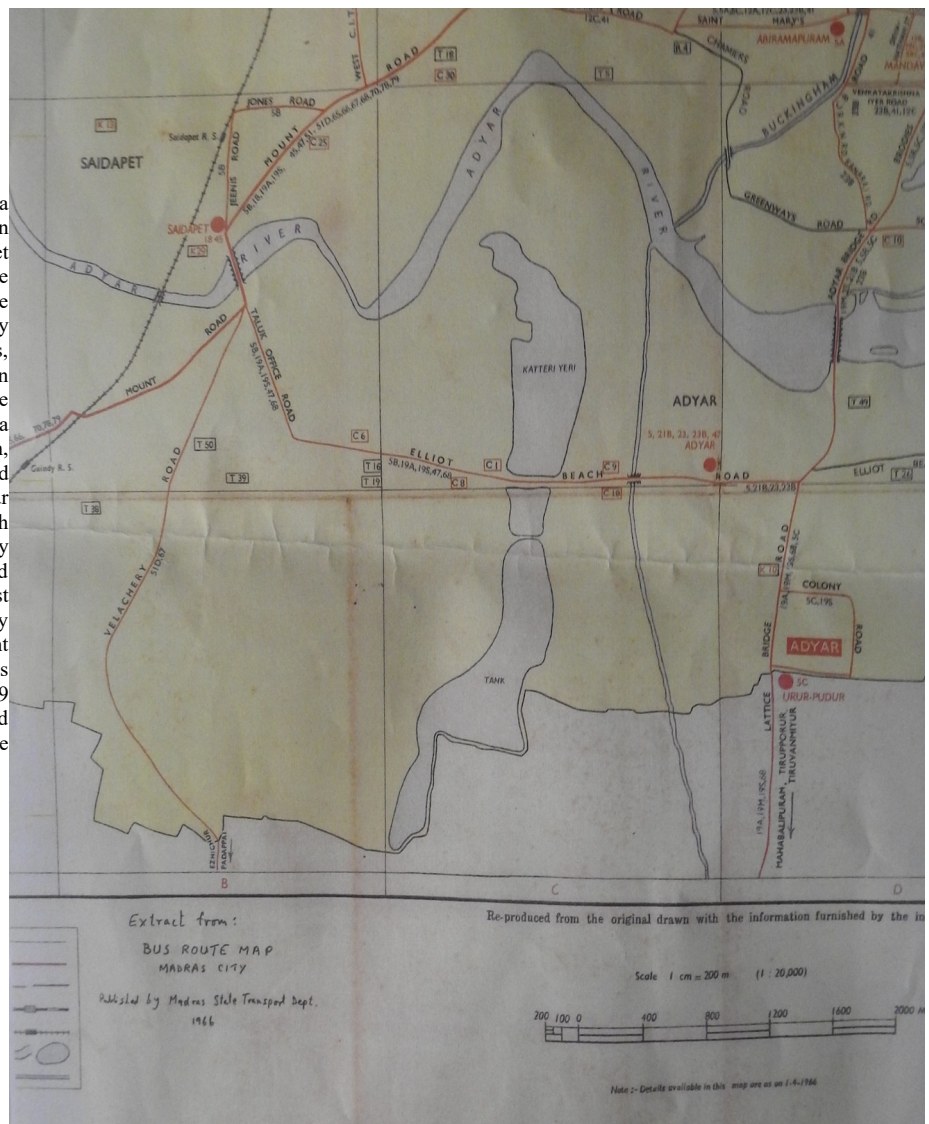


Letter from Heritage Centre

IIT Madras
15 January 2021

The campus and the velocity of sound

The picture alongside shows a part of a Madras City bus route map published in 1966. Areas such as Adyar and Saidapet are marked, whereas IIT Madras (more than 6 years old then), CLRI, the College of Engineering Guindy/Anna University and Raj Bhavan are not. Two water bodies, the larger one marked 'Tank', are shown occupying much of the IIT campus. These had presumably been connected with a third water body, lying to the north, marked as 'Katteri Eri', and had subsequently been separated by the Sardar Patel Road (then known as Elliot Beach Road). A comparison with a contemporary map will show the extent to which the road network in the area has grown in the last 50 years or so. The map was published by the Madras State Transport Department and is in the collection of Mr. Thomas Tharu ('Tee Square'), alumnus of the 1969 batch of IIT Madras, who kindly allowed this photograph to be taken for the Heritage Centre



Among the articles published in the *Philosophical Transactions of the Royal Society of London* in 1823 was one titled 'Experiments for Ascertaining the Velocity of Sound, at Madras in the East Indies'. The author was a person named John Goldingham.

Goldingham conducted his study over many months, beginning in July 1820. He used the sound of guns that were fired daily at two places: "At Fort St. George (Madras) a morning and an evening gun are fired from the ramparts, as is customary in fortified places, the former at day light, and the latter at eight o'clock in the evening", wrote Goldingham. "At St. Thomas's Mount, the artillery cantonment, morning and evening guns are also fired, one at day light and the other at sun set." Goldingham made a series of observations from the Madras Observatory, at Nungambakkam: "All the experiments were made with chronometers, which had 100 beats in 40 seconds, sometimes by three observers, myself and two of the Observatory Bramin assistants, but generally by two: the observers having repaired to the station at the top of the Observatory building, a little before the expected time, and each holding his chronometer so that he could distinctly hear the beats, began to count the instant he saw the flash, and continued counting till he heard the report; the number of beats between the flash and report was then immediately put down upon a slip of paper, by each observer, without communication with the others, and the papers delivered to me for their contents to be registered..."

Goldingham measured the distances with great care: "first, by a survey made for the purpose, a base having been measured, and the angles taken with a great circular instrument ... Secondly, by using two or three of Colonel Lambton's distances and bearings found by the trigonometrical survey."

Goldingham's account tells us much about the level of advancement of science at the time that it was written. So too does it offer hints that transport us back in time to Madras as it was 200 years back—a practice of firing guns twice a day at the Fort and at St. Thomas Mount, the existence of an active observatory in the city, the construction of a new building at that observatory.

Goldingham's publication carried a map that showed the relative positions and distances of the points. According to Goldingham, this map was "filled up from the best surveys, under the superintendance of E. Lake, Esq. of the Madras Engineers", who he mentions is his son-in-law. I found the map engrossing. I thank Shyamal L. for drawing my attention to this map and thus to the article in which it appeared.

The following are the results deduced from the experiments in the different tables. I shall first give the general results from Table I. and VI.

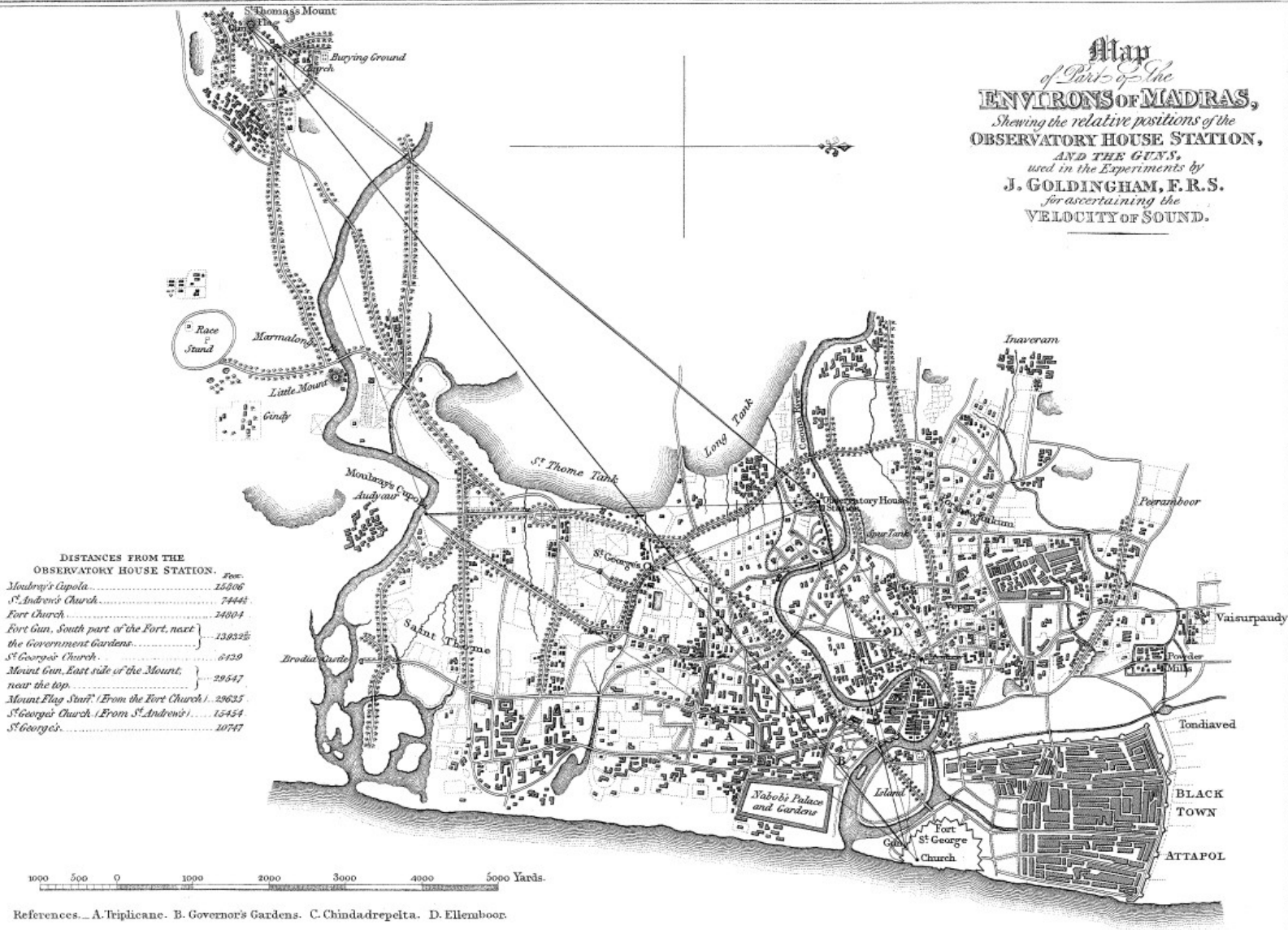
Tab.	Mean height of Barom.	Thermo-meter.	Hygro-meter.	Seconds.	Distance.	Velocity in a Second.
	Inch.	°	°		Feet.	Feet.
I.	29,992	84,11	19	25,869	29,547	1142,18

Or almost precisely the same as the velocity by the theory.

Tab.	Barometer.	Thermo-meter.	Hygro-meter.	Seconds.	Distance.	Velocity in a Second.
	Inch.	°	Dry.		Feet.	Feet.
VI.	30,065	80,47	11,4	12,306	13932,3	1132,14

Results presented by Goldingham in his paper. The units he uses are inches, feet and degrees Fahrenheit. He uses commas in the numerical values as we would full stops

Map
of Part of the
ENVIRONS OF MADRAS,
Shewing the relative positions of the
OBSERVATORY HOUSE STATION,
AND THE GUNS,
used in the Experiments by
J. GOLDINGHAM, F.R.S.
for ascertaining the
VELOCITY OF SOUND.



DISTANCES FROM THE OBSERVATORY HOUSE STATION.

	Fms.
Moubray's Capota	15806
S ^t . Andrew's Church	7444
Fort Church	34804
Fort Gun, South part of the Fort, next the Government Gardens	13832½
S ^t . George's Church	6129
Mount Gun, East side of the Mount, near the top	29547
Mount Flag Staff (From the Fort Church)	29625
S ^t . George's Church (From S ^t . Andrew's)	15454
S ^t . George's	10747

1000 500 0 1000 2000 3000 4000 5000 Yards.

References. — A. Triplicane. B. Governor's Gardens. C. Chindampelita. D. Ellamboor.

Printed and Sold by J. B. White, No. 11, Strand, London.

There are several points about the map that one finds striking simultaneously. The city is of course much smaller and sparsely built over compared with the present. The road network appears ludicrously rudimentary. One cannot even find a road along the Marina. That having been said, many of the roads that are shown seem to have been lined entirely with trees, including Mount Road and Poonamallee High Road. Naturally, there are no railway lines or the Buckingham Canal—these would come up later.

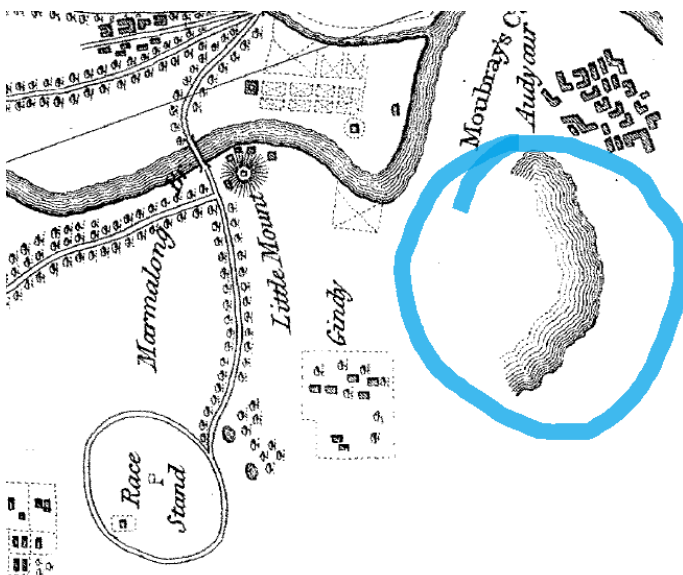
Places such as Besant Nagar and T. Nagar are not marked on the map—these places were non-existent when the map was made. Indeed, at the present situation of T. Nagar is a large water body, one bearing the name ‘St. Thome Tank’, and close to it is the ‘Long Tank’. On the other hand, the map does have ‘Race Stand’, ‘Moubray’s Cupola’ and ‘Brodia Castle’ marked on it.

And the spellings of place-names! We have Peeramboor, Inaveram, Porshewaukam, Chindadrepeta, Ellemboor and Tondiaved, which we can relate to current names. But what was the ‘Powder Mills’? An explosives factory? And what was ‘Attapol’, pray?

Of special interest to us of course are ‘Audyaur’ and ‘Gindy’, to the vicinity of which our eyes are drawn as we search for the place that would become the IIT Madras campus.

In November 1821 (a month in which Goldingham was still making his measurements, six months before he wrote up his article in the *Philosophical Transactions*), the government bought three contiguous properties at Guindy (the ‘Guindy Forest’), as a result of which it had some 1000 acres for development into the residential estate of the Governors of Madras. According to S. Muthiah’s book on the Raj Bhavans of Tamil Nadu, at this point there were three single-storeyed buildings at the place where the present Raj Bhavan stands. Presumably these are the buildings shown as a set of small constructions at ‘Gindy’ on the map.

There is no Highways Research Station marked on the map—it would have been very surprising if it *had* been marked because the HRS was established in 1954! There is a sharp bend in the course of the Adyar River in this region, and just outside this bend is an unnamed plot, marked in dotted lines on the map.



The College of Engineering (Anna University) is also not marked on the map. This is only to be expected. Although the precursor of this institution, the School of Survey, was established in 1794, the College of Engineering would move to the present location of Anna University only in 1920. It would seem that Audyaur was an unremarkable hamlet, for it is not connected to the rest of the city by any road. There was none worth marking on the map anyway.

And finally, the future IIT campus: no feature is marked on it except for a water body that occupies a good part of it and space outside, one that bears no name.

Kumaran Sathasivam

The mystery of the fallen potted plants



There was order and neatness in every aspect, on the lawn outside. The glass window of the Heritage Centre revealed a soothing view of greenery and sunlight. However, there was a slight concern at the Centre. Three pots amidst the uniform green, always seemed to be lying down. Funnily, they pointed to the same direction in their state of horizontal languor.

Who could have knocked them down? The housekeeping staff never ventured out onto the lawn, unless it was to clean the glass window, which was a rare occurrence in itself, so that was ruled out. We decided that it was the wind that accompanied the unpredictable downpours, which was responsible for this breach in tidiness. The very next day, the pots were up again, vertically positioned, vigilant. Standing upright as though they hadn't done anything wrong. The three plants reminded me of my college days, of a good friend of mine, who always sat next to me.

He found the time to nap in class between classes, during classes, before classes and after classes. His head was always on the table, face flat, eyes shut, and body still as a rock. This was irrespective of the level of noise in class. He was similar to the fallen plants in the sense that, when someone woke him up, usually me, when the teacher walked in, he would rise up straight and turn his face toward the front of the class where the teacher stood. There would be no trace of the fact that he was in a completely different dimension just a second ago. Similarly, the plants, on assuming the vertical position again, bore the mark of innocence, much like my friend, who now is an assistant professor at a university. I don't think he can continue his old practice of napping during classes now, unless he manages to put his students to sleep, following which he will be free to do the same, now that he has a table for himself.

Coming back to the mysterious plants at our Heritage Centre, we forgot about the incident until one fine, sunny day we saw the plants flat on the ground, yet again. I do not know which god they were paying obeisance to, but it seemed that they were deeply engaged in a prayer of sorts. Yet again, they had chosen to face the same direction as they lay there. On second thoughts, I thought this was a protest of some sort. Maybe they did not get along well with the other plants in the hood? Were they discriminated or threatened, or was their share of water and sunlight being stolen by the neighbourhood plant bully? Or even worse, was there a plant battle at night, where there was a shootout, and our three lucky musketeers had ducked just in time? It all seemed possible, given the enigmatic occurrences that were likely to happen in the forest of IIT Madras, long after we had gone to sleep.



A few days later, the rain came down hard. We were watching the blackbuck and spotted deer galloping around looking for shelter. A corpulent fellow, a spotted deer, that is, had made himself comfortable outside the window. He had located a dry spot. He showed no signs of getting up and leaving as the rain got heavier. As the rain subsided, he got up, shook himself and walked along the length of our glass window outside the building and stepped onto the lawn. As he did so, he knocked down one, two, and three pots down, since there was no space for him to move leisurely. He casually knocked them down, nonchalant and unfettered by the protests of the innocent green bystanders.

Bhuvanesh Santharam

Your response to Letter from Heritage Centre is welcome. Please send mail to heritage@iitm.ac.in.

The Heritage Centre is located in the ground floor of the Administration Building, IIT Madras. It is open on weekdays from 9.30 am to 5.30 pm.

heritage.iitm.ac.in