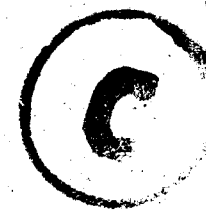
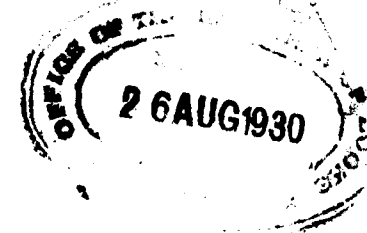


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South Indian Pearl Fisheries.

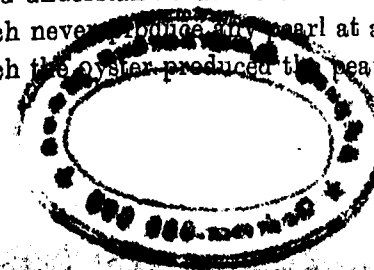
Dr. Sundar Raj addressed the members of the Association on **South Indian Pearl Fisheries** on 26-10-'29 and in the course of his lecture illustrated the various points dealt with by him by means of lantern slides prepared by the Department of Fisheries of the Government of Madras. He had hesitated, he said, in accepting the invitation to address a gathering of their Association, as he was not a geographer and could not treat his subject from the geographical point of view. The most he could do in that respect was to tell them something about the geographical distribution of pearl fisheries. Therefore he could leave the geographical aspect of the question to the geographers he saw before him.

In beginning to speak on the subject it was as well for him to start with the pearl oyster itself. Though pearls were best known to almost everyone the oyster responsible for the production of the pearl was not well known. Then he would deal with the pearl fisheries of the world, tell them something about the life history and distribution of the pearl oyster round the Indian coasts and end up with the cultural pearls produced in Japan.

The Oyster : its Classification.

The most valuable pearls in the world are produced by oysters.

The oyster is a mollusc covered by a shell. A species of the oyster family is known as the pearl oyster, because it is capable of producing pearls. The pearl, after a long period of research, has been traced to be a pathological product of the pearl oyster. The pearl is produced as a result of a disease of the oyster and therefore they could understand that there is a very large number of pearl oysters which never produce any pearl at all. As to the actual method by which the oyster produced the pearl there were many theories.



In South India the pearl producing oyster is found in very large numbers in the Gulf of Mannar between India and Ceylon. The pearls fished from this area of the sea are the most valuable and the oyster responsible for its production is a tiny creature and is the smallest pearl oyster in the world. Its shell is not of any value.

In general pearl oysters could be divided into two classes :—

1. The *maxima oyster* which is very large and whose shell sometimes measures 13 inches across is fished for the value of its shell and not for any pearl. In fact in many of the shells no pearl of any value is generally found. But the shell is very valuable as it is from the shell that the most valuable mother-of-pearl is produced. In the Australasian waters, in the South Seas, the Dutch East Indies and the Philippines pearl oysters of the *maxima* species only are fished for their shells.

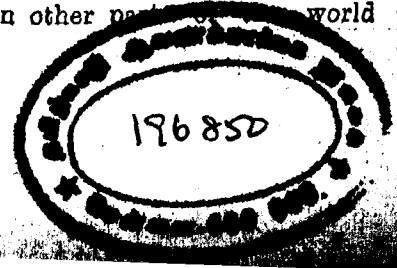
2. The second class of oysters are the *small oysters* generally known as the "common oyster" (perhaps because of the fact they were known for a long time). These are fished only for the sake of the pearls contained in them and not for their shells which are of no value at all. This is the type of oyster fished off the coast of India, in the Persian Gulf and in the Japanese waters.

Between these two extreme types of the oyster there are many intermediary types varying in size and variety.

The Life History of the Pearl Oyster.

The oyster is most prolific in multiplying itself and a single oyster produces anything between 50,000 to a million eggs at a time. They could understand the magnitude of that number when he said that after having held six pearling camps they had not been able to collect even a million oysters. But the difficulty in connexion with the pearl banks in the Gulf of Mannar is that they were never rehabilitated in time. The result is therefore unique in the experience of pearl fisheries in the world. Consequently in South Indian and Ceylon the fisheries suffer from quite uncommon irregularity of operations. The problem is one for research with the object of finding out the reasons why our fishing suffers from this singular irregularity. In other parts of the world pearl fisheries are annual affairs.

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The egg of the oyster is very tiny and pear-shaped. After floating in the water for some time the oyster emerges from the egg in the form of a larva and swims about the waters for 4 days. On the fourth day it develops a tiny shell which grows till on the fifth day the shell adheres to any floating object by means of a hairy substance which projects out from between the shells. In 1921 when ships came to anchor in the Tuticorin Harbour their anchors and the anchor cables were found completely clustered with the oyster spats. The volume of spats found in the pearling banks in the Gulf of Mannar was simply enormous.

Enemies of the Pearl Oyster.

The pearl oyster has several enemies to contend with in the sea. Chief among them is a fish which proves the most destructive and has been known to completely destroy an entire bank overnight. Another enemy of the oyster is the Trigger fish which is remarkable for its variegated colours. Crabs, clusters of barnacles and the star fish are also destroyers of pearl oysters. The last named has rather a funny way of getting at the pearl oyster and devouring it. It brings out its stomach from within its own body, grabs at the pearl oyster, digests it in the stomach outside its body and then returns the stomach inside its own body! The mollusc shell commonly known to the Hindus as the Chank is also a very large destroyer of the pearl oyster. The octopus otherwise known as the devil fish drills the shell of the oyster and destroys it. Several species of the sea sponge add to the large number of enemies that the oyster has to face at the bottom of the sea.

Origin of Pearl : Theories Old and New.

Besides these extraneous enemies which threaten the life of the pearl oyster in its placid banks are the parasites which eat into the shell. The whole question of pearl fisheries is bound up with the study of the parasitology of the pearl oysters. Though the oysters themselves might not like it (laughter) yet it is necessary from their point of view to have the parasites in the oysters, as, but for the parasites and the resulting disease they bring to the oyster the latter will not produce any pearls at all. (At this stage the lecturer exhibited on the screen a picture showing the multitudinous black spots in the oyster indicating the diseased spots.) It was round these spots that the oyster tends to secrete the nacre covering

which slowly develops into a pearl. The parasite that produces the small black spots is the young of a creature known as the tape-worm. Incidentally, tape worm is the cause of a great number of diseases in Europe.

It was in 1913 that the discovery was made that before an oyster produced a pearl certain preliminary conditions had to be fulfilled. Though this fact had been suspected from 1902, yet till 1913 it had been held that nearly all foreign substances which happen to get inside the shell and irritate the oyster form the centre round which, in order to overcome the irritation, the oyster secretes nacre which results in the ultimate pearl. The skin of the oyster throws out a sort of perspiration and this is the nacre which gives the pearl its iridescent surfaces. Thus was the presence of the pearl in the oyster accounted for before 1912. But the difficulty that faced the acceptance of this solution of the origin of the pearl was that if that theory was correct they should find the pearl attached to the shell and also find some foreign body inside the pearl if they broke it open. But the fact remains that the real pearl is a free body. The real origin of the pearl, discovered in 1913, is that a parasite enters the shell and delves into the flesh of the oyster dragging the outer skin of the oyster along with it. This outer skin which thus surrounds the parasite gives off the nacre secretion which forms the basis of the pearl. The skin contains a series of single cells which are in a living state as they surround the parasite and give out the secretion.

Once the theory had been held that the oyster came up to the surface of the water early in the morning and sucked in the dew water which later congealed into a pearl. This theory has found mention in Oriental and Greek literature. But some later writer had to a great extent foreseen the recent discovery when he wrote that the origin of the pearl was probably similar to the origin of parasites in pork. By a remarkable coincidence it is true that the parasite in pork is also the same parasite which induces the production of pearl by an oyster, namely, the tape worm. The pearls produced by the oysters which are found in the Gulf of Mannar are those induced by the tape worm.

The Distribution of Pearl Fisheries in the World.

The pearl fisheries in Asia are all ancient and well known. The fisheries in the Persian Gulf are very ancient and are now as prolific

as they were ever known to be. The Red Sea fisheries were well known in the time of the Ptolemys but they are now decayed. In the Gulf of Aden, too, pearl oysters are to be fished.

Other fisheries are situated off the Indian coast at Navnagar in the Gulf of Cutch. It is owned by the Nawab of Navnagar and is worth about Rs. 4,000 per annum. But they are not fisheries in the strict sense of the word as no boats or divers are employed in the collection of the oysters. They are collected between the tides when they are found washed ashore. Over 60 miles along the coast they are washed and this space of beach is usually leased out by the Nawab. Pearl oysters are also sometimes to be found off Ratnagiri. In 1901 a quantity of pearls was fished from the sea opposite the town of Balapur which is situated on the mainland adjacent to the peninsula of Bombay. Pearling has also been carried out off Cannanore and Travancore. Except in very recent times no great amount of pearling has been done in the Gulf of Mannar.

A pearl bank discovered off the coast of Bassein in Burma in 1895 was very short-lived and nothing great came out of it. In Malaya Archipelago are to be found extensive areas of oyster banks whose approximate area is about 11,000 square miles. In 1888 for the first time European exploiters became interested in those banks and commenced operations on rather a large scale. The pearls fished from that centre were carried to Europe by vessels sailing from the Philippines and Singapore. In the Archipelago the oyster fished is the maxima variety fished for the value of its shell. The Government of Burma which at the commencement leased out areas of banks to speculators stopped that practice from 1900 whence they leased out only boats. Those fisheries are worth about Rs. 1½ lacs per annum to the Government of Burma. But Mannar fisheries are worth about Rs. 5 lacs per annum. It employs about 300 boats and 5,000 divers. The fisheries in the Persian Gulf are however richer and employ about 30,000 divers.

Australasia, the Dutch East Indies near Borneo, the Sulu Archipelago south of the Philippines, Fiji, the Torres Strait, and the West Coast of Australia contain fisheries where oysters similar to those found in the Gulf of Mannar are to be found.

In the South Seas and on the Pacific coast of Central America are fished the maxima oysters which possess the shells from which are made the mother-of-pearl.

(At this stage the speaker handed round to the audience specimens of the maxima oyster's shell and a specimen of the shell of the tiny oyster found off the Indian coast.) Between the two types there are a large variety of oysters which vary in size and the quality of the pearls they produce.

In South America the Carribean Sea on the Atlantic side and Equador and Peru on the Pacific side had good fisheries where maxima oysters were found. In North America most of the fisheries were in fresh water. The mussels fished in the waters of the Mississippi yielded enormous quantities of pearls of a medium grade. Also valuable shells were fished there.

In Europe there was practically no pearl fishery. What there was of it was confined to fresh waters in countries like Norway, Sweden, Denmark, Bavaria, Scotland, Switzerland, Hungary and Russia.

Window Pane Oyster.

Besides the pearl oyster there were some other creatures like the window pane oyster which produced pearls of a sort. They were known as the window pane oyster because in the Philippines the shells of that creature was used in the windows instead of glass. They were transparent enough for the purpose. Even off the coast of India a small quantity of the window pane oyster was fished. In Ceylon there is a salt water lake in the interior where also the window pane oyster was found in large numbers.

Gulf of Mannar Fisheries.

So far as South Indian Pearl Fisheries were concerned the main centre of activities was the Gulf of Mannar where the pearl banks were found at a depth of about 10 to 12 fathoms (fathom equals six feet). From 1912 onwards intermittently big banks had been discovered in the Gulf. But between 1926 and 1927 the banks showed signs of dying out. The maximum life of an oyster was about 8 to 9 years. The Fisheries Department of the Madras Government first noticed spats in 1921. It had to wait for 5 years before pearling could be started. Before the department decided on starting operations, divers were sent to sound the bank at intervals of about 100 yards whence samples were fished. The oysters brought ashore and washed are then valued and only if they were

and these pellets were introduced into the shell between the mussel and the shell. The mussels thus grafted were placed on stones under the water and the pond was manured regularly. After six months had elapsed the harvest was reaped. The pellets which were introduced within the shells were covered by nacre and imparted to them the brilliant lustre and iridescence of natural pearls. But the defect of the pearl produced by this method was that only part of it was covered by the nacre as one part of the pellet was adjacent to the shell to which it adhered and where the nacre could not form. Therefore these were known as demi-pearls. The ingenious Chinaman also used small idols of Buddha to be introduced inside the shells thereby managing to have part of it covered with nacre. Following this Chinaman, others came into the field opened out by him and at present more than 30,000 families in China were engaged in this industry.

Since 1880 several experimenters engaged themselves in finding out the best way of producing full cultural pearls. After years of experiment Mikimoto of Japan surprised the world on May 4, 1921 when an evening paper in London announced that he had succeeded in producing a cultural pearl which had duped even the best experts in Hatton Garden and on the Continent.

Describing the method adopted by Mikimoto, as far as the outside world knew it from the patent taken out by him, the speaker said, for each operation two oysters were needed. One oyster was taken out from the shell, and the skin from that oyster was taken out and used to form a small pellet which was tied round. By a secret and delicate process the pellet which was of the living tissue of the oyster was placed inside the other shell which was then closed and caged in iron cages which in turn were again placed in water on floats. The cleverness of the operation of grafting the oyster with the pellet was largely responsible for the success. The nacre formed round the pellet grafted in was the ultimate pearl. The cultural pearl was so like the natural pearl produced by the Japanese oyster that even Mikimoto himself was unable to distinguish between the two. But fortunately for them all it was possible to differentiate between the pearl produced in other parts of the world and those produced either culturally or naturally by the species of oysters found in the Japanese waters. The instrument used for finding out the differences employed ultra-violet rays in its operation

The speaker then gave a graphic description of the X-ray method of detecting the real from the *artificial* pearl. Experiments were now being carried on to devise means to distinguish between the natural and cultural pearls of Japan. In view of the possibility of finding out the difference between the Japanese cultural and natural pearls and the pearls produced in the other parts of the world the fears entertained as to the depreciation of the value of real pearls at the time of Mikimoto's discovery had proved groundless.

Dr. B. Sundara Raj, M. A., Ph. D.

An Ordinary Meeting of the Association was held at 6 p.m., on Saturday the 26th October, 1929 in the Presidency College when **Dr. B. Sundara Raj**, M. A., Ph. D., Director of Fisheries delivered a lantern lecture on "**South Indian Pearl Fisheries.**"

Mr. R. Gopalan M.A., L.T., Professor of Zoology in the Presidency College presided on the occasion.

Introducing the speaker to the meeting the Chairman said: Dr. Sundara Raj, the lecturer of the evening, did not need any introduction to them. He had been in charge of the Fisheries Department for a number of years and had been in charge of the pearl fisheries carried out in the course of those years. He had also visited several pearling centres and biological stations and was therefore preeminently fitted to tell them about pearl fisheries. In these days of artificial and cultural pearls it was a pleasure to them to hear an expert talk on the oriental pearl. He also expected the speaker would tell them what effect the artificial and cultural pearls had on the genuine pearl in the world's market and what their effect on Indian pearls in particular was. He had great pleasure in requesting Dr. Sundar Raj to address them.

(The Lecture printed above was then delivered.)

The meeting came to a close with a vote of thanks to the lecturer and the Chairman.

Experiences of Air Travel.

A Meeting of the Association was held at 5-15 p.m. on Monday the 18th November, 1929 in the Presidency College, when **Sir. C. P. Ramaswami Ayyar**, K. C. I. E., delivered a lecture on "**Experiences of Air Travel.**"

G. G. Armstrong Esq., Chairman, Madras Port Trust presided on the occasion.

The Chairman said that he had little experience of air transport. The first aeroplane that he saw was in Madras and the last time he went up in one, it missed a tree just by a foot or two. But now people were travelling all over the world by air. The history of transport was being made to-day and he was sure the address they had all come there to hear would be a very interesting one.

Sir C. P. RAMASWAMI AIYAR said that when he landed in Karachi after the flight from London, his friends greeted him as a person who had done something very much out of the normal and particularly heroic, especially as it so happened that that particular aeroplane in which he had travelled was the one which crashed on its way back. The main object of the lecture would be to convince them that there was nothing of that kind, that air-travel to-day was not a particularly dangerous nor a particularly inconvenient mode of progression. One never felt, he said, the great speed at which the plane travelled nor the altitude at which it moved, though one did feel some sensation when ascending or descending. But even here a good pilot could effect a landing without the inmates of the plane being aware of the change of elevation.

There was also a kind of fallacy that once an aeroplane went up, nobody knew what was going to happen to it—that, indeed, it was a kind of derelict in the atmosphere. That, he said, was hardly the case. The wireless was constantly at work and it was easy with the increasing standardisation of airways to locate exactly where an aeroplane was and to ascertain in what direction it was moving. Thus with the progress of science there would be much less risk in air transport than was usually imagined to be the case.

Air travel would, he said, reveal beauties of the earth as no other form of locomotion did or could do. One never could realise, the beauty of snow-clad mountains en masse. Travelling by air

one would get a birds'-eye-view of the whole lay of the earth underneath, a complete panorama of the snow-bound peaks of high mountains, their undulations, the lakes and rocks between and the forests climbing up and disappearing with the snow-line. The effect of moonlight on the desert was a thing the like of which one could not imagine: so pellucid was the atmosphere so clear the view. But, if for nothing else, the prospect of seeing Athens and Baghdad made the London-Karachi route worth travelling by.

Altogether we found it was more convenient to travel by air, and it saved so much time. One got all the comforts in an aeroplane between London and Alexandria, but on this side of Alexandria the service was yet in the making both as to accommodation and food. Everywhere in Germany, Austria, Italy, Persia and Afghanistan progress was being rapidly made in aircraft. In Germany which was prevented by the Treaty of Versailles from having aeroplanes or aero-engines beyond a certain limit, all young men were trying to get the "air sense" by flying in engineless monoplanes or gliders from high towers and houses just to get equipped in piloting. In Persia, where road-making was difficult and expensive due to frequent inundations by rivers or due to the mountainous nature of the country, the different centres were connected by air-ways. One of Amanullah's achievements in Afghanistan was the introduction of aerial service. He was anxious to convey this message to them so that India might not be behindhand in these matters. Whether they liked it or not, India was being brought face to face with a competitive world. They could not stand still. If they did they would be pushed, and unless they pushed themselves forward, they would be pushed backward and in this world there was very little mercy shown to the hindmost. Commercially and industrially aviation had a great future. As a matter of convenience, as one of the elements that would go to make India a self-defending country when it was going to be a self-governing country, it had great possibilities and potentialities. He would conclude by exhorting all of them to see to it that they were not behindhand in the race for aerial navigation and aerial supremacy. (Applause).

The Chairman then requested the lecturer to make clear two points—first, the altitude at which the planes travelled between India and Europe, and secondly, whether any agreement had to be

entered into by the passenger exonerating the pilot in case any accident occurred to him (the passenger).

Answering these questions, Sir C. P. Ramaswami Aiyar said that in Europe, while crossing the Alps and at certain points, the plane rose to eight or nine thousand feet above sea-level and in fact he had once gone to twelve thousand feet. Above the Dead Sea it flew at an altitude of five to six thousand feet. But generally speaking from England to India the altitude of flight was between one to two thousand feet. As for the next point raised, did not all railway companies when one sent anything by it, declare that they were not responsible for anything that might happen to it? In the case of difficult surgical operations and in mesmeric cures similar agreements were entered into. There was of course such a stipulation in the tickets of passengers by aeroplanes, but how far it would be binding in law or how far negligence of the pilot could be contracted out thereby was a matter for a test case. But he thought the stipulation was only to prevent vexatious complaints where there was no negligence on the part of the pilot. If however there were more companies and more competition in regard to the air-ways between England and India these stipulations would be dropped.

The Chairman continuing his remarks said the railways introduced a great change seventy years ago, and probably seventy years hence, their sons and grandsons would no longer be citizens of Madras or India alone but would be citizens of the world, taking an interest in what happened in New Zealand.

"Trichinopoly under the Sea."

A Lecture.

Under the auspices of the Madras Geographical Association Mr. N. S. Arunachala Aiyar delivered a lecture on 11-12-'29 at the Presidency College on "Trichinopoly under the Sea". Miss I. H. Lowe, Deputy Directress of Public Instruction presided. There was a large gathering of ladies and gentlemen present on the occasion.

The lecturer first explained the nature of the several fossils which consisted of pearl oysters, woods and chambered shells which he had collected round about Ariyalur in the Trichinopoly District

in 1922. He said that these belonged to the cretaceous age according to geological calculations. He also pointed out that the animals upon whose shells these fossils had been cast were animals which were not found in fresh water and as such there was a strong suspicion that the locality in which he collected these fossils must have been under sea.

The lecturer then gave a short geological history of South India and stated that that portion of India south of the Vindhya Ranges belonged to what was known as the Gondwana age when South India, Africa and Arabian sea were comprised in one continent. The fact that similar fossils had been found in Africa confirmed the above statement.

A short discussion ensued in which Messrs. T. Sankar Singh, N. Subramaniam and Miss E. D. Birdseye took part

Miss Lowe in the course of her remarks thanked the lecturer for his very interesting lecture. The teachers of geography now chiefly dealt with the environment of man as it stood at the present time, but of course their ideas were only limited and might also be inaccurate. A very clear idea of the history that was behind the environment would be very useful. Man came to inhabit the earth only very late and the fossils that had been exhibited by the lecturer might be older. She hoped that the secretary of the geographical association would arrange many more such interesting and instructive lectures.

Mr. P. T. Srinivasa Iyengar proposed a vote of thanks to the President and the lecturer. He was glad that the lecturer who was a schoolmaster had not succumbed to the routine work of schoolmasters and had kept his eyes open and interested himself in studying his environment. The speaker hoped that the lecturer would be an example to many young men in colleges to continue their interest in subjects which they liked most even after their college course had been completed.

The meeting then terminated.

“ A City built on Sands.”

Mr. C. B. Elliott's Lecture.

An ordinary meeting of the Madras Geographical Association was held on 18th December 1929 at the Presidency College Physics Lecture Hall when Mr. Charles Brooke Elliott delivered an interesting lecture on “ Venice, the City built on Sand.” The lecture was illustrated with lantern slides. Mr. R. J. C. Robertson, Sheriff of Madras, presided.

The lecturer said that his main object that day was to show them some pictures of Venice and her architecture and of Roman, Greek and Byzantine types of architecture so that they might see those things rather than hear about them. Venice had been built upon an expanse of sand in Northern Italy and was one of the most beautiful cities in the world. It would be difficult to find out there where the land ended and the sea began. Being surrounded by great empires as Roman, Grecian, Byzantine and Gothic which had developed distinct types of architecture, with the arch, lintel, dome and gable as their dominant characteristics respectively, Venice combined all of those types in her buildings and beautified them in an extraordinary variety. The lecturer was of opinion that the St. Mark's Cathedral at Venice, the Westminster Abbey in London and the Taj Mahal at Agra were the three most wonderful buildings in the world and if one had seen these three, one need not search for beauties elsewhere.

The speaker then showed on the screen the historic buildings at Rome, Athens, and Pompey and explained their architectural characteristics. He also threw on the screen certain pictures taken at Venice.

Owing to the failure of lights, the lecturer could not show all the slides which he intended to show. He concluded by saying that it was due to the colour scheme which Venice took from the East that it was the most wonderful city in the world.

With a few remarks from the Chairman and a vote of thanks to the chairman and the lecturer, the meeting terminated.

Madras Harbour.

ITS HISTORY AND DEVELOPMENT.

Mr. C. G. Armstrong's Address.

Mr. C. G. Armstrong, President of the Madras Port Trust, addressed the Rotary Club on 20—2—'30 on the subject of the history and development of the Madras Harbour. He said :—

In the year 1639 Francis Day came sailing down the Coromandel coast looking for a place to found a trading settlement. He came to a river, a sandbank and a marsh, and—it is hard to see why—he decided that they would do. On the sandbank, which was then surrounded by two arms of the river, he built Fort St. George. The only advantages of the site seem to have been that it was protected on all sides, by the river, by the sea which in those days came right up to it, and by the Island which was then a marshy plain ; and also the possibility of capturing trade from the Portuguese settlement of San Thome.

Here then, on this sandbank was the first Madras harbour ; for the whole object of the Fort's existence was to provide a safe place for the ships and trade of the Honourable East India Company. The first fort was a small square, with a bastion at each corner for defence, containing the Company's offices and godowns ; the Company's officers at first were lodged in huts outside. It seems a very modest affair, but the East India Company Directors, after the manner of directors in all ages, were not pleased ; they said too much money had been spent and the place was not worth it. Nor has posterity been any more grateful ; among the statues and buildings and streets which preserve the names of the makers of Madras, Francis Day appears nowhere at all. It has been forgotten that the fort he built was the beginning of the Madras harbour.

The First Harbour.

Not, of course, that it was a harbour then. There was no pier or jetty even, nothing but beach, and very little of that. In stormy weather the sea came right into the fort moat and caused endless anxiety and expense to the Company's engineers by undermining

the foundations of the wall: they even seriously considered abandoning the fort altogether on this account. There was no trade, of course, in stormy weather ; ships avoided the monsoon months. In fine weather they lay at anchor outside the surf, and goods and passengers were all landed by masulah boats on to the strip of beach in front of the fort. There was nowhere to put them ; they were piled anyhow on the sand, till they could be carried in through the Sea Gate, past the inspection of the Sea Customer, under the eyes of the merchants on the verandah of the Commercial Exchange, now the Officers' Mess and stored in the Company's godowns on the ground floor of the fort houses, the first harbour godowns. Such was the original use of the narrow strip of beach which in those days constituted the foreshore.

Transfer of the Present Site

The trade of Madras seems always to have struggled with congested premises : in the course of 150 years the fort became much too small to hold it ; and, as usual, expansion was necessary. In 1794 the Governor, Lord Clive, moved the sea customers' office away from the Sea Gate, where it had always been, to its present site. Merchants were much alarmed as of course goods had to be landed where the Custom House was and it was considered most unsafe to keep goods in such an exposed spot, so far from the rest of Madras. It must be remembered that there was then no Georgetown, or very little : Black Town was originally on the site of the present High Court, and Messrs. Parry and Co's building was all that existed of the present First Line Beach. And Madras was still exposed to the raids of Tippoo. But no harm came of this daring move into the open country, and the second Lord Clive must rank with Francis Day and Sir Francis Spring as one of the makers of the Madras harbour.

Masulah Boats.

From the end of the eighteenth century, goods were landed on the strip of beach opposite the Custom House instead of at the fort ; but they were still brought ashore by masulah boats, which flourished exceedingly. In fact, one of the great objections raised to the first plan of building a harbour was that it would deprive the boatmen caste of their means of making a living. On the other hand, the great reason which induced the Chamber of Commerce

in 1862 to press for the building of a harbour was the exceedingly good living which these boatmen were making. They had a magnificent monopoly, being a closed caste and quite indispensable as nothing but a masulah boat could live in the surf. They charged what they liked, five, six, and even ten times the regulation fare; and they also took a very heavy toll on all goods in the way of damage and pilferage. The loss in this way between ship and shore was estimated at 90 per cent of the loss on the whole voyage, and at 20 per cent. of trade profits.

Schemes and Squabbles

For this reason in 1868 the Chamber of Commerce urged on Government the construction of some sort of harbour to protect ships from weather and from the extortions of boatmen. A committee was appointed to report, which was strongly in favour of building something, but much divided on the question whether it should be a closed harbour, or a long breakwater parallel with the coast, keeping the force of the waves off the ships lying inside it. The majority was "strongly of opinion that no closed harbour at Madras however ingeniously constructed, could be prevented from shoaling up," nor could they believe that any basin could be kept open by dredging. The President of the Committee however was of the opinion that no sand whatever would pass the mouth of an enclosed harbour, and that there would be no necessity whatever for dredging. This clash of opinions is characteristic of the early history of the Madras harbour; experts and boards of experts have reported with the utmost confidence in completely opposite senses, and the Government has steered its way as best it might between the Scylla and Charybdis of high engineering authority completely unacquainted with the place, and the vehement opposition of local experts.

Mr. Parke's Plan and its Dangers

The first idea was a backwater, 1,200 yards from the shore, extending from opposite the lighthouse to opposite the railway station at Royapuram, with guns mounted on it for defence. After much contradictory reporting by experts, however, they adopted a plan by Mr. Parkes, who had been very successful at Karachi, but had not at that time even seen Madras. He proposed a pair of breakwaters, 3,000 feet apart, stretching out seawards parallel to

one another for a length of about 3,000 feet, and then curving round towards each other till they left an opening of 515 feet between their pier-heads. This work was begun in 1877, but met with much tribulation. First it was in danger from the Viceroy, Lord Lytton, who was strongly of the same opinion as the Directors of the East India Company 230 years before, that Madras was not worth the money that was being spent on it. He wanted the whole thing abandoned at once, but was overruled by the Secretary of State, and the work continued. After the Viceroy, came the cyclone. In 1881 a storm destroyed a large part of the unfinished work, wrecking much of the piers, rolling the two Titan cranes into the harbour, and sinking the two small ships which lay at anchor inside. This was hardly surprising as the walls were only designed to be 2½ feet above the surface of the water at ordinary times, and the entrance faced due east, exposing the still unfinished harbour to the full force of the waves.

The North Entrance.

It was after this storm of 1881 that the question of changing the entrance to the N. E. corner of the harbour was raised. Again the experts girded themselves for battle; a committee of distinguished engineers at home declared that it would be impossible for a ship to get in and out of the harbour at the north end, as the prevailing wind for two-thirds of the year was from the north; while the captains of the P. and O. and B. I. lines unanimously agreed that it would be perfectly easy, as the prevailing wind was from the South. The Government of Madras, with all the local engineers, pressed strongly for the northern entrance, with a protective arm as at present; but they were overruled by the Secretary of State, who insisted that Mr. Parkes should complete his plan with the entrance on the east; and later recommendations in favour of the north-east corner were met at home with the same refusal.

Sir Francis Spring

This, then, was the situation when the real maker of the Madras harbour, Sir Francis Spring, came on the scene in 1904. He has described it himself. "The harbour at this date was formed by the pair of arms already described, curving round so as to leave an entrance on the east side, with full scope for the swell to roll in nearly all the year round, which made the working of vessels slow, difficult and dangerous during many months of the year,

The 5-fathom line was about half a mile from the shore forming the west side of the harbour, which consisted of a long flat sandy slope, with surf rolling in on it but little less violently than outside. There was no place for small craft to lie in shelter in dangerous weather, and though a few dozen 10-ton lighters had come into existence alongside of the old surf boats, they were constantly breaking loose during May and November, and, once broken from their moorings, nothing could save them from wreck. Needless to say, this greatly discouraged the provision by capitalists of an adequate tonnage of lighters. Between high water mark and the streets of the town of Madras there were to be found a few confused and unregulated railway sidings and two or three exiguous sheds. The beach was to be seen at all times littered with timber, coal, railway materials, general cargo, machinery, liquors, etc., all in dire confusion. Every packet of dutiable goods landed along the beach, unless too big to be so handled, was obliged to be carried on men's heads to the Government Custom House across the road, while goods arriving over the old screw-pile pier had to be pushed into the same Custom House on lorries. The entire dutiable trade of Madras had to pass in, and the empty lorries to pass out through one 10-foot Custom House gateway. The result was that it was no uncommon thing for a consignee not to get his packages under several weeks and even months. Machinery and railway packages used to be piled up in stacks, sometimes three or four deep, on the beach, and it was constantly happening that before the cargo of one vessel could be delivered to waiting consignees, that of another had perforce, for want of sidings, to be dumped on top of it. In fact, the arrangements were about as bad as they could possibly be." So Sir Francis Spring found the Madras harbour; there is no need for me to enumerate in detail how he left it. To those who know the harbour as it is to-day the best tribute to him is the contrast with this description of the place as it was when he came to it. He saw, too, as indeed the Chamber of Commerce saw in 1868 that it was the lack of harbour facilities which discouraged the trade of Madras and made it in the nineteenth century such a poor, tenth-rate sort of place. Kipling saw the poverty; he wrote of Madras in 1896:—

Clive kissed me on the mouth and eyes and brow,
Wonderful kisses; so that I became

Crowned above queens; a withered beldame now,
Brooding on ancient fame.

The withered beldame has taken a new lease of life since, very largely owing to Sir Francis Spring. The Directors in 1640 and the Viceroy and his Council in 1878 were all wrong; Madras was worth spending money on. Given decent harbour facilities, the trade would come and would more than repay the expense, in prosperity for the city. The event proved him abundantly right but his work was better than he knew; he did not altogether foresee the enormous rate at which the trade would come. He left Madras in 1919, just at the beginning of the great boom, when the trade and prosperity of the city leapt up and the harbour again found itself too narrow to cope with it. He estimated that the next big step would have to be taken in twenty, thirty, or even fifty years: the need for it has begun to be felt in ten.

Future Development

We must never forget that the city of Madras is built on her trade. It was a trading settlement that Francis Day founded in 1639 on the site of a little fishing village; the Honourable East India Company had no interest whatever in anything else. When in the nineteenth century her trade declined, her importance sank to nothing. As efforts were made to improve her shipping accommodation, her trade began to return and the withered beldame to revive. The more the harbour grew, the more trade and prosperity returned. And now, though competition is keener than ever it was, the total volume of trade is still growing, though checked by the limitations of the harbour. What are we to do next?

Well, it is not possible to say "Enough; we will expand no more." For if the trade cannot expand it will go elsewhere, and Madras will shrink again into the withered beldame, with no money to spend on anything. This is a very thorny subject on which I cannot enter fully now; but it is one which deserves earnest consideration. I would make just two points in connection with it. One is that we cannot afford to nibble at the problem; we must look ahead. If you construct things a little bit at a time hand to mouth, you will always find you have put them in the wrong place and have made endless extra difficulty and expense for yourself. And the other point is in connection with that sand

accretion. Before the harbour walls were built, it was not there; it began to come into existence as the walls were built by the first Harbour Engineer, Mr. Parkes, and it was called in derision "Parkes' land," until it was seen that it might be valuable, when it was called "military land" instead. But the fact remains that the whole bill for its creation was paid by the Port, and no light bill either; and, as Mr. Parkes himself said, "it is somewhat inconsistent that the outlay by which it was acquired should be debited to one Department and the returns credited to another."

Needed A Constructive Suggestion

But if any one has a constructive suggestion, I should be very glad to hear it. The matter is, after all, one of great importance to every one to whom the prosperity of Madras means anything at all. To read the papers, you would think that the Harbour was a rather disgraceful skeleton, to be kept strictly in the cupboard, instead of being the goose that lays the golden eggs, and incidentally, a very presentable, well-kept goose. You may, of course, think the goose would be better dead, and Madras a fishing village again; but if not, then the question touches you nearly: "What are we to do next." (Applause).

Progress of Aviation

Its Influence on Education

No subject is of such absorbing interest to the mechanically minded modern boy as flying. No human activity touches education at so many points. And it follows that nothing provides the teacher with so many convenient pegs on which to hang otherwise dry and uninspiring facts. The constant stream of news in the daily press about developments in aviation can be turned to educational use in countless ways.

We were reminded of this possibility by the publication of Sir Alan Cobham's "Twenty Thousand Miles in a flying Boat". (says "Education" in an editorial.) This book takes the form of a "humanised" log-book of Sir Alan's great aerial circumnavigation of Africa. The reader shares with him, his wife and his crew the daily hazards, major and minor, his hourly observation on climate, topography, manners and customs, and, by the aggregation of innumerable small incidents, grows to conceive himself a fellow-adventurer.

He would be an unusual boy who would need prompting to read this book, and by so doing he would insensibly pick up facts which would illustrate many of the principles offered for his bored attention in the geography, science and history lessons. For example: He will read, perhaps with some surprise, that Sir Alan found the flight up the West African coast to Walvis Bay from Luderitz treacherously fog-bound and will glean a basic fact of meteorology from the following: "..... the permanent wind in this direction is south-westerly, coming direct from the South Pole over the cold waters of the Antarctic Ocean. These winds are full of moisture, but they are also very cold. Consequently, instead of coming down in rain when they strike the hot desert coastline of South West Africa, they go up in steam, causing a perpetual fog."

The peculiar geographical conditions of Egypt, an understanding of which is essential not only in the geography lesson, but for a realisation of the origin of culture, the birth of most of our domestic arts and, in the opinion of one prominent school of thought, the whole theme of civilisation, are seen unforgettably through Sir Alan Cobham's eyes.

Examples of this kind could be multiplied indefinitely from this book, but perhaps the best example which has been brought to our notice recently was the news item in the daily press announcing that Easter Island might become a landing ground of the future for air lines across the South Pacific which would link China, Japan, South America and Australia.

The ordinary boy is not easily interested in archaeology, but there is the stuff of romance in this association between the newest form of transport with that old, mysterious island of the south seas, with its four hundred inscrutable images speaking dumbly of long forgotten adventurers and an obliterated culture.

Geography without Tears

It is, however, in the inculcation of simpler, more matter-of-fact geographical details that this wealth of material offers its chief advantage. As a practical suggestion for its utilisation, would it not be worth while to display on the class-room wall a large-scale map of the world on which could be traced, from time to time, the routes of new air-ways, or the flights of air adventurers, and followed? If the boys were asked to scan the newspapers for material

for this purpose they would be compelled to acquire a knowledge of the world's configuration, of distances and climate, which would be assimilated as easily as the rules of a fascinating game. Naturally, the teacher would improve on the occasion by calling attention to the natural phenomena with which the pilot would have to contend. Prevailing winds would be indicated, the likelihood of his meeting dust-storms or fogs would be speculated on, the alternative methods of ground transport would be discussed in a consideration of the time-saving advantages of the airway, and the habits and customs of the people of the country would have a vital interest for the pupils concerned about the aviator's safety in the event of a forced landing.

Air Photographs

An instance of co-operation between education and aviation which has taken definite form is, of course, the provision of aerial photographs, many sets of which are already in use in schools. Diagrams and maps are, and will remain, indispensable. But their merit of simplicity is of use only in aiding the pupil to grasp a principle, and, if the phenomena does not come under his own observation it is highly desirable he shall be shown a pictorial representation of it. Oblique and vertical air photographs could not be bettered for this purpose, as anyone will agree who has endeavoured to convey to a class of boys precisely what was meant by a "moraine" or a "meander" with the aid of a blackboard and coloured chalks. It is a matter of regret that the small use which is being made of air photographs for this purpose is limiting their general acceptance for educational purposes. Most of these photographs, to be of the greatest value, must be specially taken, and a flight for the specific purpose is only economical if a big demand is forthcoming.

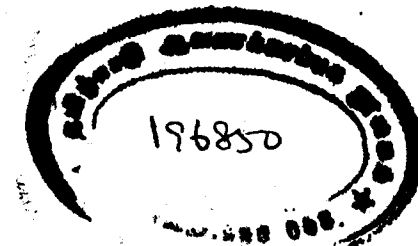
Another valuable series of air photographs is the set of oblique views of typical towns, from the decaying market town which owes its being to a mediaeval fortification, to the thriving industrial city. As an illustration for lessons dealing with economic history or commercial geography we should imagine this series to be not simply a mental appetiser for the children but of real practical value.

More specialised subjects, such as meteorology, some branches of physics, and ancient history could hardly be taken without at least passing reference to the influence of aeronautics. Civil and

military aviation is responsible for the collection of a vast amount of data on which our knowledge of weather conditions rests. Mention of the wind-tunnels, and other apparatus of the air-craft laboratory, will give zest to many a disquisition on airflow; while the aerial camera has revealed remains of an ancient civilisation of which archaeologists had formerly been unaware. This discovery of "Woodhenge" is, of course, the outstanding example of the successful use of the aeroplane as revealer of ancient cultures, but recent issues of the archaeological journals will furnish many other interesting, if less spectacular, successes.

Then there is the magnificent organisation of forest fire patrol, surveying, mapping and exploration which has been built up in Canada. That, too, provides pegs for illuminating comment,

The next decade is likely to see such progress in civil aviation that the ten years following the war will seem in retrospect to have been a period of experiment and cautious advance. School boys of the future are going to be even more obsessed with the subject than they are to-day. It is for the educationist to make of aviation an ally, instead of a distraction.



A Scheme and Syllabus for the Diploma in Geography.

University of Madras.

The Diploma course is open to

- (a) those who have passed the Intermediate Examination in Arts and Science with Geography;
- (b) teachers of Geography who can produce evidence of sufficient knowledge of the subject to profit by the course; and
- (c) Graduates in Mathematics, Science, History and Economics.

Students are required to attend a course of study approved by the University.

The Subjects of the Course are as follows :—

- (a) *The Physical Basis of Geography*, including the elements of Meteorology, Oceanography, and Geomorphology.

Syllabus.

Meteorology.—The Atmosphere, distribution and variation of insolation, temperature, pressure, humidity, and precipitation, and the causes of this distribution and variation. Movements of the atmosphere and their causes, storms. Classification of climates.

Oceanography.—Distribution of temperature and salinity in the oceans. Movements of the water, tides.

Geomorphology.—The influence of rock-texture, tectonic movements, and volcanic activity on relief. The evolution of fluvial, glacial, aeolian and littoral topography. Theories to account for the present distribution of land and sea. Structure and development of the present land-masses.

Reading and discussion of physical and geological maps and weather charts.

(b) *A Short Course in one of the three following :—*

1. Historical and Political Geography.
2. Economic Geography.
3. Bio-Geography and Anthro-Geography.

(c) *The Use of Instruments.* map-making, map-reading, and map-correlation, including practical work in class and field, and the presentation of a short dissertation on a selected area in India. The particular area must be selected by the student in consultation with his teacher.

The candidates will be expected to be able to measure angles and distances, to use a plane-table, a prismatic compass, a clinometer, and an aneroid barometer, to read and measure maps, to draw sections showing vertical relief, to convert contoured into hachured maps, to show a knowledge of the methods by which the data are collected for cartographical purposes, and to express cartographically (that is, by means of isotherms, isobars and other isometrical lines, shaded or tinted areas, and other signs) any given data relating to climate, population, and other similar subjects.

(d) *General Regional Geography of the World*, with a special study of two of the continents, of which Asia shall be one.

The Course for the Diploma in Geography will be a full-time one, and shall extend over a period of one year. But the dissertation shall be submitted in the September following the Examination.

The subjects for the examination are as follows :—

1. The Physical Basis of Geography, including the elements of Meteorology, Oceanography, and Geomorphology. (One paper of 3 hours).

2. Historical and Political Geography; or Economic Geography; or Bio-Geography and Anthro-Geography. (One Paper of 3 hours).

3. The Use of Instruments, Map-making, Map-reading, and Map-correlation. (One practical examination of 3 hours.)

4. General Regional Geography of the World, with special study of two of the continents. (3 papers of 3 hours each.)

The distribution of marks shall be 100 for each of the six papers and 200 for the dissertation, making a total of 800. The minimum required for pass will be 35 per cent. in each of the papers and 50 percent. in two of the papers and in the dissertation. Those who fail to get the minimum in the dissertation may be allowed to prepare a fresh one. Candidates getting 60 per cent. of the aggregate of marks will be declared to have passed with distinction.

S. S. L. C. Syllabus in Geography (as Finally Approved)

GROUP A. SOUTHERN CONTINENTS

Australia

1. Relief and Rivers of Australia.
2. Climate of Australia, The seasonal distribution of temperature and rainfall.
3. Vegetation and animals; relation between rainfall and natural vegetation regions of Australia; peculiarity of its animal life.
4. Life and work of the people with special reference to (a) East Coast Region, (b) Murray-Darling Basin, (c) Mediterranean regions of West Australia and Victoria.
5. Favourable position for trading with lands around the Pacific and Indian Oceans.

Africa

6. Structure—effect upon the coastline; rivers and lakes of Africa, relief and drainage.
7. Climate and vegetation of Africa, apparent seasonal migration of the sun and the duplication of climatic and vegetation belts north and south of the Equator.
8. Chief Natural Regions of Africa.
9. Peoples of Africa.
10. Trade routes of the Indian Ocean.

South America

11. Structure—relief; rivers.
12. Climate and vegetation of South America: the effect of a mountain barrier, of a cold current and of altitude upon rainfall and temperature; Andean Zones.
13. Peoples and States of South America; the importance of minerals in the past and present development of the continent.
14. Temperate countries of South America—Argentina, Uruguay and Chile.

15. Tropical countries of South America: Brazil—the world's chief store-house of tropical products.

16. Revision of the three southern continents.

North America

1. Structure and Relief; the work of rivers as illustrated on a large scale by the Colorado and Mississippi and as seen by actual observation of local streams.

2. Climate and Vegetation; factors that modify climate as evidenced in North America; natural regions of North America.

3. Population and political divisions; immigration.

4. *United States* :—

- a. North-Eastern industrial and commercial region.
- b. South-Eastern plantation region.
- c. Central farming region.
- d. The basins and mining regions of the Rockies.
- e. Pacific shorelands—fruit, grain, timber and minerals.

5. *Dominion of Canada and Newfoundland*.—

- a. Eastern Canada—agricultural, dairying, timber, fisheries, mining and manufacture.
- b. Prairie provinces.
- c. British Columbia.

6. Mexico, Central America and West Indies.

7. Transport and communications of North America and important links in round the world routes.

SECOND YEAR.

GENERAL AND REGIONAL GEOGRAPHY OF EURASIA AND INDIA.

1. Surface, relief and rivers of Eurasia.

2. Climate of Eurasia; the major climatic regions, comparison of temperature; conditions on east and west margins; effect of latitude and distance from the sea on range of temperature, causes of monsoons and their effect on climate of South-east Eurasia.

3. British Isles—relief; influence of the sea and the climate upon the life and activities of the people; fisheries and farming; the chief industrial regions and their outlets.

4. Western Mainland of Europe.

France—Agriculture and industry; position of Paris and Marseilles.

Belgium—plain of Flanders and the Sambre-Meuse Valley. Holland a delta land reclaimed from the sea; its colonies and sea trade. Denmark—Co-operative dairy farming. Germany—plain and plateau, forestry and development of special industries; industries of the Ruhr and Saxon Coalfields.

5. Baltic Region—the new border states; Scandinavian peninsula—forestry and wood work of Sweden.

6. Central Highlands of Europe; Czecho-Slovakia—its minerals and industries; Agriculture of the Mid-Danubian plain. Alpine region—development of hydro-electric power and effect on industrial development.

7. Mediterranean region.—influence of climate on plant adaptation and fruit culture. Spain—its mineral wealth but lack of coal. Italy—alluvial plain of Lombardy and its industrial development; peninsular Italy.

8. South Western Lands of Asia—region of plateau and deserts with one important alluvial plain; its historical importance as a highway.

9. Central and Northern Eurasia—rich wheat and pasture lands of Rumanian and Russian plains—desert conditions of the Aral Sea Basin; tundra, taiga and steppe of Siberian plain; contrast development of this region with the similar region in North America.

10. China—her dependencies. Effect of climate and relief upon occupations and industries.

11. Japan. A mountainous country, yet productive; agricultural, mineral and industrial development; importance of Korea.

12. South-east Asia and the East Indies.

13. Position, relief, soils and minerals of India and Burma.

14. Climate of India; her chief climatic regions; means of irrigation.

15. Vegetation and animal life of India.

16. Peoples of the Indian Empire.

17. Survey of the Provinces and States.

a. Mountain States.

b. Great Plain.

c. Plateau states and provinces.

d. Madras,

e. Bombay.

18. Occupations and industries of India.

19. Trade, transport and seaports.

20. Ceylon.

THIRD YEAR.

GENERAL AND REGIONAL GEOGRAPHY OF THE WORLD.—

I. Studies in climate—size and shape of the earth, movements of the earth, day and night, the seasons, annual and seasonal distribution of temperature, pressure and winds and rainfall, ocean currents, natural vegetation.

II. Regions of the world.—

1. Tundra and Ice-cap.

2. The cold forests.

3. Broad-leaved Forests.

4. Temperate grasslands.

5. Mediterranean Lands.

6. Desert Lands.

7. Equatorial forests and tropical grasslands.

8. Monsoon Lands.

9. Islands of the Pacific.

10. High mountain and plateau.

11. Industrial Regions of Europe.

12. „ „ of North America.

13. Regions of the Empire.

Syllabus of C. Group Geography

I.—Physical Geography.

The land.—Land masses—outline and shape. Mountains, valleys, plains, deserts, watersheds, springs, rivers, lakes, glaciers, ice-sheets, ice-bergs. The changes produced in the land by rain rivers, and other surface agents; by underground water; and by the sea. Coastlines. Internal drainage areas and salt lakes. Earthquakes, slow movements of the land. Evidence of elevation and depression. The characters and origin of the various rocks forming the land. The nature and distribution of volcanoes.

The air.—Weather and climate. General conditions of the air; the measurement of pressure, temperature and rainfall. Means, maps and isometric lines; reduction to sea-level. World distribution of pressure. Relation of winds to pressure; the depression and the anticyclone; wind direction and isobars; general wind system of the world. The aqueous vapour in the atmosphere; evaporation; modes of condensation. World distribution of rainfall; seasonal rainfall. Climate and conditions determining it. Climatic characters of the major climatic regions of the world. The influence of climate on the distribution of the chief vegetation types.

The sea.—The general contour of the ocean floor and methods of representing on maps, salinity. Temperature of the oceans and enclosed seas. Movements of the sea; waves; currents; tides and their causes. The courses of the main ocean currents.

II.—A detailed regional study of India.

A. A general survey of the physical conditions of India.

B. Frontier Zone—

- (1) Afghan-Baluchi Frontier.
- (2) Himalayan Border.
- (3) Sub-Himalayan Region.
- (4) N. E. Hill Tracts.

C. Indo-Gangetic Plain—

- (1) Plain of Lower Indus.
- (2) Western Indo-Gangetic plain (Jhelum to the Jumna).
- (3) Middle Gangetic Plain (Jumna to Patna).
- (4) The Delta lowlands.
- (5) Assam Valley.

D. Intermediate Zone—

- (1) Kathiawar and Gujerat.
- (2) Aravalli-Vindhya uplands.
- (3) Central Highlands.
- (4) High plains of Berar and Nagpur.
- (5) Chattisgarh plain.
- (6) Bastar and Orissa highlands.

E. Southern India—

(1) Deccan plateau—

- (a) Maharashtra region.
- (b) Middle basins of Godavari and Kistna.
- (c) Mysore.
- (d) High southern plateaux.

(2) West Coast—

- (a) Konkan (north of latitude 16°).
- (b) Malabar-Travancore.

(3) East Coast—

- (a) Coastal plain of Orissa (north-east of Mahendragiri).
- (b) Nellore to Mahendragiri.
- (c) Nellore to Cape Comorin.

III.—A detailed study of a major natural region of the world other than India.

The region will be selected every alternate year from such regions as the Mediterranean; Australia and the Eastern Archipelago; South-west lands of Asia; Western Europe; North America east of the prairies, etc.

Practical work.

It will be assumed in setting the papers that practical work has been done along the following lines:—

1. *Physical Geography.*—Observations of temperature of the atmosphere and the conditions affecting variations of temperature. Use of the barometer. Observation of the direction and strength of the winds. Observations of the rainfall by means of the rain-gauge. Study of rainfall and temperature maps. Study of the weather map.

Finding direction by means of shadow, watch and compass. Drawing sections from contour maps. Making of simple plans and maps by means of the chain. Study of maps of the school district drawn to various scales.

2. *Regional and Economic Geography.*—The construction of population and economic maps, graphs, diagrams, etc., from census and other returns. The correlation of simple orographical, climatic, population and economic maps.

Books recommended.

1. Regional Geographies of Indian Empire, Parts I, II, III—Stamp—Longmans.
2. Provincial Geographies of India, 3 books—Cambridge University Press.
3. The Groundwork of Modern Geography, Wilmore—G. Bell and Sons.
4. Principles of Geography (Physical and Human)—E. W. Skeat—Clarendon Press.
5. Surveying for Schools and Scouts—Richardson—Philip and Son.
6. A Class Book of Practical Geography—Young and Fairgrieve—G. Philip and Sons.

Fourth annual meeting of the Association.

The fourth annual meeting of the Madras Geographical Association was held on Saturday the 26th April 1930 at the Hindu High School Hall Triplicane, with Mr. P. T. Srinivasa Iyengar, the President, in the Chair. There was a large attendance. The report for the year 1929-30 was read by Mr. N. Subrahmanyam, the Secretary, and was adopted. The following office-bearers were elected for 1930-31. Mr. P. T. Srinivasa Iyengar, (President), Mr. S. Lakshmana Iyer, and Miss E. D. Birdseye (Vice-Presidents), Mr. N. Subrahmanyam, (Secretary), Mr. A. Appadurai (Treasurer). Four other Committee members were also elected, *vis.*, Miss H. A. Edington, Major A. M. V. Hesterlow, Mr. V. K. Sourirajan and Mr. K. Rangaswami Ayyangar (*Mofussil*).

The President narrated briefly the genesis of the new S.S.L.C. syllabus in Geography and Mr. N. Subrahmanyam, Secretary, explained the main principles underlying the new syllabus. It was, however, decided to have two or three special lectures on the subject in July next after the re-opening of the schools. It was also decided to hold a Conference of the Association at Coimbatore along with the South Indian Teachers' Union Conference next month in accordance with the suggestion made in the Annual Report.

The meeting came to a close with a vote of thanks to the Chairman.

News and Notes

The provision for the *academic* qualification of the teacher of Geography in the School and the College has been lacking in most Indian Universities; and a step taken by the University of Madras in this direction three years ago has not yet fructified. The recent acceptance by the Academic Council of Geography as a subject of the B.A. (Pass) course is naturally the next step to having it in the Intermediate Course.

* * * *

But the subject has to be strengthened first in the Intermediate stage by facilities being given to colleges for opening it. On the other hand, as a matter of fact, four colleges that provided for it have had to close it, and Queen Mary's College is the only one that still continues it. The chief difficulty has been the lack of qualified staff.

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It is, therefore, highly incumbent on the University authorities to take immediate steps to give early effect to the sanctioned Diploma Course, which will in the first instance provide batches of teachers of Geography, *academically* qualified to handle the subject in the Intermediate as well as the High School classes.

* * * *

The University has, however, done well in obtaining a Government Overseas Scholarship for Geography, though one such or once in a way only will not meet the great demand that there is. A suitable candidate has been selected. We congratulate the recipient, Mr. M. S. Subramaniam, who is a distinguished Honours Graduate in Geology, and a keen student of Geography, besides being an active member of the Madras Geographical Association. He has contributed a paper on the "Meteorology of the Coimbatore District" for the Geographical Conference at Coimbatore.

* * * *

The *technical* training of the teacher of Geography is also one that is equally urgent in view of the new position accorded to Geography in the High School and the paucity of qualified teachers to handle the subject on modern lines. The slow process of training some forty or fifty graduates every year in the training colleges cannot meet the urgent needs of the hundreds of schools in

the Presidency. Refresher-Courses and Summer Schools in different centres are badly needed. The Summer School conducted by the Association in April last (Vide Report appended) is but a drop. The great rush for seats indicates the keenness and the insistent demand.

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The new S. S. L. C. Syllabus in Geography has, after a year's delay, been approved in an altered form. We have no hesitation in asserting that the change has been for the worse, a very well-thought-out and organic syllabus having been tampered with as a compromise to satisfy popular criticism. But at the same time we deprecate frequent pulling out. Let the new syllabus in its present form be worked for a few years, however unsatisfactory it may be; and then in the light of experience and with the growth of a body of qualified teachers in the subject, it will be time enough to think of revision.

* * * *

A meeting of the Association was held on 2nd April 1930 at the Hindu High School, Triplicane, when Mr. R. Dann, Director of Town-Planning, delivered an interesting lecture on "Urban Geography with special reference to South Indian Cities". The full proceedings of the meeting will be published in the next number of the Journal.

Books and Journals Received

Rural India: February to April 1930.
Wealth and Welfare: Vol. VI, Nos. 6 to 16.
Wealth and Welfare: Pamphlet Series—Tuberculosis.
Our Home Magazine: February 1930.
The Geographical Review (of New York): February 1930.
The South Indian Teacher: February to April 1930.
The Geographical Journal: February to April 1930.
The Educational Review: February to April 1930.
Journal of the Travancore Teacher's Association: January and April 1930.
Indian Educator: February and March 1930.
Geography: March 1930.
Digest No. 86 of the Department of Agriculture, Madras.
Quarterly Journal of the Mythic Society: April 1930.
Mysore Secondary Education League Journal: December 1929.
Journal of the Manchester Geographical Society: April 1929.
Map-Drawing Exercises: By K. Narayanaswami Ayyar.

The Fourth Annual Report of the Madras Geographical Association, 1929—1930.

The Working Council of the Madras Geographical Association has great pleasure in presenting the Annual Report for the Year 1929-30:—

The fourth year has been one of further consolidation of the position already attained as well as of some progress.

The strength of the Association at the commencement of the year was 173, 54 members were admitted during the year, and 2 members resigned, while 55 names have been removed for non-payment of arrears of subscription. The strength has thus been brought down to 170 at the end of the year.

The Journal has 128 subscribers, as against 108 of the preceding year. Of these 42 are official, as against 40 in the previous year. Volume IV Number 3 was the super-number for the year, containing 31 maps, illustrative of the main article in it. While publishing the proceedings of the meetings of the Association with the full report of the important papers read, the Journal has included during the year articles on the teaching of Geography also. The recent increase in the number of teacher-members subscribing for the Journal points to the fact that this new feature is being appreciated.

The financial position as seen from Appendix A will show that, though being able to make both ends meet, the Association has not yet built up any reserve fund. It is hoped that members who can afford it will help to build up a capital fund by converting their ordinary membership to life-membership as per Rule 8 of the Rules of the Association.

The Working Council met five times during the year. A list of the lectures delivered and the papers read, is given in Appendix B. Two of these meetings, which were arranged during Christmas week, were specially appreciated by the mofussil members who were present in large numbers at the time in order to attend the A. I. F. T. A. and S. I. T. U. Conferences. A desire was then expressed that a Conference of the Association may be held every year along with the S. I. T. U. Conference, as several mofussil members are expected to be present on the occasion. It is hoped that this idea will materialise itself in May next at Coimbatore, where the S. I. T. U. Conference is to be held this year.

In accordance with the approval of the General Body, obtained in July last, two mofussil branches have been formed during the year at Trichinopoly and Villupuram. It is expected that this new development will tend to increase the activities of the Association.

It is gratifying to find that Geography has been gaining ground in the University of Madras, very slowly though, during the year under report. The final sanction of the Senate has been received for starting a Department of Geography in the University and opening a Diploma Course; and it only remains for the Syndicate to give effect to the scheme. The Academic Council has at its last meeting accepted Geography as one of the Optionals in the B. A. (Pass) Degree Course. The Government Overseas Scholarship of the year has been recommended for the study of Geography abroad.

In the High School too the subject has gained in importance with its inclusion in the reorganised S. S. L. C. Scheme, both as a compulsory and as an optional subject. But owing to the paucity of qualified teachers in the subject, a simple and sensible syllabus on quite modern lines has been vehemently decried, and the substitution of another in its place, to meet the general level of the average present-day Geography teachers here, has been too long in coming. There is however, evidence of a keenness and desire to learn and be guided.

It is to satisfy this general desire and help the teacher of Geography at this juncture to greater efficiency that the Working Council decided to run another Summer School during April next and appointed a special committee to conduct the course. The principal of the Teachers' College, Saidapet has kindly consented to permit the classes being held in the Geography Department of the College; and to him our thanks are due. We have also to thank the Director of Public Instruction, Madras, who has not only approved of the course, but has also promised to recommend to Government for a grant as for the Summer School of 1928. He has also kindly consented to open the School on the 10th instant. A separate report will be issued after the course is over.

In conclusion, the Working Council desires to record that the year has been one of steady progress both for the Association and for Geography,

Gopalapuram,
Cathedral Post, Madras,
2nd April, 1930.

(By order)
N. SUBRAHMANYAM,
Secretary.

APPENDIX A.

The Madras Geographical Association, Madras.

Statement of Receipts and Disbursements for the Year Ending 31st March, 1930.

	RECEIPTS.	RS. A. P.	RS. A. P.	DISBURSEMENTS.	RS. A. P.
<i>Opening Balances:—</i>					
Cash on hand to be remitted to Bank	...	7 0 0	...	Journal Expenses Paper, Printing, Blocks, Lithographing, etc.,	...
Indian Bank Limited, Madras...	...	26 12 10	...	Postage	1,080 12 6
Imprest Account	...	0 0 7	...	Charges at Meetings	... 116 2 6
Postage Account	...	0 7 0	...	Cooly and Conveyance	... 14 6 0
Interest from Bank	...	...	34 4 5	Stationery	... 12 12 9
V.P.P. Charges Collected	...	...	3 12 11	Furniture	... 12 15 6
Refund of remuneration from Mr. V. Adinayana Chetty, (Re: Summer School)	...	...	7 2 0	Repayment of Loan to Mr. M. Subramaniam...	... 21 0 0
Sale of Copies of Journal	...	...	49 8 0	Telephone and Miscellaneous	... 18 0 0
Subscriptions for:—	...	...	12 0 0	<i>Closing Balances:—</i>	... 8 13 0
Ordinary Membership	...	297 0 0	...	Cash to be remitted to Bank	... 7 0 0
Life Membership	...	30 0 0	...	Balance with Indian Bank Ltd., Madras	... 36 11 9
The Journal	...	861 8 0	...	Imprest Account	... 0 11 10
Advance Subscriptions	...	...	1,188 8 0	Postage Account	... 2 13 6
			37 0 0		47 5 1
Total ...	1,382 3 4			Total ...	1,332 3 4

The Madras Geographical Association, Madras.

Income and Expenditure Account for the Year Ending 31st March, 1930.

EXPENDITURE	Rs. A. P.	INCOME	Rs. A. P.
To Journal Expenses-Paper, Printing, lithographing etc.,	858 10 6	By subscriptions for :—	
" Postage	116 2 6	Ordinary Membership	342 0 0
" Charges at Meetings	21 6 0	The Journal	700 0 0
" Cooly and Conveyance	12 12 9		1,042 0 0
" Stationery	12 15 6	By Sale of Copies of Journal	12 0 0
" Telephone and Miscellaneous	8 13 0	" V.P.P. Charges Collected	7 2 0
" Balance (carried down)	83 10 8	" Interest from Bank	3 12 11
		" Refund of remuneration from Mr. V. Adinayana Chetty, (Re: Summer School).	49 8 0
Total	1,114 6 11	Total	1,114 6 11
To Irrecoverable Subscriptions written off :—			
" Ordinary Membership	43 0 0		
" Subscriptions for the Journal	29 0 0		
" Surplus (carried to Balance Sheet)	11 10 8		
Total	83 10 8	By Balance (Brought down)	83 10 8
		Total	83 10 8

Balance Sheet as on 31st March, 1930.

LIABILITIES.	Rs. A. P.	ASSETS.	Rs. A. P.
Advance Subscriptions	38 0 0	Subscriptions Outstanding :—	
Bills Payable :—		Ordinary Membership—	
Bills for Printing etc.	109 3 0	for 1928—1929	15 0 0
Hall Rent and Electric Charges due	7 0 0	for 1929—1930	85 0 0
		Life Membership ;	100 0 0
M. G. Association Fund :—	116 3 0	Journal :—	50 0 0
Balance as per last Balance Sheet		for 1927—28	10 0 0
Surplus since last Balance Sheet	261 15 5	for 1928—29	16 0 0
		for 1929—30	183 8 0
		Furniture	209 8 0
		Cash and other Balances :—	21 0 0
		Cash on hand	7 0 0
		Balance with Indian Bank Ltd., Madras	36 11 9
		Do of Imprest Account	0 11 10
		Do of Postage Account	2 13 6
Total	427 13 1	Total	427 13 1

AUDITOR'S REPORT.

I have audited the above Balance Sheet with the accounts and vouchers kept by the Secretary of the Association, and have obtained all the needed information and explanations. I am of opinion that the same is properly drawn up so as to exhibit a true and correct view of the state of affairs of the Association according to the best of my information, and the explanations given me, and as shown by the books of the Association.

Madras. }
'Dated, 21st April, 1930. }

A. APPADORAI,
Treasurer.

G. L. NARASIMHAM, G.D.A.,
Honorary Auditor.
N. SUBRAHMANYAM,
Secretary.

APPNIDX B

Date.	Subject.	Lecturer.	Chairman.
1. 19 4-'29	"Scenes of Rural Life"	Dr. A. LAKSHMI-PATI'S Film Show.	
2. 27-7-'29	Third Annual Meeting. Report & Elections.		P. T. SRINIVASA AYYANGAR.
3. 29-8-'29	"Environment and Economic Activities; with special reference to South India."	K. C. RAMAKRISHNAN. M.A., Lecturer in Economics, University of Madras.	E. W. GREEN. M.A., Principal, Govt. Muhammadan College.
4. 26-10-'29	'South Indian Pearl Fisheries'; Illustrated with slides.	B. SUNDERA RAJ, M.A., Ph. D, Director of Fisheries.	R. GOPALAN, M.A., L.T., Professor of Zoology, Presidency College.
5. 18-11-'29	"Air Travel'.	Sir C. P. RAMASWAMI AYYAR, C.I.E.	G. G. ARMSTRONG, O.B.E., M.C., V.D. M. Inst. T. Chairman & Traffic Manager, Madras Port Trust.
6. 11-12-'29	"Trichinopoly under the Sea."	N. S. ARUNA-CHALA AYYAR, B.A., L.T.	Miss. I. H. LOWE, M. Sc., F.R.G.S.
7. 18-12-'29	"A City built on Sand"; illustrated with slides.	C. BROOKE ELIOTT Bar at-law.	R. J. C. ROBERTSON, Sheriff of Madras.
8. 30-12-'29	"The Work Before us".	N. SUBRAHMANYAM, M.A., L.T.	S A S A D H A R BANERJEE M.A., F.R.G.S.
9. 30-12-'29	"Regional Survey".	Miss M. W. BARRIE, M.A.	K. S. Vakil, M.A., Inspector of Schools, Bombay.
10. 28-2-'20	"Pompeii": Illustrated with slides.	C. BROOKE ELIOTT, Bar-at-law.	R. Dann, Director of Town Planning.

APPENDIX C.

List of Members of the Association.

Janab Abdul Hamid Saheb, B.A., District Educational Officer, Calicut.
Janab Abdul Khadir Saheb, B.A., L.T., Deputy Inspector of Schools, Coimbatore.
M.R.Ry. S. Ananthanarayana Ayyar Avl., (Life Member) 10, Pandadimal, Andar Street, Teppakulam, (Trichy.)
M.R.R.y. K. M. Abraham Avl., M.A., L.T., B.D., Y.M.C.A. School of Physical Education, Royapettah, (Madras).
Mr. R. D. Anstead, M.A., Director of Agriculture, Chepauk, Madras.
M.R.Ry. A. Appadorai Avl., M.A., L.T., (Treasurer). Ramakrishna Home, Mylapore, (Madras).
M.R.Ry. P. Appa Rao Garu, Teacher, Board High School, Kollur, (Guntur Dt.).
Miss. F. A. Baker, Principal, Ewart School, Vepery (Madras).
Miss. M. W. Barrie, M.A., Lecturer, Lady Willingdon Training College, Triplicane, (Madras).
Mr. E. E. Berry, M.A., Headmaster, Stanes European High School, Coimbatore.
Miss. E. B. Birdseye, B.Sc. (Vice-President), Wesleyan Mission Girls' High School, Royapettah, (Madras).
Mr. H. Champion, M.A., Deputy Director of Public Instruction, Cathedral, (Madras).
Miss M. I. Clarke, Teacher, Saifabad, Hyderabad, (Deccan).
Dr. J. H. Cousins, M.A., D. Litt., Principal, Brahma Vidyasrama, Theosophical Gardens. Adyar.
M.R.Ry. Rao Saheb S. Dandapani Ayyar Avl., B.A., Gopalapuram, Cathedral, (Madras).
Mr. R. Dann, Director of Town Planning, Mount Road, (Madras).
Miss. P. S. Darling, Wesleyan Mission, Doveton Lodge, Mylapore, (Madras).
M R.Ry. V. Desikachari Avl., M.A., L.T., Teacher, Islamiah High School, Melvisharam, (North Arcot Dt.)
Miss F. Dinker, B.A., Sub-Assistant Inspectress of Girls' Schools, Kurnool.

- M.R.Ry. W. Duraiswami Ayyangar, Avl.,
Manager, Messrs. Longmans, Green & Co.,
Mount Road, (Madras).
- M.R.Ry. S. Duraiswami Ayyar Avl., M.A., B.L.,
Advocate, "Palm Grove", Mylapore, (Madras)
- Miss H. A. Edington, Churchpark Training College,
Cathedral, (Madras).
- M.R.Ry. C. S. Ekambara Ayyar Avl., B.A., B.L.,
Advocate, 1 (a), 36th Street, Rangoon.
- M.R.Ry. C. N. Ekambara Mudaliar Avl., M.A., L.T.,
Lecturer, Teachers' College, Saidapet, (Madras).
- M.R.Ry. M. S. Ekambara Rao Avl., B.A., L.T.,
Headmaster, Ganapathi High School,
Mangalore.
- Mr. P. F. Eyson, M.A., Principal, Presidency College,
Triplicane, (Madras).
- M.R.Ry. M. P. Ganosa Ayyar Avl., B.A., L.T.,
Teacher, St. Joseph's College, Trichinopoly.
- M.R.Ry. K. Ganesier Avl., B.A., L.T.,
Superintendent of Municipal Schools
Kumbakonam.
- M.R.Ry. V. Ganudadi Avl., Commercial Inspector,
High School, Devakottai.
- Miss J. M. Gerrard, M.A., Principal, Lady Willingdon
Training College, Triplicane, (Madras).
- M.R.Ry. C. M. Gopal Avl., B.A., L.T., Asst., Model School,
Teachers' College Saidapet, (Madras).
- M.R.Ry. N. Gopalakrishna Rao Avl., B.A., L.T.,
Asst. Board High School, Puttur,
(South Canara Dt.).
- M.R.Ry. B. N. Gopalswami Naidu Garu,
Lithographer, 16 Ramaswami Pillai Street,
Purasawakkam, Vepery (Madras)
- Srimathi N. Gouri Ammal, M.A., L.T.,
Teacher, Girls' High School,
Irinjalakuda, (Cochin).
- Mr. E. W. Green, M.A., Principal, Govt. Muhammadan
College, Mount Road, (Madras).
- M.R.Ry. V. Guruswami Sastri Avl., B.A., L.T.,
Head Master, High School, Tirukattupalle,
(Tanjore Dt.).
- M.R.Ry. V. R. Harihara Ayyar, B.A., L.T.,
Headmaster, Manthiramurthy High School,
Tinnevelly.
- M.R.Ry. R. Hari Rao Avl., M.A., L.T.,
Teacher, Stanes European, High School,
Coimbatore.
- Rev. K. Heiberg, B.A., B.D., Danish Mission,
Popham's Broadway, Madras.

- Major A. M. V. Hesterlow, I.M.S., Professor of Hygiene,
Medical College, Park Town, (Madras).
- Miss R. E. Howard, M.A., Principal, Sarah Tucker College,
Palamcottah.
- M.R.Ry. V. Jagannadha Rao, Garu, M.A., L.T.,
Lecturer in Geography, Govt. Training
College, Rajahmundry.
- M.R.Ry. V. Jayarama Ayyar Avl., B.A., L.T.,
Assistant, Municipal High School, Villupuram.
- M.R.Ry. A. Jayarama Rao Garu B.A., L.T.,
Headmaster, Board High School,
Kavali, (Nellore Dt.).
- M.R.Ry. P. Kuruvilla Joseph Avl., B.A., L.T.,
Headmaster, Wesleyan Mission Middle School,
Ketti, (Nilgiris).
- M.R.Ry. K. Jogayya Garu, 79, M. K. Ammen Kovil Street,
Mylapore, (Madras).
- M.R.Ry. V. Kachapeswara Ayyar Avl., B.A., B.L.,
Advocate, Katcherri Road, Mylapore, (Madras).
- M.R.Ry. V. Kalyanarama Ayyar Avl., B.A., G.D.A.,
Assistant, Govt. Institute of Commerce, Madras
- M.R.Ry. M. Kalyanasundara Mudaliar Avl., B.A., L.T.,
Junior Deputy Inspector of Schools, Tiruppur.
- M.R.Ry. K. Karunakaran Nair Avl., B.A., L.T.,
Teacher, High School, Kunnamkulam, (Cochin).
- M.R.Ry. Bh. Krishna Rao Garu, B.A.,
District Scout Organiser, Narasapur,
(West Godavari Dt.).
- M.R.Ry. Rao Bahadur Krishna Rao Bhonsle Avl., B.A.,
"Stone-Gift", Vepery, (Madras)
- M.R.Ry. N. Krishnamachari Avl., B.A., L.T.,
Teacher, T.M.T.V. High School, Madras.
- M.R.Ry. N. Krishnaswami Ayyar Avl., M.A., L.T.,
Asst. Lecturer, Govt. Arts College,
Rajahmundry.
- M.R.Ry. Rao Pahadur Capt. P. Krishnaswami Avl., M.B. C.M.,
Professor, Medical College, Vizagapatam.
- M.R.Ry. O. V. Krishnaswami Ayyar Avl., B.A., L.T.,
Teacher, Wesleyan Mission High School,
Imambandi Street, Secundarabad, (Deccan).
- M.R.Ry. S. S. Krishnaswami Ayyar Avl., B.A., L.T.,
Teacher, Ramakrishna Residential High School,
Mylapore, (Madras).
- M.R.Ry. C. K. Krishnaswami Pillai Avl., M.A.,
Professor of Geology, Presidency College,
Triplicane, (Madras).
- M.R.Ry. K.V. Krishna Ayyar Avl., M.A.,
Lecturer in History, Zamorin's College, Calicut
- M.R.Ry. V. N. Krishna Rao Avl., M.A., B.L.,
Advocate, Sundara Ayyar Street, Chittoor.

- M.R.Ry. Krishnamurti Ayyar Avl., B.A., L.T.,
Geography Asst., Hindu College School,
Masulipatam.
- M.R.Ry. S. Lakshmana Ayyar Avl., B.A., L.T.,
(Vice-President), 67, Bazaar Road,
Saidapet, (Madras).
- M.R.Ry. P. S. Loganatha Ayyar Avl., M.A.,
University Reader of Economics, Senate House,
Triplicane, (Madras).
- Miss Irene H. Lowe, M. Sc., F.R.G.S., Deputy Directress
of Public Instruction, Old College, Cathedral
(Madras).
- M.R.Ry. C. Mahadevan Avl., M.A., 210 Bow Bazaar Street,
Calcutta.
- M.R.Ry. V. K. Mahadeva Sastri Avl., B.A., B.L.,
Advocate, Lalita Sadanam, Royapettah, (Madras).
- M.R.Ry. G. Mahadevayya Garu, B.A., L.T., Geography
Asst., Hindu Theological High School,
Mint Street, Madras.
- M.R.Ry. K. C. Manavikraman Rajah Avl., B.A., L.T.,
Geography Asst., Zamorin's College School,
Calicut.
- M.R.Ry. M. D. Manickam Pillai Avl., B.A., L.T.,
Headmaster, Fabricius High School,
Purasawakkam, Vepery, (Madras).
- M.R.Ry. D. Michael Avl., B.A., L.T., Asst. Wesleyan
Mission High School, Trivellore, (Chingleput Dt.).
- M.R.Ry. M.L.N. Murthi Avl., M. Sc., B.L.,
Research Scholar, Bio-Chemistry Department,
Indian Institute of Science, Hebbal, Bangalore.
- M.R.Ry. T. N. Muthuswami Ayyar Avl., M.A., L.T.,
Instructor in Science, College of Engineering,
Guindy.
- M.R.Ry. A. Nagaraja Iyer Avl., B.A., L.T.,
Teacher, Municipal High School Villupuram.
- M.R.Ry. S. V. Nagayya Garu, B.A., L.T., Geography Asst.,
Board High School, Uttiramerur,
(Chingleput Dt.).
- M.R.Ry. G. Narasimham Garu, G.D.A., Auditor,
Gopalapuram, Cathedral, (Madras).
- M.R.Ry. G. L. Narasimham Garu, G.D.A.,
Auditor, 19 Linghi Chetti Street, Madras.
- M.R.Ry. K. Narasimhachari Avl., Teacher, P. S. High School
Mylapore, (Madras).
- M.R.Ry. C. V. Narayana Ayyar Avl., M.A., L.T.,
Asst. Professor of History, Presidency College,
Triplicane, (Madras).
- M.R.Ry. V. Narayana Ayyar, Avl., M.A., Assistant
Accountant-General, Fort St. George, Madras.

- M.R.Ry. Rao Bahadur H. Narayana Rao Avl., M.A.,
"Shankar Bagh", Landon's Gardens,
Kilpauk, (Madras).
- M.R.Ry. G. Narayanaswami Ayyar Avl., M.A., L.T.,
Lecturer in History, Ceded Districts College,
Anantapur.
- M.R.Ry. K. Narayanaswami Ayyar Avl.,
Teacher, Municipal High School, Villupuram.
- M.R.Ry. S. Nataraja Ayyar Avl., B.A., L.T.,
Science Asst., St. Gabriel's High School, Madras.
- M.R.Ry. C. A. Natesa Ayyar Avl., B.A., L.T.,
Headmaster, Board High School, Dharmapuri,
(Salem Dt.).
- M.R.Ry. S. Natesa Ayyar Avl., B.A., L.T.,
Lecturer, Maharajah's College, Pudukottah.
- M.R.Ry. S. Natesa Ayyar Avl., B.A.,
Teacher, Municipal High School, Villupuram.
- Babu Indra Mohan Palit, B.A., L.T.,
Deputy Inspector of Schools, Surada,
(Ganjam Dt.).
- Rev. J. Palocaren, M.A., Principal,
St. Thomas College, Trichur, (Cochin).
- Mr. N. P. Pandya, B.A., Desai Sheri, Baroda.
- M.R.Ry. S. Parthasaradhi Naidu Garu, M.A., L.T.,
Lecturer, Mrs. A. V. N. College, Vizagapatam.
- Srimathi A. Parukutty Ammal, B.A., L.T.,
Teacher, Moyan Girls' High School, Palghat.
- Sister Patricia, Principal, Churchpark Training College,
Cathedral, (Madras).
- M.R.Ry. K. S. Raghavachari Avl., F.A., L.T.,
Asst. St. Bede's High School, San Thome, (Madras).
- M.R.Ry. V. Raghavachari Avl., B.A., L.T.,
Teacher & Auditor, Jeeyar House, Thadalan
Sannadhi, Shiyali.
- M.R.Ry. K. K. Raghavacharya Avl., B.A.,
1, Perumal Koil Street, Egmore, (Madras).
- M.R.Ry. T. L. Raghupati Sarma Avl., M.A., L.T.,
Headmaster, Board High School,
Uthamapalayam, (Madura Dt.).
- M.R.Ry. C. S. Rajagopala Ayyar Avl., B.A., L.T.,
Teacher, P.S. High School, Mylapore, (Madras).
- M.R.Ry. S. Rajaratnam Avl., B.A., L.T.,
Teacher, London Mission High School,
Coimbatore.
- M.R.Ry. C. S. Rama Rao Avl., B.A., L.T., Teacher, Sarva
Jana High School, Peelamedu, (Coimbatore Dt.).
- M.R.Ry. T. S. Ramachandra Ayyar Avl.,
Teacher, St. Joseph's College, 23, Andar Street,
Teppakulam, (Trichy).

- M.R.Ry. B. Ramachandra Rao Garu, M.A., L.T.,
Headmaster, Town High School, Guntur.
- M.R.Ry. Ramachandra Rao Garu, B.A., L.T.,
Teacher, Board High School, Amalapuram,
(East Godavari Dt.)
- M.R.Ry. K. C. Ramakrishna Ayyar Avl., M.A.,
University Lecturer in Economics,
Senate House, Triplicane, (Madras).
- Dr. C. Ramamurthi, B.A., M.B., B.S., B.S.Sc.,
Professor of Hygiene, Medical College,
Vizagapatam.
- M.R.Ry. K. S. Ramamurthi Ayyar Avl., B.A., L.T.,
Teacher, Municipal High School, Villupuram.
- M.R.Ry. N. Ramanatha Ayyar Avl., B.A., L.T.,
Junior Deputy Inspector of Schools,
Madhacaram, Via Perambore.
- M.R.Ry. A. Ramanatha Rao Avl., B.A., L.T.,
Teacher, St. Aloysius College School, Mangalore.
- M.R.Ry. V. N. Ramanatha Rao Garu, B.A., B.L.,
District Munsiff, Guntur.
- Sir C. P. Ramaswami Ayyar** Avl., K.C.I.R., (Vice-Patron),
"The Grove", Teynampet, Cathedral (Madras).
- M.R.Ry. K. Ramaswami Ayyar, Avl., B.A., L.T.,
Teacher, St. Joseph's College, Trichinopoly.
- M.R.Ry. K. V. Ramaswami Ayyar Avl., B.A., L.T.,
Headmaster, Board High School,
Payyanore, (Malabar).
- M.R.Ry. S. Ramaswami Ayyar Avl., B.A., L.T.,
Teacher, Muslim High School,
Triplicane, (Madras).
- M.R.Ry. T. S. Ramaswami Ayyar Avl.,
Lalita Sadanam, Royapettah, (Madras).
- M.R.Ry. N. Ramaswami Ayyangar Avl., B.A., L.T.,
Assistant, T.M.T.V. High School, Madras.
- M.R.Ry. M. S. Ramaswami Mudaliar Avl., B.A., L.T.,
C/o M. S. Swaminatha Mudaliar Avl.,
Postmaster, Tiruvarur.
- M.R.Ry. V. Rangacharya Avl., M.A., L.T.,
Professor of Indian History, Presidency
College, Triplicane, (Madras).
- M.R.Ry. S. M. Rangaswami Ayyangar,
Headmaster, Nadar Elementary School,
Nanjundapuram, Podanur P.O.
- M.R.Ry. **K. Rangaswami Ayyangar** Avl., B.A., L.T.,
Lecturer, St. Joseph's College, Trichinopoly.
- M.R.Ry. C. S. Rangaswami Ayyangar Avl., B.A., L.T.,
Headmaster, Municipal High School, Villupuram.
- M.R.Ry. G. Ratnam Pillai Avl., B.A., L.T.,
72, Bazaar Road, Saidapet, (Madras).

- M.R.Ry. V. N. Sama Rao Avl., B.L., M.A.,
Advocate, High Road, Egmore, (Madras).
- M.R.Ry. M. S. Sabhesa Ayyar Avl., M.A.,
18, Nallathambi Street, Triplicane, (Madras).
- M.R.Ry. B. Sanjiva Rao Avl., B.A., L.T.,
31, "Bhaskar Vilas", Gangadhareswarar Koil St.
Purasawakkam, Vepery, (Madras).
- M.R.Ry. K. N. Sankara Menon Avl., B.A., L.T.,
Teacher, Sirkar High School,
Irinjalakuda, (Cochin).
- M.R.Ry. K. Satyanarayana Garu,
Geography Asst., Rajah's College School,
Parlakimidi.
- M.R.Ry. P. V. Seshagiri Rao Garu, M. Com., B.L.,
Lecturer, Hindu College, Masulipatam.
- M.R.Ry. R. Seshagiri Rao Garu,
Chief Educational Representative,
Messrs. Macmillan & Co., Mount Road, (Madras).
- M.R.Ry. R. Seshagiri Rao Garu, B.A., L.T.,
Geography Asst., Municipal High School,
Ellore, (West Godavari).
- M.R.Ry. K. Sethu Rao Avl., B.A., L.T.,
Deputy Inspector of Schools,
Hospet, (Bellary Dt.)
- M.R.Ry. K. J. Sharma Avl., B.T.,
Teacher, National Theosophical College,
Adyar, (Madras).
- M.R.Ry. M. P. Sitarama Ayyar Avl., B.A., L.T.,
85, Bell's Road, Triplicane, (Madras).
- M.R.Ry. M. Sitarama Rao Garu, B.A., L.T.,
Headmaster, Board High School, Chandragiri.
- M.R.Ry. V. K. Souriraja Ayyangar Avl., M.A., L.T.,
Assistant, Hindu High School, Triplicane,
(Madras).
- M.R.Ry. **P. T. Srinivasa Ayyangar** Avl., M.A., (President)
University Reader of Indian History,
42, Mowbray's Road, Royapettah, (Madras).
- M.R.Ry. S. T. Srinivasa Ayyangar Avl., B.A., L.T.,
Teacher, High School, Srirangam.
- M.R.Ry. V. C. Srinivasachari Avl., B.A., L.T.,
Manager, Oxford University Press,
Mount Road, (Madras).
- M.R.Ry. C. S. Srinivasachari Avl., M.A.,
Professor, Pachaiyappa's College,
29, Krishnappa Naik Agraharam St., Madras.
- M.R.Ry. H. S. Srinivasan Avl., B.A., L.T.,
Teacher, European High School, Adyar, (Madras).
- M.R.Ry. K. Srinivasaraghavan Avl., M.A.,
Teacher, National Theosophical College,
Adyar, (Madras).

- M.R.Ry. G. V. Subba Rao Garu, M.A.,
Principal, National Theosophical College,
Adyar, (Madras).
- M.R.Ry. K. Subramania Ayyar Avl.,
Sub-divisional Officer, D. P. W.,
18, North Madah Street, Mylapore, (Madras).
- M.R.Ry. K. Subramania Ayyar Avl., B.A.,
Teacher, High School, Krishnan Kovil, Street,
Nagerecoil, (Travancore).
- M.R.Ry. M. Subramania Ayyar Avl., B.A., L.T.,
Assistant, Board High School, Tirur; (Malabar).
- M.R.Ry. P. S. Subramania Ayyar Avl., B.A., L.T.,
Headmaster, S. M. School, Tattamangalam,
(Cochin).
- M.R.Ry. Rao Sahab T. S. Subramania Ayyar Avl. M.A., L.T.,
"Sesha Vilas," Tiruvateeswasanpet
Triplicane, (Madras).
- M.R.Ry. A Subramania Pillai Avl., B.A., L.T.,
Headmaster, Board Secondary School, Kamuthi.
- M.R.Ry. G. V. Subramaniam Garu, B.A., L.T.,
Headmaster, Municipal Middle School,
Stonehousepet, Nellore.
- M.R.Ry. M. Subramania Ayyar Avl. B.A., B.L.,
(Member, Working Council) Law Reports Office,
8, Wood's Road, Mount Road, (Madras).
- M.R.Ry. K. V. Subramaniam Garu, M.A., L.T.,
Headmaster, Board High School,
Sulurpet, (Nellore Dt.)
- M.R.Ry. N. Subrahmanyam Avl., M.A., L.T., (Secretary)
Lecturer in Geography, Teachers' College,
Saidapet.
- M.R.Ry. S. R. Subramania Ayyar Avl., B.A., L.T.,
Teacher, Board High School, Kadirur, (Malabar).
- M.R.Ry. T. R. Subramania Ayyar Avl., B.A., L.T.,
History Assistant, High School, Ponani. (Malabar.)
- M.R.Ry. T. S. Sundaram Ayyar Avl., B.A.,
Geography Assistant, Tirthapathi High School,
Ambasamudram, (Tinnevely Dt.)
- M.R.Ry. K. R. Sundaramurti Avl., B.A., L.T.,
Teacher, Municipal High School, Pollachi.
- M.R.Ry. T. K. Sundaraja Rao Avl., B.A., L.T.,
Teacher, Kellett High School, Triplicane.
- M.R.Ry. M. Sundararama Ayyar Avl., B.A., L.T.,
Teacher, S.M.D. High School, Vellore.
- M.R.Ry. A. V. Sundaresa Ayyar Avl., B.A., L.T.,
Headmaster, Sarvajana High School,
68, First Agraharam, Salem.
- M.R.Ry. L. R. Sundaresa Ayyar Avl., M.A., L.T.,
Geography Assistant, Model High School,
Teachers' College, Saidapet.

- M.R.Ry. S. Sundaresa Ayyar Avl., B.A., L.T.,
Teacher, Board High School, Poonamallee
- M.R.Ry. A. Swaminatha Ayyar Avl., B.A.,
Retired Deputy Collector, 9 Brodie's Road,
Mylapore.
- M.R.Ry. N. Swaminathan Avl., B. Sc., A.I.L.S.C.,
Sewage Analyst, King Institute, Guindy.
- Sister M. Terecita, B.A., L.T.,
Principal, Presentation Convent, Madras.
- Mr. K. S. Vakil, M.A.,
Inspector of Schools, Southern Circle, Dharwar.
- M.R.Ry. V. N. Varadaraja Mudaliar Avl., B.A., L.T.,
Teacher, Municipal High School, Tiruvannamalai.
- M.R.Ry. P. V. Vasu Nair Avl., B.A., L.T.,
History Assistant, Board High School,
Angadipuram, (S. Malabar).
- M.R.Ry. D. Venkatachari Avl., B.A., L.T.,
Headmaster, Board High School, Tiruttani.
- M.R.Ry. S. Veeraraghavachari Avl., B.A., L.T.,
127, China Bazaar Road, Madras.
- M.R.Ry. N. Venkatarama Ayyar Avl., B.A., L.T.,
Teacher, Native High School, Chingleput.
- M.R.Ry. N. V. Venkatarama Ayyar Avl.,
Teachers, P. S. High School, Mylapore.
- M.R.Ry. V. Venkatarama Sastri Avl., B.A., L.T.,
Teacher, Board High School, Vundi,
(Godavari West).
- M.R.Ry. A. V. Venkatarama Ayyar Avl., M.A., L.T.,
Vadagoor Selva Vinayagar Koil Street, Mylapore.
- M.R.Ry. D. V. Venkatarama Ayyar Avl., B.A.,
Teacher, Municipal High School, Villupuram.
- M.R.Ry. P. N. Venkatarama Ayyar Avl., B.A., L.T.,
Teacher, N. E. High School, Alatur.
- M.R.Ry. V. Venkatarama Ayyar Avl., M.A., L.T.,
Asst. Profecor of History, Presidency College,
Triplicane, (Madras).
- M.R.Ry. P. Venkatrama Rao Avl., B.A., L.T.,
Teacher, M. E. L. M. High School, Ambur.
- M.R.Ry. D. Venkat Rao Garu, M.A., L.T.,
Lecturer, Govt. Arts College, Rajahmundry.
- M.R.Ry. K. Venkataraghavachari Avl., B.A., L.T.,
Teacher, Board High School, Ponneri.
- M.R.Ry. T. S. Venkatadri Ayyar Avl., B.A., L.T.,
Teacher, Sirkar High School Trichur, (Cochin).
- M.R.Ry. S. Venkatachari Avl., M.A., L.T.,
Asst. Prof. of History, Presidency College,
Triplicane.
- M.R.Ry. P. S. Venkatesa Ayyar Avl., B.A.,
First Grade Pleader, Villupuram,

M.R.Ry. Balraj M. Victor Avl., B.A.,
Headmaster, Wesleyan Mission Boy's School,
St. Thomas Mount.

M.R.Ry. M. Viraraghava Ayyangar Avl.
Deputy Inspector of Schools, Koyambedu,
Via Aminjikarai, (Chingleput Dt.)

M.R.Ry. A. S. Viraswami Ayyar Avl., B.A., B.L.,
Subordinate Judge, Bapatla.

M.R.Ry. Rao Bahadur V. N. Visvanatha Rao Avl. M.A., B.L.,
Deputy Collector, Tinnevely.

Rev. D. W. Wolfenden, B.A., L.T.,
St. Winifred's, Mitherdon Road, Vepery, (Madras).

REPORT OF THE Summer School of Geography

—
Held in April 1930
—

Under the Auspices of the
Madras Geographical Association.



Summer School of Geography, April, 1930.
(Conducted by the Madras Geographical Association)

Report of the Second Summer School of Geography, April 1930.

The Committee appointed by the Working Council on 1-2-'30 to organise and conduct the Second Summer School of Geography in April 1930 has the honour to present the following Report:—

In view of the inclusion of Geography in the reorganised S. S. L. C. SCHEME, both as a compulsory and as an optional subject, and in view of the paucity of qualified teachers of it, the Working Council decided at its meeting on 1-2-'30 to run another Summer School in April 1930, and entrusted the organisation and conduct of it to a special committee consisting of Miss I. H. Lowe, Miss E. D. Birdseye, Miss J. M. Gerrard, Miss H. A. Edington and Mr. N. Subrahmanyam (Secretary). The Committee subsequently co-opted Messrs. S. Balakrishna Aiyar, T. N. Muthusawmi and V. Adinarayana Chetti, who took part in the work of the School.

The Committee met accordingly on 8-2-'30, and issued a Prospectus (Appendix I), which was addressed to all Headmasters of High Schools in the Presidency, and published in the local press. It was therein proposed to train 30 graduate teachers of Geography for a fortnight as in the first Summer School. The response was very great: nearly 200 applications were received and several enquiries were made.

Meantime, the Secretary applied to the Director of Public Instruction for financial support, and interviewed him personally on behalf of the Committee. The Director, in his Proceedings R. C. No. 85-B/30 dated 10-3-'30, approved of the running of the Summer School by the Madras Geographical Association, and promised to recommend to Government for Grant—the amount to be fixed on submission of the financial statement of receipts and expenses.

The Principal of the Teachers' College consented very kindly to allow the course to be conducted in the Geography Department of the College, besides permitting the Lecturers in Geography and

Mathematics to be engaged in the work of the School. Further, he placed the Hostel at the disposal of the Association for the use of the teachers attending the course.

The Principal of the Engineering College also very kindly permitted Mr. T. N. Muthusawmi, Instructor in Geology, and Mr. V. Adinarayana Chetty, Instructor in Surveying, to work in the Summer School, besides lending the Epidiascope and the surveying instruments needed for the Course.

The Committee met a second time on 17-3-'30 to make the selection, which was however found to be a difficult job, owing to the large number of applicants. It was decided to take in only trained graduate teachers of Geography, and not more than one such from each institution. Still, several eligible teachers were left out, for whom a second course later in the year was at first proposed; but, as the Director of Public Instruction was not inclined to address the Government for grant a second time during the current year, the Committee met again and finally decided to take in 60 teachers and work the classes in two batches of 30 each (Appendix II).

At the same time a detailed Programme of work (Appendix III) was prepared. It may be stated in this connection that in addition to the subjects dealt with in the last Summer School the Committee felt strongly the great need there was for giving a course in Land Forms and Physiographic Processes, as most of the teachers of Geography are Graduates in History, weak on the side of Physical Geography. This need was supplied by a course of lectures on the subject by Mr. T. N. Muthusawmi.

At 10 A.M. on Thursday the 10th April 1930, Mr. W. Erlam Smith, the Director of Public Instruction, opened the Summer School (Appendix IV). The work went on steadily for about a fortnight. The course on Land Forms was illustrated by a large number of plates specially prepared for the occasion by Mr. T. N. Muthusawmi Aiyar. The Course on Quantitative Methods by Mr. S. Balakrishna Aiyar was fuller and more elaborate than in the last Summer School. The teachers were taken in two separate batches for Surveying by Mr. V. Adinarayana Chetti and for Map Work by Mr. N. Subrahmanyam, Miss H. A. Edington and Major A. M. V. Hesterlow helped in the supervision of Practical Work

in connection with Climatology, the classes being conducted by Mr. N. Subrahmanyam. Miss E. D. Birdseye gave two demonstration lessons in Modelling. The revised S. S. L. C. Syllabus in Geography was explained in three periods with hints and suggestions as to treatment and division into lessons. A few general lectures were also delivered as shown in the Programme (Appendix III).

On the three intervening holidays, excursions were arranged to Pallavaram Hill, the Harbour and the Observatory. For some two or three days during the period of the Summer School, Messrs. Longmans, Green and Co., MacMillan and Co., Oxford University Press, and Christian Literature Society exhibited their geographical publications, atlases, maps, apparatus and appliances. On the evening of 22-4-'30 the Summer School came to a close with a Social. The Practical Work has been valued, and special remarks added in the Certificate (Appendix V) for good work done.

Receipts and Payments are shown as Appendix VI. Miss J. M. Gerrard had kindly advanced Rs. 50 for the preliminary expenses, which has since been returned with thanks; and the fees collected amounted to Rs. 640. The balance of Rs. 300 will be utilised along with the Grant expected from Government in remunerating the Lecturers who actually conducted the School.

The Teachers that attended the course went through every portion of the syllabus earnestly and diligently, unfamiliar as was to them the greater part of the subjects handled. It was however generally felt that the course was very arduous and crowded, and that the period might with advantage have been extended to about a couple of weeks more. The Committee feels strongly along with the teachers themselves that the gain of the training was not merely in the new matter and methods learnt but also in the changed orientation and outlook regarding the subject. Owing to the great demand that still exists, the school will have to be repeated.

Gopalapuram, Cathedral Post, }
Madras, 2nd May 1930. }

(By Order)

N. SUBRAHMANYAM.

APPENDIX I

THE MADRAS GEOGRAPHICAL ASSOCIATION.

Summer School of Geography, April 1930.

It is proposed to run under the auspices of the Madras Geographical Association a Summer School of Geography in the Geography Department of the Teachers' College, Saidapet, from Thursday the 10th April to Tuesday the 22nd April, 1930. It is primarily intended to give training in Practical Geography to teachers of Geography in High Schools.

The Summer School undertakes to provide for the teacher who has already had grounding in Geography work the training which would normally require two term's work, in the course of a short period, by means of intensive effort along a concentrated course of studies, judiciously chosen for their value and importance from the point of view of the teacher. The course will consist mainly of Practical Work, Field Work and Excursions, and will present the salient points in such essential matters as map-making, map-reading and map-correlations, the study of land forms, climate and weather, use of graphic methods and statistics, and construction of diagrams, models and appliances. A course of training in Elementary Surveying will be given by an Instructor from the Engineering College and a few general lectures, illustrative of geographic method and view-point, will also be delivered.

A Committee, consisting of Miss J. M. Gerrard, Miss E. D. Birdseye, Miss H. A. Edington and Mr. N. Subrahmanyam, will conduct the School.

The increasing recognition of Geography as an educational subject, both in the College and the High School, more especially the inclusion of it in the remodelled S. S. L. C. Course both as a compulsory and as an optional subject, have made it incumbent that those who handle the subject shall get up now that amount of practical training, which they have not been able to obtain up till now, and which they will not for some time to come get otherwise. Only so will the teacher be in a position to handle the subject competently in the class and come up to the mark. It is specifically to provide this opportunity that this Association has undertaken to have another Summer School this year.

It is notorious that much of what passes for Geography is only book work, and it is to counteract this tendency and to inculcate the right methods and give training in them that this Summer School is undertaken.

It is expected that Principals, Headmasters and Management will, in the interests of efficiency of Geography teaching in their institutions, provide all the necessary facilities for their Geography teachers to come to Madras and undergo training in the Summer School. The number proposed to be trained is 30.

To cover the cost of stationery, postage, printing, excursions and other incidental charges, a fee of Rs. 10 will be charged for the entire course. This amount should be remitted to the Secretary, after receipt of intimation of selection, so as to reach him not later than the 25th March, 1930. Those whose fees are not received by that date cannot have their seats guaranteed.

Lodging and Boarding for those that require it will be arranged in the Teachers' College, Saidapet, and the probable expenses will be Rs. 15 for the whole period, payable in advance. Those wishing to stay in the Hostel will remit this amount to the Secretary. Only vegetarian food will be provided. Special arrangements will be made for accommodating lady teachers.

Applications are invited, and the applicants such as are selected will be furnished with other details regarding the course. Applications should be addressed to:—

"The Secretary."

THE MADRAS GEOGRAPHICAL ASSOCIATION.

Gopalapuram,

CATHEDRAL POST (MADRAS)."

so as to reach him not later than the 15th March, 1930.

MADRAS.

N. SUBRAHMANYAM.

15th February, 1930.

Secretary.

APPENDIX II.

List of Teachers who attended the Summer School of Geography in April 1930.

Name.	School.	Remarks (Deputed by)
1. Abdul Khudus, Mr. T.	Model Urdu Middle School, Bangalore City.	D. P. I., Mysore.
2. Chorley, Miss M.	St. Thomas Convent, Mysore.	Management.
3. Devasahayam, Mr. J.	C. M. S. High School, Megnanaipuram.	"
4. Durairaj, Mr. J. A.	London Mission High School, Salem.	President, Coimbatore D. B.
5. Duraiswami Pillai, Mr. U. K.	Board High School, Kollegal.	Management.
6. Ganesaiver, Mr. M. P.	St. Joseph's College School, Trichinopoly.	"
7. George, Mr. N.	A. B. M. High School, Ongole.	"
8. Hanumantha Row, Mr. A.	P. R. Collegiate School, Cocanada.	"
9. Hari Rao, Mr. R.	Stanley European High School, Coimbatore.	"
10. Johnson, Mr. R. J.	Wesley College School, Royapettah.	"
11. Jonas, Miss M.	Govt. Girls' High School, Wandiwash.	On her own account (not deputed).
12. Kandasami Deekshitar, Mr. A.	Board High School, Wandiwash.	President, D. B., N. Arcot.
13. Kartappa, Mr. B. M.	Central High School, Mercara.	Coorg Govt.
14. Kothandaraman, Mr. T. V.	Board High School, Namakkal.	President, D. B., Salem.
15. Krishnan, Mr. M. A.	S. M. High School, Tinnevely.	On his own account.
16. Krishna Rao, Mr. B.	Board High School, Uravakonda.	President, D. B., Anantapur.
17. Krishnamurthi Aiyar, Mr. S. V.	S. M. D. High School, Vellore.	On his own account.
18. Krishnamurthy, Mr. M. V.	Town High School, Guntur.	Discontinued owing to illness.
19. Krishnaswami Iyer, Mr. V. L.	Board High School, Polur.	President, D. B., N. Arcot.
20. Manuel, Mr. D.	U. C. High School, Madura.	Management.
21. Manuel, Miss A. G.	St. John's Girls' High School, Nazareth.	"
22. Muthiah Pillai, Mr. R.	Sarah Tucker College, Palamcottah.	D. P. I., Mysore.
23. Nanjammal, Sri. S.	Vani Vilas Institute, Bangalore.	"
24. Narasimhan, Mr. D.	Govt. High School, Tumkur.	"
25. Narasimhan, Mr. T.	Municipal High School, Bimlipatam.	Chairman, Municipal Coun., Bimlipatam.
26. Narayan, Mr. T. K.	Municipal High School, Udumalpet.	Management.
27. Narayana Rao, Mr. T. K.	Bishop Heber College School, Trichinopoly.	On his own account.
28. Nataraj, Mr. P.	Cheri Secondary School, Pudukottah.	On her own account.
29. Noronha, Mr. M.	Govt. Secy. & Trg. School for Mistresses, Mangalore.	Management.
30. Paranjothi, Mr. P.	Capron Hall High & Trg. Schools, Madura.	D. P. I., Mysore.
31. Puttanna Rao, Mr. N.	Govt. High School, Fort, Bangalore.	President, D. B., West Godavary.
32. Raghava Rao, Mr. T.	Board High School, Tanuku.	On his own account.
33. Raghunadachari, Mr. K. T.	Model School, Training College, Trivandrum.	"
34. Rajaram, Mr. K. S.	Hindu High School, Madurantakam.	Management.
35. Rama Rao, Mr. G. V.	Town High School, Kumbakonam.	President, D. B., Anantapur.
36. Ramalinga Rao, Mr. T.	Board High School, Dharmavaram.	Management.
37. Ramalinga Rao, Mr. A.	Taylor High School, Narasapur.	"
38. Ramamurti, Mr. T.	U. L. C. M. High School, Guntur.	On his own account.
39. Ramaswami Ayyangar, Mr. A. S.	D. J. High School, Gobichettipalayam.	Chairman, Mun. Coun., Vizianagaram.
40. Ratnam Pillai, Mr. G.	G. N. S. School, Saidapet.	Elore.
41. Sanjiva Rao, Mr. B.	Municipal High School, Vizianagaram.	"
42. Seshagiri Rao, Mr. R.	Municipal High School, Elore.	Management.
43. Sivasubban, Mr. S.	T. A. High School, Tiruvadamardur.	On his own account.
44. Sitarama Iyer, Mr. S.	Zamindar High School, Katuputtur.	President, D. B., Coimbatore.
45. Srinivasa Ayyar, Mr. K. S.	Board High School, Dharmavaram.	On his own account.
46. Srinivas Iyengar, Mr. S. T.	High School, Srirangam.	"
47. Srinivasa Iyengar, Mr. V.	National High School, Negapatam.	President, D. B., West Godavery.
48. Srinivasulu, Mr. C. V.	Board High School, Kovur.	Chairman, Municipal Coun., Karur.
49. Sundaram, Mr. A. L.	Municipal High School, Karur.	On his own account.
50. Sundaresan, Mr. V.	V. M. High School, Bodinayakanur.	President, D. B., Chingleput.
51. Sundaresan, Mr. S.	Board High School, Poonamallee.	Coorg Govt.
52. Thimmayya, Mr. B. N.	Govt. High School, Virajpet.	On his own account.
53. Veerabahu Pillai, Mr. M. E.	High School, Chintadripet.	Management.
54. Venkataraman, Mr. A.	Native High School, Kumbakonam.	President, D. B., West Godavery.
55. Venkatarayana, Mr. V.	Board High School, Vundi.	"
56. Venkateswara Rao, Mr. M.	S. V. G. K. High School, Punadipadu.	"
57. Viraghava Iyengar, Mr. V.	Sourashtra High School, Madura.	"
58. Visvanathan, Mr. C.	O. V. C. High School, Manamadura.	"
59. Visvanatha Iyer, Mr. S.	R. B. A. N. M's. High School, Bangalore.	"

(Mr. M. C. Subbappa, who was deputed by the D. P. I., Mysore, attended the first three days and was then re-called.)

APPENDIX III.

Summer School of Geography.

April, 1930.

TIME-TABLE.

Time.	Thursday 10th	Friday 11th	Saturday 12th	Monday 14th	Tuesday 15th
7 to 9 A.M.	NIL.	Surveying.....	Batch I.....		
10-30 to 11-30 A.M.	Nature and Scope of Modern Geo- graphy.	Fundamentals of Plant Geo- graphy.	Essentials of Economic Geography.	The New Syllabus.	The New Syllabus.
11-30 A.M. to 1-30 P.M.	Land forms and Physiographic Processes.....				
2-30 to 3-15 P.M.	Climatology (Lectures).....				
3-20 to 4-20 P.M.	Climatology (Practical work in two batches.).....				
4-30 to 6-30 P.M.	Surveying Batch II.....				
Time.	Wednesday 16th	Thursday 17th	Saturday 19th	Monday 21st	Tuesday 22nd
7 to 9 A.M.	Surveying Batch I.....				
10 to 11-30 A.M.	Map-work (Batch II).....				
11-30 A.M. to 1 P.M.	Quantitative methods (Graphs, Statistics, etc.).....				
2 to 3-30 P.M.	Map-work (Batch I.).....				
3-30 to 4-30 P.M.	Modelling.	Safety first in camp.	Home Geo- graphy.	Geographi- cal equip- ment	Model- ling.
5-30 to 6-30 P.M.	Surveying (Batch II.).....Social.				

GOPALAPURAM,
Cathedral, P. O., Madras,
4th April, 1930.

N. SUBRAHMANYAM,
Secretary.



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estimated at a minimum of Rs. 10 per 1,000 is it considered financially practicable to carry on fishing on a large scale. Usually fishing was held between February and April when there was a long lull between the monsoons. A new record was made in South India the last time when fishing operations were carried out in November.

The Actual Method of Fishing.

When fishing operations were decided upon preparations were made for the erection of a camp on the site. Streets were marked out close to the water's edge on the sands and huts were erected to accommodate the huge population of more than 10,000 souls who formed the permanent population of the camp for the period of the fishing. Besides this a floating population of between 20 to 30 thousand people formed of the merchants and visitors frequented the camp every day. Every morning at an early hour the divers accompanied by the Government boat left in their boats so as to reach the pearling banks at sunrise. Each diver had two ropes to one of which was tied a stone to help him to get to the bottom at the quickest possible time. The other rope was used to haul up the rope bag of shells collected by the diver at the bed of the ocean. When coming on to the surface from the bed, he did so without the help of any rope. Each diver had two attendants on the boat and each boat had about 12 to 20 divers. So that each boat had on the whole a goodly number of men on it.

The divers employed were of the Parava caste and Arabs from the Persian Gulf who were attracted by the large sums they could earn during the fishing operations. The Arabs were distinguished from the other Indian divers by the nose clip which they used to close their nostrils when they dived. They were by far the better divers than the Indian divers and managed to stay at the bottom of the bed at a depth of about 66 feet for more than a minute. The shells they collected were put in a rope bag which was then hauled up to the boat by an attendant. Though there were many fantastic stories as to the time the divers managed to keep under water, yet according to actual records the maximum time a diver was able to remain in water was 109 seconds. The average at present was about 60 to 70 seconds. The average remuneration of a diver for a day's work was about Rs. 25 to Rs. 30. The collections of shells on the boats were watched at the Bank itself by Government boats.

which collected their share of two-thirds of the oysters. In the evening at about four o'clock in good weather the boats returned to the shore where huge crowds of merchants and speculators watched with keen interest for news of the catch. The divers sold their share of the catch to the merchants on the beach while the Government auctioned its share. The oysters were sold by the thousand and the rate was about Rs. 10 per 1,000. There were various diversions at the Camp at the time of the selling when people were at fever pitch excitement when they bought the oysters and opened them to see how their luck had served them!

To sort out the various grades and sizes of pearls a standard series of sieves were used. Besides the size, the colour and shape of the pearls also were factors in determining its value. The pearls fished in the Gulf were divided into several grades, each grade known as the Ani, Anathari, Vadivu, Masahun, Karuval, Kalippu, Oddu, Peesal, Maithul and Thul. The valuation of pearls was based upon a unit system combined with a geometrical progression of prices. If one grain weight of pearl cost Rs. 100, two grains weight of pearl costs not Rs. 200 but Rs. $100 \times$ Rs. 100.

Cultural Pearls.

There was a difference between artificial and cultural pearls. Artificial pearl was an imitation of a pearl made from any substance that came in handy. But cultural pearl was produced by the oyster itself. While the natural pearl was produced by the oyster in the course of nature, the cultural pearl was one which the oyster was *induced* to produce. There have been attempts from early times to induce oysters to produce pearls. But none of them succeeded definitely in producing the desired article till Mikimoto of Japan discovered a way of inducing the oyster to produce pearl which was indistinguishable from the natural pearl.

There were legendary tales as to how Arabs used to induce oysters to produce pearls. The first reliable record of an attempt at culturing pearls comes from China where a peasant named Ya Yung Yung in an obscure village off Hang Chow first succeeded in producing a culture pearl. A Swedish writer in 1864 gave an account of the process adopted by that peasant wherein he stated that the pearl mussels were collected in a pond early in March. Then small balls or pellets of mother-of-pearl were made