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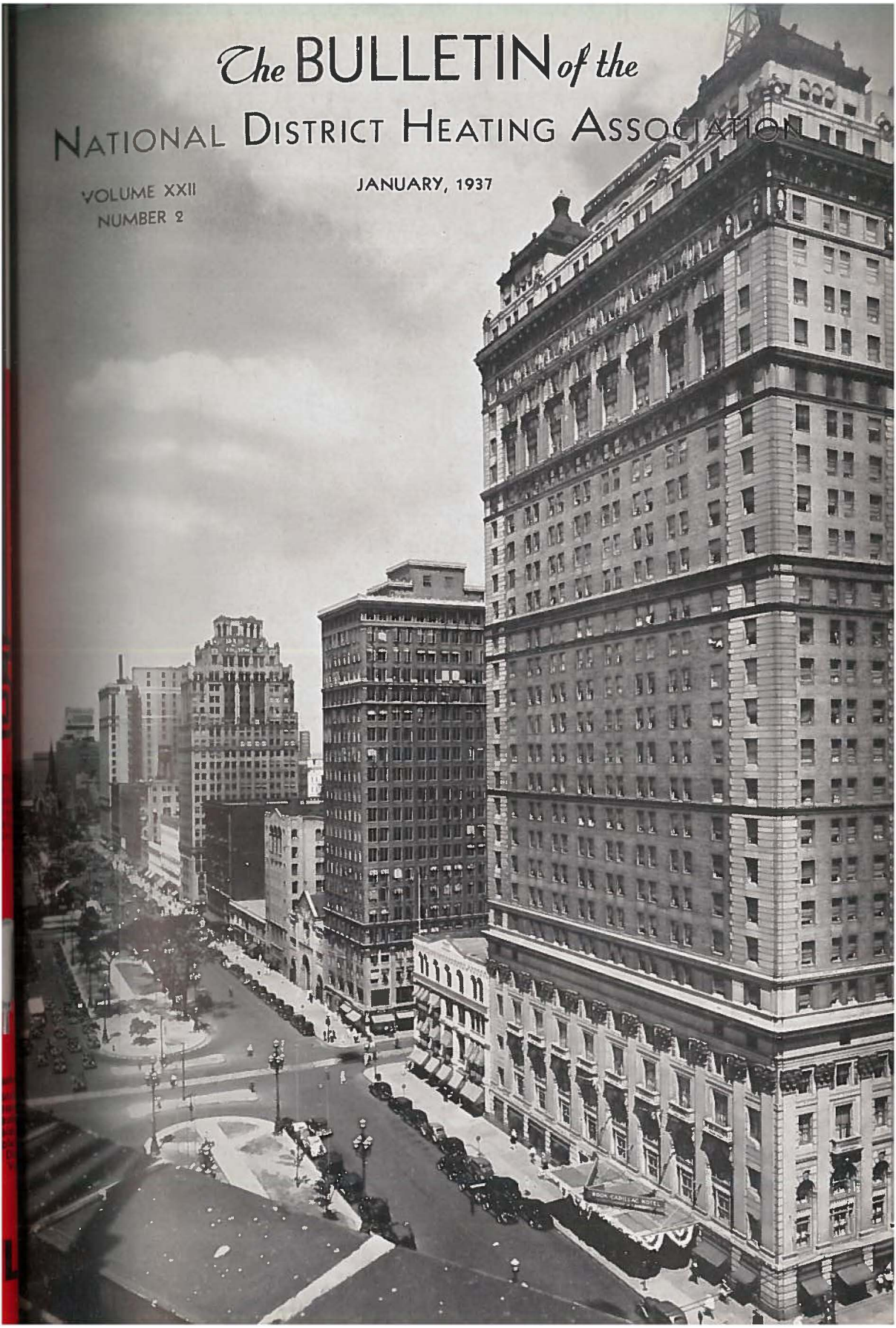

The System of Urban Heating of Paris in 1936-1937

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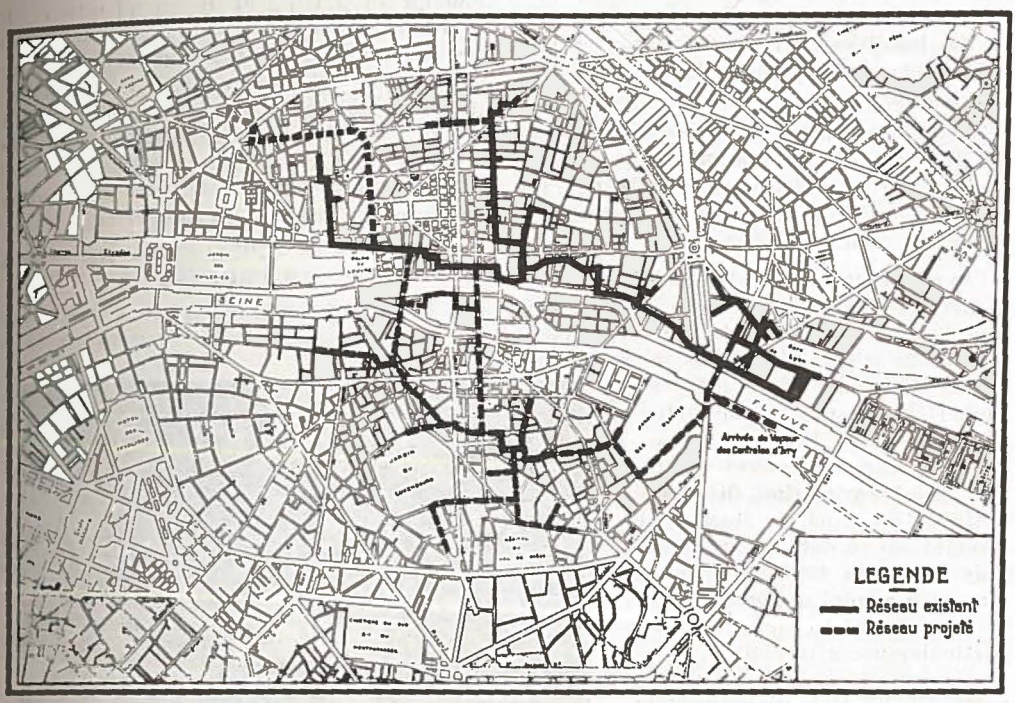


Plan of Network in Service and under Construction

I

THE last description of urban heating of PARIS, published by the bulletin of the N.D.H.A. is dated 15th October 1930. At that time, the system was in its opening stages for the simple reason that the Winter of 1930-1931 was the first Winter it had ever operated.

At the same time, it was merely a demonstration system because, in fact, it operated at a pressure of 2 to 3 kgs. over a distance of 1 km; the object was to find an answer and to perfect the numerous technical, administrative and commercial questions such as are bound to arise through creation of a novel public service in an old township with the substrata particularly encumbered, like that of PARIS.

II. DESCRIPTION OF THE SYSTEM AS A WHOLE

The preliminary stages came to an end several years ago and the Winter of 1936-1937 will be the seventh during which the system has been working.

The schemes set out in 1930 were in connection with a 15 kilometer system, with a power of 70 million calories. The system now in operation is already approaching those figures (11 kilometers and 56 million calories, on 1st October 1936). Construction contracts already signed will

increase it beyond the 15 km mark and beyond 70 million calories, towards the end of 1937. To meet such a situation the capital of the Company is at present under process of being raised to 38 million francs.

This system, it may be mentioned, is maintained by the same central station as the demonstration system. It develops in the centre of the city, on the right bank, in the localities bordering the river Seine, extending as far as the Palais Royal and the Bourse.

It has been found necessary to postpone development of the Auteuil system due to the adverse circumstances concerning the construction of the buildings it was proposed so supply with heat.

From the technical standpoint, a result of the experiment has been to draw near to American ideas, to a certain extent, that is to say, the system distributes vapor at a pressure which is fairly high (15 atmospheres), surheated to 225° and at the same time, produces very little electric current; the Bercy station, fitted out entirely on modern lines and brought up to date in 1934-1935 only possesses two turbo-dynamos with a total of 600 kw. just being sufficient to supply its own particular needs in energy.

We should like to point out, however, that a difference exists from the American technique in that the whole of the condensed water is delivered back to the central station. A certain number of tests have been carried out wherein condensed water was conveyed to the drains but they were of little importance and were limited to lateral branches of small diameter.

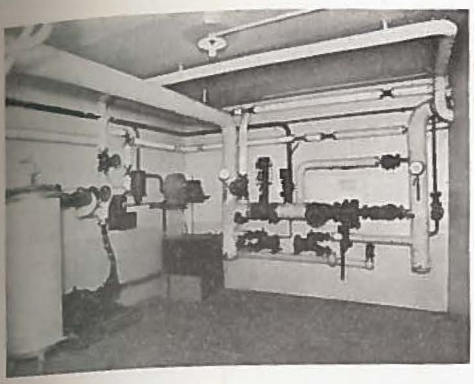
The expansion joints are of the following types: 1°) diameters greater than 350 mm: sliding joints. 2°) diameters from 0 to 350 mm lyres in ribbed or smooth pipes.

From an adminstrative point of view, an excellent collaboration has been obtained from the traffic police although it is not an easy matter to do so; in PARIS, as a matter of fact, there is a traffic regulation requiring that entire rubbish should be removed as soon as it has been produced although in fact, certain streets were scarcely large enough for putting in the canalization. In other streets it was absolutely impossible to lay the canalization near the surface on account of the Underground Railway, in rue de Rivoli for instance over a length of about 1 km., the 600 mm diameter canalization happens to be established in a tunnel located under a drain, going down to a depth of as much as 10 meters from the surface.

III. SYSTEM IN OPERATION AND WORK IN PROCESS

A feature of the Paris system is that it has been established with a view to its sub-

Figure No. 1 Most recent Steam Construction



Pressure regulating arrangement.

sequent development and canalizations with a large diameter (500 mm and over) are rather numerous.

In the present condition, out of 10,400 meters of canalization in use, 1,700 m of it has a diameter of 600 mm. Fig. No. 1 shows a section of the tunnel in rue de Rivoli. Fig. No. 1 shows how a Pipe with 600 mm diameter has been established in the tunnel.

In the program of construction, execution of which has just been put in hand, (October 1936) comprising 15,000 meters of canalizations, there will be upwards of 4,000 meters with 600 mm and 3,000 meters with 700 mm diameters.

In that program of new constructions, special mention ought to be made to a 4,500 feeder which will connect the Bercy works to the IVRY central station; in principle therefore, the Bercy works will no longer be extended as the power installed in the IVRY works is amply sufficient. In a year's time, this new feeder will enable the central station at IVRY to have its most distant client more than 10 kms away.

The system is provided with junction points which are worked automatically; a a certain number are of the intermittent (Pendleton) system but the majority are controlled by outside temperature. (Duostats). Very few points are not automatic. To prevent corrosion, all the points are fitted with iron turning appliances so as to absorb the oxygen, to such an extent that for these past five years, no trouble has occurred through corrosion.

IV. A LITTLE STATISTICAL DATA

From a commercial point of view, sale is conducted by millions of calories which, in metric tons, correspond to about 1.8 tons. Evidently, prices vary but we might quote, for instance, the rate granted to the Municipal establishments, that is to say, at the present time, 105 francs per million calories.

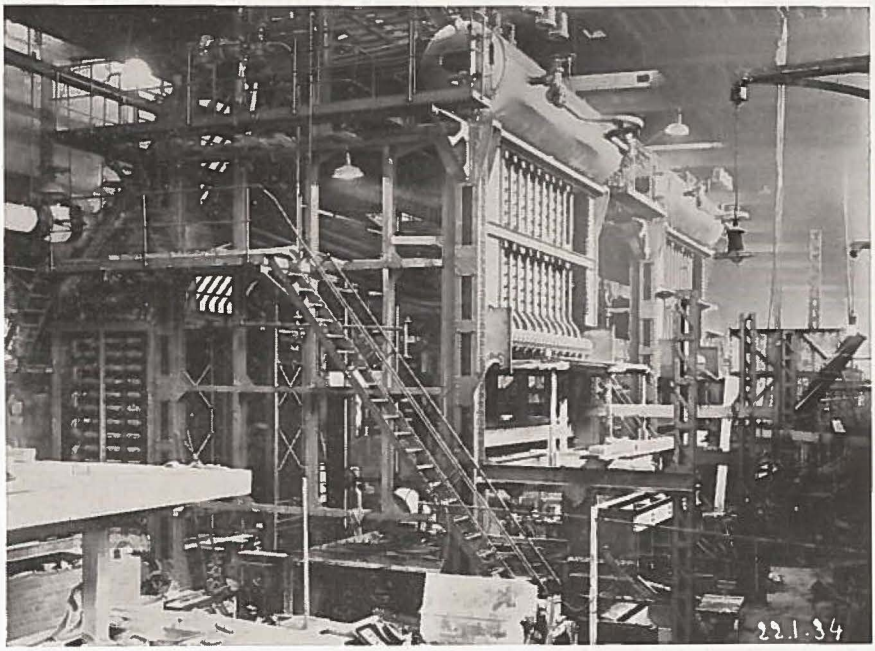
Thanks to the high pressure and the temperature of the vapor, urban heating can be applied to a rather large number of uses; in particular, it feeds mouldings of plastic material, wash-houses, it is used for heating trains in stations but in the main, the largest part of the clientele, very evidently, is composed of dwelling and tenement houses, offices and the like.

The client who is the farthest away from the central station is at a distance of 5,000 meters. The total length of the system is 10,400 meters without the branches and 11, 300 with branches, which therefore constitute about 10% of the total.

The calorific power of the connected system is 56 million calories as against 41 millions on 1st October, 1935, very special attention should be drawn to that increase of 15 millions, in other words, 38% in a year. The peak for 1935/1936 (a mild Winter) was 40,000,000 c/h.

The number of subscribers for 1936-1937 will be 112; with the peak figure of calorific power at 57,000,000 calories/hour, the average power per subscriber will therefore be 510,000 calories/hour.

Pressure regulating arrangement.



View of the new Bercy boilers being set up.

The total quantity of vapor produced at the central station during last season was 128,000 tons, against 90,000 tons during the previous season, that is to say, an increase of about 25%, thus indicating that out of three consecutive years, development has pursued a steady upward path.

Here is a table showing the tonnages of vapor produced from the outset. It demonstrates the annual increase of the system.

Years	Tonnage of vapor
1930 - 1931	41,053 T
1931 - 1932	58,000 T
1932 - 1933	55,000 T
1933 - 1934	60,400 T
1934 - 1935	85,000 T
1935 - 1936	120,300 T

The annual output of vapor per kilometer of canalization is on an average, about 15,000 tons.

The load factor has been higher than had been hoped at the beginning.

It is in the region of about 1,350 hours whereas in the 1930 article, written before the demonstration system was put into operation, a period of 1100 to 1200 hours was contemplated.

Cover Page

Downtown Detroit. Looking north on Washington Boulevard. Book-Cadillac Hotel in right foreground.