

PART VI

PUBLIC UTILITIES

WATER SUPPLY.

The water supply of the metropolis is controlled by the Melbourne and Metropolitan Board of Works, and consists of three main branches, viz. :—

The Yan Yean System.

The Maroondah System.

The O'Shannassy and Upper Yarra System.

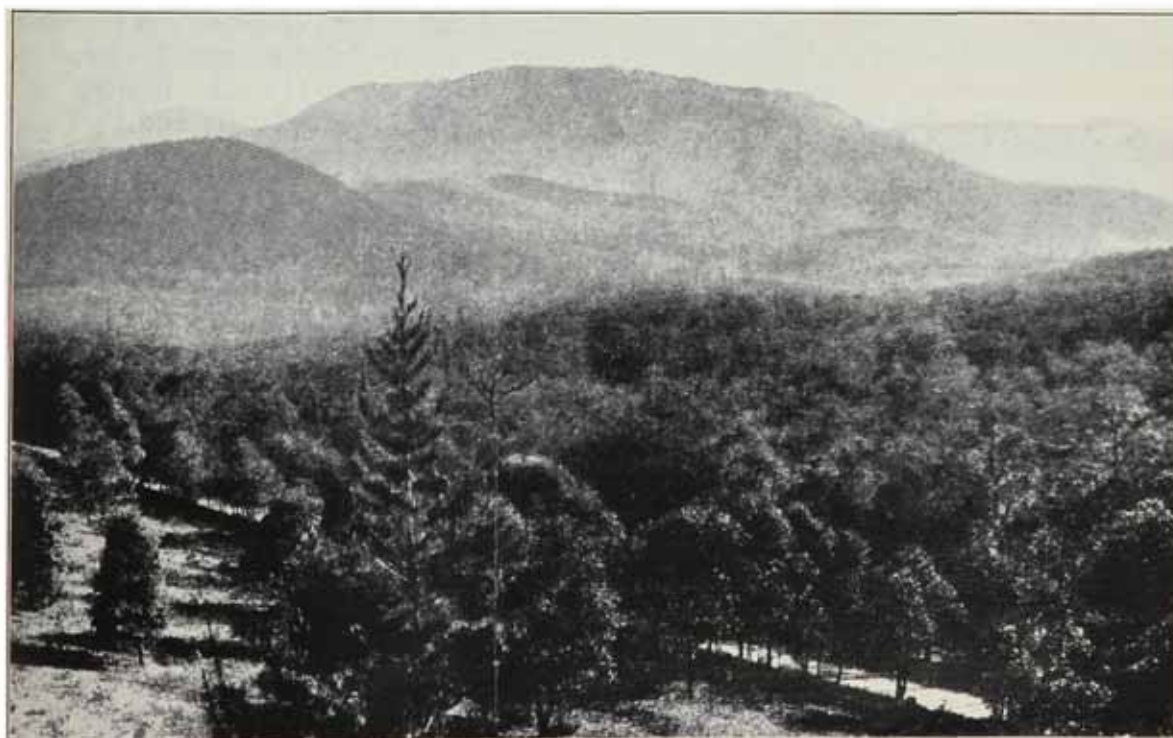
These are all located in the Great Dividing Range, which runs from east to west, and, as its name implies, divides the State of Victoria.

The Yan Yean system lies almost due north of Melbourne, and the total area held for water supply purposes is about 33,962 acres. The available capacity of the storage reservoir is 5,400,000,000 gallons. There is also a smaller storage reservoir known as Toorourrong in this catchment, with a capacity of 60,000,000 gallons.

The Maroondah system is located north-easterly, and has a catchment area of about 40,000 acres, the available capacity of the Maroondah reservoir being 4,855,000,000 gallons.

Beyond the Maroondah system, and east of it, lies the O'Shannassy River Watershed of 32,650 acres, which supplies a storage reservoir with a capacity of 930,000,000 gallons. This system also includes the Silvan Dam, now in course of construction, about half-way between O'Shannassy and Melbourne. This reservoir will have a capacity of 8,800,000,000 gallons.

The total capacity of all of these storage reservoirs amounts to 20,045,000,000 gallons. In conjunction with the perennial stream flow, these reservoirs are capable of supplying the requirements of a population of about 1,430,000. Having regard to the future requirements, the Government has been asked to vest in the Melbourne and Metropolitan Board of Works a further large area of 90,000 acres bordering on the east of the O'Shannassy Watershed, on which area the source of the River Yarra exists, with its many tributary streams. This area is expected to be capable of supplying the requirements of about 970,000 people additional.



General view of watershed areas.

In order that those responsible for the future water supply may be assured of ample catchment area, the Melbourne and Metropolitan Board of Works has urged that the Baw Baw Plateau of 36,500 acres be made available to them. It is estimated that this area would be capable of supplying the needs of a further 600,000 people, thus ensuring a plentiful supply for about 3,000,000 people.

In addition to the Baw Baw Plateau, there is a very large area known as the Thomson and Aberfeldy Rivers Watershed, comprising about 184,000 acres lying east of the Upper Yarra and Baw Baw Watersheds, which the Melbourne and Metropolitan Board of Works has also asked should be reserved for water supply purposes. All these areas are mountainous, are covered with timber, inaccessible, and generally unsuited for settlement. The Thomson River Watershed is the only unalienated Crown land which could be drawn upon for the water supply of Melbourne without conflict with other important industries. During recent years the Forests Department has vied with the Melbourne and Metropolitan Board of Works for the rights to certain timber in the additional areas sought for water supply purposes. The Board has strenuously opposed any licence of any kind being given to the Forests Department or to any other authority which will allow entrance for any purpose whatever into such splendid natural pure water catchment and conservation areas.

The population of the metropolitan area is now in excess of 1,000,000, and the existing water supply services are stated by the Melbourne and Metropolitan Board of Works to be capable of supplying the requirements of a population of 1,430,000. This takes into account the capacity of the Silvan Dam now under construction, which will not be completed for some years. As a maintenance of a 3 per cent. per annum increase in population would mean that there would be 1,430,000 people in the metropolis in 1940, the Commission hopes the metropolitan water supply will be kept well in advance of the requirements of the population, and that the provision of adequate reservations for safeguarding a supply in the future will receive the necessary attention of the authorities concerned.

The Commission has given consideration to the opposing arguments, and believes that nothing should be permitted which may have the slightest detrimental effect upon areas so suitable as a potential water supply. The Commission is of opinion that no other use should be considered when the objective is so vital. As the competent water supply authorities have so strenuously opposed any other policy, it is recommended that the whole of the Upper Yarra, Baw Baw, and Thomson River Watersheds be forthwith vested in full control of the Melbourne and Metropolitan Board of Works.

REAFFORESTATION OF CATCHMENT AREAS.

In certain parts of the watersheds, denudation of timber both complete and partial has resulted, principally from cutting timber and later by successive forest fires. The Commission is of the opinion that this condition discloses the gravest danger to the water supply. It is, therefore recommended that further timber cutting should not be allowed, and that areas denuded should be replanted without delay, and a systematic reforestation policy maintained. The timber and undergrowth on the watersheds are of the greatest value in conserving the water supply.

MAIN DRAINAGE.

The Commission does not consider it necessary to make detailed reference to the question of surface drainage in its relationship to the plan of future development. It has been stated under "Public Recreation" (page 212) that the banks and beds of the various well-located streams and watercourses in the metropolis should be secured and retained as public property, and that the best method of utilizing the land in the immediate vicinity of these streams is as public reserves. It is most desirable from the points of view of drainage and sanitation that these reservations should be made.

The Metropolitan Drainage and Rivers Acts, 1923 and 1926, vested the control of the beds and banks of all metropolitan streams in the Melbourne and Metropolitan Board of Works, who have made much progress in improving the drainage facilities.

A well-conceived zoning scheme should prevent the extension of built-up areas into new sections that cannot readily be drained into the common outlet. It should also provide definite information whereby the run-off from particular areas may be estimated with more accuracy than is possible under conditions of variable development.

SEWERAGE.

The sewerage of the metropolis is also the responsibility of the Melbourne and Metropolitan Board of Works. Practically the whole of the metropolis, except on the fringe of development, is connected with an underground sewerage system. All sewage flows to a pumping station at Spotswood on the bank of the Lower Yarra, from whence approximately 40,000,000 gallons of sewage are pumped daily into an underground rising main for about $3\frac{1}{2}$ miles, to near Brooklyn, after which the sewage gravitates to the Metropolitan Sewage Farm at Werribee—a distance of nearly 16 miles.

The purification of the sewage of Melbourne and suburbs is effected by filtration and aeration through the natural soil of the farm at Werribee, the sewage being applied to the land by broad irrigation. The farm now consists of an area of 22,633 acres. The total length of all sewers, excluding house connexions, is 2,253 miles. There are 230,000 buildings connected with this system.

The Sewage Farm property produces high-class fat cattle, and during recent years the Melbourne and Metropolitan Board of Works has carried off many prizes at the Melbourne Royal Agricultural Show in all sections of cattle exhibits. The turnover of this farm for the year ending 30th June, 1928, amounted to £116,063, the trading profit being £44,289.

The present outfall sewer can only take the sewage of a population of 1,100,000. Its enlargement to meet the requirements of double that population is, however, quite practicable. The Engineer of Sewerage of the Melbourne and Metropolitan Board of Works, who has given evidence before the Commission on two occasions, has advised that it will shortly be necessary to provide a system on the south-eastern side of the metropolitan area so that many eastern and southern suburbs now being served by the Werribee system can have their sewerage directed to the south-east. These diversions would enable the Werribee system to cater for the increasing population of the inner and western and northern suburbs.

With this object in view, the Board recently purchased an area of 1,158 acres at Braeside, several miles east from Mentone and Mordialloc. It is not practicable to have a similar scheme, on the south-eastern side of the metropolis to that on the south-west. The Melbourne and Metropolitan Board of Works has stated its intention of installing at the Braeside area a system of treatment which will result in supplying an almost pure effluent.

The Braeside scheme is estimated to be capable of treating sewage from a population of 700,000, allowing for a daily flow of 32 gallons per head.

BACTERIAL TREATMENT.

There are certain areas in the Municipalities of Essendon, Coburg, Preston, Heidelberg, Camberwell, and Kew which cannot be connected to the schemes outlined above, and which the mains referred to would not be large enough to serve. There are 12,300 acres altogether, most of which are now served by the pan system referred to below. An area at Kew is at present being successfully dealt with by bacterial treatment, and it is proposed that all of these areas should be similarly dealt with.

UNSEWERED AREAS.

Notwithstanding the extensive sewerage system in operation in this metropolis, there are a large number of unsewered properties, the majority of which are on the outskirts. The Commission considers that every possible effort should be made to reduce the number of unsewered properties. With this objective, **it is recommended that no further building be permitted in the metropolitan area unless a water supply exists on to the property, and that, pending connexion with the general sewerage scheme, it shall be obligatory to install a septic tank or other system according to standards laid down by the Commission of Public Health.** The Commission desires it to be understood, however, that these systems should not be regarded as a substitute for sewerage facilities as generally supplied, but a necessary interim convenience and health precaution.

The Commission is of opinion that the provision of septic tanks, advantageous as it will be in improving the sanitary condition of the metropolis, should go hand in hand with outer suburban development on town-planning lines. This would avoid in the future the present unsatisfactory haphazard and scattered development which brings in its train undesirable and uneconomic conditions.

The pan system of nightsoil disposal is fraught with dangers to health, and perhaps the only complaint that can be substantiated in regard to an otherwise excellent sewerage system in this metropolis is the fact that uncontrolled development has been allowed to advance to such an extent as to give to the Melbourne and Metropolitan Board of Works the unpleasant responsibility of some 24,000 or more cess-pans, with the attendant troubles and objections which are necessarily associated with such obsolete disposal methods.

The present law which provides that buildings shall not be erected on lands subject to inundation has not been sufficiently enforced. Apart from the health aspect, this often causes difficulties in sewerage the buildings. In such areas the erection of buildings should not be permitted unless they can be effectively and economically sewerage.

OTHER PUBLIC SERVICES.

GAS, ELECTRICITY, LIGHTING, TELEPHONES.

It is only necessary to make passing reference to other services, which are of relatively minor consequence from a town-planning point of view.

Gas.

The gas supply for the city and suburbs is in the hands of a public company operating under an Act of Parliament, and two private companies, whilst the Municipalities of Heidelberg and Mordialloc have taken advantage of the powers conferred upon them in the Local Government Act to manufacture gas for supply to their own ratepayers. Gas services are being continually installed in outer areas as the metropolis expands.

Electricity.

The principal source of electric power supply for the State of Victoria, including the metropolis of Melbourne, is controlled by the State Electricity Commission, which operates under the State Electricity Commission Acts, 1918 to 1922. It generates its supply principally at the extensive brown coal deposits at Yallourn, in Gippsland. Practically the whole of the metropolitan requirements are supplied by it, there being several distributing authorities, mostly municipal councils, which purchase their energy in bulk from the State scheme. The Commission controls the distribution in four metropolitan districts within the area of planning adopted by the Town Planning Commission, and in 1930 will take over the undertaking of the Melbourne Electric Supply Company Limited, which at present retails in most of the southern and eastern suburbs the energy it purchases from the Commission in bulk. The Commission also supplies 140 centres throughout the State by means of a transmission system, which extends for distances of 300, 294, and 280 miles in various directions, from Melbourne.

The Melbourne City Council supplies the greater part of its own area with electric power obtained for the major part from the State Electricity Commission, supplemented by its own generating plant.

The Victorian Railways Department generates its own power at Newport, where it has a very large plant.

Lighting.

Very great improvements in the lighting of the streets of this City have been made in recent years, nearly all of which are now lit with electricity. St. Kilda-road, certain beach areas, the main shopping centres in the city and suburbs, the principal bridges, &c., are all splendidly lighted. As the importance of streets and localities is increased by development, it is to be expected that the lighting system will be improved.

Telephones, &c.

All telephone, telegraph, postal, and wireless services are controlled as a Commonwealth activity by the Postmaster-General, who is a member of the Federal Cabinet.

RELATIONSHIP TO ZONING.

Some references to the relationship of zoning to the public services have already been made in the Zoning chapter (pages 155 and 156), but there are certain phases of this matter which should be more particularly mentioned in this Part. The past uncertainty as to the trend of building has resulted in replacements of small mains with large mains, and the removal of pipes which might have served for much longer periods if the original type of development had remained as was anticipated. Conversely, large mains have been installed before the requirements warranted the heavier expenditure involved.

Where the development of a city is controlled and regulated as to the limits of its industrial sections, its areas for high buildings, for apartment houses, for single, double, or three storied houses, &c., the requirements of the various services can be estimated with reasonable accuracy. At present, in Melbourne and suburbs, there must be a certain amount of conjecture as to the capacity of the plant and mains to be installed in respect of water, drainage, sewerage, telephone, and other public services, a considerable amount of which might be avoided if a definite zoning plan were adopted. It would then be possible for the authorities concerned to estimate the demand upon those services for a reasonable period in advance. They would also be able to determine with greater confidence the financial outlay which would be reproductive.

An aspect of the water supply services which does not apply to the same extent in other services is the necessity for having adequate pressure in all types of areas so that fire fighting may be effectively carried on. Zoning the height, bulk, and use of buildings would permit the necessary water facilities to be determined.

Most of the services referred to must be installed in nearly all buildings, and to that extent the authorities concerned are able more easily to plan their mains and plant, but the position of the telephone services is by no means similar. Not only is there a vast difference in the ratio of telephones to area in different types of districts, but the installation of this service is entirely a matter of individual choice. It is obvious that any conditions of development which will give some form of permanency to a locality and an indication of its likely future development must be of great service to the postal authorities. The zoning scheme upon which the Commission has been working during the last two or three years has been made available to the Postal Department, and it is known that the preparation of data and the formulation of their plans have been aided materially thereby.

Streets must accommodate pedestrian and vehicular traffic, tramway tracks, subways, electric light and power cables, telephone, telegraph, and signal conduits, sewers, gas pipes, water mains, and lighting services. This agglomeration of services frequently presents many problems. It is, therefore, most desirable that every method of alleviating these difficulties in a large city should be adopted. In dealing with underground services (pages 57 and 58), some references to this matter were made. Easements and lanes should be used for as many services as possible, excepting, perhaps, lighting and water only; the latter only because of the necessity of having fire hydrants in the streets. The zoning scheme would materially aid engineers in estimating requirements with a greater assurance that the works will warrant the expenditure and conform to the needs of the community.

THE COSTS OF PUBLIC SERVICES.

One of the principal contributing factors to the relatively high cost of rates, public services, transport, &c., in this metropolis is the tendency of development to spread unreasonably over large areas. There are few, if any, cities of a population of 1,000,000 or more which occupy such a large area as does Melbourne and its suburbs. **The relatively low average density of population in Melbourne, however beneficial it has been in other respects, has presented many problems to those charged with the responsibility of supplying the various public services.** The statement appended hereto shows that the provision of these services in this metropolis is more expensive than in most other cities of similar or greater population.

POPULATION DENSITIES.

COMPILED FROM LATEST INFORMATION AVAILABLE.

City.	Area. Square Miles.	Population.	Average Density Per Acre.	Densest Portions.
<i>United Kingdom—</i>				
London—Greater	693	7,809,963 (1927)	17.6	
County	117	4,550,000 (1927)	60.8	163 in Southwark, but up to 500 in places
Glasgow	30	1,200,000 (1928)	62.5	300 to 400
Birmingham	68	952,800 (30. 6. 27)	21.8	
Liverpool	33	872,900 (April, 1928)	41.1	
<i>Europe—</i>				
Berlin—Greater	339	4,024,165 (16. 6. 25)	18.5	Averages 118 on 29 square miles
Paris	185	4,567,000	38.6	Averages 148 on 30 square miles and reaches 400 per acre
<i>United States—</i>				
New York—Greater	297	6,017,500 (1. 7. 28)	31.6	Averages 133 on the 22 square miles of Manhattan Island, and reaching 650 per acre on the Lower East Side
Chicago	193	3,157,400 (1. 7. 28)	25.6	
Philadelphia	128	2,064,200 (1. 7. 28)	25.2	
Detroit	77	1,378,900 (1. 7. 28)	27.7	
Cleveland	56	1,010,300 (1. 7. 28)	28.2	
St. Louis	61	848,100 (1. 7. 28)	21.5	
Baltimore	79	830,400 (1. 7. 28)	16.4	
<i>Canada—</i>				
Montreal	50	952,875 (1926)	29.8	
<i>Australia—</i>				
Sydney	185	1,200,000 (1929)	10.1	87—Darlinghurst
MELBOURNE—				
Area of existing development	110	1,007,000	14.3	60—Fitzroy
Commission's area of planning	(approx.) 257	1,020,000 (1929)	6.2	

It is obvious that the cost of transport, water, sewerage, power, lighting, road construction, and maintenance generally must fall much more heavily upon those residing in a metropolis where the density of population averages about 6 to the acre, as compared with a city where there are 20, 40, or more people to the acre. The Commission has been careful in its zoning proposals to plan for the relatively low densities of 20 to 40 people per acre as compared with many older cities, but this is because of the necessity for preserving modern and hygienic conditions of development within the economic capacity of the community.

Under the present system there is little to discourage the person who desires to erect a new home in a new area, more or less isolated from the built-up areas. He is only directly and financially concerned with the payment of the costs of half the road construction opposite his own frontage and of the reticulation of the services from the street mains into his own allotment. In order that he and such others as may be located there in the first place can be supplied, the services are provided to them mainly at the expense of the citizens generally. The vacant lands become enhanced in value by reason of the new services, but the rates paid on vacant land under the present system of rating by no means compensate for the outlay by the public authorities.

The Commission is of the opinion that its zoning proposals and its recommendations as to the necessity of making water and sewerage available before any new house is erected should

assist in achieving the objective of avoiding indiscriminate and unsatisfactory new development. The costs of services would thereby be reduced, because of their more intense use by a greater number of ratepayers and consumers per acre or per mile, as the case may be.

In its First Report, the Commission urged strongly that further outer suburban development by the erection of houses in scattered positions without the provision of the necessary services, should be curtailed. With a view to assisting in securing this corrective, and a more gradual accretion on the perimeter of the more densely built-on areas, it was recommended (page 54) that legislation be enacted to ensure that municipal councils, before sealing plans of new subdivisions, insist that—

(a) the streets be formed to the permanent levels, and

(b) a complete drainage system, including street channels, be installed,

such work to be carried out at the expense of the subdivider.

There can be no doubt that the scattered development, combined with the extraordinarily large area on which Melbourne's 1,000,000 people are housed, have contributed substantially to the high cost of living and of overhead business expenses.