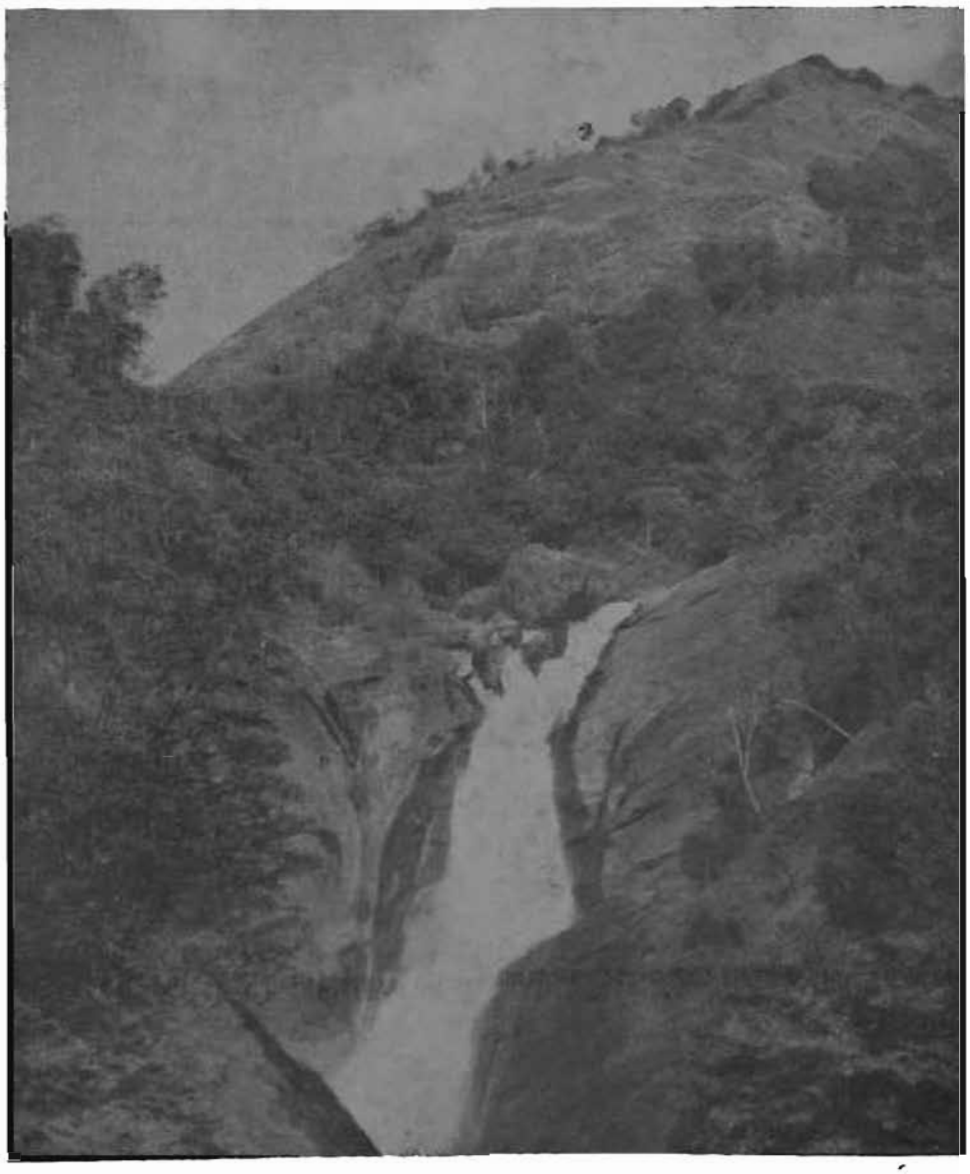
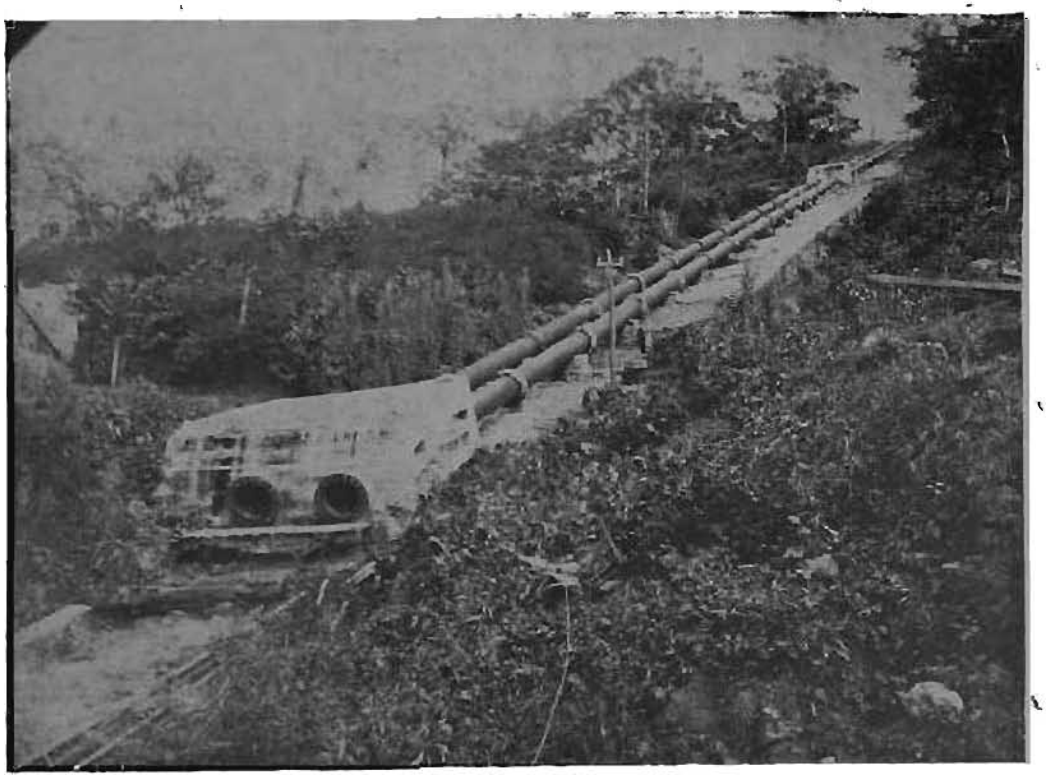
ELECTRICAL DEVELOPMENT IN TRAVANCORE

The availability of Electric Power in most places in Travancore with the completion of the Hydro-electric Station at Pallivasal, and the very low rates of tariff offered have opened up great possibilities in the fields of industrial and agricultural development. Travancore has to-day not only a net-work of telephones within her own borders, but is connected with the rest of India by linking the local system with the All-India Trunk. A Broadcasting Station is being constructed and it is expected to be in operation by the middle of this year.

Electric supply undertakings are of ~ ~ent growth in Travancore. Although the first power station was in existence in the High Ranges as early as 1905, it



The Pallivasal Falls.



The Penstock Lines, Pallivasal

was only towards the latter part of 1927 that Government created a separate organization to carry out a programme of electrical development in the State. With the inauguration of this Department, electric supply was first introduced in TRIVANDRUM the capital, in March 1929.

The beginnings were very modest but during the last 12 years of the operation of the station, substantial progress was made in all directions. The capital outlay on this undertaking till the last financial year was Rs. 11 lakhs. The scheme has been paying a satisfactory return on its investment ever since it started working. A substantial depreciation fund has been built up in the meantime and the balance after adjusting interest and depreciation is credited to a reserve fund. The gross revenue during the last financial year was Rs. 2·443 lakhs and the total generation 1·35 million units. The number of consumers at present is about 2,600. There are 66 miles of L. T. overhead distribution lines besides 16 miles of 3·3 K. V. underground cables. Although Trivandrum is not an industrial town it has been possible to develop a power load by supplying energy to consumers like Printing Presses, the Rubber Factory, Ice Factory, Flour Mills, Rice Mills, Pumping plants, Cold Storage etc. The tariffs in force compare favourably with those in similar undertakings in South India. Power is obtained from a Thermal Station with a capacity of about 1,100 K. W.

Kottayam and Nagercoil

With the lead given by Government in the supply of electric power to the capital, two other undertakings worked by private agencies, one in KOTTAYAM and the other in NAGERCOIL were shortly afterwards inaugurated. The former came into existence early in 1932 while the latter was put into operation

towards the middle of 1934. The Kottayam Electric Supply is now self-supporting and distributes power to nearly 700 consumers from a network of about 23 miles. The Nagercoil Electric Supply was initiated about two years thereafter and it has made very satisfactory progress in the meantime. This scheme now supplies power to nearly 550 consumers from a distribution network of about 26 miles.

At Quilon

Based on the experience gained in the working of the Trivandrum Electric Supply undertaking a scheme for the supply of power at QUILON another important town in the State was inaugurated towards the middle of 1934. The capital expenditure on this undertaking is about Rs. 3¼ lakhs. Very rapid progress has been made in its operation during the last three years, the generation towards the end of the last year having reached over 2 millon units per annum, bringing in a gross revenue of about Rs. 1½ lakhs. The supply covered about 20 miles of 11 K. V. lines, 45 miles of L. T. distribution and 2½ miles of 3·3 K. V. underground cables and caters for about 850 consumers. Power was supplied from a thermal station of about 630 K. W. capacity till the supply was changed over to the Pallivasal Hydro-electric System in May 1940. Quilon is an important industrial town and it has not been possible to meet the power requirements from this small thermal station to any appreciable extent. The total capacity of installed power plants in Quilon is well over 2,000 H. P., but as many of them are in a very unsatisfactory condition on account of their old age it should be possible to secure all these loads, now that the Hydro-electric Supply is available from the Pallivasal System, the bulk of which is utilised by the Ilmenite Mining Industry, the Cotton Mills and the Ceramic Factory at Kundara.

Hydro-electric Development

In view of the fact that there has been a marked activity in the electrical development of the State, Government had under consideration the question of inaugurating a large power supply harnessing some of the most suitable water falls in the State for this development. A preliminary survey of the hydro-electric possibilities of the State was carried out as early as 1919 by Mr. F. J. Jacob, the then Chief Engineer of the *Public Works Department*. But as a

The Tunnel at Pallivasal.

result of the subsequent investigations conducted in 1925 by Mr. K. P. P. Menon, the present Electrical Engineer, Government came to the conclusion that the development of a power scheme utilising the falls in the Mudirapuzha river possessed great economic possibilities. Accordingly, proposals were forwarded to Government in 1930 for a detailed investigation of this scheme. These proposals were sanctioned in December 1931 and the detailed investigations were taken up and completed by 1933. The work was thereafter started in 1934. The scheme, though not necessarily the largest of the potential water power resources of the State, is one of the most economical ones for development in stages and it is expected to be self-supporting in a very short time.

The Pallivasal Project

The present scheme utilises the head available in the Mudirapuzha river (a tributory of Periar) which passes through Munnar and after it leaves the High Range-hills drops in a series of cascades down to the plains below. This river draws its water from the catchment area of the K. D. Hills, which have very heavy rainfalls, thus ensuring a comparatively plentiful supply of water from a relatively small catchment area.

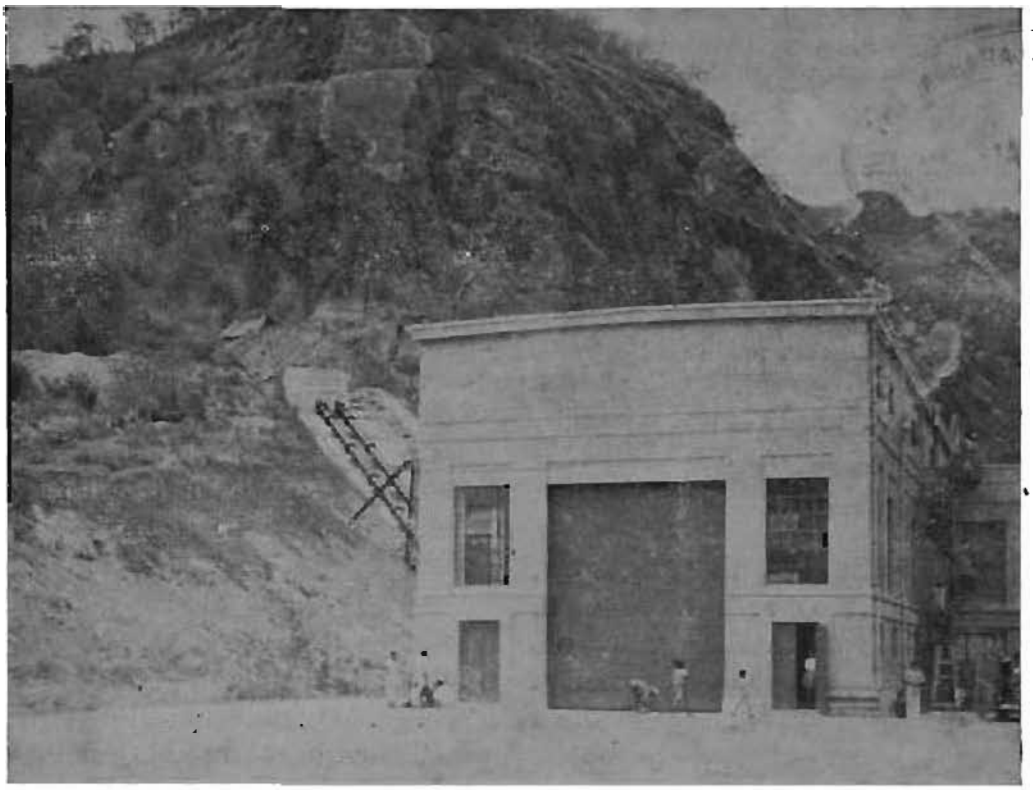
Almost all the works in connection with the first stage of development of the P. H. E. Project were completed by the beginning of 1940 and it was inaugurated in March when the supply was switched on by Sachivottama Sir C. P. Ramaswami Aiyar from the Pallivasal Generating Station in the presence of a distinguished gathering. The scheme as now completed comprises a temporary diversion dam, a pressure tunnel of 10,200 ft. in length 9' x 8' section and two penstocks each 7,800 ft. in length, the generating station and transmission lines extending up to Alwaye on the west and up to Quilon in the south. The power station has three 11,000 volts 3 phase 50 cycle alternator sets each of 4.500 K. W. capacity directly coupled to pelton wheels operating at a head of 1980 ft. The total effective capacity of the station is 9,000 K. W. as the third generating set will be used only as a standby. Power is transmitted to the plains at 66,000 volts. The transmission system consists of 134 miles of 66 K. V. double circuit lines carried on steel towers connecting the generating station with 5 major sub stations at Kothamangalam, Alwaye, Pallom, Mavelikara and Kundara, besides 26 miles of 33 K. V. single circuit line connecting Alleppey with Mavelikara. The mains distribution comprises 130 miles of 11 K. V. single circuit and 8½ miles of double circuit lines and about 92 miles of L. T. distribution network. Almost all the Municipal Towns coming within the network of the P. H. E. Supply have been provided with low tension distribution. Thus the first stage of the scheme covers a large portion of north and central Travancore, and it has been so designed that extensions to the transmission system can be added easily to distribute power to other areas such as Peermade in the east and Trivandrum in the south when such extensions are justified by the load conditions.

Industrial and Agricultural Development

The availability of electric power in most places in Travancore with the completion of the Hydro-electric Scheme and the very low rates of tariff now offered are expected to open up great possibilities in the industrial and agricultural development in the State. The progress so far made (as seen from the

last four months working of the scheme) has been quite up to expectations. By the midle of 1940 the system had a connected load of 4,155 K. W. and 1934 consumers distributed over 19 distribution centres. The peak load of the generating station had reached 2,220 K. W. and the generation 3·36 million units during the 4½ months of working. A number of power consumers came on the system soon after the inauguration of the supply, some of the largest of them being Messrs. K. D. H. P. Co., Messrs. Sri Chithira Mills, Alwaye, The Kottayam Electric Supply Agency, Messrs. A. D. Cotton Mills, Messrs. Travancore Minerals Co., Messrs. F. X. Periera & Sons, Messrs. Hopkin and Williams and Messrs. Associated Minerals Co.

The Department has been keenly alive to the need of the agriculturists for electric power, the chief uses of which are for dewatering the punja fields, the crushing of sugar cane and lifting water for irrigation. Experiments carried out in the previous year showed the ryots that electrical pumping could reduce their costs very considerably and there were several applications for extending the facilities for electric pumping during the pumping season this year. A proposal for extending the 11 K. V. supply covering a net work of 25 miles for this purpose at a cost of Rs. 2 lakhs was sanctioned by Government, and the work was taken in hand towards the middle of 1940. About 18 units of 50 H. P. electric motors were installed and an area of 2400 acres of punja fields were dewatered in this year's pumping season. It is expected that about 60 motors will be made available for the next season for dewatering about 8,000 acres.



The Power House, Pallivasal.

Lift Irrigation

Demonstrations in lift irrigation were also carried out last year. In Kuthiathodu village in Kunnathunad Taluk and in Thiruvella lift irrigation experiments by pumping water in paddy fields showed that it would be profitable to raise a second crop utilising electric energy for the purpose. Similarly demonstrations in watering cocoanut gardens by electric pumping carried out in Parur showed that substantial saving could be effected in such agricultural operations. A scheme for irrigating an area of about 10,000 acres in north Travancore is being studied in detail now.

A demonstration carried out in the Thiruvella Taluk in the application of electric drive for sugar-cane crushing has been so encouraging that applications for exending the scope of the supply to the entire sugar-cane area in Eraviperoor, Vallamkulam, Kozhencherry and other neighouring places are being taken up for detailed investigation.

Apart from these demonstrations, all reasonable aid in other directions is also rendered to would-be consumers for popularising the use of electricity. Proposals for the supply of electrical machinery on hire and hire purchase system to consumers were sanctioned by Government in September 1940 and the response from consumers in taking advantage of this scheme has been so great that within about 3 months, purchases of electric motors totalling nearly 1,500 H. P. have been arranged.

Aluminium Company

Among the large consumers expected to be supplied in the near future, the Aluminium Production Company of India Ltd., deserves special mention. A satisfactory agreement was reached between Government and this company towards July 1940 whereby Government have agreed to supply 4,500 K. W. of firm power from the middle of 1941 and 7,500 K. W. by the middle of 1944 for an Aluminium smelter plant to be installed near Alwaye. The company will be requiring another block of power aggregating to a total of 14,000 K. W. for bringing their factory to its fullest output. Government have agreed to make this block of power also available within one year after the company beings to take 7,500 K. W. An agreement is also expected to be reached very shortly with the Cochin Government for the supply of power for the entire requirements of that State. The demand from this source will be abut 3,500 K. W.

The agreement with the Aluminium Production Co., has necessitated the full development of the P. H. E. Scheme so as to bring the generation and transmission capacity to cope with their large demand. This developement will consist of the installation of 3 further generating sets of 7,500 K. W. each, 2 more penstocks and the provision of adequate storages in the upper reaches of the Mudirapuzha river. Two more 66 K. V. transmission lines from Pallivasal to Alwaye are also proposed to be constructed. The preliminary work on all these have already been taken in hand and tenders for the various items have been invited.

From the load developments now anticipated it is expected that within the next ten years the maximum demand of the systems will reach about 29,000 K. W. with an annual generation of over 200 million units. It is anticipated that the scheme will be able to yield very substantial profits after allowing for

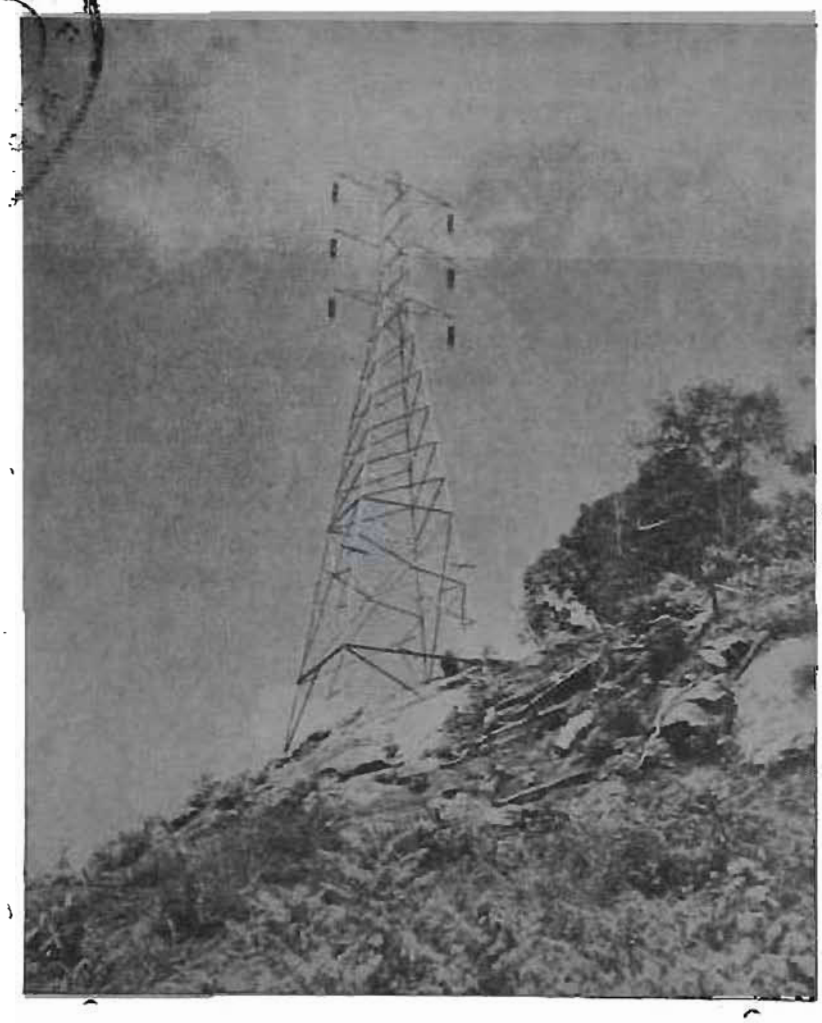
working expenses, depreciation and interest in a very short time.

The total capital expenditure on the project till the end of the last financial year was Rs. 131·28 lakhs.

The Telephone Scheme

The telephone activities in Travancore began in June 1931 when the Central Exchange with a 100 Magneto Board in [illegible] commenced regular service with 42 subscribers. Since its inauguration the exchange has proved so popular that extensions to the board have been necessitated from time to time. In 1935 a 50 line automatic exchange was also installed in the same exchange building to connect up the Palaces and other very important subscribers. The progress has been maintained during these 10 years and several extensions had to be made to cope up with the increased number of subscribers. At present this exchange serves 313 subscribers with 157 extension phones.

Government had in the meantime been considering a scheme for an All-Travancore Trunk Telephone System ultimately to be linked with the Government of India Trunk and in 1936 proposals for this took a definite shape. In 1937 the telephone branch of the Department was organised as a separate Division, but under the control of the Electrical Engineer. The services of an



The high tension lines, Pallivasal.

experienced Engineer from the Government of India Posts and Telegraphs Department were obtained and this officer was placed in direct charge of the Division. Estimates were soon after prepared for the All Travancore Scheme and submitted to Government. Government sanctioned this scheme at an estimated cost of Rs. 8 lakhs. The construction work was commenced soon after and the major portion of it was completed and the local trunk system linked up with all the important places of the State by the end of 1939. One special feature of the construction of over head lines as different from those of the Government of India was that teak wood cross arms and wooden poles obtained from the Forest Department were used. The speech and other tests on the lines, however, showed that the standard of construction has been kept very high. The linking up of the Travancore Telephone System with the Government of India Trunk was inaugurated by His Highness the Maharaja at 10·30 A. M. on the 22nd April 1940, when His Highness spoke from the Kowdiyar Palace to Sir G. V. Bowoor, the Director-General of the Indian Posts and Telegraphs Department who was at the time at Peshawar. The trunk scheme as completed up to the end of 1115 has about 507 miles of trunk circuits, 24 public call offices, 4 main and 6 sub-exchanges besides the telephone system for the Pallivasal Hydro-electric operation purposes, linking up the various sub-stations and generating station. A total number of 601 telephone connection including extensions are now being maintained. The capital expenditure on telephones till the end of the last financial year was Rs. 8·7 lakhs.

Radio Broadcasting

In sanctioning the Radio Broadcasting scheme which is to be shortly brought into operation, Government took one further step in their forward policy of the educational advancement of the State. Soon after the same was sanctioned by Government an Assistant Engineer from the Electricity Department was deputed to Delhi for training in installation work with the All-India Radio for a year. Four junior engineers were also deputed for training subsequently. It was decided to construct a 5 K. W. Medium Wave stations near Trivandrum. The Chief Engineer of the All-India Radio visited Travancore in January 1939 and selected a suitable site for the Transmitter Station at Pangappara about 7 miles to the north of Trivandrum. All the estimates required in connection with the scheme were prepared and the construction of the Transmitter building and associated buildings were taken up last year and most of the work has since been completed. The contract for the supply and erection of the equipments was placed with Messrs. Standard Telephone Company. These are now understood to be ready for shipment and are expected to arrive at site shortly. The materials for mast and earth system have been received and these have now been erected at site. The preliminary work in connection with the extension of a 3·3 K. V. power line from the Trivandrum Power House to the Transmitter station has also been completed and the construction work is being commenced. It is now expected that the station will be ready for operation by the middle of 1941.

A wave length of 455·926 meters has been allotted to the station by the Government of India.