THE METROPOLITAN DEBTS

OF

BOSTON AND VICINITY

SINKING FUND AND SERIAL BOND METHODS COMPARED

PROPOSED LEGISLATION

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BROOKLINE, MASS.:
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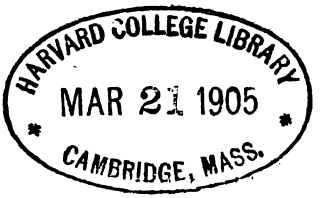

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At the Annual Town Meeting in Brookline, Mass., held in March, 1904, a committee was appointed to examine into and report on the subject, —

"To see what action the town will take to improve its financial relations with the State and Metropolitan District."

This committee, consisting of Joseph Walker, James M. Codman, Jr., Alfred D. Chandler, James R. Dunbar and Frederick P. Fish, presented its report in print at the town meeting, December 28th, 1904, and the following votes were passed by the town: —

Voted, That the report of the committee be accepted and that the committee be requested to confer with officers of the Commonwealth and officers and citizens of other municipalities and to co-operate with them in getting the recommendations of the report carried out.

Voted, That the Selectmen be authorized and instructed to appear before the General Court of 1905, to secure the passage of an act to authorize towns and cities to pay certain Metropolitan debts, substantially in the form of the act therefor submitted at this town meeting by the committee appointed under the twenty-eighth article of the warrant for the annual town meeting in Brookline of March 16th, 1904.

In support of these votes the committee have caused to be printed the following pages prepared by Alfred D. Chandler, on Metropolitan Debts, comparing Massachusetts Sinking Fund and Serial Bond methods of extinguishing public debts, together with tabular proofs, a proposed Act for the relief of municipalities in the Metropolitan District, and other pertinent information. At Mr. Chandler's request, the computations presented in typewritten form by him to the committee and herein printed, were submitted to and were approved by a public accountant, before this pamphlet was allowed to go to press.

Brookline, Mass., January 20, 1905.

THE METROPOLITAN DEBTS.

That part of Massachusetts within about twelve miles of Boston, and included in the Metropolitan District, is liable for heavy Metropolitan debts, beyond its municipal debts, and beyond its proportion of the State "direct" debt, of which it pays about 60 per cent. The Metropolitan debts in Massachusetts far exceed the entire debt of any other State in the Union.*

There are forty towns and cities within the Metropolitan District. They are held to pay about $65,000,000, gross, of principal, for Metropolitan liabilities, the interest on which is (less premiums) about $80,000,000, a total Metropolitan obligation of about $145,000,000. In addition to this are their municipal debts, of about $129,000,000, gross, exclusive of interest; and about 60 per cent of the State "direct" debt, or about $18,000,000, exclusive of interest. There is also their proportionate share of the County debts of Essex, Middlesex, Suffolk, Norfolk and Plymouth Counties, — a grand total of liability, with interest, of about $400,000,000, gross, on about 400 square miles of territory, or about one-twentieth the area of the State.†

The Metropolitan sewerage, park and water obligations are issued "in the name and behalf of the Commonwealth and under its seal," and are "deemed a pledge of the faith and credit of the Commonwealth," thus creating a State debt; but the State is empowered, through the Supreme Judicial Court, to

*A table of the debts of the 45 States is given in the Appendix, p. 34.

	Debts.	Sinking Funds.	Net Debts.
† State "direct" debt, Dec. 31, 1904,	$30,809,750	$15,233,154	$15,576,595
State "contingent" debt, Dec. 31, 1904,	64,989,412	6,230,877	58,758,535
Totals,	$95,799,162	$21,464,031	$74,335,130
Municipal debts of the 40 towns and cities in Metropolitan District, May 1, 1904,	129,017,243	37,813,786	91,203,457
Totals,	$224,816,405	$59,277,817	$165,538,587

collect from the municipalities directly involved, such apportioned annual contributions as will pay that debt. (Acts of 1889, ch. 439; 1893, ch. 407; 1895, ch. 488.)

At no time in its history, up to the period of the Civil War, was the principal of the public debt of the United States as great as that of the Metropolitan District of Boston and vicinity today. In 1816, after the war with Great Britain, the debt of the United States was $127,000,000; in 1836 Congress passed an act to distribute among the States a surplus of about $37,500,000; and on July 1, 1861, the national debt was only about $90,000,000.

It is said that in the United States the aggregate of municipal debts now rivals the national debt in magnitude.* The problem of obtaining revenue for local debts, is a more complex and difficult one than that for the national debt. This disparity has in recent years become so serious as to demand a readjustment of the sources of public revenue.

The Nation has means of revenue which the States and municipalities have not. The Nation's income from internal revenue, customs, profits on coinage, sales of public lands, postal charges, letters patent, and from other sources is very large, and can be made as elastic and responsive as war or other exigencies at any time demand.

But for the States, and for their municipalities, the revenue question is more perplexing; and of these two the needs of the States are relatively small as compared with those of local governments. There is no system in the distribution of revenue sources between the two forms of government.

While the United States has not repudiated its debt, yet when in London, in 1839, Daniel Webster was asked by the Baring Brothers & Co., for his opinion on the power of a *State* legislature to contract loans, which Mr. Webster answered in the affirmative, incautiously adding, and what afterwards became embarrassing, from the publicity the opinion received, that —

*New Internat. Cyc. Vol. V. p. 711. The returns upon this of the National Census of 1900 are not yet published.

"The States cannot rid themselves of their obligation otherwise than by the honest payment of the debt . . . Any failure to fulfil its undertakings would be an open violation of public faith, to be followed by the penalty of dishonor and disgrace: a penalty, it may be presumed, which no State of the American Union would be likely to incur." (Webster's Works, Vol. XII, pp. 211, 214.)

In an elaborate article on the "Debts of the States," first published in 1844, the late Hon. B. R. Curtis wrote that —

"Our foreign commercial debt had been paid with so much promptness, that European capitalists formed a very high opinion both of our resources and our honor, and they took the stocks of the States as freely as if they had been gold and silver." (*Life*, Vol. II., p. 106.)

Repudiation by States in this country rapidly followed. Nine out of twenty-six States in existence when Mr. Webster gave that opinion, dishonored their undertakings. In all sixteen* out of the forty-five States have repudiated or scaled down their debts, or defaulted in interest, including both northern and southern States, and before as well as since the Civil War, such debts involving, as reported, with accumulated interest, about *three hundred millions* of dollars! (No. Amer. Rev., Aug. 1884, p. 128.)

The extent of repudiation of *county* and *municipal* debts in the United States, in addition to State debts, is not known, but has been estimated to be about *one billion* of dollars.†

*Pennsylvania, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Arkansas, Tennessee, Indiana, Illinois, Michigan and Minnesota.

When the State of Pennsylvania in 1842, defaulted in its interest, the Rev. Sydney Smith declared he felt inclined, if he met a Pennsylvanian at dinner, to strip him of his clothes and boots for division among the guests, most of whom had probably suffered by his State's dishonor!

†The most prolific field for municipal delinquencies has been in and near the naturally rich Mississippi valley, from Duluth to Mobile, including Keokuk, Quincy, Cairo, St. Joseph, Leavenworth, Lawrence, Topeka, Little Rock, Memphis, New Orleans, Shreveport, Houston, etc., etc. Of over three hundred municipalities in Illinois, more than one-third refused payment of bonds. Of one hundred counties, townships and cities issuing bonds in Missouri, nine-tenths have defaulted. Kansas' record is somewhat better, but humiliating; while the bonded communities of Arkansas have been unanimous in attempting repudiation. Such municipalities also may be found within sight of the steeples of New York City. (From No. Amer. Rev. of Aug. 1884, pp. 127-144 and 563-579, wherein is a revelation of such wholesale evasive stratagem and bold defiance of law and morality, that it mocks Daniel Webster, and suggests toleration for Santo Domingo and certain Latin-American Countries.)

The gross indebtedness of the Metropolitan District of Boston and vicinity, covering an area of only 400 square miles, and a population of about 1,200,000, is now about what the indebtedness of the whole number of States, with a population of about 17,000,000, was in 1842, when repudiation was rampant, — that is, about $200,000,000, exclusive of interest, which will equal the principal.

The "States are practically free to pay their debts, or to repudiate them as they see fit." (Repudiation of State Debts, Scott, p. 30; 127 Mass. 43, 46.) But in Massachusetts the creditor has a remedy against any defaulting municipality. Hence, on that account, and because the sources of public revenue available to municipalities are the most limited of the three divisions of government, — the Nation, the State, and the municipality, — the financial problem confronting Boston and its vicinity can hardly be overrated in importance. Any practical suggestion to ameliorate the situation deserves attention, and adoption if sound.

Brookline's municipal debt is about $1,500,000 of principal; its share of the principal of the Metropolitan debts (Parks and Sewerage) is about $2,100,000; a total indebtedness of about $3,600,000, exclusive of interest, and exclusive of its share of the State "direct" debt, Brookline being the fourth largest contributor to the State tax, the order being Boston, Worcester, Cambridge, Brookline.

Massachusetts authorizes two ways of borrowing money, on long time, for public uses. One is the Sinking Fund method, intended (as operated in Massachusetts) to pay the principal at its maturity, but not to pay the interest, which is often far greater than the principal, and which must be paid by taxation. The other way is by Serial Bonds, the principal of which is paid by taxation in equal annual instalments; the interest, which annually *decreases*, is also paid by taxation.

Massachusetts arbitrarily applies the Sinking Fund method to the Metropolitan Debts. For those debts the State refuses

to the municipalities in the Metropolitan District the benefit of Serial Bonds, although the State, by Chapter 133 of the Acts of 1882, expressly authorized Serial Bonds as an advisable mode of financing public debts, and many municipalities adopt that mode.

The difference in interest, in cost, and in risk, on long time bonds, between these two fiscal methods is very great, where large amounts are involved. When the total State debt, as in the case of Massachusetts, reaches National proportions,— about $95,000,000 of principal, with Sinking Funds to invest and reinvest to the amount of about $21,000,000, and when the additional municipal debts of the Metropolitan District are about $129,000,000 of principal, with sinking funds of about $37,000,000,— the fact that neither the State, nor the Metropolitan District, nor any of its municipalities, has the revenue resources of a Nation, emphasizes the significance of the operation of these two ways of borrowing money for public uses.

Brookline, to its great advantage, long since abandoned the Sinking Fund method, as a financial anachronism for its municipal loans, as out of date, unreliable, too costly, and to be discarded in advanced municipal finance. Since 1886, Brookline has adopted the Serial Bond method; in that way it has successfully placed fifty-eight loans,* covering about $3,600,000, at an average rate of about 3½ per cent, at an average time of about fifteen years, and a difference of about $880,000 in interest.†

Two objections to the Serial Bond method are often advanced, but have long since been disposed of:—unpopularity and a high rate of interest. When Brookline first con-

* Given in full in the Appendix, pp. 37, 38.

† This, of course, does not mean that amount of *saving*. The Brookline loans were mostly on quite short time. None were forty year loans, as are the Metropolitan debts. Between the two methods, large savings do not come on short time but on long time Serial bonds for large amounts, as will be demonstrated later on for Brookline's case, Boston's case, and that of the Metropolitan District at large (pp. 20 to 27). An aggregate of fifty-eight Sinking fund accounts, many comparatively petty, was wisely avoided by Brookline. Expense lurks in a prolonged interest account which taxation must meet annually, and which must also meet any final deficiency in the sinking fund. (Rev. Laws, Ch. 27, Sect. 12.) For details of the progressive *savings*, between the two methods, when applied for example, to bonds for $1,000,000, for 20, 40 and 50 years, on a 3 and on a 4 per cent basis, see Appendix p. 73 *et seq.*

sidered the adoption of Serial Bonds, influences were brought to bear to prevent the first town in New England from confirming the municipal wisdom of that course. The opposition was ineffectual. The advantages of Serial Bonds, to both lender and borrower, are now recognized throughout the country, and are applied to loans of many millions of dollars for industrial as well as for municipal bond issues. The money market is now too broad, elastic and responsive, to be cramped by the narrower view of the last century.

As far back as 1886, Brookline's first Serial Bond loan of $100,000 was placed without difficulty at 3 65-100 per cent, notwithstanding warnings of failure. A list of Brookline's Serial Bond loans is given in the Appendix, as a convincing answer to the usual objections to that method. Among other Massachusetts municipalities that have adopted Serial Bond issues the following twenty-two are noticed: Arlington, Boston, Fall River, Fitchburg, Gardner, Gloucester, Hingham, Holyoke, Lawrence, Lowell, New Bedford, Newton, North Adams, Northampton, Peabody, Quincy, Rockport, Salem, Somerville, Springfield, Sunderland, and Winchester.

The difference to Brookline in the *interest* account of its loans since 1886, by the Serial Bond method, is about $880,000 over the Sinking Fund method. How far the successful operation of numerous Sinking Funds would have counterbalanced the greater part of that difference is so problematical, and, judging from Brookline's former experience with Sinking Funds, so sure of failure, that neither creditor nor debtor should wish now to relapse to the Sinking Fund method.

Few tax payers are aware of the contrast between these two methods. The difference in the interest account is enormous, and it is against the Sinking Fund method. The Sinking Fund, which is supposed to earn enough to meet the principal of the debt, but not the interest, is subject to constant risks. Sinking Funds are often neglected, mismanaged, lost, appro-

priated to other uses, and have been stolen.* State Constitutions and State Laws to maintain the inviolability of Sinking Funds, are found to be inadequate to protect either creditor or debtor. The suspension of a Sinking Fund is at times deliberate, and is essential in sound finance if money must be borrowed to maintain it; for to borrow to keep up the Sinking Fund is a purely fictitious operation, which really adds to the debt it in no wise reduces. England suspended the Sinking Fund in 1886–7, after the war in Egypt, and again more recently on account of the Transvaal war, reliance being placed upon the Nation's credit for the final liquidation of these debts.† In England it is affirmed that few highly educated men turn their attention to finance, unless compelled by the necessities of politics (*Sinking Funds. Sargant.* London. 1868, p. 19); and from England come astonishing revelations, proved as late as 1869 by a Parliamentary committee, to the effect that: —

"Estimated as a net result of the Sinking Fund system kept up during war, the nation had between 1785 and 1829, borrowed £330,000,000 at about 5 per cent interest, in order to pay a debt of the same magnitude at 4½ per cent interest. This policy, by which a debt at 4½ per cent was converted into one at 5 per cent, *meant an annual loss of interest of £1,627,765 extending over forty-three years.*" (Equal to a total loss of £69,993,895, or $338,770,427.) ("*Sinking Funds*," *Ross*, pp. 17, 18. *Cyclop. of Polit. Science*, III., p. 720.)

* There was a fraudulent misappropriation and loss of between $80,000 and $90,000 connected with the Boston Sinking Funds, about the year 1880. (Auditor's Rep. City of Boston, 1880–81, p. 7.) Ex-Alderman Tinkham of Boston, a close student of the city's finances, affirms that recently "money ($292,000) has been taken from the Sinking Fund for current expenses in an exceptional way." (Boston Transcript, Aug. 15, 1904.) It is reported that in Chicago the city's Sinking Funds have been generally taken for current expenses. The sinking fund begun in Mississippi, in 1832, on a $250,000 premium for its bonds, grew by 1839 to $800,000, and then shrank from bad investments to $100,000 in 1848 The most frequent reason for receiverships for railway companies, is the failure to pay the interest on mortgage bonds. During twenty-five years, up to 1898, more than 700 railroad companies, with a mileage exceeding 100,000 miles, representing about $3,000,000,000, in capital stock and bonded indebtedness, were put into receiverships, much of it not withstanding the common practice of creating sinking funds. Modern industrials, especially in the West, are now adopting serial bond issues as a better guaranty of staying commercial power.

† *Trinquat*, "*De L'Amortissement des Emprunts D'Etats*," Paris, 1899, p. 388.
Raffalovich, Review of the world's financial affairs.
Journal des Economistes, January, 1903.
Journal of Commerce and Commercial Bulletin. New York, Feb'y 3, 1903.
Sinking Funds, Ross. American Economic Association, pp. 92, 103.

During our civil war the United States did not make that mistake,* for although the Act of 1862, authorizing legal-tender notes, provided for a Sinking Fund of 1 per cent, yet —

"During the war no attempt was made to fulfil this pledge, as the government was continually borrowing and adding to its total indebtedness." (*Financial Hist. of the U. S., Dewey*, p. 356.)

Or, as stated by John Sherman: —

"While the United States was borrowing large sums and issuing bonds, it was folly to pay outstanding bonds, and this was not done until 1868, when the treasury was receiving more money than it disbursed." (*Sherman's Autobiography*, Vol. II., p. 876.)

Although our metropolitan and municipal debts have attained National proportions, and far exceed that of any State in the Union, yet but little aid can be drawn from the experience of our Nation with its sinking funds, because soon after the civil war the Nation's receipts so far exceeded its expenditures, that the National debt was paid off much more rapidly than the sinking fund required, and John Sherman writes that: —

"The term 'Sinking Fund,' as applied to *National* accounts, is a misleading phrase. It is a mere statement of the reduction or increase of the public debt, showing whether we have or have not paid one per centum of the public debt each year. *There is no actual fund of the kind in existence for national purposes.*" (*Sherman's Autobiography*, Vol. II., p. 877.)

The requirements of the National Sinking Fund Act of February 25, 1862, were not complied with, because the National expenses during the war exceeded the revenue; but after the war the debt began to be paid faster than the Sinking Fund requirements called for; thus between 1862 and 1876 the Sinking Fund called for $433,848,215.37, but by June 30, 1876, the reduction of debt was $656,992,226.44 or $223,144,011.07 more than was absolutely required. (*Public Debts, Henry C. Adams*, pp. 272, 273.)

* But the City of Boston, according to Ex-Alderman Tinkham, has recently (1904) committed this fundamental error, for, as he writes: "This year bonds have been issued to the amount of $552,670 to pay the interest and sinking fund charges of the highway debt." ("The City's Finances." Transcript, Aug. 15, 1904.)

Neither Massachusetts, nor the Metropolitan District, nor any municipality in that district, has any such sources of revenue, or powers of taxation, as the United States; hence the mode of financing the relatively enormous debt resting upon that District becomes a more serious matter than it would be for the Nation; and the necessity of examining this State's arbitrary Sinking Fund method of handling the Metropolitan debts, in contrast to the optional and safer Serial Bond mode allowed for financing municipal debts, is imperative.

In England the successive failures of Sinking Funds, it is said, "made the term Sinking Fund almost one of reproach." (*Sinking Funds. Sargant*, London, 1868, p. 82.)

"In 1816 a Sinking Fund was commenced in France, on the principle of Mr. Pitt's English one. It has long since ceased to produce any effect but that of creating confusion in the accounts." (Idem, p. 131.)

"In time of peace, it (the Sinking Fund) has no efficacy beyond that which would result from applying the surplus revenue to an equal amount in the redemption of the debt; and in time of war, when more debt is contracted than is paid off, it ceases to have any efficacy whatever, and only serves to increase the burdens of the people when they are least able to bear them, not only by the expense attending 1 per cent of taxes raised, but by the expense attending the execution of the plan." (*Edinburgh Review*, January, 1823, "*Errors in our Funding System*," pp. 1, 11, 12.)

It is true that, as late as 1875, England at last adopted the improved American Sinking Fund system, originating in 1802 with Albert Gallatin, our Secretary of the Treasury a century ago, yet England has already found it necessary to suspend its Sinking Fund in 1886–7, and in 1903, and modern authority affirms that, —

"Whenever the financial condition of a nation warrants a repayment of debt there are simpler methods of proceeding than sinking fund arrangements . . . while it (a sinking fund) has been discarded in the practice of the more advanced nations, it is sometimes used by the nations of weaker credit." (*Finance. The New Internat. Encyc.* Vol. III. pp. 382, 383.)

The late Professor Dunbar, of Harvard University, in his Economic Essays (p. 84, *et seq.* Ed. of 1904), referring to Mr. Pitt's famous Sinking Fund system which was swamped by the

gigantic wars of the French Revolution, affirms that it rested "upon a complete illusion as to the possibility of holding Parliament permanently to the system — as to the possibility, that is, of binding the debtor by a compact made with himself." On the other hand Alexander Hamilton, following Pitt, hoped for an adequate surplus revenue, to sustain his system, which "was made useless by the astonishing growth of national revenue." (*Idem*, p. 89.) So after our Civil War, the wonderful prosiliency of the Nation swept aside the Sinking Fund requirements of the Congressional Act of 1862, reducing them to a mere perfunctory book-keeping entry.

M. Trinquat, in his *De L'Amortissement des Emprunts D'Etats*, published in Paris, in 1899, wherein is a bibliography of the literature on Sinking Funds, including ninety-six works in different languages, concludes that Finance should be so simple as to be easily understood by all classes, and that the easier it is the nearer it is to perfection (p. 381).* He agrees with the eminent political economist J. B. Say in that there are no two ways of extinguishing debt; the *only way* is, for a State as for an individual, to use the revenue above the expenses. Every other form of extinguishing a debt is a pure folly, wherefrom no advantage accrues to the State (p. 385). His opening chapters aim to show that morally, politically and economically amortization [extinction rather than conversion] of public debts is a necessity. He maintains that for the public to free itself from the obligation of paying debts is to encourage itself to incur infinitely new debts (p. 78); and he quotes Ricardo, that Sinking Funds rather tend to encourage expenditure, than to diminish debt (p. 209).

A Sinking Fund — its objectors allege — "acts on the public as a narcotic," for "the confidence placed in the efficacy of these schemes has contributed further to ease the alarm which

*The voluminous literature on Sinking Funds fully reveals the theories, history and operation of that mode of extinguishing debts in Europe and America. With the aid of the Robinsonian Bond and Investment Tables, published by J. Watts Robinson, of Brookline, the application of Sinking Funds to loans can be figured easily. The test of the application to Brookline and the Metropolitan debt, appears later in this report.

the magnitude of the public debt would otherwise have produced." (*Sinking Funds*, *Sargant*, p. 170.)

There are fallacies in the management of Sinking Funds that have long since been exploded, but which are still overlooked or disregarded in this country. However sound in theory a Sinking Fund may be, it is the *mode of investment, its administration*, which is the vital point. The English Sinking Fund proved abortive because, in part, its Commissioners were required to buy government stocks.

"The chief and central misconception was in regarding *government* stocks as *productive* property. It was this that led to looking upon the interest on stocks bought in for the sinking fund as 'earnings,' and not as the proceeds of taxation." (*Sinking Funds*, *Ross*, p. 13.)

"That cannot be regarded as a productive property, to the government which rests upon taxes levied and collected by the government. It is the taxes that are the sources of revenue and not the fund." (*Public Debts*, *Henry C. Adams*, 1898, pp. 253, 254.)

But even here in Massachusetts, this fallacy that has wrecked Sinking Funds, and has been so long exposed, appears to be perpetuated by Legislative Acts. Some instances of such Acts authorizing Massachusetts municipalities to invest their sinking funds in their own loans, or government stocks, are: —

Acts 1885, *Chap. 377*, Sec. 5; under which $850,000 of the City of Boston's bonds were taken for investment by the Boston Sinking Fund Commissioners.

Acts 1895, *Chap. 36*. Brockton, $250,000 sewer loan. Sinking fund of any loan of the city may be invested therein.

Acts 1896, *Chap. 207*. Brockton, $50,000 drainage loan. Sinking fund of any loan of the city may be invested therein.

Acts 1898, *Chap. 478*. Marlborough, $50,000 water loan. Sinking fund of any loan of the city may be invested therein.

Acts 1901, *Chap. 75*. Brockton, $100,000 sewer loan. Sinkfund of any loan of the city may be invested therein.

And see *Revised Laws*, Chap. 27, Sec. 15.

The pamphlet on "*The Sinking Fund*" by George Morgan Browne, Esq., of Boston, and which reached a second edition in 1880, clearly condenses the reasons for avoiding Sinking Funds in large fiscal operations, and is from the pen of a practical man at one time President of the Eastern Railroad.

Mr. Browne objects to the Sinking Fund: —

1. Because the Sinking Fund is seldom placed, in practice, beyond the debtor's control, or, in the case of corporations, municipal or private, beyond the reach of their general creditors; so seldom, indeed, that such cases form the exceptions to the usual course of proceeding.

2. The creditor's legal rights are very little, if at all, strengthened by a sinking fund invested in outside securities, so long as they remain under the control of the debtor himself, or within reach of his general creditors.

3. If the Sinking Fund is invested in the debtor's own bonds or obligations, its existence is *not of the least advantage to the creditor*. It gives him no additional security, — legal, equitable, or honorary. It is a worthless device so far as he is concerned. (*The Sinking Fund, Browne,* 2d ed., pp. 17, 18, 19.)

"To the *creditor*, then, the Sinking Fund, in most cases is of no value; it is never of any value whatever, except in the rare instances in which it is placed absolutely beyond the control of the debtor, and out of the reach of his general creditors. If anybody, therefore, invests money in the bonds of a corporation, municipal or private, relying on such a Sinking Fund so remaining within the debtor's power, his investment rests, so far, on a basis wholly shadowy and deceptive. If the debtor is able to pay the original debt, well and good; but the Sinking Fund gives no additional guaranty; it adds nothing to the security."

"To the *debtor*, however, the Sinking Fund is always an expense, — often a snare and a delusion. If it tempts him, if it leads any city, town or State to contract unnecessary or not indispensable debt, under the futile hope that through wonder-working accumulation, that debt is to be extinguished without the hardships of taxation and self-denial; without in short, raising the last dollar of the loan with interest in one form or another, then the Sinking Fund is more than an empty delusion; then it inflicts on persons and communities, for the present and the future, great and positive injury and loss." (*The Sinking Fund, Browne,* 2d ed., p. 19.)

"The best way to sink a debt is to pay it; the surest sinking fund is *payment*." (Idem, p. 10.)

Some of the evils attendant upon the sale by a city of its bonds to itself for its sinking fund, and the reasons for the refusal of the Court to allow it, are given in the opinion of the

Chief Justice of Minnesota in the case of *Kelly* vs. *Minneapolis*, (Lawyers' Reports Annotated, Vol. 30, pp. 281, 283,) to the effect, in brief, that the board of Sinking Fund Commissioners cannot purchase from the city its bonds, although no statute forbids it, because "such a purchase is so radically inconsistent with the essential character of the sinking fund, and so destructive of the purposes to be conserved by its maintenance, that it must be held that the prohibition is implied." . . . "To construe the law so as to authorize such a sale would make the sinking fund a *debt-creating* instead of a debt-paying scheme." It would, as the Court holds, permit a city to market its bonds to itself, when the credit of the city or the state of the money market might be such that the bonds would not sell outside, which the Court regards as a diversion of the sinking fund to the projudice of the city. It would enable one branch of the city officers to play into the hands of another to create municipal debts. There was no claim of want of good faith in this Minneapolis case; but the Court affirmed that the evils which might result from permitting this to be done are serious, and that it must guard against the possibility of such evils.

One phase of the insecurity of sinking funds for both creditors and debtors appears in the Constitution of Pennsylvania, adopted in 1873, Art. IX., Sec. 11, to the effect that no part of the State Sinking Fund shall be used otherwise than to extinguish the public debt, "unless in case of war, invasion, or insurrection;" which implies that creditors may then see their security swept away; and that debtors will have to make good the loss by taxation.*

* Many believe that Pitt's Sinking Fund became valueless by the subsequent practice of making loans to the Government out of the Sinking Fund. This arose at first from Fox's proposal, acceded to, however, by Pitt. Fox's great objection to the Sinking Fund was its inalienability under any circumstances, and he introduced a clause to authorize its use for a Government loan if occasion required. Thus if six millions were wanted and a million could be had from the Sinking Fund commissioners, "a great benefit would arise to the public." Peace was essential to carry out Pitt's Sinking Fund. Seven years after his fund began, he was dragged into a war with France, accompanied by stoppage of the Bank of England, French revolutionary successes, and a war delirium in England. (Sargant, Sinking Funds, pp. 48, 54, 56, 95, 100, 102.)

Pennsylvania's gross debt, Dec. 1, 1903, was about $4,700,000; Massachusetts' gross debt was then about $91,000,000; the greater part of which, or about $61,000,000, devolved upon our Metropolitan District; a debt about thirteen times that of the State of Pennsylvania.

Pennsylvania, however, recognizes the Serial Bond principle of payment, in its Constitution, which provides that a sum of not less than $250,000 shall *annually* be applied from the sinking fund to reduce the principal of the debt.

West Virginia, by its Constitution of 1872, Art. X., Sec. 4, expressly provides for payments of the debt as under the Serial Bond method as follows: "The payment of any liability, other than that for the ordinary expenses of the State, shall be *equally distributed* over a period of at least twenty years."*

Two kinds of Sinking Funds are noticed in our Courts: a real Sinking Fund, and a pseudo Sinking Fund. The first is intended to ultimately extinguish a certain indebtedness; the second is intended to allure purchasers of bonds by holding out a security that is such in appearance only and not in reality.

This report excludes from consideration Sinking Funds of the second or fraudulent kind, and is confined to a practical application in the Metropolitan District of State Sinking Funds based upon integrity, but subject yet, for several decades, to political vicissitudes and control.

That the State itself, for nearly a quarter of a century, has appreciated the risks and the expense of even well intended Sinking Funds, appears in Chapter 133 of the Acts of 1882, now incorporated in the Massachusetts Revised Laws, Chapter 27, Sec. 13, which expressly provides that any town or city in Massachusetts —

* The action taken by the State of Maine, in discontinuing its Sinking Fund may be followed in the Inaugural Addresses of its Governors, in the Maine Acts and Resolves for: 1875, p. 54; 1876, p. 148; 1877, p. 239; 1878, p. 51; 1879, p. 120; 1880, p. 213; 1887, p. 73; 1889, p. 137; 1891, p. 133. Also, Acts and Resolves of Maine, under Resolves, for 1863, chs. 203, 276; 1864, ch. 318; 1875, ch. 48; 1878, ch. 56; 1889, ch. 308. Also Reports of Treasurer of Maine, for corresponding years.

"instead of establishing a sinking fund, may vote to provide for the payment of any debt by such annual proportionate payments as will extinguish the same at maturity."

This Massachusetts law is a recognition of the importance and safety both to creditors and to debtors of the Serial Bond method of paying public debts by annual proportionate payments. Experience now proves that the advantage of Serial Bonds cannot be questioned in Massachusetts.

But the State, in contradiction to this, has imposed a liabilty of about *sixty-five millions* of dollars upon 40 of its towns and cities composing the Metropolitan District, out of 353 municipalities in the State, and has refused to those 40 towns and cities the benefit of the Serial Bond law for that liability, although that law can still be applied to their *municipal* debts.

The State, when its attention was called recently to the extent of this inconsistency, enacted a law, (Acts of 1903, Chap. 226,) applying the principle of Serial Bond issues to *future State* Loans, but then emasculated the Act, so far as it relates to the Metropolitan District, by the following clause, which denies relief to the very part of the State the most in need of it:—

"Sec. 3. The provisions of this Act shall not apply to any issue of bonds or scrip now or hereafter authorized for the benefit of any of the Metropolitan District, so called."

That is to say, the Metropolitan District, which contains nearly two-thirds of the assessed valuation of the State, is hereafter to be discriminated against in favor of the remaining one-third in valuation, besides bearing a sixty-five million dollars liability financed and controlled by the State in an unnecessarily costly way.

It is to meet this unsatisfactory situation that a proposed Act of the Legislature is herewith submitted, which gives to any of the towns and cities in the Metropolitan District the option of availing of the Serial Bond method of financing its respective share of the Metropolitan debts, and in a way so simple as to strengthen the position of both creditor and debtor, without impairing any obligation, or the interests of any other municipality.

The significance of the operation of such an act may be summarized for the entire District, by presenting herewith one of the tabular statements drawn to the attention of the State Treasurer, prior to the Act of 1903, Chap. 226, above referred to, showing that the difference in the *interest* account between the Sinking Fund and the Serial Bond methods for the three main items of Metropolitan debt, Park, Sewerage and Water, would be about *twenty-six millions of dollars*, even if the bonds had been issued in Serial form at a one-half per cent *higher* rate than under the Sinking Fund form. The difference in the actual *cost* to tax payers, between the two methods, is also shown by a subsequent table to be about $8,360,000, on a 3½% basis.

STATE CONTINGENT DEBT (Excepting Armory Loan of $1,893,000).

	3 Per cent.	3 1-2 Per cent.	Total.	Interest.	Premiums.
Sewerage .	$7,989,912	$2,980,000	$10,969,912	$13,270,652	$370,813
Parks . .	2,680,000	8,350,000	11,030,000	14,826,000	789,160
Water . .	10,900,000	23,600,000	34,500,000	45,532,875	2,300,487
	$21,569,912	$34,930,000	$56,499,912	$73,629,527	$3,410,460
				3,410,460	
				$70,219,067	
				56,499,912	
Total, principal and interest				$126,718,979	

If the above 3 per cents had been issued as Serial 40-year Bonds at 3½ per cent, and the above 3½'s had been issued as Serial 40-year Bonds at 4 per cent, the difference in *interest* between the Sinking Fund method and the Serial Bond method would be:—

	Principal.				Interest.	Principal and Interest.
	$21,569,912	3%	40 y.	(Sinking Fund)	$70,219,067	$126,718,979
	34,930,000	3½	" "			
1.	$56,499.912					
	$21,500,000	3's at 3½%. 40 y., 1/40 each year,			Interest. $15,426,240	
	35,000,000	3½%'s at 4%. 40 y. 1/40 each year,			28,700,000	
2.	$56,500,000				44,126,240	$100,626,240

Difference in *interest* in favor of Serial Bonds, **$26,092,827**
(Dec. 10, 1902)

For additional details, see Appendix, pp. 40 to 50.

But even if the above $56,000,000 (using round numbers) is so successfully financed by the Sinking Fund method as to pay the principal of the debt at the end of 40 years, yet it is a more expensive method than the Serial Bond method (due to the difference in interest), whether the Sinking Fund is based upon a 3½ per cent or 4 per cent or even 5 per cent basis, as appears by the following, computed by the Robinsonian Sinking Fund tables, and any excess of such expense involves corresponding additional hazard.

	3½% basis. Decimal for $1 for Sinking Fund, being .011969 for 39 years.*	4% basis. Decimal for $1 for Sinking Fund, being .010635 for 39 years.*	5% basis. Decimal for $1 for Sinking Fund, being .008347 for 39 years.*
$56,000,000 Sinking Fund requirements for 40-year loan,	$26,140,296	$23,226,840	$18,229,848
$56,000,000 for 40-years interest at 3½%,	78,400,000	78,400,000	78,400,000
Cost of loan by Sinking Fund method,	$104,540.296	$101,626,840	$96,629,848
$56,000,000 40-yr. Serial Bonds, 1/40 payable yearly, $56,000,000			
Interest (annually diminishing) at 3½%, 40,180,000†			
Cost of loan, Serial Bond method, $96,180,000	96,180,000	96,180,000	96,180,000
Difference in *cost* in favor of Serial Bond method,	$8,360,296	$5.446,840	$449,848

It is thus shown that legislation is desirable to enable the municipalities involved to diminish the needless risk and cost of the great Metropolitan loans which they are compelled to meet.

Such legislation may be by a general law giving to any town or city in the District the option of paying to the State outright, any part or the whole of its share of the Metropolitan debts, and thereafter financing itself the debt so paid. The

* 39 years, instead of 40, is taken for the decimal, because one year is necessarily allowed for the practical operation of the Sinking Fund. There are also but 39 payments; following the practice at the Boston City Hall. Should the calculations be for semi-annual payments, or should the decimal for 40 years be taken, with 40 payments, the variations in either case will be too slight to alter the principle in favor of Serial Bonds.

† For details see Appendix, pp. 49, 50.

new law should also provide for the possible earlier redemption than the date of maturity of any bonds a town or city might issue to pay such debt, and for refunding them, a very serious omission in the present laws for State loans.*

How such a proposed law would operate appears from the following illustration in Brookline's case.

Brookline's proportion of the *principal* of the Metropolitan *Park, Boulevard and Nantasket* debt, under the present quinquennial apportionment, is	$625,957 50
Brookline's proportion of the *principal* of the Metropolitan *Sewer* debt, South system, is	1,481,269 98
Total	$2,107,227 48

Under the present apportionment, and under the State's *Sinking Fund* method of paying the Metropolitan 40 year bonds, the cost to Brookline of the *Park, Boulevard and Nantasket* debt, from 1905 to 1943, inclusive, for sinking fund and interest, will be . . .	$1,000,186 37
The cost to Brookline of the Metropolitan *Sewer* debt, under the State's *Sinking Fund* method, from 1905 to 1943, inclusive, for sinking fund and interest, will be	2,633,219 53
Total	$3,633,405 90

(The above figures are furnished by the Town Accountant of Brookline, and appear in detail for each year to 1943, in the Appendix.)

If, instead of the *Sinking Fund* method, the State employed the *Serial Bond* method, in successful use for municipal loans in Massachusetts, and expressly authorized by Chapter 133, Acts of 1882, now Revised Laws, Chapter 27, Section 13,

* Congress has passed refunding acts to the advantage of the country, which offer precedents for our State. "Early convertibility" is the American policy. The action of Congress in one instance is said to have prevented seasonable refunding, and proved to be a most serious error, according to John Sherman, who affirms that the law enacted by Congress, April 12, 1866, for the conversion of United States notes into interest-bearing bonds, became "by far the most injurious and expensive financial measure ever enacted by Congress," * * * * "adding fully $300,000,000 of interest that might have been saved by the earlier refunding of outstanding bonds into bonds bearing 4 to 5 per cent interest." (Sherman's Recollections, I., p. 384.)

and which Brookline has adopted for fifty-eight loans since 1886, not only would the saving to tax payers be large, but the safety and success of the loans would be assured; whereas under the present Sinking Fund method there is an expense and a risk that tax payers ought not to be subjected to against their will.

The difference in the operation of the two methods as applied at present to Brookline, is approximately as follows.

Brookline's share of the *principal* of these two Metropolitan debts — *Parks* and *Sewers* — equals, in round numbers *$2,000,000* as appears above. The outstanding bonds are on 40 years time, issued at various dates at 3% and 3½%.

Total *cost*, principal and interest, under *Sinking Fund* method, as given by the Town Accountant, for the unexpired terms of bonds		$3,633,405
Total *cost* of $2,000,000 at *3%*, for full term of 40 years, *Serial Bond* method	$3,230,000	
Difference in favor of *Serial Bond* method	**403,405**	
		3,633,405
Total *cost* of $2,000,000 at 3¼%, for full term of 40 years, *Serial Bond* method	$3,332,500	
Difference in favor of *Serial Bond* method	**300,905**	
		3,633,405
Total *cost* of $2,000,000 at 3½%, for full term of 40 years, *Serial Bond* method	$3,435,000	
Difference in favor of *Serial Bond* method	**198,405**	
		3,633,405
Total *cost* of $2,000,000 at 3¾%, for full term of 40 years, *Serial Bond* method	$3,537,500	
Difference in favor of *Serial Bond* method	**95,905**	
		3,633,405

For details see Appendix, pp. 54 to 57.

The difference in the *interest* account between the *Sinking Fund* and the *Serial Bond* methods for $2,000,000 for the full term of a 40 years loan for both loans, at 3%, 3½% and 4% appears from the following.

	3%	3½%	4%
$2,000,000. Interest under Sinking Fund method . . .	$2,400,000	$2,800,000	$3,200,000
Same, under Serial Bond method	1,230,000	1,435,000	1,640,000
Difference in interest in favor of Serial Bond	$1,170,000	$1,365,000	$1,560,000

But even if the Sinking Fund is kept intact, and is so successfully invested as to pay the principal, $2,000,000, of the debt at the end of 40 years, yet it is more expensive than the Serial Bond method, whether the Sinking Fund is based upon a 3½%, 4%, 4½% or 5% basis,* as appears by the following computed by the Robinsonian Sinking Fund tables.

	3½% basis. Decimal for $1 for Sinking Fund, being .011969 for 39 years. †	4% basis. Decimal for $1 for Sinking Fund, being .010635.	4½% basis. Decimal for $1 for Sinking Fund being .009431.	5% basis. Decimal for $1 for Sinking Fund, being .008347.
$2,000,000 Sinking Fund, requirements for 40-year loan,	$933,582	$829,530	$735,618	$651,066
$2,000,000 for 40 years, interest at 3½%,	2,800,000	2,800,000	2,800,000	2,800,000
Cost of loan by Sinking Fund method,	$3,733,582	$3,629,530	$3,535,618	$3,451,066
$2,000,000, 40 year Serial Bonds, 1/40 payable yearly, $2,000,000				
Interest (annually diminishing) at 3½%, 1,435,000				
Cost of Serial Bond method, $3,435,000	3,435,000	3,435,000	3,435,000	3,435,000
Difference in favor of Serial Bond method,	$298,582	$194,530	$100,618	$16,066

*Sinking Funds are, as a rule, now estimated as earning on a 3 per cent basis only, in actual practice.

† 39 years, instead of 40, is taken for the decimal, because one year is allowed for the practical operation of the Sinking Fund method. There are also but 39 payments.

To show what Brookline would pay *each year* from 1905 to 1944, both inclusive — a period of 40 years — under the State's mode of assessment as at present apportioned, and also under the proposed Serial Bond mode for the town to adopt, a table is given in the Appendix, (pp. 54 to 57) by which it is seen that the payments under the proposed method are larger at the beginning than by the State method, but they become smaller each year, until at the end the total saving is from about $200,000 to about $400,000 according to the rate per cent of the loan.*

These larger initial payments under Serial Bonds are well understood. Some would avoid them in order to put more rather than less upon their successors. But in the Metropolitan District successors of today already have far more to bear than their predecessors who could have borne more. The generation to come will have its full share of new tax burdens. The debt-incurring tendency is to be restrained by a present liability, rather than be encouraged by shifting that liability to a later generation.

It is thirty years since the Massachusetts municipal indebtedness act (1875, ch. 209), intended to hold towns and cities in check, was passed. In that time the assessed valuation of the Metropolitan District has increased from about $1,142,000,000 to $1,972,000,000, or 72+%; but the debt of that district in the same period (exclusive of its share of the State "direct" debt, and of county debts), has grown from about $56,545,000 to $194,062,000, or 243% (May 1, 1874, to May 1, 1904), and now, January, 1905, the debt is understood to be at least $200,000,000, or an increase of 253%.†

Among many unavoidable large expenses that our successors are to meet, is an additional water supply, to be taken in hand, it is said, even before the present forty-year water

* Observe, in the table [Appendix 16], that from 1934 to 1943 inclusive, under the Town Accountant's columns, there is a diminution in payments, due to the earlier maturity of some of the State bonds. Otherwise a still larger saving would appear under the Serial Bond columns, wherein the Bonds are continued for 40 and for 50 years from 1906.

† See Appendix for details of valuation and debt. pp. 35, 36.

bonds mature, and the water bonds of today form the largest item of the Metropolitan debts. The great sewerage system must be extended. A special provision of the Sinking Fund clause in the Metropolitan sewerage act (1889, ch. 439, §12) requires a progressive apportionment, designed to impose upon our successors a tax more than double that at first, the ratio of increase being 1-80th during each of the first ten years, 1-60th during each of the second ten years, 1-30th during each the third ten years, and the remainder to be equally divided during the next ten years. The sewerage debt is already about $25,000,000.

Moreover, our "successors" are, for a large part, to be *ourselves;* for the tax payers of today, between 25 and 40 years of age, must still be meeting our Metropolitan debts when from 55 to 70 years of age. The "successor" excuse is not altogether municipal prudence, it is rather an evasion.

The Act of the Legislature now proposed to give relief to the municipalities throughout the Metropolitan District, provides simply that any town or city may, at its option, at any time or times, pay to the State such part or all of its proportion of the Metropolitan debts that it is then liable for to the State, and, to do this, may issue its own bonds, in Serial form if it so chooses, for not exceeding 50 years, which may be redeemed after 20 years, and if refunded may be again redeemed after 10 years. Such payment to the State is to absolve the municipality from further liability to the State therefor, and is also to absolve the other municipalities affected thereby in the Metropolitan District; but an increase in the percentage of any subsequent apportionment for a municipality that has paid the State under this act, requires payment thereafter only of such excess of percentage upon the principal unpaid to the State. The State shall apply the money so received to the payment of so much of the Metropolitan debt of the class of debt paid, as the amount paid equals. The annual maintenance charges will continue, unaffected by the proposed act.

The following are some of the precedents for *50 year* bonds, in Massachusetts: —

1. 1885, ch. 377, and 1887, ch. 101. $2,500,000, beyond debt limit. Suffolk County Court House. Serial bond loan.
2. 1886, ch. 304. $2,500,000, beyond debt limit. Constructing parks in or near Boston.
3. 1887, ch. 312. $400,000, beyond debt limit. Payment for park lands in or near Boston.
4. 1888, ch. 392. $600,000, beyond debt limit. Payment for park lands for Boston.
5. 1892, ch. 150. $100,000, beyond debt limit. Payment for park lands for New Bedford.
6. 1892, ch. 155. $100,000, beyond debt limit. Payment for park lands for Malden.
7. 1893, ch. 341. $100,000, beyond debt limit. For park purposes for Waltham.
8. 1895, ch. 74. $100,000, beyond debt limit. For park purposes for Dedham.
9. 1898, ch. 140. $100,000, beyond debt limit. For park purposes for New Bedford.
10. 1902, ch. 231. $100,000, beyond debt limit. For park purposes for Fall River.

Boston's $850,000 *Serial Bond* loan, for the Suffolk County Court House, was on 50 years time at 3 per cent; was issued under the Act of 1885, Chap. 377; was placed at par; and the difference in the operation of that loan and the same amount under the Sinking Fund method appears from the following tables: —

I. Difference in Interest.

	Interest.	Principal and Interest.
$850,000 at 3% for 50 y. Sinking Fund method,	$1,275,000	$2,125,000
850,000 " " " " " Serial Bond "	650,250*	1,500,250
Difference in interest in favor of Serial Bond,	$624,750	$624,750

II. Difference in Cost.

$850,000 at 3% for 50 years,	$1,275,000	
Sinking Fund requirements on 3% basis, decimal for $1 being .008945, for 49 years, with 49 payments,	372,559	
Cost of loan, Sinking Fund method,		$1,647,559
$850,000 Serial Bond, $17,000 payable yearly,	$850,000	
Interest (annually diminishing) at 3%,	650,250*	
Cost of loan Serial Bond method,		1,500,250
Saving by Serial Bond method,		$147,309

*For detail see Appendix, pp. 58 to 60.

The readjustment of both the State and the City of Boston bonded indebtedness (about $95,000,000, gross, each) or of a large part of it, into State and City convertible consols, or otherwise, may be in order; not forcibly, without the consent of the bondholders, as tried in Virginia, which next to Massachusetts is the heaviest indebted State in the Union, but by the voluntary co-operation of both borrower and lender, and to their mutual advantage.

A modern Banking House tersely summarizes the merits of Serial Bonds, for private and for public corporations, thus: —

"WHEN A BOND ISSUE IS SERIAL, THE INVESTMENT GROWS SAFER AS IT GROWS OLDER."

ALFRED D. CHANDLER.

Brookline, January 20, 1905.

APPENDIX.

1. PROPOSED ACT to allow towns and cities in the Metropolitan District to finance their respective shares of the Metropolitan debts. Page 31.

2. DEBTS OF THE STATES. Page 34.

3. VALUATION AND DEBTS OF THE METROPOLITAN DISTRICT, May 1, 1874, and May 1, 1904, an interval of 30 years since the passage of the Municipal Indebtedness Act. (1875, Chap. 209.) Pages 35–36.

4. List of BROOKLINE'S FIFTY-EIGHT SERIAL BOND loans in the past 18 years, under Act of 1882, Chap. 133; Rev. Laws, Chap. 27, § 13; Chap. 12, § 96. Pages 37–39.

5. METROPOLITAN PARK LOANS. Summary of *interest* comparison between Sinking Fund and Serial Bonds. Page 40.

6. METROPOLITAN PARK LOANS. Details of Sinking Fund Bonds. Page 40.

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11. METROPOLITAN PARK APPORTIONMENTS for 1900, 1901, 1902, 1903 and 1904. Page 47.

12. METROPOLITAN SEWERAGE AND WATER LOANS. Detail of Sinking Fund Bonds. Page 48.

13. PARK, SEWERAGE AND WATER LOANS. Detail of $56,000,000 Serial Bond issue, at 3½ %, for 40 years. Page 49.

14. BROOKLINE'S Metropolitan Park Payments, 1905 to 1943, under present State apportionments. Page 51.

15. BROOKLINE'S Metropolitan Sewerage Payments, 1905 to 1943, under present State apportionment. Page 53.

16. BROOKLINE'S Metropolitan Park and Sewer Payments, 1905 to 1945, under present State apportionments; annual payments under Sinking Fund method and under Serial Bond method compared. Page 54.

Proposed Act.

Commonwealth of Massachusetts.

In the year One Thousand Nine Hundred and Five.

AN ACT

TO AUTHORIZE TOWNS AND CITIES TO PAY CERTAIN METROPOLITAN DEBTS.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

SECTION 1. Any town or city may, at any time or times, pay to the Treasurer of the Commonwealth any part or all of its proportion of the principal sum or sums of any part or all of the Metropolitan water, sewer, park or boulevard debts, with accrued interest, and sinking fund charges, expenses, and deficiency, if any, thereon to the day of such payment, and then apportioned as any such town's or city's share of any such Metropolitan debt or debts.

SECTION 2. To that end a town or city may at any time or times incur indebtedness beyond the limit of municipal indebtedness to an amount not exceeding two per centum of its assessed valuation at such time, and any such town or city is hereby authorized to issue from time to time bonds, notes, or scrip, not exceeding in amount such two per centum of its assessed valuation at such time, to be denominated Metropolitan Loan, Act of 1905, bearing interest not exceeding five per centum per annum, payable semi-annually, the principal to be payable in periods of not more than fifty years from the date of issuing such bonds, notes, or scrip, which shall, at the option of such town or city, be redeemable at par, on any interest-paying day, at any time after twenty years from their respective dates of issue, the bonds, notes, or scrip so to be redeemed in all cases to be

specified by class, date and number, in the order of their numbers and issue, beginning with the first numbered and issued, in a public notice to be given by the Treasurer of the town or city so redeeming, and, in three months after the date of such public notice, the interest on such bonds, notes, or scrip, so to be redeemed shall cease. Bonds, notes, or scrip so redeemed may be refunded wholly or in part for a term not exceeding fifty years from the date of the bonds, notes, or scrip that they retire, and subject to the provisions of this act, but such bonds, notes, or scrip so refunded, shall, at the option of such town or city, be redeemable at par, on any interest-paying day, at any time after ten years from their respective dates of issue, and as hereinbefore provided for the redemption of original issues.

SECTION 3. A town or city may authorize temporary loans to be made by its selectmen and treasurer, or by its mayor and treasurer, in anticipation of the issue of bonds, notes, or scrip hereby authorized, or in anticipation of any payments to be made under this act.

SECTION 4. The provisions of section thirteen of chapter twenty-seven of the Revised Laws of Massachusetts, authorizing annual proportionate payments in lieu of a sinking fund for the payment of any municipal debt, shall, at the option of any such town or city, apply to any debt or debts incurred under this act.

SECTION 5. Any payment or payments made under this act by any town or city to the Treasurer of the Commonwealth, shall thereafter absolve such town or city, and shall also absolve all other towns and cities affected thereby in the Metropolitan District, from any further liability therefor to the Commonwealth, or for any interest or sinking fund charges thereon, except for any deficiency of interest due for the payment and cancellation of bonds under section six of this act. Any town or city making a payment or payments to the Treasurer of the Common-

wealth under this act, shall, for each succeeding apportionment, be liable only for such percentage thereof as exceeds the total percentage of any payment or payments already so made.

SECTION 6. The Treasurer of the Commonwealth shall apply the money received from any town or city under this act to the payment and cancellation of bonds of the class of Metropolitan debt or debts so paid for by such town or city; he shall make a detailed record in the Treasurer's books of the bonds so paid for and cancelled; and the amount of the bonds of each class that have been so paid for, and cancelled, shall be deducted respectively from the amount of such class of the outstanding debt of the Commonwealth.

SECTION 7. This act shall take effect upon its passage.

DEBTS OF THE STATES.

(From the Commercial and Financial Chronicle, May 28, 1904.)

1.	Alabama	Oct.	1, 1903		$9,357,600
2.	Arkansas	April	4, 1904		1,256,000
3.	California	May	1, 1904		2,277,500
4.	Colorado	Dec.	1, 1902		3,973,483
5.	Connecticut	Oct.	1, 1903		448,726
6.	Delaware	Jan.	1, 1904		811,750
7.	Florida	Jan.	1, 1904		601,567
8.	Georgia	Dec.	31, 1903		7,536,000
9.	Idaho	May	1, 1904		692,500
10.	Illinois				None
11.	Indiana	Nov.	1, 1903		2,437,615
12.	Iowa				None
13.	Kansas	July	1, 1903		632,000
14.	Kentucky	Sept.	1, 1903		207,394
15.	Louisiana	Mar.	1, 1904		12,248,078
16.	Maine	Jan.	1, 1904		1,913,000
17.	Maryland	Sept.	30, 1903		7,101,926
18.	MASSACHUSETTS				
	Direct debt,*	Dec.	31, 1904	$30,809,750	
	Contingent debt,†	"	" "	64,989,412	
					$95,799,162‡
19.	Michigan				None
20.	Minnesota	April	1, 1904		2,759,000
21.	Mississippi	Oct.	1, 1903		3,014,950
22.	Missouri	Jan.	1, 1903		487,000
23.	Montana				None
24.	Nebraska				None
25.	Nevada	Jan.	1, 1904		250,100
26.	New Hampshire	June	1, 1903		1,551,148
27.	New Jersey				None
28.	New York	April	1, 1904		9,510,660
29.	North Carolina	Dec.	1, 1903		6,598,950
30.	North Dakota	July	1, 1903		692,300
31.	Ohio				None
32.	Oregon				None
33.	Pennsylvania	Dec.	1, 1903		4,718,817
34.	Rhode Island	Jan.	1, 1904		2,475,936
35.	South Carolina	Jan.	1, 1904		6,514,674
36.	South Dakota	April	1, 1904		704,000
37.	Tennessee	Sept.	1, 1903		15,727,466
38.	Texas	May	1, 1904		3,989,400
39.	Utah	Jan.	1, 1904		900,000
40.	Vermont	July	1, 1903		426,195
41.	Virginia	May	1, 1904		24,384,142
42.	Washington	April	1, 1904		1,485,000
43.	West Virginia				None
44.	Wisconsin	May	1, 1904		2,251,000
45.	Wyoming	Feb.	1, 1904		260,000
					$235,995,039

* On the State at large.

† On the Metropolitan District of Boston and vicinity.

‡ About 40 per cent of the total indebtedness of all the States.

THE METROPOLITAN DISTRICT.

May 1, 1874.

Cities.	Valuation.	Municipal Indebtedness.	Percentage.
Boston	$798,755,050	$43,879,140	.055
Cambridge	66,576,671	3,023,200	.045
Chelsea	18,722,436	1,548,650	.083
Everett	4,408,525	127,852	.029
Lynn	28,368,913	1,931,000	.068
Malden	9,337,700	425,200	.045
Medford	9,786,040	479,100	.049
Melrose	4,178,425	309,700	.074
Newton	28,081,445	387,000	.014
Quincy	7,123,200	106,503	.015
Somerville	30,824,100	956,354	.031
Waltham	10,244,428	430,350	.042
Woburn	8,655,576	583,971	.067
Towns.			
Arlington	6,014,116	311,916	.051
Belmont	3,835,218	42,610	.011
Braintree	2,615,250	41,429	.016
Brookline	27,940,200	796,704	.028
Canton	3,020,432		
Cohasset	2,231,762	15,910	.007
Dedham	6,003,056	15,000	.002
Dover	398,480	4,150	.01
Hingham	3,141,084	38,225	.012
Hull	630,028	14,593	.023
Hyde Park	7,069,323	263,028	.037
Milton	6,864,600	9,500	.001
Nahant	6,250,244	15,200	.002
Needham	4,415,706	56,200	.013
Revere	1,922,185	41,500	.022
Saugus	1,796,233	48,000	.027
Stoneham	2,991,069	111,532	.038
Swampscott	2,486,135	50,770	.02
Wakefield	3,985,335	121,857	.031
Watertown	8,041,910	96,893	.012
Wellesley	(Not then incorporated)		
Weston	1,384,666	22,558	.016
Westwood	(Not then incorporated)		
Weymouth	5,846,299	38,500	.007
Winchester	4,758,890	98,100	.021
Winthrop	805,440	50,645	.063
	$1,139,510,170	$56,492,840	.0495
Lexington (Water)	2,946,424	52,400	
	$1,142,456,594	**$56,545,240**	
Entire State	**$1,831,601,165**	**$80,427,245**	**.044**

[APPENDIX 4.] **THE METROPOLITAN DISTRICT.**

May 1, 1904.

Cities.	Valuation.	Municipal Indebtedness.	Sinking Funds.	Percentage.
Boston	$1,237,038,851	$85,912,022	$28,560,826	.069
Cambridge	104,827,600	9,176,400	2,371,799	.087
Chelsea	24,413,629	1,619,500	576,220	.066
Everett	21,504,000	1,261,181	201,822	.058
Lynn	55,343,902	5,309,450	1,618,612	.095
Malden	32,262,960	1,679,650	394,205	.052
Medford	21,042,150	1,769,363	619,204	.084
Melrose	15,237,855	1,086,074	189,581	.071
Newton	62,975,710	6,965,533	2,182,910	.110
Quincy	24,032,370	1,673,393		.069
Somerville	58,056,700	1,505,500		.025
Waltham	22,609,296	1,312,000	480,155	.058
Woburn	10,838,359	249,230	1,699	.022
Towns.				
Arlington	9,891,225	632,798	47,778	.063
Belmont	5,526,045	222,800	29,785	.040
Braintree	4,907,735	335,500	95,856	.068
Brookline	88,274,800	1,543,335		.017
Canton	3,700,590	124,000		.033
Cohasset	6,407,229	57,125		.008
Dedham	10,798,234	333,200		.030
Dover	928,028			
Hingham	4,363,449	42,300		.009
Hull	4,546,126	203,464	64,676	.044
Hyde Park	12,654,225	258,000		.020
Milton	20,791,195	410,000		.019
Nahant	5,320,743	3,724		
Needham	4,041,200	298,500		.073
Revere	12,197,225	429,125		.035
Saugus	4,333,853	128,550	3,500	.029
Stoneham	4,904,206	281,352		.057
Swampscott	7,695,293	434,170	18,909	.056
Wakefield	8,345,595	796,000		.095
Watertown	12,159,549	679,300		.055
Wellesley	11,107,139	389,000	113,293	.035
Weston	5,497,490	32,000		.005
Westwood	2,079,823			
Weymouth	7,065,363	579,500	210,925	.082
Winchester	10,293,650	687,000		.066
Winthrop	8,921,850	277,204	32,031	.031
	$1,966,935,242	$128,697,243	$37,813,786	.0654
Lexington (Water)	5,827,290	320,000		
	$1,972,762,532	$129,017,243		
Metropolitan debts, about		65,000,000	6,230,876	
		$194,062,243	$44,044,662	
"Direct" debt (about 60% of),		18,000,000	9,000,000	
Totals,		$212,062,243	$53,044,662	
Entire State	$3,251,804,634	$195,062,222	$53,403,621	.0599
Metropolitan debts, about		65,000,000	6,230,876	
State "direct" debt,		30,809,750	15,233,154	
County debts (Dec. 31, 1904),		3,221,726		
Grand Totals,		$294,093,698	$74,867,651	

TOWN OF BROOKLINE.

STATEMENT of Money borrowed from February, 1886, to January, 1904, inclusive, in the form of *Serial Bonds*.

	Purpose Issued.	Date.	Payable Annually.	Amount of Loan.	Rate.
No. 1.	Water Scrip	Feb. 1, 1886	1-10th	$100,000	3.65%
2.	White Place	Nov. 1, 1886	1-5th	12,000	3½
3.	Sumner Road Bridge	Nov. 1, 1887	1-3d	12,000	3
4.	Washington st. "	Nov. 1, 1887	1-10th	48,000	3
5.	Grammar and Primary School buildings	Nov. 1, 1887	1-10th	80,000	3
6.	Beacon Street . . .	July 1, 1889	1-10th	168,000	4
7.	Playgrounds, sewer, school houses, sts.	Feb. 1, 1889	1-10th	89,000	4
8.	Beacon st. Pub. Lib., schools	June 1, 1889	1-10th	185,000	4
9.	Beacon Street . . .	Jan. 1, 1890	1-10th	70,000	4
10.	Parks	Aug. 1, 1891	1-20th	130,000	4
11.	Water Works . . .	Jan. 1, 1892	1-30th	30,000	4
12.	Bridge	Jan. 1, 1892	1-10th	10,000	4
13.	Engine House . . .	Jan. 1, 1892	1-3d	37,000	4
14.	Parks	July 1, 1892	1-20th	70,000	4
15.	Parks	Sept. 1, 1892	1-10th	40,000	4
16.	Bridge, Library, schools, land, street	June 1, 1892	1-10th	200,000	4
17.	Parks	Mar. 1, 1893	1-20th	80,000	4
18.	Parks	June 15, 1893	1-20th	125,000	3⅝
19.	Parks	Mar. 1, 1893	1-10th	26,000	4
20.	Parks	June 15, 1893	1-10th	6,500	3⅝
21.	Water Works . . .	June 15, 1893	1-30th	61,950	3⅝
22.	Water Works . . .	June 15, 1893	1-5th	32,500	3⅝
23.	Water Works . . .	July 1, 1894	1-30th	133,980	4
24.	Water Works . . .	July 1, 1904	1-6th	6,000	4
25.	School, bridge, and brook	Nov. 1, 1894	1-20th	96,500	4
26.	School	April 1, 1894	1-10th	56,000	4
27.	Sewers	Feb. 1, 1895	1-10th	12,500	4
28.	Water Works . . .	June 15, 1895	1-30th	30,000	3 9/16
29.	Park, brook, hospitals	June 15, 1895	1-10th	17,000	3 9/16
30.	Streets and school .	June 15, 1895	1-20th	186,000	3 9/16
31.	School	Jan. 1, 1896	1-20th	50,000	3½
32.	Parks	Jan. 1, 1896	1-20th	21,600	3½
33.	Schools	May 1, 1896	1-20th	10,000	3⅝
34.	Park	May 1, 1896	1-10th	4,000	3⅝
35.	Sewer	July 1, 1896	1-3d	9,000	3½
36.	Schools	Aug. 1, 1896	1-10th	25,000	3½
37.	Water	Aug. 1, 1896	1-30th	18,000	3½
38.	Bath House	July 1, 1897	1-10th	25,000	3 9/16
39.	Playground, brook, and school . . .	July 1, 1897	1-10th	94,000	3 9/16
40.	Water	Jan. 1, 1898	1-20th	15,000	3 9/16
41.	Bridge	Oct. 1, 1898	1-20th	25,000	3 9/16
42.	Water	Jan. 1, 1899	1-10th	14,000	3.35
43.	Police Station . . .	Mar. 1, 1899	1-5th	59,000	3.45

	Purpose Issued.	Date.	Payable Annually.	Amount of Loan.	Rate.
44.	Parks	Nov. 1, 1899	1-5th	25,000	3½
45.	Bridge	Oct. 1, 1898	1-20th	25,000	3 9/16
46.	Bridge	Mar. 1, 1899	1-20th	50,000	3 4/10
47.	Police	Dec. 1, 1899	1-10th	75,000	3 1/15
48.	Boylston street . .	April 1, 1901	1-10th	250,000	3.15
49.	Boylston street . .	June 1, 1902	1-10th	35,000	3.10
50.	Water Works . . .	June 1, 1902	1-20th	24,000	3.10
51.	School and playground	Jan. 1, 1903	1-10th	75,000	3.15
52.	Water Works . .	Jan. 1, 1903	1-20th	74,000	3½
53.	Parks	Jan. 1, 1903	1-20th	100,000	3½
54.	Playgrounds	Jan. 1, 1903	1-20th	100,000	3½
55.	Water Works . . .	Jan. 1, 1904	1-20th	40,000	3½
56.	School	Jan. 1, 1904	1-10th	80,000	3½
57.	Streets	Jan. 1, 1904	1-10th	20,000	3½
58.	Schools and Library	Jan. 1, 1904	1-20th	110,000	3½
				$3,603,530	

Calling the average rate of the above 3½%, and the average time 15 years, then:—

$3,600,000 @ 3½% for 15 years, interest is $1,890,000
" " " " payable 1-15 each year, interest is . . . . . * 1,008,000

Difference *in interest* in favor of Serial Bonds $882,000

* See the table following.

TOWN OF BROOKLINE.

$3,600,000 at 3½% for fifteen years, paying 1-15, or $240,000 each year.

			Interest.
	$3,600,000 at 3½% for 1 year		$126,000
1	240,000		
	$3,360,000	" "	117,600
2	240,000		
	$3,120,000	" "	109,200
3	240,000		
	$2,880,000	" "	100,800
4	240,000		
	$2,640,000	" "	92,400
5	240,000		
	$2,400,000	" "	84,000
6	240,000		
	$2,160,000	" "	75,600
7	240,000		
	$1,920,000	" "	67,200
8	240,000		
	$1,680,000	" "	58,800
9	240,000		
	$1,440,000	" "	50,400
10	240,000		
	$1,200,000	" "	42,000
11	240,000		
	$960,000	" "	33,600
12	240,000		
	$720,000	" "	25,200
13	240,000		
	$480,000	" "	16,800
14	240,000		
	$240,000	" "	8,400
15	240,000		
	000,000		
	Total interest		$1,008,000

Metropolitan Park Loans.

Summary of Interest Comparisons between Sinking Fund and Serial Bonds, the rate for the latter being raised a fraction.

	Principal.				Interest.	Principal and Interest.
	$2,680,000	3 %	40 year	} (Sinking fund)	$14,826,600	$25,116,840
	8,350,000	3½	"			
1.	$11,030,000					
2.	$11,030,000	3½%	20 year	1-20 each year,	$4,053,537	$15,083,537
3.	11,030,000	4	20 "	1-20 " "	4,632,600	15,662,600
4.	11,030,000	3½	40 "	1-40 " "	7,912,964	18,942,964
5.	11,030,000	4	40 "	1-40 " "	9,044,600	20,074,600

(Dec. 10, 1902.)

Metropolitan Park Loans.

	Issued.	Amount.	Rate.	Due.	Interest.	Premiums.	
1.	1894	$1,000,000	3½%	1934	$1,400,000	108.535	$85,250.00
2.	1894	100,000	3½	1934	140,000	109.375	9,375.00
3.	1894	500,000*	3½	1934	700,000	109	45,000.00
4.	1895	200,000	3½	1934	280,000	par	
5.	1896	1,400,000	3½	1937	2,009,000	105.829	82,192.09
6.	1897	2,000,000	3½	1936	2,730,000	106.+	224,568.81
7.	1897	1,600,000*	3½	1936	2,184,000	106.+	125,086.25
8.	1898	1,000,000	3½	1938	1,400,000	110.459	104,590.00
9.	1898	100,000*	3½	1938	140,000	110.459	10,459.00
10.	1899	1,025,000	3	1939	1,230,000	100 64	6,560.00
11.	1899	500,000*	3	1939	600,000	100.64	3,200.00
12.	1900	80,000	3	1939	93,000	100.79	632.00
13.	1900	325,000*	3	1940	390,000	100.29	4,192.50
14.	1901	650,000	3	1941	780,000	100.10	700.00
15.	1901	100,000†	3	1941	120,000	100.10	50.00
16.	1902	450,000	3½	1940	630,000	108.29	37,305.00
		$11,030,000			$14,826,000		$739,160.65
					739,160		
					$14,086,840		
					11,030,000		
	Princi	pal and inte	rest .	. . .	$25,116,840		

For Park purposes $7,905,000
*For parkway purposes (Series Two), $3,025,000
† " Nantasket 100,000
$11,030,000

"One half the amount for boulevards is paid by the State at large, the balance by the Metropolitan district."—(*Auditor's Report*, 1901, p. 474.)

Cost of Outstanding Metropolitan Park Loans, Issued Between 1894 and 1902, Both Inclusive, a Total of $11,030,000, for 20 Years at 3½%, Paying 1-20 or $551,500 Each Year.

			Interest.	Principal and Interest.
	$11,030,000	at 3½% for 1 year	$386,050	
1	551,500			$937,550
	$10,478,500	" "	366,747	
2	551,500			918,247
	$9,927,000	" "	347,445	
3	551,500			898,945
	$9,375,500	" "	328,142	
4	551,500			897,642
	$8,824,000	" "	308,840	
5	551,500			860,340
	$8,272,500	" "	289,537	
6	551,500			841,037
	$7,721,000	" "	270,235	
7	551,500			821,735
	$7,169,500	" "	250,932	
8	551,500			802,432
	$6,618,000	" "	231,630	
9	551,500			783,130
	$6,066,500	" "	212,327	
10	551,500			763,827
	$5,515,500	" "	193,042	
11	551,500			744,542
	$4,963,500	" "	173,722	
12	551,500			725,222
	$4,412,000	" "	154,420	
13	551,500			705,920
	$3,860,500	" "	135,117	
14	551,500			686,617
	$3,309,000	" "	115,815	
15	551,500			667,315
	$2,757,500	" "	96,512	
16	551,500			648,012
	$2,206,000	" "	77,210	
17	551,500			628,710
	$1,654,500	" "	57,907	
18	551,500			609,407
	$1,103,000	" "	38,605	
19	551,500			590,105
	$551,500	" "	19,302	
20	551,500			570,802
	000,000		$4,053,537	$15,083,537

[APPENDIX 8.]

Cost of Outstanding Metropolitan Park Loans, Issued Between 1894 and 1902, Both Inclusive, a Total of $11,030,000 for 20 Years at 4%, Paying 1-20 or $551,500 Each Year.

				Interest.	Principal and Interest.
	$11,030,000	at 4%	for 1 year	$441,200	
1	551,500				
					$992,700
	$10,478,500	"	"	419,140	
2	551,500				
					970,640
	$9,927,000	"	"	397,080	
3	551,500				
					948,580
	$9,375,500	"	"	375,020	
4	551,500				
					926,520
	$8,824,000	"	"	352,960	
5	551,500				
					904,460
	$8,272,500	"	"	330,900	
6	551,500				
					882,400
	$7,721,000	"	"	308,840	
7	551,500				
					860,340
	$7,169,500	"	"	286,780	
8	551,500				
					838,280
	$6,618,000	"	"	264,720	
9	551,500				
					816,220
	$6,066,500	"	"	242,660	
10	551,500				
					794,160
	$5,515,000	"	"	220,600	
11	551,500				
					772,100
	$4,963,500	"	"	198,540	
12	551,500				
					750,040
	$4,412,000	"	"	176,480	
13	551,500				
					727,980
	$3,860,500	"	"	154,420	
14	551,500				
					705,920
	$3,309,000	"	"	132,360	
15	551,500				
					683,860
	$2,757,500	"	"	110,300	
16	551,500				
					661,800
	$2,206,000	"	"	88,240	
17	551,500				
					639,740
	$1,654,500	"	"	66,180	
18	551,500				
					617,680
	$1,103,000	"	"	44,120	
19	551,500				
					595,620
	$551,500	"	"	22,060	
20	551,500				
					573,560
	000,000				
				$4,632,600	$15,662,600

Cost of Outstanding Metropolitan Park Loans, Issued Between 1894 and 1902, Both Inclusive, a Total of $11,030,000, for 40 Years at 3½%, Paying 1-40 or $275,750 Each Year.

			Interest.	Principal and Interest.
	$11,030,000	at 3½% for 1 year	$386,050	
1	275,750			
				$661,800
	$10,754,250	" "	376,398	
2	275,750			
				652,148
	$10,478,500	" "	366,747	
3	275,750			
				642,497
	$10,202,750	" "	357,096	
4	275,750			
				632,846
	$9,927,000	" "	347,445	
5	275,750			
				623,195
	$9,651,250	" "	337,793	
6	275,750			
				613,543
	$9,375,500	" "	328,142	
7	275,750			
				603,892
	$9,099,750	" "	318,491	
8	275,750			
				594,241
	$8,824,000	" "	308,840	
9	275,750			
				584,590
	$8,548,250	" "	299,188	
10	275,750			
				574,938
	$8,272,500	" "	289,537	
11	275,750			
				565,287
	$7,996,750	" "	279,886	
12	275,750			
				555,636
	$7,721,000	" "	270,235	
13	275,750			
				545,985
	$7,445,250	" "	260,583	
14	275,750			
				536,333
	$7,169,500	" "	250,932	
15	275,750			
				526,682
	$6,893,750	" "	241,281	
16	275,750			
				517,031
	$6,618,000	" "	231,630	
17	275,750			
				507,380
	$6,342,250	" "	221,978	
18	275,750			
				497,728
	$6,066,500	" "	212,327	
19	275,750			
				488,077
	$5,790,750	" "	202,676	

			Interest.	Principal and Interest.
20	275,750			
				478,426
	$5,515,000 at 3½% for 1 year		193,025	
21	275,750			
				468,775
	$5,239,250 " "		183,373	
22	275,750			
				459,123
	$4,963,500 " "		173,722	
23	275,750			
				449,472
	$4,687,750 " "		164,071	
24	275,750			
				440,821
	$4,412,000 " "		154,420	
25	275,750			
				430,170
	$4,136,250 " "		144,718	
26	275,750			
				420,468
	$3,860,500 " "		135,117	
27	275,750			
				410,867
	$3,584,750 " "		125,465	
28	275,750			
				401,215
	$3,309,000 " "		115,815	
29	275,750			
				391,565
	$3,033,250 " "		106,164	
30	275,750			
				381,914
	$2,757,500 " "		96,512	
31	275,750			
				372,262
	$2,481,750 " "		86,861	
32	275,750			
				362,611
	$2,206,000 " "		77,210	
33	275,750			
				352,960
	$1,930,250 " "		67,558	
34	275,750			
				343,308
	$1,654,500 " "		57,907	
35	275,750			
				333,657
	$1,378,750 " "		48,266	
36	275,750			
				324,016
	$1,103,000 " "		38,605	
37	275,750			
				314,355
	$827,250 " "		28,953	
38	275,750			
				304,703
	$551,500 " "		18,292	
39	275,750			
				294,042
	$275,750 " "		9,650	
40	275,750			
				285,400
	000,000			
			$7,912,964	$18,942,964

Cost of Outstanding Metropolitan Park Loans, Issued Between 1894 and 1902, Both Inclusive, a Total of $11,030,000, for 40 Years at 4%, Paying 1-40 or $275,750, Each Year.

			Interest.	Principal and Interest.
1	$11,030,000 275,750	at 4% for 1 year	$441,200	$716,950
2	$10,754,250 275,750	" "	430,170	705,920
3	$10,478,500 275,750	" "	419,140	694,890
4	$10,202,750 275,750	" "	408,110	683,860
5	$9,927,000 275,750	" "	397,080	672,830
6	$9,651,250 275,750	" "	386,050	661,800
7	$9,375,500 275,750	" "	375,020	650,770
8	$9,099,750 275,750	" "	363,990	639,740
9	$8,824,000 275,750	" "	352,960	628,710
10	$8,548,250 275,750	" "	341,930	617,680
11	$8,272,500 275,750	" "	330,900	606,650
12	$7,996,750 275,750	" "	319,870	595,620
13	$7,721,000 275,750	" "	308,840	584,590
14	$7,445,250 275,750	" "	297,810	573,560
15	$7,169,500 275,750	" "	286,780	562,530
16	$6,893,750 275,750	" "	275,750	551,500
17	$6,618,000 275,750	" "	264,720	540,470
18	$6,342,250 275,750	" "	253,690	529,440
19	$6,066,500 275,750	" "	242,660	518,410

			Interest.	Principal and Interest.
	$5,790,750 at 4% for 1 year		231,630	
20	275,750			
				507,380
	$5,515,000	" "	220,600	
21	275,750			
				496,350
	$5,239,250	" "	209,570	
22	275,750			
				485,320
	$4,963,500	" "	198,540	
23	275,750			
				474,290
	$4,687,750	" "	187,510	
24	275,750			
				463,260
	$4,412,000	" "	176,480	
25	275,750			
				452,230
	$4,136,250	" "	165,450	
26	275,750			
				441,200
	$3,860,500	" "	154,420	
27	275,750			
				430,170
	$3,584,750	" "	143,390	
28	275,750			
				419,140
	$3,309,000	" "	132,360	
29	275,750			
				408,110
	$3,033,250	" "	121,330	
30	275,750			
				397,080
	$2,757,500	" "	110,300	
31	275,750			
				386,050
	$2,481,750	" "	99,270	
32	275,750			
				375,020
	$2,206,000	" "	88,240	
33	275,750			
				363,990
	$1,930,250	" "	77,210	
34	275,750			
				352,960
	$1,654,500	" "	66,180	
35	275,750			
				341,930
	$1,378,750	" "	55,150	
36	275,750			
				330,900
	$1,103,000	" "	44,120	
37	275,750			
				319,870
	$827,250	" "	33,090	
38	275,750			
				308,840
	$551,500	" "	22,060	
39	275,750			
				297,810
	$275,750	" "	11,030	
40	275,750			
				286,780
	000,000			
			$9,044,600	$20,074,600

Metropolitan Park Assessments for 1900, 1901, 1902, 1903, and 1904.

CITIES.	1900.	1901.	1902.	1903.	1904.
Boston	$258,961 59	$285,747 96	$309,709 50	$314,588 27	$346,581 67
Cambridge	28,444 58	31,348 24	34,013 41	34,541 40	38,064 53
Chelsea	7,531 43	8,300 24	9,005 91	9,145 71	10,078 55
Everett	6,258 93	6,897 86	7,484 28	7,600 49	8,375 72
Lynn	14,788 70	16,298 36	17,684 01	17,958 53	19,790 23
Malden	12,833 27	14,143 28	15,345 72	15,583 93	17,173 46
Medford	12,636 70	13,926 64	15,110 66	15,345 22	16,910 40
Melrose	4,257 12	4,691 69	5,090 56	5,169 59	5,696 87
Newton	26,660 13	29,381 68	31,879 66	32,374 56	35,676 65
Quincy	6,791 89	7,485 24	8,121,62	8,247 69	9,088 94
Somerville	17,959 70	19,793 09	21,475 86	21,809 23	24,033 70
Waltham	6,900 35	7,604 75	8,251 29	8,379 38	9,234 06
Woburn	3,765 71	4,150 13	4,502 98	4,572 87	5,039 28
TOWNS					
Arlington	4,158 67	4,583 18	4,972 83	5,050 01	5,565 13
Belmont	2,229 44	2,457 02	2,665 90	2,707 29	2,983 44
Braintree	1,764 04	1,944 16	2,109 42	2,142 18	2,360 69
Brookline	31,185 94	34,369 45	37,291 45	37,870 31	41,732 98
Canton	2,157 02	2,377 20	2,579 31	2,619 35	2,886 52
Cohasset	327 65	412 65	440 43	468 43	477 54
Dedham	4,029,66	4,441,06	4,818 63	4,893 42	5,392 53
Dover	512 35	564 59	612 57	622 09	685 51
Hingham	1,691 46	1,864 14	2,022 61	2,054 01	2,263 50
Hull	2,162 33	2,383 10	2,585 70	2,625 85	2,893 67
Hyde Park	3,936 40	4,338 10	4,707 07	4,780 12	5,267 70
Milton	15,740 40	17,347 29	18,822 12	19,114 30	21,063 90
Nahant	3,765 70	4,150 14	4,502 98	4,572 87	5,039 27
Needham	1,194 71	1,316 65	1,428 58	1,450 77	1,598 76
Revere	7,117 61	7,844 19	8,511 09	8,643 20	9,524 80
Saugus	1,210 41	1,333 97	1,447 38	1,469 84	1,619 77
Stoneham	1,789 59	1,972 25	2,139 93	2,173 12	2,394 81
Swampscott	2,172 90	2,394 52	2,598 09	2,638 42	2,907 51
Wakefield	2,007 00	2,211 89	2,399 94	2,437 19	2,685 79
Watertown	4,758 86	5,244 66	5,690·54	5,778 90	6,368 32
Wellesley	2,922 71	3,221 11	3,494 95	3,549 22	3,911 19
Weston	2,498 24	2,753 24	2,987 32	3,033 69	3,343 11
Westwood	506 77	558 46	605 96	615 36	678 13
Weymouth	2,539 61	2,798 84	3,036 80	3,083 93	3,398 49
Winchester	5,271 11	5,809 23	6,303 12	6,400 97	7,053 84
Winthrop	2,482 72	2,736 14	2,968 78	3,014 84	3,322 36
Total	$517,923 17	$570,897 13	$619,418 96	$629,076 55	$693,163 32

Metropolitan Sewerage Loans.

	Issued.	Amount.	Rate.	Due.	Interest.	Premiums.	
1.	1890	$3,000,000	3%	1930	$3,600,000		$89,835.00
2.	1891	368,000	3	1930	430,560		35,130.30
3.	1892	1,053,000	3	1930	1,200,420		11,575.00
4.	1893	579,000	3	1930	646,690		1,760.00
5.	1894	500,000	3	1930	540,000	par	
6.	1895	300,000	3	1930	315,000	par	
7.	1895	300,000	3	1935	360,000	100.5	1,755.00
8.	1896	30,000	3	1930	30,600	par	
9.	1896	200,000	3	1935	234,000	par	
10.	1897	80,000	3½	1930	92,400	106.243	5,084.80
11.	1897	300,000	3½	1935	399,000	106.98	
12.	1898	5,000	3	1930	4,800	par	22,843.75
13.	1898	215,000	3½	1930	240,800	par	4,088.00
14.	1898	35,000	3½	1935	45,325	par	
15.	1899	1,000,000	3	1939	1,200,000	100.64	6,400.00
16.	1899	25,000	3	1936	27,750	100.64	160.00
17.	1900	265,000	3	1930	238,500	103.948	10,541.20
18.	1900	10,000	3	1939	11,700	100.79	
19.	1900	912		1939	1,067	par	
20.	1901	2,000,000	3½	1940	2,730,000	106.71	134,200.00
21.	1901	40,000	3	1936	42,000	100.915	366.00
22.	1902	14,000	3	1939	15,540	par	
23.	1902	650,000	3½	1940	864,500	107.243	47,074.25
		$10,969,912			$13,270,652		$370,813.30
					370,813		
					$12,899,839		
					10,969,912		
	Princi	pal and inte	rest .	. . .	$23,869,751		

Metropolitan Water Loans.

	Issued.	Amount.	Rate.	Due.	Interest.	Premiums.	
1.	1895	$2,225,000	3½%	1935	$3,115,000	110.67	$237,407.50
2.	1896	2,775,000	3½	1935	6,517,875	110.67	412,672.50
3.	1896	2,000,000	3½	1935		105.829	
4.	1897	6,000,000	3½	1935	7,980,000	107.82	487,924.60
5.	1898	2,000,000	3½	1938	5,600,000	113.176	521,060.00
6.	1898	2,000,000		1938		112.877	
7.	1899	3,000,000	3	1939	3,600,000	100.64	19,200.00
8.	1900	1,000,000	3	1939	1,200,000	102.78	27,800.00
9.	1901	6,900,000	3	1941	8,280,000		274,872.50
10.	1901	3,100,000	3½	1941	4,340,000		
11.	1902	3,500,000	3½	1942	4,900,000	109.13	319,550.00
		$34,500,000			$45,532,875		$2,300,487.10
					2,300,487		
					$43,232,388		
					34,500,000		
	Princi	pal and inte	rest .	. . .	$77,732,388		

Interest on deposits not included in above.

Dec. 10, 1902.

Cost of Metropolitan Park, Water, and Sewer Loans, Issued Between 1890 and 1902, both Inclusive, Approximately at $56,000,000, for 40 Years at 3½% paying 1-40, or $1,400,000 Each Year.

			Interest.	Principal and Interest.
	$56,000,000	at 3½% for 1 year	$1,960,000	
1	1,400,000			
				$3,360,000
	$54,600,000	" "	1,911,000	
2	1,400,000			
				3,311,000
	$53,200,000	" "	1,862,000	
3	1,400,000			
				3,262,000
	$51,800,000	" "	1,813,000	
4	1,400,000			
				3,213,000
	$50,400,000	" "	1,764,000	
5	1,400,000			
				3,164,000
	$49,000,000	" "	1,715,000	
6	1,400,000			
				3,115,000
	$47,600,000	" "	1,666,000	
7	1,400,000			
				3,066,000
	$46,200,000	" "	1,617,000	
8	1,400,000			
				3,017,000
	$44,800,000	" "	1,568,000	
9	1,400,000			
				2,968,000
	$43,400,000	" "	1,519,000	
10	1,400,000			
				2,919,000
	$42,000,000	" "	1,470,000	
11	1,400,000			
				2,870,000
	$40,600,000	" "	1,421,000	
12	1,400,000			
				2,821,000
	$39,200,000	" "	1,372,000	
13	1,400,000			
				2,772,000
	$37,800,000	" "	1,323,000	
14	1,400,000			
				2,723,000
	$36,400,000	" "	1,274,000	
15	1,400,000			
				2,674,000
	$35,000,000	" "	1,225,000	
16	1,400,000			
				2,625,000
	$33,600,000	" "	1,176,000	
17	1,400,000			
				2,576,000
	$32,200,000	" "	1,127,000	
18	1,400,000			
				2,527,000
	$30,800,000	" "	1,078,000	
19	1,400,000			
				2,478,000

				Interest.	Principal and Interest.
	$29,400,000	at 3½%	for 1 year	$1,029,000	
20	1,400,000				
					$2,429,000
	$28,000,000	"	"	980,000	
21	1,400,000				
					2,380,000
	$26,600,000	"	"	931,000	
22	1,400,000				
					2,331,000
	$25,200,000	"	"	882,000	
23	1,400,000				
					2,282,000
	$23,800,000	"	"	833,000	
24	1,400,000				
					2,233,000
	$22,400,000	"	"	784,000	
25	1,400,000				
					2,184,000
	$21,000,000	"	"	735,000	
26	1,400,000				
					2,135,000
	$19,600,000	"	"	686,000	
27	1,400,000				
					2,086,000
	$18,200,000	"	"	637,000	
28	1,400,000				
					2,037,000
	$16,800,000	"	"	588,000	
29	1,400,000				
					1,988,000
	$15,400,000	"	"	539,000	
30	1,400,000				
					1,939,000
	$14,000,000	"	"	490,000	
31	1,400,000				
					1,890,000
	$12,600,000	"	"	441,000	
32	1,400,000				
					1,841,000
	$11,200,000	"	"	392,000	
33	1,400,000				
					1,792,000
	$9,800,000	"	"	343,000	
34	1,400,000				
					1,743,000
	$8,400,000	"	"	294,000	
35	1,400,000				
					1,694,000
	$7,000,000	"	"	245,000	
36	1,400,000				
					1,645,000
	$5,600,000	"	"	196,000	
37	1,400,000				
					1,596,000
	$4,200,000	"	"	147,000	
38	1,400,000				
					1,547,000
	$2,800,000	"	"	98,000	
39	1,400,000				
					$1,498,000
	$1,400,000	"	"	$49,000	
40	1,400,000				
					1,449,000
	0,000,000				
				$40,180,000	$96,180,000

Metropolitan Park Payments for Brookline, Under Present Apportionment.

		Parks.	Boulevards.	Nantasket.	Total.
1905	Sinking Fund	$6,955 55	$1,875 63	$569 69	
	Interest	15,679 32	4,291 14	1,240 66	$30,611 99
1906	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1907	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1908	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1909	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1910	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1911	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1912	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1913	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1914	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1915	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1916	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1917	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1918	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1919	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1920	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1921	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1922	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1923	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1924	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1925	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1926	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,246 66	30,611 99
1927	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1928	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1929	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1930	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1931	Sinking Fund	6,955 55	1,875 69	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1932	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99
1933	Sinking Fund	6,955 55	1,875 63	569 69	
	Interest	15,679 32	4,291 14	1,240 66	30,611 99

		Parks.	Boulevards.	Nantasket.	Totals.
1934	Sinking Fund	$ 5,603 63	$1,615 65	$ 569 69	
	Interest	12,936 12	3,763 60	1,240 66	$25,729 35
1935	Sinking Fund	5,603 63	1,615 65	569 69	
	Interest	12,936 12	3,763 60	1,240 66	25,729 35
1936	Sinking Fund	3,706 58	1,331 10	569 69	
	Interest	8,715 82	3,130 56	1,240 66	18,694 41
1937	Sinking Fund	2,436 99	877 67	569 69	
	Interest	5,761 61	2,075 48	1,240 66	12,962 10
1938	Sinking Fund	1,569 41	834 29	569 69	
	Interest	3,651 46	1,969 98	1,240 66	9,835 49
1939	Sinking Fund	1,147 03	626 66	80 88	
	Interest	2,738 07	1,517 80	177 24	6,287 68
1940	Sinking Fund	1,147 03	287 66	80 88	
	Interest	2,738 07	749 10	177 24	5,179 98
1941	Sinking Fund	607 19	287 66		
	Interest	1,562 42	749 10		3,206 37
1942	Sinking Fund	607 19	287 66		
	Interest	1,562 42	749 10		3,206 37
1943	Sinking Fund	238 66	119 33		
	Interest	633 05	616 52		1,607 56
		$732,313 73	$205,804 50	$62,068 14	$1,000,186 37

Brookline's proportion of the Metropolitan Parks, Boulevards and Nantasket debt is $625,957 50

Parks.	Sinking Fund	$224,378 29		
	Interest	507,935 44		
			$732,313 73	
Boulevards.	Sinking Fund	$62,276 50		
	Interest	143,527 90		
			205,804 50	
Nantasket.	Sinking Fund	$19,531 22		
	Interest	42,536 92		
			62,068 14	
				$1,000,186 37

(This table is from Brookline's Town Accountant.)

Metropolitan Sewer Payments for Brookline, Under Present Apportionment.

	Sinking Fund.	Interest.	Total.
1905	$9,129 59	$45,830 99	$54,960 58
1906	9,103 55	49,546 55	58,650 10
1907	9,103 55	49,546 55	58,650 10
1908	9,103 55	49,546 55	58,650 10
1909	9,680 60	49,546 55	59,227 15
1910	13,041 62	49,546 55	62,588 17
1911	13,041 62	49,546 55	62,588 17
1912	13,041 62	49,546 55	62,588 17
1913	13,721 15	49,546 55	63,267 70
1914	13,945 39	49,546 55	63,491 94
1915	16,133 17	49,546 45	65,679 72
1916	16,302 67	49,546 55	65,849 22
1917	16,302 67	49,546 55	65,849 22
1918	16,302 67	49,546 55	65,849 22
1919	18,975 25	49,546 55	68,521 80
1920	30,035 52	49,546 55	79,582 07
1921	30,035 52	49,546 55	79,582 07
1922	30,035 52	49,546 55	79,582 07
1923	32,632 70	49,546 55	82,179 25
1924	33,654 89	49,546 55	83,201 44
1925	35,447 57	49,546 55	84,994 12
1926	35,586 46	49,546 55	85,133 01
1927	35,586 46	49,546 55	85,133 01
1928	35,586 46	49,546 55	85,133 01
1929	37,776 38	49,546 55	87,322 93
1930	40,411 43	44,931 34	85,342 77
1931	40,411 43	44,931 34	85,342 77
1932	40,411 43	44,931 34	85,342 77
1933	42,539 57	44,931 34	87,470 91
1934	43,377 15	44,931 34	88,308 49
1935	38,104 97	39,765 20	77,870 17
1936	37,696 51	39,390 22	77,086 73
1937	37,696 51	39,390 22	77,086 73
1938	37,696 51	39,390 22	77,086 63
1939	31,256 08	33,477 50	64,733 58
1940	8,722 04	9,341 93	18,063 97
1941	8,722 04	9,341 93	18,063 97
1942	8,722 04	9,341 98	18,063 97
1943	2,463 28	2,638 35	5,101 63
	$951,537 14	$1,681,682 39	$2,633,219 53

Brookline's proportion of the Metropolitan Sewer Dept., South System, is	$1,481,269 98
Brookline's proportion of the Metropolitan Parks, Boulevards and Nantasket debt is	625,957 50
Total	$2,107,227 48

(This table is from Brookline's Town Accountant.)

BROOKLINE.

Comparison of Payments under Sinking Fund and Serial Bond methods, made year by year from 1905 to 1955.

		Annual cost to Brookline, as charged by the *State*, for *Parks* and *Sewers*,—40-year *Sinking Fund* Bonds. Principal equal to $2,107,227.48; as given by the Town Accountant.		*Annual* cost to Brookline of $2,000,000 40-year *Serial Bonds*, payable 1-40th each year.			*Annual* cost to Brookline of $2,000,000 50-year *Serial Bonds*, payable 1-50th each year.		
				3%	3¼%	3½%	3%	3¼%	3½%
1	1905 Parks	$30,611 99							
	1905 Sewers	54,960 58	$85,572 57						
2	1906 Parks	30,611 99							
	1906 Sewers	58,650 10	89,262 09	$110,000	$115,000	$120,000	$100,000	$105,000	$110,000
3	1907 Parks	30,611 99							
	1907 Sewers	58,650 10	89,262 09	108,500	113,375	118,250	98,809	103,700	108,600
4	1908 Parks	30,611 99							
	1908 Sewers	58,650 10	89,262 09	107,000	111,750	116,500	97,600	102,400	107,200
5	1909 Parks	30,611 99							
	1909 Sewers	59,227 15	89,839 14	105,500	110,125	114,750	96,400	101,100	105,800
6	1910 Parks	30,611 99							
	1910 Sewers	62,588 17	93,200 16	104,000	108,500	113,000	95,200	99,800	104,400
7	1911 Parks	30,611 99							
	1911 Sewers	62,588 17	93,200 16	102,500	106,875	111,250	94,000	98,500	103,000
8	1912 Parks	30,611 99							
	1912 Sewers	62,588 17	93,200 16	101,000	105,250	109,500	92,800	97,200	101,600
9	1913 Parks	30,611 99							
	1913 Sewers	63,267 70	93,879 69	99,500	103,625	107,750	91,600	95,900	100,200
10	1914 Parks	30,611 99							
	1914 Sewers	63,491 94	94,103 93	98,000	102,000	106,000	90,400	94,600	98,800
11	1915 Parks	30,611 99							
	1915 Sewers	65,679 72	96,291 71	96,500	100,375	104,250	89,200	93,300	97,400

			Annual cost to Brookline, as charged by the *State*, for *Park* and *Sewers*,—40-year *Sinking Fund* Bonds. Principal equal to $2,107,227.48; as given by the Town Accountant.		*Annual* cost to Brookline of $2,000,000 40-year *Serial Bonds*, payable 1-40th each year.			*Annual* cost to Brookline of $2,000,000 50-year *Serial Bonds*, payable 1-50th each year.		
					3%	3¼%	3½%	3%	3¼%	3½%
12	1916	Parks	30,611 99							
		Sewers	65,849 22	96,461 21	95,000	98,750	102,500	88,000	92,000	96,000
13	1917	Parks	30,611 99							
		Sewers	65,849 22	96,461 21	93,500	97,125	100,750	86,800	90,700	94,600
14	2818	Parks	30,611 99							
		Sewers	65,849 22	96,461 21	92,000	95,500	99,000	85,600	89,400	93,200
15	1919	Parks	30,611 99							
		Sewers	68,521 80	99,133 79	90,500	93,875	97,250	84,400	88,100	91,800
16	1920	Parks	30,611 99							
		Sewers	79,582 07	110,194 06	89,000	92,250	95,500	83,200	86,800	90,400
17	1921	Parks	30,611 99							
		Sewers	79,582 07	110,194 06	87,500	90,625	93,750	82,000	85,500	89,000
18	1922	Parks	30,611 99							
		Sewers	79,582 07	110,194 06	86,000	89,000	92,000	80,800	84,200	87,600
19	1923	Parks	30,611 99							
		Sewers	82,179 25	112,791 24	84,500	87,375	90,250	79,600	82,900	86,200
20	1934	Parks	30,611 99							
		Sewers	83,201 44	113,813 43	83,000	85,750	88,500	78,400	81,600	84,800
21	1925	Parks	30,611 99							
		Sewers	84,994 12	115,606 11	81,500	84,125	86,750	77,200	80,300	83,400
22	1926	Parks	30,611 99							
		Sewers	85,133 01	115,745 00	80,000	82,500	85,000	76,000	79,000	82,000
23	1927	Parks	30,611 99							
		Sewers	85,133 01	115,745 00	78,500	80,875	83,250	74,800	77,700	80,600
24	1928	Parks	30,611 99							
		Sewers	85,133 01	115,745 00	77,000	79,250	81,500	73,600	76,400	79,200

			Annual cost to Brookline, as charged by the *State*, for *Parks* and *Sewers*,—40-year *Sinking Fund* Bonds. Principal equal to $2,107,227.48; as given by the Town Accountant.		*Annual* cost to Brookline of $2,000,000 40-year *Serial Bonds*, payable 1-40th each year.			*Annual* cost to Brookline of $2,000,000 50-year *Serial Bonds*, payable 1-50th each year.		
					3%	3¼%	3½%	3%	3¼%	3½%
25	1929	Parks	30,611 99							
		Sewers	87,322 93	117,934 92	75,500	77,625	89,750	72,400	75,100	77,800
26	1930	Parks	30,611 99							
		Sewers	85,342 77	115,954 76	74,000	76,000	78,000	71,200	73,800	76,400
27	1931	Parks	30,611 99							
		Sewers	85,342 88	115,954 76	72,500	74,375	76,250	70,000	72,500	75,000
28	1932	Parks	30,611 99							
		Sewers	85,342 77	115,954 76	71,000	72,750	74,500	68,800	71,200	73,600
29	1933	Parks	30,611 99							
		Sewers	87,470 91	118,082 90	69,500	71,125	72,750	67,600	69,900	72,200
30	1934	Parks	25,729 35							
		Sewers	88,308 49	114,037 84	68,000	69,500	71,000	66,400	68,600	70,800
31	1935	Parks	25,729 35							
		Sewers	77,870 17	103,599 52	66,500	67,875	69,250	65,200	67,300	69,400
32	1936	Parks	18,694 41							
		Sewers	77,086 73	95,781 14	65,000	66,250	67,500	64,000	66,000	68,000
33	1937	Parks	12,962 10							
		Sewers	77,086 73	90,048 83	63,500	64,625	65,750	62,800	64,700	66,600
34	1938	Parks	9,835 49							
		Sewers	77,086 73	86,922 22	62,000	63,000	64,000	61,600	63,400	65,200
35	1939	Parks	6,287 68							
		Sewers	64,733 58	71,021 26	60,500	61,375	62,250	60,400	62,100	63,800
36	1940	Parks	5,179 98							
		Sewers	18,063 97	23,243 95	59,000	59,750	60,500	59,200	60,800	62,400
37	1941	Parks	3,206 37							
		Sewers	18,063 97	21,270 34	57,500	58,125	58,750	58,000	59,500	61,000

		Annual cost to Brookline, as charged by the *State*, for *Parks* and *Sewers*,—40-year *Sinking Fund* Bonds. Principal equal to $2,107,227.48 as given by the Town Accountant.		*Annual* cost to Brookline of $2,000,000 40-year *Serial Bonds*, payable 1-40th each year.			*Annual* cost to Brookline of $2,000,000 50-year *Serial Bonds*, payable 1-50th each year.		
				3%	3¼%	3½%	3%	3¼%	3½%
38	1942	Parks 3,206 37 Sewers 18,063 97	21,270 34	56,000	56,500	57,000	56,800	58,200	59,600
39	1943	Parks 1,607 56 Sewers 5,101 63	6,709 19	54,500	54,875	55,250	55,600	56,900	58,200
40	1944	. . .	. . . .	53,000	53,250	53,500	54,400	55,600	56,800
41	1945	. . .	. . . .	51,500	51,625	51,750	53,200	54,300	55,400
	Totals	. . . . .	$3,633,405 90	$3,230,000	$3,332,500	$3,435,000	. . . .	. . . .	. . . .
	Savings by Serial Bonds	. . . . .		**403,405**	**300,905**	**198,405**	. . . .	. . . .	. . . .
				$3,633,405	$3,633,405	$3,633,405	. . . .	. . . .	. . . .
42	1946	. . . . .					52,000	53,000	54,000
43	1947	. . . . .					50,800	51,700	52,600
44	1948	. . . . .					49,600	50,400	51,200
45	1949	. . . . .					48,400	49,100	49,800
46	1950	. . . . .					47,200	47,800	48,400
47	1951	. . . . .					46,000	46,500	47,000
48	1952	. . . . .					44,800	45,200	45,600
49	1953	. . . . .					43,600	43,900	44,200
50	1954	. . . . .					42,400	42,600	42,800
51	1955	. . . . .					41,200	41,300	41,400
							$3,530,000*	$3,657,500	$3,785,000†

* Under the Sinking Fund method this total would be $3,876,610 for the 50 years, on a 3 per cent. basis, or an excess of $346,610 over the Serial Bond method.

† Under the Sinking Fund method this total would be $4,253,816 for the 50 years, on a 3 1-2 per cent. basis, or an excess of $468,816 over the Serial Bond method.

Boston's Serial Bond Issue. $850,000 for 50 Years, at 3%, For the Suffolk County Court House. Issued under Acts of 1885, Chap. 377, Sect. 5.

			Interest.	Principal and Interest.
	$850,000 at 3% for 1 year		$25,500	
1	17,000			
				$42,500
	$833,000	" "	24,990	
2	17,000			
				41,990
	$816,000	" "	24,480	
3	17,000			
				41,480
	$799,000	" "	23,970	
4	17,000			
				40,970
	$782,000	" "	23,460	
5	17,000			
				40,460
	$765,000	" "	22,950	
6	17,000			
				39,950
	$748,000	" "	22,440	
7	17,000			
				39,440
	$731,000	" "	21,930	
8	17,000			
				38,930
	$714,000	" "	21,420	
9	17,000			
				38,420
	$697,000	" "	20,910	
10	17,000			
				37,910
	$680,000	" "	20,400	
11	17,000			
				37,400
	$663,000	" "	19,890	
12	17,000			
				36,890
	$646,000	" "	19,380	
13	17,000			
				36,380
	$629,000	" "	18,870	
14	17,000			
				35,870
	$612,000	" "	18,360	
15	17,000			
				35,360
	$595,000	" "	17,850	
16	17,000			
				34,850
	$578,000	" "	17,340	
17	17,000			
				34,340
	$561,000	" "	16,830	
18	17,000			
				33,830
	$544,000	" "	16,320	
19	17,000			
				33,320
	$527,000	" "	15,810	

			Interest.	Principal and interest.
20	17,000			
	$510,000	at 3% for 1 year	$15,300	$32,810
21	17,000			
	$493,000	" "	14,790	32,300
22	17,000			
	$476,000	" "	14,280	31,790
23	17,000			
	$459,000	" "	13,770	31,280
24	17,000			
	$442,000	" "	13,260	30,770
25	17,000			
	$425,000	" "	12,750	30,260
26	17,000			
	$408,000	" "	12,240	29,750
27	17,000			
	$391,000	" "	11,730	29,240
28	17,000			
	$374,000	" "	11,220	28,730
29	17,000			
	$357,000	" "	10,710	28,220
30	17,000			
	$340,000	" "	10,200	27,710
31	17,000			
	$323,000	" "	9,690	27,200
32	17,000			
	$306,000	" "	9,180	26,690
33	17,000			
	$289,000	" "	8,670	26,180
34	17,000			
	$272,000	" "	8,160	25,670
35	17,000			
	$255,000	" "	7,650	25,160
36	17,000			
	$238.000	" "	7,140	24,650
37	17,000			
	$221,000	" "	6,630	24,140
38	17,000			
	$204,000	" "	6,120	23,630
39	17,000			
	$187,000	" "	5,610	23,120

				Interest.	Principal and Interest.
40	17,000				22,610
	$170,000	at 3%	for 1 year	$5,100	
41	17,000				$22,100
	$153,000	"	"	4,590	
42	17,000				21,590
	$136,000	"	"	4,080	
43	17,000				21,080
	$119,000	"	"	3,570	
44	17,000				20,570
	$102,000	"	"	3,060	
45	17,000				20,060
	$85,000	"	"	2,550	
46	17,000				19,550
	$68,000	"	"	2,040	
47	17,000				19,040
	$51,000	"	"	1,530	
48	17,000				18,530
	$34,000	"	"	1,020	
49	17,000				18,020
	$17,000	"	"	510	
50	17,000				17,510
	00,000				
				$650,250	$1,500,250

For tables showing the difference in interest, and the difference in the cost, in favor of this Serial Bond issue, see p. 26.

$1,000,000 at 3% for 20 Years, 1-20 Payable Each Year.

			Interest.	Principal and Interest.
	$1,000,000	at 3% for 1 year	$30,000	
1	50,000			$80,000
	$950,000	" "	28,500	
2	50,000			78,500
	$900,000	" "	27,000	
3	50,000			77,000
	$850,000	" "	25,500	
4	50,000			75,500
	$800,000	" "	24,000	
5	50,000			74,000
	$750,000	" "	22,500	
6	50,000			72,500
	$700,000	" "	21,000	
7	50,000			71,000
	$650,000	" "	19,500	
8	50,000			69,500
	$600,000	" "	18,000	
9	50,000			68,000
	$550,000	" "	16,500	
10	50,000			66,500
	$500,000	" "	15,000	
11	50,000			65,000
	$450,000	" "	13,500	
12	50,000			63,500
	$400,000	" "	12,000	
13	50,000			62,000
	$350,000	" "	10,500	
14	50,000			60,500
	$300,000	" "	9,000	
15	50,000			59,000
	$250,000	" "	7,500	
16	50,000			57,500
	$200,000	" "	6,000	
17	50,000			56,000
	$150,000	" "	4,500	
18	50,000			54,500
	$100,000	" "	3,000	
19	50,000			53,000
	$50,000	" "	1,500	
20	50,000			51,500
	00,000			
			$315,000	$1,315,000

$1,000,000 at 3% for 40 Years, 1-40 Payable Each Year.

				Interest.	Principal and Interest.
	$1,000,000	at 3%	for 1 year	$30,000	
1	25,000				$55,000
	$975,000	"	"	29,250	
2	25,000				54,250
	$950,000	"	"	28,500	
3	25,000				53,500
	$925,000	"	"	27,750	
4	25,000				52,750
	$900,000	"	"	27,000	
5	25,000				52,000
	$875,000	"	"	26,250	
6	25,000				51,250
	$850,000	"	"	25,500	
7	25,000				50,500
	$825,000	"	"	24,750	
8	25,000				49,750
	$800,000	"	"	24,000	
9	25,000				49,000
	$775,000	"	"	23,250	
10	25,000				48,250
	$750,000	"	"	22,500	
11	25,000				47,500
	$725,000	"	"	21,750	
12	25,000				46,750
	$700,000	"	"	21,000	
13	25,000				46,000
	$675,000	"	"	20,250	
14	25,000				45,250
	$650,000	"	"	19,500	
15	25,000				44,500
	$625,000	"	"	18,750	
16	25,000				43,750
	$600,000	"	"	18,000	
17	25,000				43,000
	$575,000	"	"	17,250	
18	25,000				42,250
	$550,000	"	"	16,500	
19	25,000				41,500
	$525,000	"	"	15,750	

			Interest.	Principal and Interest.
20	$ 25,000			
	$500,000	at 3% for 1 year	$15,000	$40,750
21	25,000			
	$475,000	" "	14,250	40,000
22	25,000			
	$450,000	" "	13,500	39,250
23	25,000			
	$425,000	" "	12,750	38,500
24	25,000			
	$400,000	" "	12,000	37,750
25	25,000			
	$375,000	" "	11,250	37,000
26	25,000			
	$350,000	" "	10,500	36,250
27	25,000			
	$325,000	" "	9,750	35,500
28	25,000			
	$300,000	" "	9,000	34,750
29	25,000			
	$275,000	" "	8,250	34,000
30	25,000			
	$250,000	" "	7,500	33,250
31	25,000			
	$225,000	" "	6,750	32,500
32	25,000			
	$200,000	" "	6,000	31,750
33	25,000			
	$175,000	" "	5,250	31,000
34	25,000			
	$150,000	" "	4,500	30,250
35	25,000			
	$125,000	" "	3,750	29,500
36	25,000			
	$100,000	" "	3,000	28,750
37	25,000			
	$75,000	" "	2,250	28,000
38	25,000			
	$50,000	" "	1,500	27,250
39	25,000			
	$25,000	" "	750	26,500
40	25,000			
	00,000			25,750
			$615,000	$1,615,000

$1,000,000 at 3% for 50 Years, Paying 1-50th or $20,000 Each Year.

			Interest.	Principal and Interest.
	$1,000,000	at 3% for 1 year	$30,000	
1	20,000			$50,000
	$980,000	" "	29,400	
2	20,000			49,400
	$960,000	" "	28,800	
3	20,000			48,800
	$940,000	" "	28,200	
4	20,000			48,200
	$920,000	" "	27,600	
5	20,000			47,600
	$900,000	" "	27,000	
6	20,000			47,000
	$880,000	" "	26,400	
7	20,000			46,400
	$860,000	" "	25,800	
8	20,000			45,800
	$840,000	" "	25,200	
9	20,000			45,200
	$820,000	" "	24,600	
10	20,000			44,600
	$800,000	" "	24,000	
11	20,000			44,000
	$780,000	" "	23,400	
12	20,000			43,400
	$760,000	" "	22,800	
13	20,000			42,800
	$740,000	" "	22,200	
14	20,000			42,200
	$720,000	" "	21,600	
15	20,000			41,600
	$700,000	" "	21,000	
16	20,000			41,000
	$680,000	" "	20,400	
17	20,000			40,400
	$660,000	" "	19,800	
18	20,000			39,800
	$640,000	" "	19,200	
19	20,000			39,200
	$620,000	" "	18,600	

			Interest.	Principal and Interest.
20	20,000			
	$600,000 at 3% for 1 year		$18,000	$38,600
21	20,000			
	$580,000	" "	17,400	38,000
22	20,000			
	$560,000	" "	16,800	37,400
23	20,000			
	$540,000	" "	16,200	36,800
24	20,000			
	$520,000	" "	15,600	36,200
25	20,000			
	$500,000	" "	15,000	35,600
26	20,000			
	$480,000	" "	14,400	35,000
27	20,000			
	$460,000	" "	13,800	34,400
28	20,000			
	$440,000	" "	13,200	33,800
29	20,000			
	$420,000	" "	12,600	33,200
30	20,000			
	$400,000	" "	12,000	32,600
31	20,000			
	$380,000	" "	11,400	32,000
32	20,000			
	$360,000	" "	10,800	31,400
33	20,000			
	$340,000	" "	10,200	30,800
34	20,000			
	$320,000	" "	9,600	30,200
35	20,000			
	$300,000	" "	9,000	29,600
36	20,000			
	$280,000	" "	8,400	29,000
37	20,000			
	$260,000	" "	7,800	28,400
38	20,000			
	$240,000	" "	7,200	27,800
39	20,000			
	$220,000	" "	6,600	27,200

				Interest.	Principal and Interest.
40	$20,000				$26,600
	$200,000	at 3%	for 1 year	$6,000	
41	20,000				26,000
	$180,000	"	"	5,400	
42	20,000				25,400
	$160,000	"	"	4,800	
43	20,000				24,800
	$140,000	"	"	4,200	
44	20,000				24,200
	$120,000	"	"	3,600	
45	20,000				23,600
	$100,000	"	"	3,000	
46	20,000				23,000
	$80,000	"	"	2,400	
47	20,000				22,400
	$60,000	"	"	1,800	
48	20,000				21,800
	$40,000	"	"	1,200	
49	20,000				21,200
	$20,000	"	"	600	
50	20,000				20,600
	00,000				
				$765,000	$1,765,000

$1,000,000 for 20 Years, at 4%, Paying $50,000 Yearly.

			Interest.	Principal and Interest.
1	$1,000,000	at 4% for 1 year	$40,000	
	50,000			$90,000
2	$950,000	" "	38,000	
	50,000			88,000
3	$900,000	" "	36,000	
	50,000			86,000
4	$850,000	" "	34,000	
	50,000			84,000
5	$800,000	" "	32,000	
	50,000			82,000
6	$750,000	" "	30,000	
	50,000			80,000
7	$700,000	" "	28,000	
	50,000			78,000
8	$650,000	" "	26,000	
	50,000			76,000
9	$600,000	" "	24,000	
	50,000			74,000
10	$550,000	" "	22,000	
	50,000			72,000
11	$500,000	" "	20,000	
	50,000			70,000
12	$450,000	" "	18,000	
	50,000			68,000
13	$400,000	" "	16,000	
	50,000			66,000
14	$350,000	" "	14,000	
	50,000			64,000
15	$300,000	" "	12,000	
	50,000			62,000
16	$250,000	" "	10,000	
	50,000			60,000
17	$200,000	" "	8,000	
	50,000			58,000
18	$150,000	" "	6,000	
	50,000			56,000
19	$100,000	" "	4,000	
	50,000			54,000
20	$50,000	" "	2,000	
	50,000			52,000
	00,000		$420,000	$1,420,000

1,000,000 for 40 Years, at 4%, Paying $25,000 Yearly.

		Interest.	Principal and Interest.
	$1,000,000 at 4% for 1 year	$40,000	
1	25,000		
			$65,000
	$975,000 " "	39,000	
2	25,000		
			64,000
	$950,000 " "	38,000	
3	25,000		
			63,000
	$925,000 " "	37,000	
4	25,000		
			62,000
	$900,000 " "	36,000	
5	25,000		
			61,000
	$875,000 " "	35,000	
6	25,000		
			60,000
	$850,000 " "	34,000	
7	25,000		
			59,000
	$825,000 " "	33,000	
8	25,000		
			58,000
	$800,000 " "	32,000	
9	25,000		
			57,000
	$775,000 " "	31,000	
10	25,000		
			56,000
	$750,000 " "	30,000	
11	25,000		
			55,000
	$725,000 " "	29,000	
12	25,000		
			54,000
	$700,000 " "	28,000	
13	25,000		
			53,000
	$675,000 " "	27,000	
14	25,000		
			52,000
	$650,000 " "	26,000	
15	25,000		
			51,000
	$625,000 " "	25,000	
16	25,000		
			50,000
	$600,000 " "	24,000	
17	25,000		
			49,000
	$575,000 " "	23,000	
18	25,000		
			48,000
	$550,000 " "	22,000	
19	25,000		
			47,000
	$525,000 " "	21,000	

				Interest.	Principal and Interest.
20	$25,000				$46,000
	$500,000	at 4%	for 1 year	$20,000	
21	25,000				45,000
	$475,000	"	"	19,000	
22	25,000				44,000
	$450,000	"	"	18,000	
23	25,000				43,000
	$425,000	"	"	17,000	
24	25,000				42,000
	$400,000	"	"	16,000	
25	25,000				41,000
	$375,000	"	"	15,000	
26	25,000				40,000
	$350,000	"	"	14,000	
27	25,000				39,000
	$325,000	"	"	13,000	
28	25,000				38,000
	$300,000	"	"	12,000	
29	25,000				37,000
	$275,000	"	"	11,000	
30	25,000				36,000
	$250,000	"	"	10,000	
31	25,000				35,000
	$225,000	"	"	9,000	
32	25,000				34,000
	$200,000	"	"	8,000	
33	25,000				33,000
	$175,000	"	"	7,000	
34	25,000				32,000
	$150,000	"	"	6,000	
35	25,000				31,000
	$125,000	"	"	5,000	
36	25,000				30,000
	$100,000	"	"	4,000	
37	25,000				29,000
	$75,000	"	"	3,000	
38	25,000				28,000
	$50,000	"	"	2,000	
39	25,000				27,000
	$25,000	"	"	1,000	
40	25,000				26,000
	00,000				
				$820,000	$1,820,000

$1,000,000 at 4% for 50 Years, Paying 1-50 or $20,000 Each Year.

		Interest.	Principal and Interest.
1	$1,000,000 at 4% for 1 year	$40,000	
	20,000		
	$980,000 " "	39,200	$60,000
2	20,000		
	$960,000 " "	38,400	59,200
3	20,000		
	$940,000 " "	37,600	58,400
4	20,000		
	$920,000 " "	36,800	57,600
5	20,000		
	$900,000 " "	36,000	56,800
6	20,000		
	$880,000 " "	35,200	56,000
7	20,000		
	$860,000 " "	34,400	55,200
8	20,000		
	$840,000 " "	33,600	54,400
9	20,000		
	$820,000 " "	32,800	53,600
10	20,000		
	$800,000 " "	32,000	52,800
11	20,000		
	$780,000 " "	31,200	52,000
12	20,000		
	$760,000 " "	30,400	51,200
13	20,000		
	$740,000 " "	29,600	50,400
14	20,000		
	$720,000 " "	28,800	49,600
15	20,000		
	$700,000 " "	28,000	48,800
16	20,000		
	$680,000 " "	27,200	48,000
17	20,000		
	$660,000 " "	26,400	47,200
18	20,000		
	$640,000 " "	25,600	46,400
19	20,000		
	$620,000 " "	24,800	45,600

			Interest.	Principal and Interest.
20	$20,000			$44,800
	$600,000	at 4% for 1 year	$24,000	
21	20,000			44,000
	$580,000	" "	23,200	
22	20,000			43,200
	$560,000	" "	22,400	
23	20,000			42,400
	$540,000	" "	21,600	
24	20,000			41,600
	$520,000	" "	20,800	
25	20,000			40,800
	$500,000	" "	20,000	
26	20,000			40,000
	$480,000	" "	19,200	
27	20,000			39,200
	$460,000	" "	18,400	
28	20,000			38,400
	$440,000	" "	17,600	
29	20,000			37,600
	$420,000	" "	16,800	
30	20,000			36,800
	$400,000	" "	16,000	
31	20,000			36,000
	$380,000	" "	15,200	
32	20,000			35,200
	$360,000	" "	14,400	
33	20,000			34,400
	$340,000	" "	13,600	
34	20,000			33,600
	$320,000	" "	12,800	
35	20,000			32,800
	$300,000	" "	12,000	
36	20,000			32,000
	$280,000	" "	11,200	
37	20,000			31,200
	$260,000	" "	10,400	
38	20,000			30,400
	$240,000	" "	9,600	
39	20,000			29,60
	$220,000	" "	8,800	

			Interest.	Principal and Interest.
40	20,000			
	$200,000 at 4% for 1 year		8,000	28,800
41	20,000			
	$180,000	" "	7,200	28,000
42	20,000			
	$160,000	" "	6,400	27,200
43	20,000			
	$140,000	" "	5,600	26,400
44	20,000			
	$120,000	" "	4,800	25,600
45	20,000			
	$100,000	" "	4,000	24,800
46	20,000			
	$80,000	" "	3,200	24,000
47	20,000			
	$60,000	" "	2,400	23,200
48	20,000			
	$40,000	" "	1,600	22,400
49	20,000			
	$20,000	" "	800	21,600
50	20,000			
	00,000			20,800
			$1,020,000	$2,020,000

$1,000,000 at 3% for 20 years. Comparison Between Sinking Fund and Serial Bond Methods.*

By the Sinking Fund method the interest at 3% is		$600,000
" Serial Bond " " "		315,000
Difference in *interest* in favor of Serial Bonds		$285,000
$1,000,000 Sinking Fund requirements for 20 years, on a 3% basis, the decimal for $1 being .038654	$734,426	
$1,000,000 at 3% for 20 years, interest	600,000	
Cost of loan, Sinking Fund method		$1,334,426
$1,000,000 20 year Serial Bond, 1-20, or $50,000, payable yearly	$1,000,000	
Interest (annually diminishing) total at 3%	315,000	
Cost of loan, Serial Bond method		$1,315,000
Difference in *cost* in favor of Serial Bond method		$19,426

$1,000,000 at 3% for 40 Years. Comparison between Sinking Fund and Serial Bond Methods.

By the Sinking Fund method the interest at 3% is		$1,200,000
" Serial Bond " " "		615,000
Difference in *interest* in favor of Serial Bonds		$585,000
$1,000,000 Sinking Fund requirements for 40 years, on a 3% basis, the decimal for $1 being .013441	$524,199	
$1,000,000 at 3% for 40 years, interest	1,200,000	
Cost of loan, Sinking Fund method		$1,724,199
$1,000,000 40 year Serial Bond, 1-40, or $25,000, payable yearly	$1,000,000	
Interest (annually diminishing) total at 3%	615,000	
Cost of loan, Serial Bond method		1,615,000
Difference in *cost* in favor of Serial Bond method		$109,199
$1,000,000 Sinking Fund requirements for 40 years, on a 3½ % basis, the decimal for $1 being .011969	$466,791	
$1,000,000 at 3% for 40 years, interest	1,200,000	
Cost of loan, Sinking Fund method		1,666,791
" " Serial Bond "		1,615,000
Difference in *cost* in favor of Serial Bond method		$51,791

* For summary of this and of the following five examples see p. 78.

$1,000,000 at 3%, for 50 Years. Comparison Between Sinking Fund and Serial Bond Methods.

By the Sinking Fund method the interest at 3% is . .		$1,500,000
" Serial Bond " " " . . .		765,000
Difference in *interest* in favor of Serial Bonds . . .		**$735,000**
$1,000,000 Sinking Fund requirements for 50 years, on a 3% basis, the decimal for $1 being .008945	$438,305	
$1,000,000 at 3% for 50 years, interest . .	1,500,000	
Cost of loan, Sinking Fund method . . .		$1,938,305
$1,000,000 50 year Serial Bonds, 1-50, or $20,000, payable yearly . -	$1,000,000	
Interest (annually diminishing) total at 3%	765,000	
Cost of loan, Serial Bond method . . .		$1,765,000
Difference in *cost* in favor of Serial Bond method		**$173,305**
$1,000,000 Singing Fund requirements for 50 years, on a 3½% basis, the decimal for $1 being .007692	$376,908	
$1,000,000 at 3% for 50 years, interest . .	1,500,000	
Cost of loan, Sinking Fund method . . .		$1,876,908
" " Serial Bond " . . .		1,765,000
Difference in *cost* in favor of Serial Bond method		**$111,908**
$1,000,000 Sinking Fund requirements for 50 years, on a 4% basis, the decimal for $1 being .006593	$323,057	
$1,000,000 at 3% for 50 years, interest . .	1,500,000	
Cost of loan, Sinking Fund method . . .		$1,823,057
" " Serial Bond " . . .		1,765,000
Difference in *cost* in favor of Serial Bond method		**$58,057**

$1,000,000 at 4% for 20 Years. Comparison between Sinking Fund and Serial Bond Methods.

By the Sinking Fund method the interest at 4% is . .		$800,000
" Serial Bond " " " . .		420,000
Difference in *interest* in favor of Serial Bonds . . .		**$380,000**
$1,000,000 Sinking Fund requirements for 20 years, on a 8% basis, the decimal for $1 being .038654	$734,426	
$1,000,000 at 4% for 20 years, interest . .	800,000	
Cost of loan, Sinking Fund method . . .		$1,534,426
$1,000,000 20 year Serial Bond, 1-20, or $50,000, payable yearly	$1,000,000	
Interest (annually diminishing) total at 4%	420,000	
Cost of loan, Serial Bond method . . .		1,420,000
Difference in *cost* in favor of Serial Bond method . .		**$114,426**
$1,000,000 Sinking Fund requirements for 20 years, on a 3½% basis, the decimal for $1 being .036657	$696,483	
$1,000,000 at 4% for 20 years, interest . .	800,000	
Cost of loan, Sinking Fund method . . .		$1,496,483
" " Serial Bond " . . .		1,420,000
Difference in *cost* in favor of Serial Bond method . .		**$76,483**
$1,000,000, Sinking Fund requirements for 20 years, on a 4% basis, the decimal for $1 being .034749	$660,231	
$1,000,000 at 4% for 20 years, interest . .	800,000	
Cost of loan, Sinking Fund method . . .		$1,460,231
" " Serial Bond " . . .		1,420,000
Difference in *cost* in favor of Serial Bond method . .		**$40,231**

$1,000,000 at 4% for 40 Years. Comparison Between Sinking Fund and Serial Bond Methods.

By the Sinking Fund method the interest at 4% is . .		$1,600,000
" Serial Bond " " " . .		820,000
Difference in *interest* in favor of Serial Bonds . . .		$780,000

$1,000,000 Sinking Fund requirements for 40 years, on a 3% basis, the decimal for $1 being .013441	$ 524,199	
$1,000,000 at 4% for 40 years, interest .	1,600,000	
Cost of loan, Sinking Fund method . . .		$2,124,199
$1,000,000 40 year Serial Bonds, 1-40, or $25,000, payable yearly	$1,000,000	
Interest (annually diminishing) total at 4%	820,000	
Cost of loan, Serial Bond method . . .		$1,820,000
Difference in *cost* in favor of Serial Bond method . .		$304,199

$1,000,000 Sinking Fund requirements for 40 years, on a 3½% basis, the decimal for $1 being .011969	$ 466,791	
$1,000,000 at 4% for 40 years, interest .	1,600,000	
Cost of loan, Sinking Fund method . . .		$2,066,791
" " Serial Bond " . . .		1,820,000
Difference in *cost* in favor of Serial Bond method . .		$246,791

$1,000,000. Sinking Fund requirements for 40 years, on a 4% basis, the decimal for $1 being .010635	$ 414,765	
$1,000,000 at 4% for 40 years, interest .	1,600,000	
Cost of loan, Sinking Fund method . . .		$2,014,765
" " Serial Bond " . . .		1,820,000
Difference in *cost* in favor of Serial Bond method . .		$194,765

$1,000,000 at 4% for 50 Years. Comparison between Sinking Fund and Serial Bond Methods.

By the Sinking Fund method the interest at 4% is . .		$2,000,000
" Serial Bond " " " " . . .		1,020,000
Difference in *interest* in favor of Serial Bonds . . .		$980,000
$1,000,000 Sinking Fund requirements for 50 years, on a 3% basis, the decimal for $1 being .008945	$438,305	
$1,000,000 at 4% for 50 years, interest . .	2,000,000	
Cost of loan, Sinking Fund method . . .		$2,438,305
$1,000,000 50 year Serial Bonds, 1-50, or $20,000, payable yearly	$1,000,000	
Interest (annually diminishing) total at 4% .	1,020,000	
Cost of loan, Serial Bond method . . .		$2,020,000
Difference in *cost* in favor of Serial Bond method . .		$418,305
$1,000,000 Sinking Fund requirements for 50 years, on a 3½% basis, the decimal for $1 being .007692	$376,908	
$1,000,000 at 4% for 50 years, interest .	2,000,000	
Cost of loan, Sinking Fund method . . .		$2,376,908
" " Serial Bond " . . .		2,020,000
Difference in *cost* in favor of Serial Bond method . .		$356,908
$1,000,000 Sinking Fund requirements for 50 years, on a 4% basis, the decimal for $1 being .006593	$323,057	
$1,000,000 at 4% for 50 years, interest . .	2,000,000	
Cost of loan, Sinking Fund method . . .		$2,323,057
" " Serial Bond " . . .		2,020,000
Difference in *cost* in favor of Serial Bond method . .		$303,057

SUMMARY OF PRECEDING SIX EXAMPLES ON PAGES 73 TO 77.

$1,000,000 at 3 per cent.

DIFFERENCE IN **Interest** IN FAVOR OF SERIAL BONDS.

20 Years.	40 Years.	50 Years.
$285,000	$585,000	$735,000

DIFFERENCE IN **Cost** IN FAVOR OF SERIAL BONDS.

Sinking Fund.	20 Years.*	40 Years.†	50 Years.‡
On 3 per cent. basis . . .	$19,426	$109,199	$173,305
" 3½ " " . . .	. . . .	51,791	111,908
" 4 " " . . .	. . . .	. . . .	58,057

$1,000,000 at 4 per cent.

DIFFERENCE IN **Interest** IN FAVOR OF SERIAL BONDS.

20 Years.	40 Years.	50 Years.
$380,000	$780,000	$980,000

DIFFERENCE IN **Cost** IN FAVOR OF SERIAL BONDS.

20 Years.*	40 Years.†	50 Years.‡
$114,426	$304,199	$418,305
76,483	246,791	356,908
40,231	194,765	303,057

* Decimal for 19 years, and 19 payments. † Decimal for 39 years, and 39 payments. ‡ Decimal for 49 years, and 49 payments.

If the number of payments were to equal the full number of years, there would be an increase over the above in the saving in favor of Serial Bonds, the ratio of such increase being larger with the Bonds of a shorter term.

If both the decimal taken and the number of payments made each equal the full number of years, there will still be a large gain in favor of the Serial Bonds.