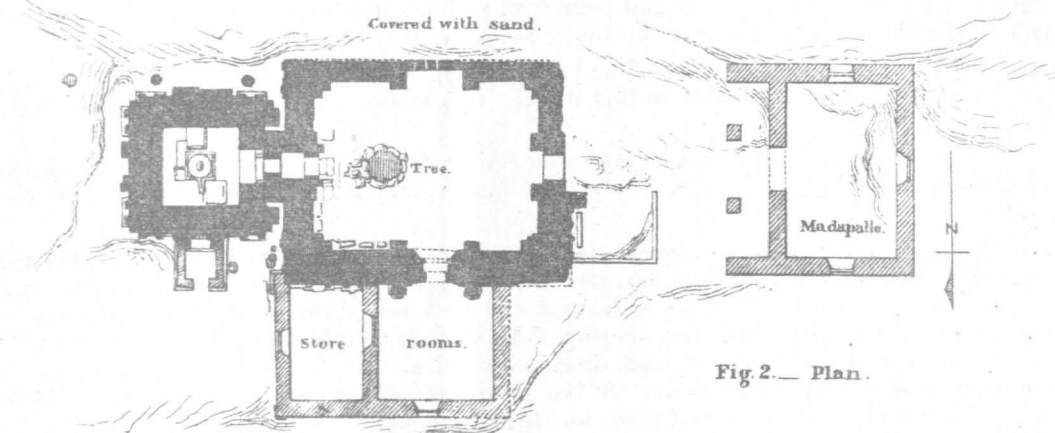


Fig. 2.—Plan.

SCALE OF 10' 20' 30' 40 FEET
Scale for Plan, Section, & Elevation.



Fig. 3.—Section of tower.

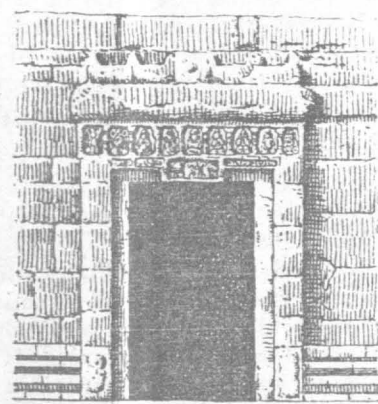


Fig. 4.—Front doorway in Mandapa.

SCALE OF 12' 1' 2' 3' 4 FEET
Scale for Doorway.



Fig. 5.—Ganēsa.



Fig. 10.—Nāga pilasters on doors.



Fig. 6.—Subramanya.



Fig. 7.—Ganēsa.



Fig. 8.—Rishi.



Fig. 9.—Rishi.

SCALE OF 12' 1' 2' 3 FEET
Scale for sculptured slabs.

In the same spot, they then fix a stalk of sugarcane (Tam. pēkarumbu)*, a stem of the castor-oil plant and a slender plantain tree. All these are tied in one bundle with the sacred grass (dharbē) before being fixed. These stems are similarly worshipped with offerings of cocoanuts, plantains, betel leaves, nuts and other edibles. Camphor and aromatic gum (sāmbārāni) are also burnt. The worship so far is conducted by a Brahman priest.

On the completion of this worship, two boys are selected from among the inhabitants of the village—one to be disguised as Kāman and the other as Rati. Generally, however, there are other persons who have made a vow during illness, that, if they are cured, they will act the part of either Kāman or Rati during the following festival. In this case, without consideration of age, anyone may take either part.† These two persons go through the ceremony of betrothal to each other on the first day. From that time till the close of the festivities, they eat only once a day, tie only one pair of new cloths each and decorate themselves with jewels and flowers. They bring water every evening and pour it in and around the pandal. They clean the ground around it and generally attend to the stems which are there fixed.

Every evening music is played and songs sung. Those on the first day are in praise of Gānēśa. From the second day to that of the full moon, Kāman's history will be recited and song sung in his praise.

Worship is carried on every day as on the first day, but not to Gānēśa on the kalasam. The stems of the plants which receive the worship remain, as at first fixed, throughout the festival.

On the evening of the full moon, the ceremony of marriage between the two persons is gone through. After the marriage, a car, made of bamboo and wood, decorated with mango leaves and flowers, is brought. Pictures of Kāman and Rati are placed on it, and the vehicle is drawn around the village with music and singing. Meanwhile, another pandal has been erected close to the other one, and in this an old man, disguised as Siva, takes his seat facing southwards with his eyes shut as if in deep meditation. On the return of the procession, Kāman shoots an arrow at Siva, who becomes indignant and turns his third eye—painted on his forehead—on Kāman. The latter is now immediately removed from the sight of the people, in fact hidden in one of the adjoining houses, and his picture on the car is burnt. The pandal with its plants and other contents are also burnt.

Rati then begins to pray to Siva for the recovery of her husband. The person disguised as Siva now falls in a swoon, behaves as if possessed with his spirit and offers life to her husband in this wise: that Kāman will appear to her in his sūtra sarira (corporeal body) for a fortnight once a year, but in sūkshma sarira (invisible body) to others.

The people now collect the burnt ashes, mix them with water and mould them into a resemblance to the linga of Siva, which they worship for three days. It is then taken away and cast into a tank.

On the third day after burning, the festival is brought to a close by those who took an active part in it feeding many of the other villagers.

Kontiagodo, Ganjam district.—The Śrī Botēśvara Mahāprabhu temple is a small building in what Dr. Fergusson in his *Indian and Eastern Architecture* calls the "Northern or Indo-Aryan" style. The style of architecture is peculiar to Orissa, and the only parts of Madras in which examples are found are those which adjoin that province. It differs in many essential points from any of the styles of architecture seen in Southern India. The principal feature is in the towers, whose curved outline gives them the appearance of elongated domes. They thus present a decided contrast to the pyramidal towers or gōpuras of Dravidian architecture.

The temple under note (Plate 1) is a small building with a tower 34 feet in height over the shrine and a mandpa in front measuring 22 feet 6 inches by 16 feet 10 inches. Broad bands are carried up the centre of each face of the tower, and others ornamented with rolls are at the angles. These have been highly ornamented, but most of the carving is now entirely covered with whitewash. On the top is a large amalaka or crowning ornament (fig. 1). The squat

* *Indian and Eastern Architecture*, p. 224.

outline of the tower is an indication of its age. The shrine measures 7 feet 9 inches square, with walls 4 feet thick and in it stands a linga. It has a false roof or ceiling carried across at about half the height of the interior. The upper storey thus formed has a small entrance through the floor at one side; it is supposed to contain treasure guarded by demons, so that the people are afraid to enter.

§ Fergusson mentions a similar roof over the altar at the great temple of Puri. *Ind. and East. Architecture*, p. 432.

¶ The heights of this upper storey had to be measured by a man standing on a beam over the shrine door and holding up a torch fixed on the end of a bamboo.

“About half a century ago” an attempt was made to investigate the treasure, but the seekers were driven away by snakes and demons or such like. The front mandapa is roofless.

and a large banyan tree now grows inside. There are no piers in it, nor—as these temples are astylar—is it likely that there have been any. The roof would be of flat pyramidal form, constructed of horizontal stone beams fixed over each other and bracketting inwards till they meet over the centre. At one side are two modern store-rooms, and in front is a newly built madapalli or cooking house. Outside the front door of the mandapa and buried under six feet of sand is an inscribed stone. It is three feet square. The inscription is almost illegible, but a few letters are still decipherable. From these it would seem the language is Uriya. On the wall head of the same building is a small inscription in modern Telugu characters. Some sculptured stones stand in the mandapa, and others are carved on the base of the tower. A few of these are shown in figs. 5 to 9. The doorway from the mandapa to the shrine is represented in fig. 4. Over its lintel is a central panel with Gaja Lakshmi, and nine panels with the

* And doubtless also on the south side door now entirely buried in sand.

Nava graha or nine planets. At the front and north side doors of the mandapa* are massive round pilasters with a nāgakanya coiled around (fig. 10). These are similar to one in the Raj Rani temple at Bhuvanésivara in Cuttack.† The temple dates from the eleventh century. The building is surrounded and over-topped by sand-hills which have silted up

† *Ind. and East. Arch.* pl. 236, p. 425.

against it. The walls of the mandapa are all blocked up almost to the wall head. The sand surmounts the south wall and blows over into the mandapa. Streams of sand flow into the madapalli and store-rooms through the windows; the people seem to have given up the attempt to keep it out. The front entrance door is closed up, and rather than take the trouble to clear out the sand, the priests prefer to scale the front wall when they come to make pūja. Some time ago, the entire building, with the exception of the top of the tower, was covered, and then the pūjaris performed worship opposite the portion of the building still visible. "About a year ago," the zemindar, some merchants and villagers cleared the interior, but as the sand is heaped up on every side it is fast drifting in again.

ORDER—dated 8th July 1891, No. 556, Public.

Recorded.

(True Extract.)

J. F. PRICE,
Chief Secretary.

To the Superintendent, Archaeological Survey.
,, the Superintendent, Central Museum.
,, Dr. E. Hultzsch, Epigraphist.
,, all Collectors.
,, the Public Works Department.
,, the Revenue Department.

Copy to the Secretary, Royal Asiatic Society, London.
,, the Secretary, Royal Asiatic Society, Ceylon Branch.
,, the Secretary, Royal Institute of British Architects,
9, Conduit Street, Hanover Square, London, W.
,, the President, Asiatic Society, Bengal.
,, the Secretary, Madras Literary Society.
,, R. Sewell, Esq.
,, Dr. J. Burgess, C.I.E.
,, V. A. Smith, Esq., Bengal Civil Service.
,, Dr. Rost, Librarian, India Office.
,, A. C. MacDonald, Esq., Dy. Keeper of the Indian Institute, Oxford.
,, J. F. Fleet, Esq., Bo. C.S., C.I.E., Bijapur.
,, Dr. G. Oppert, Madras.
,, the Archaeological Commissioner for Ceylon.
,, Henry Cousens, Esq., Archaeological Surveyor for Western India, Poona.
,, Pandit Natesa Sastri, M.F.L.S.

Editors' Table.

Exd. A. Raitt.

GOVERNMENT OF MADRAS.

PUBLIC DEPARTMENT.

READ—the following paper :—

From A. REA, Esq., M.R.A.S., Archæological Surveyor to the Government of Madras, to the Chief Secretary to Government, dated Bangalore, 21st May 1891, No. 210.

In continuation of the letter embodied in G.O., No. 166, Public, of the 3rd March 1891, I have the honour to forward a progress report on the work since finished.

2. On the completion of the survey of the great temple at Tanjore, I visited the large temple at Avadaiyarkôil which was said to be famed for its splendid carvings. Some of these are very fine, and I intend to make a partial survey at a future date.

3. On my return, I proceeded *via* Kumbakonam to Gaṅgaikondachôlapuram whose temple it was considered necessary to survey on account of its unique character and through its being contemporaneous with the temple at Tanjore. The work done here includes a complete set of drawings, photographs and copies of the inscription. Some mounds there were also inspected. They have never been explored, and though excavation might show interesting results, yet, as the ancient floors are six feet below the present surface of the surrounding ground, the work would be expensive. Some drawings were made at the large temple of Karukaikâvalappankôil near Gaṅgaikondachôlapuram.

4. I visited the following places in the Udaiyarpâlaiyâm taluk.

5. At Jayankondachôlapuram, sketches of some Jaina images were made and notes taken of the traditional history.

6. The temple at Kâmarasavalli was partially surveyed and other antiquities noted.

7. Some very ancient temples at Kirapavûr and a beautifully carved Chôla temple at Melpavûr were inspected for future survey. The latter temple is of archaic design and has a large amount of fine sculpture cut in blackstone. Among these are some minutely carved piers resting on couchant lions, similar in design to those in the more ornate caves at the Seven Pagodas. They are specially worthy of delineation. In the building are many good subjects for casts in plaster. There are a number of archaic inscriptions on the walls.

8. The temple at Tirumalavâdi is a large building, with architecture resembling in part the temple at Tanjore. There are long lines of Chôla inscriptions on the walls. This temple will be afterwards surveyed.

9. With reference to G.O., No. 19, Public, of 9th January 1891, the temple at Kontiagodo has been surveyed and the inscriptions copied. These latter have been forwarded to the Government Epigraphist. A description will be found in the report, to which also a sheet of sketches is added.

10. The draughtsman deputed to undergo a course of instruction in the taking of plaster casts at the School of Arts has rejoined this office. I hope to get some of this class of work done during next tour.

Enclosure to Director General of Railways' Circular No. 16, dated the 30th
July 1891.

RATE LIST.

CLASS B.

ENGINEERS' PLANT

(Excluding Petty Tools)

FOR 1890.

Enclosure to Director General of Railways' Circular No. 16, dated the 30th July 1891.

Statement showing the average rate per ton for entire sea freight on class B. Stores imported from England at the several ports during 1890-91.

Class of Stores.	Port of Bombay.	Port of Calcutta.	Port of Karachi.	Port of Rangoon.	REMARKS.
Class B.—“Engineers Plant” (excluding petty tools)	s. d. 20 0	s. d. 23 0	s. d. 20 0	s. d. 27 6	

CLASS OF STORES. R.—ENGINEERS' PLANT (EXCLUDING PETTY TOOLS).

Contracted for in 1890.

Contract number and date.	Articles.	Details.	RATE—FREE ON BOARD.				REMARKS.
			Amount.			Unit.	
			£	s.	d.		
3375 21-10-90	Apparatus, Diving.	Complete, with fittings for a depth of 90 feet, of which 80 feet is water and 10 feet above water, <i>vide</i> Appendix A.	112	0	0	Set.	
3391 28-3-90	Beaters	Platelayers, with solid steel ends, weight about 11 lbs.	0	2	3	Each.	
4034 25-10-90		" iron, with solid steel ends, 7 lbs. each	0	1	6½	"	
3898 9-10-90	Blocks.	Differential, pulley, Weston's, with chain, complete— To lift 10 cwt.	1	11	6	Each.	With 52 feet chain.
"		" 1 ton	2	8	0	"	With 55 feet chain.
4074 3-11-90		" 1 "	2	5	3	Set.	
"		" 1½ "	3	19	0	"	
3467 15-5-90		" 2 "	3	17	6	"	
4074 3-11-90		" 5 "	9	10	0	"	
"		" 8 "	18	15	6	"	
3354 18-3-90	Boilers	Locomotive type, multitubular, 25 H. P. nominal, working pressure 80 lbs. per square inch, fitted with chimney and piping and fittings, complete, with extra large fire-box of Lowmoor iron	455	0	0	Each.	

ENGINEERS PLANT (EXCLUDING PETTY TOOLS)—*contd.*

Contracted for in 1890.

CLASS OF STORES. B.—ENGINEERS' PLANT (EXCLUDING PETTY TOOLS)—*contd.*

Contracted for in 1890.

CLASS OF STORES. B.--ENGINEERS' PLANT (EXCLUDING PETTY TOOLS)--contd.

Contracted for in 1890.

Contract number and date.	Articles.	Details.	RATE—FREE ON BOARD.				REMARKS.
			Amount.			Unit.	
			£	s.	d.		
3786 24-7-90	Jim Crows.	With levers, 2½" screw	2	5	0	Each	Span 20 inches diameter.
3869 30-9-90		" " " for 41½ lbs. flat-footed rails	2	15	0	"	
3949 15-10-90		" " "	3	8	0	"	
4043 29-10-90		" " "	2	12	0	"	
3786 24-7-90		With levers, 2½" screw	3	5	0	"	Ditto.
3949 15-10-90		" " " for 50 lbs. flat-footed rails	2	8	0	"	
4043 29-10-90		" " "	2	15	0	"	
4043 29-10-90		With levers, 2½" screw, for 68 lbs. D. H. rails	4	0	0	"	
4043 29-10-90		With levers, 2½" screw	4	0	0	"	Ditto.
4127 7-11-90		" " "	4	0	0	"	Ditto.
4094 6-11-90	Mills, Mortar.	One Double, Lucop's pulverizer, F size, with latest improvements	456	0	0	Total	
		One Single " " " " " " "					
		Note.—Spare wearing parts for above machine, and 50 pieces wire gauze to suit pulverizers, cut to shape of 2 sizes, 8 wires and 6 wires per inch, strong iron wire not galvanized.					

CLASS OF STORES. B.--ENGINEERS' PLANT (EXCLUDING PETTY TOOLS)--contd.

Contracted for in 1890.

Contract number and date.		Articles.	Details.	RATE—FREE ON BOARD.			Unit.	REMARKS.
				Amount.				
				£	s.	d.		
3044	26-11-90	Monkeys, Pile driving.	Cast iron, ½ ton	...	...	...	Each.	Similar to those supplied under Nos. 2019 and 2181 of 1889.
4034	25-10-90	Picks	Beater, Platelayer's, 8 lbs. each	0	1	9	Each.	
4123	7-11-90	Presses, Rail-straightening.	Suitable for bending or straightening steel rails, of the Vignoles section weighing 41½ lbs. per yard. No punching gear or punches are required.	32	10	0	Each.	
3900	9-10-90	Pulsmeter	No. 9 size, each with wrought iron suction and discharge pipes, and connections, and 2 bends, suitable for 40 feet lift.	160	0	0	Each.	
3886	4-10-90	Pumps.	Hydraulic, for testing boilers, with copper pipes and connections, complete...	46	5	0	Each.	
4057	30-10-90		Cameron's patent, double ram, with steam cylinders 12" diameter and pump barrels 6" diameter, working pressure 40 lbs. per square inch, suitable for colliery purposes.	473	0	0	"	
3248	15-2-90	Ropes, Wire.	Each 500 feet long, for shafts, to have a spliced eye at each end, the splices warranted for a load of 50 tons.	53	13	9	Each.	
3377	25-3-90		Note.—To be suitable for a working load of 8 tons and to work round a drum 4 feet in diameter. The breaking strain of the ropes is to be not less than 80 tons. Each 200 fathoms long, circumference 4½", weight per fathom 19 lbs., breaking strain 80 tons, working strain 13 tons.	3	7	0	Cwt.	

CLASS OF STORES. B.—ENGINEERS' PLANT (EXCLUDING PETTY TOOLS)—*contd.*

Contracted for in 1890.

Contract number and date.	Articles.	Details.	RATE—FREE ON BOARD.			REMARKS.
			Amount.	Unit.		
3977 25-3-90		Each 800 fathoms, weight per fathom 8½ lbs., breaking strain 36 tons, working strain 6 tons. Note.—The ropes on contract No. 3377 are to be of the description known as Lang's patent, and are required to work over 4' 6" pulleys, eyes or attachments not needed.	£ 3	s. 7	d. 0	Cwt.
3787 23-8-90		Of extra plough steel, each 290 fathoms long— Circumference 4½", Weight per fathom 19 lbs., breaking strain 80 tons, working strain 13 tons. Note.—The ropes are required to work over 4' 6" pulleys, eyes or attachments are not required.	{ 2 100	1 17	0 0	Cwt. Rope.
4036 27-10-90	Ropes, Wire— <i>contd.</i>	Flexible steel, 2½" circumference, 1,450 feet long. The twist of the wires in the strands and the strands round the core to be in the same direction as Lang's patent. Best plough steel alone to be used in construction ...	35	0	0	Each.
4039 " "		Special steel, for running tackle, breaking stress 135 tons per square inch, diameter of rope ¾", to be in lengths of 500, 250, 200 and 150 feet. (Total 1,100 feet long) Special steel, for standing rigging, breaking stress 100 ton per square inch, diameter of rope 1", for use as derrick guys, in lengths of 250, 225 and 200 feet. (Total 675 feet long). Note.—The ropes have a thimble rigged at each end of sufficient size to pass a hook of the same strength as the rope.	25 24	10 10	0 0	Total "

CLASS OF STORES. B.—ENGINEERS' PLANT (EXCLUDING PETTY TOOLS)—*contd.*

Contracted for in 1890.

Contract number and date.	Articles.	Details.	RATE—FREE ON BOARD.			REMARKS.
			Amount.	Unit.		
4124 7-11-90		Winding, Lang's patent, made of best plough steel wire, each 400 feet long, ¾" diameter and weighing 7½ lbs. per fathom. Caps or sockets for above rope made of Lowmoor iron ... Note.—Each rope to be suitable for winding on a drum 6 feet diameter, with a maximum load of not less than 5 tons at a speed of 30 feet per minute and to work over pulleys 12 feet diameter at angles of 63° and 57°. Lang's patent, made of best plough steel wire, 1,250 feet long, ¾" diameter and weighing 4½ lbs. per fathom. Caps or sockets for above rope made of Lowmoor iron ... Note.—To be suitable for an underground hauling engine and to wind on a drum 36" diameter with a working load not less than 2 tons, 5 cwt. Guide, made of steel wire, with steel core, 300 feet long and weighing 9 lbs. per fathom.	£ 10 0	s. 0 12	d. 0 0	Each "
138 11-11-90	Screws, Mooring and Guts, cast iron.	On wrought iron round shanks, each with a ring 6" internal diameter at one end, in lengths as under— Long. Diameter. Thick in shank. No. ordered ... 6 ft. 18" 2½" 8 ... 8 ft. 20" 2½" 8 ... 10 ft. 22" 2½" 8 ... 12 ft. 24" 3" 8 ...	124 0	0	0	Lot.

CLASS OF STORES. B.—ENGINEERS' PLANT (EXCLUDING PETTY TOOLS)—concl'd.
Contracted for in 1890.

Contract number and date.	Articles.	Details.	RATE—FREE ON BOARD.				REMARKS.
			Amount.			Unit.	
			£	s.	d.		
4017 23-10-90	Tester, Cement.	Complete in every respect, and supplied with an equivalent weighing machine, 2 moulds (extra), and an automatic filler, including 28 lbs. shot.	19	0	0	Each.	
3596 20-6-90	Tools, Earth Boring in sets, complete.	Fide Schedule in Appendix B	45	0	0	Set.	
3590 19-6-89	Tools, Earth Boring, spare parts of.	Tubes, borings, 5½" outside diameter " 4½" " " 3½" "	186	12	6	for 800 feet.	
3854 25-9-90		Wheels with axles for 2 feet gauge, outside bearings	6	0	0	Pair.	
3252 17-2-90		Wheels and axles for 2' 0" diameter, metre gauge (Platelayer's)	5	14	6	Set.	
3849 23-9-90		Wheels and axles, light, for 5' 6" gauge	5	3	0	"	
4070 3-11-90	Trolleys.	Cast steel, 10" diameter, in sets, each set consisting of one axle with one fixed and one loose wheel attached (Plant for Dandot Colliery)	1	0	9	"	
		Pedastals, cast iron, for	0	6	1	Each.	of 4 wheels and 2 axles.

Appendix A.

List of Stores to be supplied to form 1 set of Diving Apparatus as per Contract No. 3975.

- 1 Improved, two cylinder, double action diving machine air pump, complete in strong chest.
 - 2 Handles, pump.
 - 1 Spanner 1½" × ⅝", 1 Spanner ⅝" × ⅜", 1 Spanner ¾" × ⅝".
 - 1 Socket spanner, 1 washer punch, 1 oil can.
 - 2 Screw drivers.
 - 1 Joint, union, double, connecting, male.
 - 1 " " " " female.
 - 1 " " for air pump, male.
 - 1 " " " " female.
 - 2 Caps, iron, to protect crank ends.
 - 1 Tin box containing—
 - 2 Springs top inlet valve pump.
 - 1 Valve top outlet pump.
 - 1 Valve bottom " "
 - 6 Nuts, brass wing Helmet collar.
 - 6 Screws for Helmet collar.
 - 2 Springs Inlet helmet.
 - 2 " " Outlet " "
 - 1 Wing spanner, for nuts on oval frames on Helmet.
 - 1 Nozzle overflow.
- Note.—All the foregoing are contained in the Pump Chest.
- 2 Wheels, fly, cast iron.
 - 1 Strong double Wicker Basket containing—
 - 1 Improved tinned copper Helmet, with breast plate fitted speaking apparatus.
 - 1 Set of speaking apparatus, consisting of mouth piece and diaphragm for Helmet.
- Copper connection and shut up nut.
- 90 feet speaking pipe, with couplings.
- Attendant's Mouth piece and tube.
- " " Belt.
- 1 Body shackle, 90 feet air piping with couplings.
 - 1 Helmet cushion.
 - 1 Seamen's chest containing—
 - 2 Dresses, diving, waterproof, 1 pair cuff expanders.
 - 1 Spanner, Wing, and Helmet nut, 12 wrist rings.
 - 3 Frocks, Woollen, 3 pairs Drawers, woollen.
 - 3 Pairs stockings, woollen inside.
 - 1 " " " " overall.
 - 1 Woollen cap, 1 neckerchief, 1 dress canvas overall.
- 180 feet reverse laid signal line.
- 1 Pair lead soled boots.
 - 1 " " weights with mountings.
 - 1 Belt weight, to carry 30 lbs.
 - 1 Knife in watertight case.
 - 1 Leather knife belt, 1 holder pipe, air.
 - 2 ½ lb. tins solution, 1 yard prepared twill.
 - 1 Screw frame, with glass for helmet.
 - 2 Spare glasses for helmet.
 - 1 Book of instructions.

Specification.

The air piping tendered for, to be made of vulcanized india-rubber in and outside, inlaid with metallic wire, and fitted with gun metal union joints. To be made of the best Para Caoutchouc, and with no other ingredients whatever than sulphur and white oxide of zinc, the sulphur not to exceed 3 per cent., the oxide of zinc, 30 per cent., to endure a dry heat test of 270° Fahrenheit for an hour, and a moist heat of 320° Fahrenheit for three hours without its quality being impaired.

The diving dresses to be made of india-rubber between tanned twill, with insertion between the parts of india-rubber of collars, the cuffs to be made of solid rubber without insertion.

Appendix B.

Detail of set of Earth Boring Tools as supplied under Contract 3596 of 1890.

Description.	No.
Augurs, clay, 2' long, for 4" hole	1
„ shell or wimble scoop 2' long, 4" hole	1
„ worm (short) " spiral," 2' long, 4" hole (for extracting broken rods) ...	1
„ „ (long) 2' long, 4" hole (for loosening stuff in bore hole) ...	1
Ball valve sludger 2' long, 4" hole	1
Bell or screw or screw box, 2' long, 4" hole (for extracting rods in case of breakage)	1
Chisel, flat, or straight bits 2' long, 4" hole... ..	1
„ T, 2' long, 4" hole	1
„ double T, 2' long, 4" hole	1
„ V, or diamond point 2' long, 4" hole... ..	1
Common block sludger 2' long, 4" hole	1
Crows feet 2' long, 4" hole	1
Dogs, hand, to fit 1 1/4" square rods (rod wrench)	1
Dogs, lifting, to fit 1 1/4" square rods	1
Kinds plug, to raise tubes	1
Lengthening pieces of 1 1/4" square iron, to suit rods with loop swivel top, 4' long...	1
Nipping tongs, or tigers, to fit 1 1/4" square rods	1
Pipe, clamp, for 4" bore to suit tubing	1
Rods, 1 1/4" square, mild steel, each 10' long	70 feet.
Stone breaker, 2' long, for 4" hole	1
Tiller, or brace head, to fit 1 1/4" square rods	1
Tubes, flush, outside, screw joints in 10' lengths, 4" in external diameter ...	80 feet.

FROM

THE DIRECTOR GENERAL
OF RAILWAYS,

TO

Circular No. 16.

Dated Simla, the 30th July 1891

Received

INDIAN STATE RAILWAYS.

RATE LIST, CLASS B.—“Engineers’ Plant ”
(excluding Petty Tools) for 1890.

[General Distribution.]

Circular No. 16.

FROM

THE DIRECTOR GENERAL OF RAILWAYS,

TO

THE MANAGER, NORTH WESTERN RAILWAY.
THE MANAGER, OUDH AND ROHILKHAND RAILWAY.
THE SUPERINTENDENT OF WORKS, CHAMAN EXTENSION.
THE SUPERINTENDENT OF WORKS, HYDERABAD-UMERKOT RAILWAY.
THE ENGINEER-IN-CHIEF, EAST COAST RAILWAY.
THE ENGINEER-IN-CHIEF, KISTNA BRIDGE.
THE ENGINEER-IN-CHIEF, MU VALLEY RAILWAY.
~~THE ENGINEER-IN-CHIEF, MOGHAL SARAI-HOWRAH RAILWAY SURVEY.~~
THE ENGINEER-IN-CHIEF, MOGHAL SARAI-DALTONGUNGE SECTION OF THE MOGHAL
SARAI-HOWRAH RAILWAY SURVEY.
THE ENGINEER-IN-CHIEF, FRONTIER RAILWAY SURVEY.
THE ENGINEER-IN-CHIEF, KASHMIR RAILWAY SURVEY.
THE ENGINEER-IN-CHIEF, ZHOB VALLEY RAILWAY SURVEY.
~~THE ENGINEER-IN-CHIEF, JEYPORE-CHUMBAL RAILWAY SURVEY.~~
THE ENGINEER-IN-CHIEF, GOONA-BINA RAILWAY SURVEY.
THE ENGINEER-IN-CHIEF, UJJAIN-BHOPAL RAILWAY SURVEY.
THE PORT STOREKEEPER, STATE RAILWAY DEPARTMENT, CALCUTTA.

Rate List, Class B.—“Engineers’ Plant” (excluding Petty Tools) for
1890.

Simla, the 30th July 1891.

SIR,

I have the honor to forward, for information and guidance, a printed state-
ment showing the actual English rates, *free on board* in England, for Class
B Stores, “Engineers’ Plant” (excluding Petty Tools), contracted for by the
Stores Department of the India Office during 1890.

2. A table giving the average rates of sea freight for Class B Stores im-
ported from England to the several ports in India for State Railways during
1890-91 is prefixed to the Rate List.

I have the honour to be,

SIR,

Your most obedient Servant,

R. A. SARGEANT, Lieut.-Col., R.E.,
Offg. Director General of Railways.

Documents accompanying.

1. Statement showing the average rate
per ton for entire sea freight on Class B
Stores imported from England at the several
ports during 1890-91.
2. Rate List, Class B.—Engineers’ Plant
(excluding Petty Tools) for 1890.

The Secretaries to the Governments of Madras, Bengal, the North-Western Provinces and Oudh, and the Punjab, Public Works Department.
 The Secretaries to the Chief Commissioners of the Central Provinces, Burma and Assam, Public Works Department.
 The Secretaries to the Residents, Hyderabad and Mysore, Public Works Department.
 The Secretaries to the Agents to the Governor General, Rajputana and Central India and Baluchistan, Public Works Department.
 The Superintendent of Port Blair and Chief Commissioner, Andaman and Nicobar Islands.
 The Director General of Telegraphs.
 The Director General of Military Works.
 The Accountant General, Public Works Department.
 The Comptroller General.
 The Accountant General, Bengal.
 The Consulting Engineers for Railways, Madras and Bombay.
 The Consulting Engineers to the Government of India for Railways, Calcutta, Lucknow, and Central Division.
 The Agent and General Manager, Assam Railways and Trading Company, Limited.

Copy forwarded to
 the Local Govern-
 ments, Administra-
 tions and Officers
 noted in the margin
 for information.

R. A. SARGEANT, Lieut.-Colonel, R.E.,
 Officiating Director General of Railways.