AN

ATTEMPT

TO ASCERTAIN

A THEORY

FOR DETERMINING THE

VALUE

OF

FUNDED PROPERTY.

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AN

ATTEMPT,

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THE object of this pamphlet is to discuss the two following questions: First, at what rates money may be funded in a stock which bears a low rate of interest, with as great advantage to the public, as in a stock bearing a higher rate of interest: and secondly, whether the sinking-fund should be applied to the stocks which bear the higher, or to those which bear the lower rate of interest.

The public has hitherto entertained an opinion, that whatever loans are made on any stock, which pays less than the current interest for money, are made on disadvan-

tageous terms; because the stock can only be redeemed by paying the full amount of the debt. With this opinion the most able calculators have concurred. It is impossible to have lived during either the last war, or the American war, without the recollection of reiterated complaints of the profligacy of the Government, in borrowing money on the terms on which the loans have been negotiated; because it was the received opinion, that the country borrowed the money on disadvantageous terms, though it was tacitly admitted, that the necessity of the moment compelled the Government to sacrifice the interest of futurity. But however strong the prejudice may have been, and with whatever arguments the literati may have enforced their opinion, it seems pretty evident, that one consideration necessary for the decision of the point, has been entirely neglected; *i.e.* the duration of the existence of the loan.

That this circumstance ought to be taken into consideration is plain; for it may be demonstrated, that the advantage or disadvantage resulting from a loan made on a 3 per cent. stock, which the government will have to extinguish at par at some future period, must depend on the duration of the loan, connected with the rate of interest payable on the net sum borrowed.

This position will be made evident by the following supposition. Let the value of money be such, that a loan on stocks bearing 5 per cent. could be effected at par, and that it should be found necessary to impose additional duties, amounting on the whole to 6 per cent. on the sum borrowed, for the purpose of procuring 1 per cent. for the sinking-fund; and that at the same period a loan could be made on stock paying 3 per cent. interest, at the rate of

100*l.* stock created for each $66\frac{2}{3}$*l.* of money received.

The merit or demerit of this loan will depend, not on what it at first appears to do, *i. e.* on the difference between the sum received, and the sum which will be required to be paid at some remote period, but on the period at which the sum will require to be discharged; for if the period should be 36,7237 years, the debt will be solved without either profit or loss. But then it must be recollected that two things are always supposed, viz. the uniform value of money, and the due application of the interest resulting from the sums applied to the sinking-fund. That these two loans would be equally advantageous, will appear from the following consideration.

If the difference between investing money at 5 per cent. interest, and the interest

made by purchasing the 3 per cent. stock at $66\frac{2}{3}$ be regarded as an annuity, and be suffered to accumulate at compound interest at the rate of 5 per cent., it will amount to a sum equal to the difference between 100*l.* and $66\frac{2}{3}$*l.* in the same number of years in which the 1 per cent. would liquidate the debt. For the interest made by purchasing the 3 per cent. stock at $66\frac{2}{3}$ is $4\frac{1}{2}$ per cent.; and the difference between 5 per cent. and $4\frac{1}{2}$ per cent. is 10*s.*, which is 6*s.* 8*d.* on $66\frac{2}{3}$*l.* Now an annuity of 1*l.* will amount to 100*l.* in 36,7237 years, if suffered to accumulate at compound interest at 5 per cent.; an annuity of 6*s.* 8*d.* if suffered to accumulate at 5 per cent. compound interest, will therefore amount to $33\frac{1}{3}$*l.* in the same number of years, which is exactly the difference between 100*l.* and $66\frac{2}{3}$*l.*

The equality of these two loans may also be shewn, by placing the subject in

another point of view. The 66⅔*l.*, the price paid for 100*l.* stock in the 3 per cents., may be considered as divided into two parts; viz. First, 60*l.* paid for an annuity of 3*l.*, which 60*l.* the lender is to be repaid when the stock is paid off: and, secondly, 6⅔*l.* paid for the additional 40*l.* to make up 100*l.* for his hundred pound stock; which 40*l.* is to be repaid him at the same period. This last sum shall, hereafter, for the sake of clearness, be called the *deferred part*. Now, if the period of re-payment be 36,7237 years, the present worth of this 40*l.* is exactly 6⅔*l.*; so that Government, in this case, pays back an exact equivalent for what it has received.

The foregoing account of the value of stock, the redemption of which depends on a fund that is to be applied annually to buy up a portion thereof, (which portion

is to be considered as an addition to the fund), implies, that each year, as the period approximates at which the debt will be discharged at par, the value of the stock must increase, notwithstanding the value of money should remain stationary.

Suppose that money were invested in a 3 per cent. stock, which would continue for 50 years before it should be paid at par; it is evident that, so far as its value depends on the amount of interest which it produces, the purchaser should have 100*l.* 3 per cent. stock for 60*l.*; but, as a condition is attached to it, which provides for the payment of an additional sum of 40*l.* at the end of the period, and as the value of this additional sum can be determined in no other way than by estimating the period at which the debt will be discharged, it will be found, that the present

value of the remote payment is 3,4882*l.*, which makes the value of 3 per cent. stock to be 63,4882*l.* But should the period be only 20 years before the payment is to be made, the reduction of the time will add to the value of the stock, and it will be found to be worth 75,0755*l.* It is therefore evident, that the price of that stock which pays a less rate of interest than money is worth, must include a consideration to be paid for, which varies in value according to the period of its duration; in as much as its intrinsic value will alter every year, until the full maturity of the loan. This alteration is set forth in Table, No. 5.

The case which has been supposed, is very simple; but the probability is, that either a surplus or deficiency of revenue will occur during each succeeding year, from the uncertainty of the exact com-

mensuration of the revenue with the expenditure; in which case the value of stock will be affected thereby. Should there be such a surplus of revenue as to admit of applying an additional sum to the sinking-fund, the redemption of the 3 per cent. stock would be accelerated, and its value would increase annually beyond the price indicated in the table.

But, should the expences exceed the income, and the country be obliged to have recourse to new loans, the period of the extinction of the debt, by being removed to a greater distance, would diminish the value of stock, though a sinking-fund of 1 per cent. should be levied on the new debt; because the savings which have been made by the old sinking-fund, would in future become applicable to the extinction of an increased debt.

Hitherto we have supposed the value of money to continue the same; but this is scarcely to be expected during the period in which additions are making to the debt. It would require a very extensive collection of tables to determine the relative value of the stocks, when not only the rate of interest, but the amount of the annuity, or sinking-fund, as a measure of the debt, is subject to vary. For these reasons, the enquiry will be limited to the effect produced, by the variations occasioned by altering the proportion that has been supposed to exist, between the annuity or revenue of the sinking-fund, and the amount of the debt, while the value of the money is supposed to be stationary, that is, worth 5 per cent.

It must be evident, that, in proportion to the period that a sinking-fund shall have existed, the debt itself will become

of greater value; and, as it is impossible to have a separate stock for the loan of each year, the whole of the debt funded on any particular stock, must be considered as one debt; and the sinking funds, which have been instituted at the times of funding, must be considered as one fund, for the purpose of its extinction. The effect produced by the consolidation of the debt will be, that the increase of the value of the stock that was first created will be impeded; but the quantity of stock given for money at every succeeding loan, will be increased in proportion to the increase of the revenue of the aggregated sinking-fund.*

* Were the Government to borrow the same sum every year, during a period of 10 years, and to give an equivalent for the loans respectively, in 3 per cent. stock; the price at which the 3 per cent. stock should be taken, may be determined by Table, No. 5, wherein it appears, that the present value of 3 per cent. stock, which is to be paid at par at the end of 37 years, is 66,5774*l.* The reason is, that an annuity of 1*l.* improved at 5 per cent., will amount to the capital at

The value of stock at any period, depends on the rate of interest that money produces at the time, and the period for which the debt is to exist. The Commissioners, by employing the revenue of the fund in buying stock as it comes to market, may possibly buy on advantageous terms; in which case the continuance of the debt will be shortened, which must necessarily increase the value of stock, and vice versâ.

It is therefore necessary at the time of making a loan, to know the period at which the sinking-fund will be able to discharge the debt, in order to determine the amount of 3 per cent. stock, that will be an adequate compensation for the money. But

this period. But when the last of these loans is to be made, the stock that was given as an equivalent for the loan of the first year, will be worth 70,2036*l.* The question may be stated in a more familiar manner. What is the present value of 40*l.* to be received 37 years hence? Answer, 6,5774*l.* What is the present value of the same sum, to be received 27 years hence? Answer, 10,2036*l.*

as the proportion that now exists between the sinking-fund and the debt will be destroyed, when any new debt is added thereto, which must happen every time a loan is made, during the continuance of this, or any succeeding war, (because the savings of the fund which have accrued will be applied in common to both the old and new debt) it becomes a question of importance, and on which an opinion should be formed, what will be the probable duration and annual expence of the war, and the additional expenditure that may be occasioned by any other cause. To calculate a set of tables which would give an answer to all the variations, occasioned by changes arising from political considerations, would occupy too much room in a publication of this kind; it is sufficient to shew the effect of the protractions on a 3 per cent. stock at par, which is done in Table, No. 4. By this it appears, that the part of the 3 per

cent. stock, which is denominated the deferred part of the stock, (and which is represented by $6\frac{2}{3}l.$ because it is to be redeemed by $40l.$ at the end of 36,7237 years), will be only worth 3,4881*l.* in present money, should payment be protracted to 50 years.

It has been shewn, that the difference of interest receivable on 100*l.* invested in 3 per cent. stock; and the same sum invested in 5 per cent. stocks, is $\frac{1}{2}$ per cent., or 10*s.* on every 100*l.* money, which is 6*s.* 8*d.* on every 100*l.* 3 per cent. stock. This sum of 6*s.* 8*d.* in the interest of every 100*l.* of 3 per cent. stock, will amount at the end of the period at which an annuity of 1*l.* would provide the means of paying the debt, (*i. e.* at the end of 36,7237 years) to the difference between the price paid for the deferred part, and its amount at par. For the amount of the deferred part at par is 40*l.*; and an an-

nuity of 6*s*, 8*d.* will in 36,7237 years amount to $33\frac{1}{3}l.$, which is the difference between 40*l.* and $6\frac{2}{3}l.$ the price paid for it. And by Table, No. 6, it appears, that should the debt be protracted to a period of 50 years, this annuity of 6*s.* 8*d.* will amount to 69,7826*l.* In this case the country will profit by the difference between it, and 40*l.* (which is the ultimate sum that 3,4881*l.* will be worth), *i. e.* it will be advantaged by 29,7826*l.* on every 100*l.* stock.

This position will serve as a proof of the necessity of considering the political situation of the country at the time of the contract, both on the part of the Government itself, and on the part of the Contractors. If further proof were wanting, it might be derived from the following consideration, viz. the gain arising from money funded in 3 per cent. stock for the period of 100 years, (supposing the interest of money to

continue at 5 per cent. during the whole time) would amount on every 100*l.* stock to the difference between 870,0083*l.* and 40*l.*, *i. e.* to 830,0083*l.* For an annuity of 6*s.* 8*d.* (which is gained on every 100*l.* stock by funding in the 3 per cent. stock at 66⅔*l.* instead of the 5 per cent. stock at par), would amount in 100 years to 870,0083*l.* For this the Government pays only 40*l.* to the holder of the stock when it discharges the debt. Now this gain amounts to about 13 times the first cost of the stock.

Had the same sum which was borrowed in the year 1776, been borrowed on stock bearing 5 per cent. interest, instead of stock bearing 3 per cent. interest, the difference of charge would amount, at the end of about 18 years from the present time, *i. e.* about the end of 1826, to the sum received from the Contractors when the loan was

made; and the debt itself would still remain to be discharged. That this is true may be thus proved. An annuity of 1*l.* will amount at the end of 50 years to 209,347995*l.** One-third of this sum, being the difference between 5 and 4½ per cent. *i. e.* 10 shillings on every 100*l.* money (or 6*s.* 8*d.* on every 104*l.* stock), is 69,7826*l.*; which is the sum as stated in Table, No. 6.

The principal speakers in every parliament, as well as the members of every administration, have been agreed on the supposed advantage of funding in the stock bearing the highest rate of interest, with which opinion the public have pretty uniformly concurred. And, it is to be observed, that the contractors for the loans seem to have entertained the same opinion; for they have uniformly opposed the funding of the debt in this kind of stock. And

* See Dr. Price, Vol. II. Table, No. 4.

indeed, they have so far succeeded, that of the whole of the debt that existed before the last loan, *i. e.* 616,142,643*l.* 17*s.* 6¾*d.*, there has been created but 97,697,870*l.* 15*s.* 7*d.* which pay more than 3 per cent. on the capital, exclusive of about 56 millions, which were converted from a higher stock into 3 per cent. stock, and denominated reduced annuities; by which conversion the 3 per cent. reduced annuities were originally established.

The opinion which has operated on the minds of those with whom the public administration has been entrusted, must have been the probability of the arrival of such a period, as would enable them to revise the terms of payment, for such part of the public debt as is charged with more than 3 per cent. interest. This period had nearly arrived during the time that the late Mr. Pitt was in administration; and it is highly probable that he meant to

profit by the opportunity; but unfortunately the precise period never arrived, at which he could avail the country of the utmost advantage that such a prosperous state of public credit seemed to promise. For before the price of stock became such as would have enabled him to effect the reduction of that part of the debt which paid 4 and 5 per cent., into a stock which, though it paid only 3 per cent. interest, retained the nominal value of the capital; before, but almost at the very period at which it could have been done, the late French war put it out of his power. Since which, the causes of prevention have been too notorious to require any comment.

Thus we find that, for 50 years at least, the expectation of grasping the opportunity of reducing the higher rate of interest paid on that part of the debt, to the lower rate of interest, which is 3 per cent., has been

constantly within the expectation of a few years; and the Government is still amusing itself with the same expectation, not imagining that other causes may intervene, from circumstances which lie hidden within the womb of time, that are as likely to frustrate its purposes as any which have been hitherto experienced. If we retrace the preceding period, with the exception of that single opportunity; if we reason of the future from our experience of the past; if we form an opinion of the probability on an even calculation; it may be 50 years before such another opportunity will present itself. In this case, the amount of the yearly sum that would have been saved by funding in a 3 per cent. stock, instead of a 5 per cent. stock, supposing the stocks to retain their present value, would enable the Government to purchase a quantity which would much exceed the amount of the sum borrowed.

It must be admitted that, in forming our expectation of the future from our experience of the past, our conclusions may be false. The chance and consequences of their failure should, therefore, be duly considered, and fairly balanced, against the chance and consequences of their success. Now if the period so long expected should arrive, and the interest on the 4 and 5 per cent. stock (which may be supposed to amount to about a 100,000,000*l.*, the greater part of which is at 4 per cent.) be reduced to 3 per cent., the annual saving could not exceed 2,000,000*l.* But will the chance of accomplishing this reduction, in opposition to the experience of 50 years, warrant our acting upon the expectation of gaining 2 per cent. annually, with a certainty of paying $\frac{1}{3}$ per cent. annually? Would any prudent trader act upon such a principle? The answer to this position is too palpable to admit of any doubt. The

conduct, therefore, of those who administer to the public exigencies, is perfectly justifiable in continuing the present system, though it is a system fraught with many consequences, which may become the subject of future discussion, but which bear no relation to the way in which the subject is here considered.

It is therefore of importance to the public, that a strict and rigid attention should be given to the subject at the time of making a loan, and it is equally necessary that the Commissioners should conduct themselves by the same rule, though required to be applied reversely, and that these duties should be executed without regard or compliment to the opinions of any man, or the sentiments of any party. The duty of an administrator of the public resources, directs him to apply its powers to the most available purpose. It is with him to judge of

the propriety of what is here recommended; and it is presumed that he is bound to examine the subject in all its extent and bearings.

An annuity of 1*l.* applied to the redemption of 100*l.* 3 per cent. stock, when money is worth 5 per cent. will effect it in 36,7237 years. But as the dividend receivable from 100*l.* of 3 per cent. stock (which according to its supposed value, *i. e.* 66⅔*l.*) would only produce 4½ per cent.; the period at which the discharge of the stock could be effected, by money employed at this rate of interest, would be much extended. Thus while the purchases which result from the annuity, and the dividends thereon, when invested in a 5 per cent. stock at par, necessarily increase in a compound ratio, corresponding therewith; the same annuity applied in the purchase of a 3 per cent. stock at 66⅔*l.* increases only in the

ratio of $4\frac{1}{2}$ per cent. Were the value of 3 per cent. stock to be redeemed at $66\frac{2}{3}$*l.*, the duration of the debt would be diminished, because an annuity of 1*l.* would redeem a debt of $66\frac{2}{3}$*l.* when employed at $4\frac{1}{2}$ per cent.; before the same annuity, when employed at 5 per cent., would redeem a debt of 100*l.* As the debt is supposed to be paid at par at some determinate period, which is here supposed to be 36,7237 years, the value of 3 per cent. stock will continue to increase every year until the period of payment arrives, which yearly increase is indicated in Table, No. 5. It also follows that the rate of interest on the purchase, or loan, diminishes periodically, in exact relation with the increase of value, and will continue so to do until it is reduced from $4\frac{1}{2}$ per cent (the rate of interest that money affords when invested in 3 per cent. stock at $66\frac{2}{3}$*l.*), to 3 per cent. See 2nd part of Table, No. 1.

On this hypothesis, 3 per cent. stock consists of $\frac{6}{10}$ of a stock producing 5 per cent. interest, which is worth - - - - - - - - - - - -	£ 60
of $\frac{4}{10}$ of deferred stock for which 40*l.* is to be paid 36,7237 years hence, worth in present money - - - -	$6\frac{2}{3}$
making together this sum, which may be considered as the present value of 3 per cent. stock - - - -	$66\frac{2}{3}$

The annuity of 1*l.* that is to be applied towards the extinction, or repurchase of the capital, may be thus divided, viz.

$\frac{6}{10}$, or $\frac{18}{30}$ of an annuity of 1*l.* to redeem	60
$\frac{1}{15}$, or $\frac{2}{30}$ of do.	$6\frac{2}{3}$
$\frac{1}{3}$, or $\frac{10}{30}$ of do. to provide the difference	$33\frac{2}{3}$
$\frac{30}{30}$	*L.* 100

From this statement it appears, that the liquidation of the debt is provided for in the following manner, viz.: by an annuity of 12*s.* which is intended to form a fund, which in 36,7237 years, will discharge that

part of the sum borrowed at 5 per cent. *i. e.* 60*l.*;—1*s.* 4*d.* as a means of providing a sum, which at the end of the period will amount to the deposit of $6\frac{2}{3}$*l.*, and the remaining 6*s.* 8*d.* for the purpose of providing for the sum by which the $6\frac{2}{3}$*l.*, in the hands of the Government will be increased.

But let it be assumed, that the country possesses a revenue in a sinking-fund, employed in purchasing the debt at prices corresponding with its value, according to the fund on which the debt is implanted, money being computed at 5 per cent. It is not entended in this place to enquire how much of the debt is represented by annuities on lives, or by annuities terminable at stated periods, because, whether it be a little more or less, the difference that it will occasion in the amount is so small, in comparison with the aggregate debt,

that it can affect the total quantity but in a small degree. Taking it as granted, then, that the debts of all these terminable funds do not exceed the sum of 1,112,662*l.*, the value thereof, computed at 20 years purchase, will add but 22,243,240*l.* to the admitted debt of 646,641,228*l.*, which was the total amount of the different stocks on the 1st January 1808, making together 668,894,368*l.* (see accounts presented to the House of Commons). The same authority informs us, that the income of the sinking-fund, at the same period, amounted to 9,312,392*l.* The relation that these sums bear to each other will not make the income of the sinking-fund to amount to $1\frac{1}{2}$ per cent. on the stock debt. But supposing that it does actually produce $1\frac{1}{2}$*l.* on every 100*l.* of the debt; the period at which it can effect the redemption of the whole debt may be determined near enough, to appreciate the present value of 3 per cent. stock, on

this hypothesis, by referring to Table, No 3. The Table which is here referred to, extends to all the variations that are likely to take place in the value of money, when applied to the purchase of a perpetual annuity; which variations become the means of determining the value of each of the three kinds of stock; it being presumed, that the debt which they represent will be paid by the annuity, and at the periods which are therein respectively stated.

The whole of this argument has been applied to the relation that subsists between 3 and 5 per cent. stock, for the purpose of directing the attention to the consideration of the subject in its most simple form. But it is proper to observe, that what has been said as to the value of 3 per cent. stock, is equally applicable to 4 per cent. stock, and to every other kind of stock which may exist. The argument is general,

and is applicable to every kind of stock which produces a lower rate of interest than money is worth when the loan is made; it proves that the value of the stock depends on the period at which the loan will be paid at par, which must be determined by the means which the Government may possess of accumulating for the purpose. That part of the money, which corresponds with the interest, must be considered as a simple loan, and the excess, becomes the price paid, for the prospect of receiving 100*l.* at a distant period, as a compensation for the amount thereof.

These considerations require to be examined with considerable attention, in as much as they indicate the expediency of an opposite line of conduct to that, which has been universally considered as the wisest that a Minister can pursue. The profligacy of Administration in borrowing money on

terms that enlarge the stock capital, has been the subject of general declamation (as has already been noticed), on account of the sum required to be paid eventually for the redemption of the debt. But it appears that the eventual payment of this sum is not the only object that requires attention, in as much as a part of the sum, paid by the contractors, may be considered as money advanced at the period of the loan, which is to be repaid, together with the accumulation of the interest, when it may be conveniently done. The means that the country provides for its discharge, may be diminished in their effect by subsequent enlargements of the debt; in which case the effect that results from the fund, intended to discharge the whole debt, will be applied as well to the discharge of the new, as of the old, considered as one debt. It may happen, that though the old debt may, by the sinking-fund, have been pro-

vided for to the extent of 50 per cent.; yet when a new debt is added to it, the same sinking-fund may only measure 30 per cent. on the total amount thereof.

But though there exists a possibility that there may be such an increase of debt, as may diminish the pro rata of effect which would have been produced by the old sinking-fund, it is not surmised that these new loans will make any immediate, or material impression thereon. But it is certain, that during the period that the expences exceed the income of the country (including the sinking-fund), the progress of the sinking-fund must not only be arrested, but extinguished. And as the value of any stock, which pays a lower rate of interest than the market value of money, depends on the period at which it will be paid off, it follows, that every event which removes the period to a greater distance,

diminishes the value of the stock; should these circumstances be contemplated at the time of making the bargain, they would make the Contractors bid less for the loan.

The present price of 3 per cent. stock is about $65\frac{1}{4}$*l.*; and 4 per cent. stock about $80\frac{1}{2}$*l.*, which, according to Table, No. 2, makes 5 per cent. stock to be about $94\frac{3}{8}$*l.** When these different kinds of stock are worth the above prices, the value of a perpetual annuity, should be $92\frac{3}{4}$*l.*; and the annual equivalent which should be paid for every 100*l.* money, applied in the purchase of these securities, should be as follows, viz.; money applied in the purchase of a perpetual annuity should give 5,3908*l.* per cent. interest; in the purchase of 5 per cent. stock 5,3006*l.* per cent.; in 4 per cent. stock it

* On the 17th January, the prices of stock were stated in Lloyd's List to be as follow, viz.

5 per cent. navy, ex div. ..... $97\frac{3}{8}$, $\frac{1}{2}$
4 per cent. consol. $\frac{1}{4}$ dividend..... $81\frac{5}{8}$, $\frac{7}{8}$
3 per cent. consol. ex div. ..... $65\frac{1}{4}$, $\frac{1}{8}$

should give 5,0115*l.*; and in 3 per cent. stock 4,5939 per cent. But the price of 5 per cent. stock is now about $97\frac{3}{8}$*l.* Under these circumstances it requires but little judgment to perceive, that were the loan to be paid at the period which is contemplated, the Government should prefer the 5 per cent. stock, as that in which it should fund any new debt, because it would occasion a saving of about 3 per cent. But as it is not only possible, but even probable, that the payment thereof will be protracted very much beyond the expected period, it becomes questionable whether the 5 per cent stock should be preferred, because the advantage will not exceed $3\frac{2}{3}$ per cent. But should the debt be funded in a 3 per cent. stock, and the payment thereof be deferred to a very remote period, the advantage which the Government would gain might be very great. Suppose these causes should operate so as to require the assistance of the sinking-fund for 60 years,

and that the value of money should be uniformly 5 per cent.; it appears that the interest of $6\frac{2}{3}l.$ (*i. e.* the present value of that part of the stock, that may fairly be considered as deferred stock), accumulated throughout a period of 60 years will amount to 117,8612*l.*; (see Table, No. 6) so that by the circumstances which occasion this extension of time, as to the period of payment, the country will eventually gain much more than the value of the sum it has received as a compensation.

A very slight investigation of the principles on which the theory of accumulating interest depends, will point out the advantage that may be derived by Government, from an attentive consideration of every minutia at the time of making the contract, in as much as it involves considerations which are connected with a foresight of futurity; but with the Contractors, the question of futurity forms but a

small part of their proper consideration. The subject which they ought fairly to weigh, is the prospect of advantage by the sale of their new stock within a limited time; but the Government is bound by the contract with all its consequences; it cannot change its creditors, but the Contractors can alienate at pleasure. At every change of the situation of affairs, they may find some one who will adopt the bargain with a small sacrifice, and the buyer also may find some one who will adopt the purchase with all its consequences, for a small advantage, possibly the turn of the market, which is but $\frac{1}{8}$ per cent.

A very few words will suffice for the discussion of the second question proposed; *i. e.* Whether it is more advantageous to employ the sinking-fund in redeeming the stocks which bear a higher, or those which bear a lower, rate of interest?

Whatever may be the line of conduct that should be pursued by the Government, when funding a new debt, it is pretty evident that the reverse should be the conduct of the Commissioners for liquidating the National Debt. Should the Government prefer one particular kind of stock, for the purpose of borrowing money, in order to avail itself of the advantages that it may afford, it is evident that the Commissioners of the National Debt, should pursue a directly opposite line of conduct. This opinion has been entertained, and acted on for a very long period; but the kind of stock that has been selected, in both these cases, has been the reverse of that which it is here intended to recommend. It has hitherto been thought advantageous to fund in 5 per cent., and to redeem the 3 per cent. stock by the purchases of the Commissioners.

The practical inference deducible from these premises is, that the new debt should be funded in a 3 per cent. stock, and that the national Commissioners should direct their efforts towards the purchase of the 5 per cent. debt: because, by funding in 3 per cent. stock, the country avoids the effects which result from continuing the debt beyond the period at which its payment is contemplated; and the Commissioners, by purchasing 5 per cent. stock, avoid the loss, which will then be sustained by the holders of the 3 per cent. stock.

When there exists any material difference between the prices of stock, and the value of money, as represented by a perpetual annuity, the only cause that can justify the difference, is the prospect of a continued increase of expence, such as is likely to prevent the discharge of the debt

within the period indicated in the Table. But when the prices of stock correspond with the Table, the Commissioners should give a decided preference to the 5 per cent. stock, in as much as the war may be continued so long, that the difference may become a saving of a sum so large, that its amount at the end of the period may exceed the amount of the debt.

The sinking-fund is the only measure, by which the continuance of the debt can be appreciated. It may happen, that in the event of peace the country may find means to reduce its expenditure, and that the prices of the stocks may advance in consequence thereof. But with the weight of the present floating debt, and the increased demand for commercial capital which peace may occasion, it is not likely that the price of 3 per cent. stock can advance to par, in less

than 8 years from the present time; in which case, 5 per cent. stock created in 1797, (supposing the difference in funding 18,000,000*l.* to be 6*s.* 8*d.* per cent. loss per annum), will become an actual charge of 11,022 per cent. which amounts to 1,983,960*l.*; a sum that the country will have expended, in addition to what it would have done, had the money been borrowed on a 3 per cent. stock.* There does not, however, appear any symptom in the present aspect of public affairs, that should encourage a Minister to expect, in less than double this time, the arrival of the period, at which he can effect a reduction of the stocks paying a higher rate of interest. The prospect has been constantly in view, but never yet realized: and, as the expectation has been uniformly

* An annuity of 6*s.* 8*d.* will amount in 50 years to 69,782*l.*, which amount exceeds the sum paid in money for the debt.

deceptive, is it not incumbent on Government to change the system; to embrace the certainty, and abandon the expectation; particularly when the advantage of money, considered as commercial capital, is taken into account?

TABLE, No. 1. Part I.

Shewing the period at which an Annuity of 1*l.* will amount to 100*l.* when employed at the rate of interest that will enable the sum in the first column to produce 5*l.* annually; together with the present value of 5, 4, and 3 per cent. Stock, when their extinction depends on the due application of the above Annuity.

When an Annuity of 5*l.* costs	An Annuity of 1*l.* will amount to 100*l.* in the following periods.	Present Value of the different Stocks, viz.		
		5 per Cent.	4 per Cent.	3 per Cent.
90.	34.7807	91.5254	76.2711	61.0169
90.25	34.8278	91.7408	76.4506	61.1605
90.50	34.8785	91.9560	76.2999	61.3040
90.75	34.9286	92.1709	76.8091	61.4473
91.	34.9787	92.3858	76.9881	61.5905
91.25	35.0288	92.6004	77.1670	61.7336
91.50	35.0789	92.8149	77.3157	61.8766
91.75	35.1285	93.0291	77.5242	62.0194
92.	35.1783	93.2432	77.7026	62.1621
92.35	35.2278	93.4574	77.8809	62.3047
92.50	35.2713	93.6709	78.0590	62.4472
92.75	35.3271	93.8844	78.2370	62.5896
93.	35.3775	94.0988	78.4148	62.7319
93.55	35.4260	94.3110	78.5925	62.8740
93.50	35.4752	94.5240	78.7700	63.0160
93.75	35.5244	94.7368	78.9474	63.1579
94.	35.5734	94.9495	79.1246	63.2934
94.25	35.6223	95.1620	79.3016	63.4413
94.50	35.6711	95.3743	79.4785	63.5128
94.75	35.7199	95.5864	79.6553	63.7243
95.	35.7687	95.7983	79.8220	63.8672

TABLE, No. 1. Part I. (*continued*).

When an Annuity of 5*l.* costs	An Annuity of 1*l.* will amount to 100*l.* in the following periods.	Present Value of the different Stocks, viz.		
		5 per Cent.	4 per Cent.	3 per Cent.
95.25	35.8167	96.0100	80.0083	64.0065
95.50	35.8657	96.2217	80.1847	64.1477
95.75	35.9142	96.4314	80.3609	64.3387
96.	35.9674	96.6443	80.5369	64.4295
96.25	36.0108	96.8554	80.7068	64.5702
96.50	36.0589	97.0662	80.8885	64.7108
96.75	36.1072	97.2769	81.0641	64.8513
97.	36.1550	97.4875	81.2395	64.9916
97.25	36.2030	97.6978	81.4148	65.1319
97.50	36.2505	97.8896	81.5899	65.2720
97.75	36.2857	98.1182	81.7676	65.3681
98.	36.3461	98.3278	81.9498	65.5518
98.25	36.3969	98.5374	82.1139	65.6905
98.50	36.4410	98.7469	82.2890	65.8313
98.75	36.4885	98.9562	82.4635	66.0330
99.	36.5357	99.1653	82.6377	66.1101
99.25	36.5823	99.3742	82.8118	66.2495
99.50	36.6300	99.5830	82.9858	66.3886
99.75	36.6778	99.7915	83.1596	66.5277
100.	36.7237	100.0000	83.3333	66.6666

TABLE, No. 1. Part II.

Shewing the rate of Interest that each of the following Stocks will produce, when purchased at prices which correspond with the Value stated in the First Part of this Table.

When an Annuity of 5*l.* costs	Interest on each 100*l.*	The following Rates of Interest should result from the Stocks, viz.		
		5 per Cent.	4 per Cent.	3 per Cent.
90.	5.5555	5.4630	5.2444	4.9166
90.25	5.5401	5.4501	5.2321	4.9049
90.50	5.5248	5.4371	5.2199	4.8936
90.75	5.5096	5.4247	5.2077	4.8822
91.	5.4945	5.4121	5.1956	4.8708
91.25	5.4794	5.3995	5.1835	4.8595
91.50	5.4644	5.3870	5.1736	4.8483
91.75	5.4496	5.3748	5.1597	4.8372
92.	5.4348	5.3623	5.1478	4.8261
92.25	5.4201	5.3500	5.1360	4.8150
92.50	5.4054	5.3354	5.1243	4.8040
92.75	5.3908	5.3257	5.1126	4.7931
93.	5.3763	5.3136	5.1010	4.7822
93.25	5.3619	5.3016	5.0895	4.7714
93.50	5.3476	5.2896	5.0781	4.7607
93.75	5.3333	5.2778	5.0666	4.7500
94.	5.3191	5.2660	5.0553	4.7399
94.25	5.3050	5.2542	5.0440	4.7288
94.50	5.2910	5.2425	5.0328	4.7182
94.75	5.2770	5.2308	5.0216	4.7078
95.	5.2631	5.2193	5.0111	4.6972
95.25	5.2495	5.2078	4.9995	4.6870
95.50	5.2356	5.1963	4.9884	4.6767

TABLE, No. 1. Part II. *(continued)*.

When an Annuity of 5*l.* costs	Interest on each 100*l.*	The following Rates of Interest should result from the Stocks, viz.		
		5 per Cent.	4 per Cent.	3 per Cent.
95.75	5.2219	5.1850	4.9775	4.6628
96.	5.2083	5.1736	4.9666	4.6562
96.25	5.1948	5.1623	4.9562	4.6461
96.50	5.1813	5.1511	4.9450	4.6360
96.75	5.1679	5.1400	4.9343	4.6260
97.	5.1546	5.1289	4.9237	4.6160
97.25	5.1413	5.1178	4.9131	4.6060
97.50	5.1282	5.1078	4.9026	4.5962
97.75	5.1150	5.0959	4.8919	4.5894
98.	5.1020	5.0850	4.8810	4.5765
98.25	5.0890	5.0742	4.8713	4.5668
98.50	5.0761	5.0634	4.8609	4.5571
98.75	5.0632	5.0527	4.8506	4.5432
99.	5.0505	5.0421	4.8404	4.5379
99.25	5.0377	5.0315	4.8302	4.5283
99.50	5.0251	5.0209	4.8201	4.5188
99.75	5.0125	5.0104	4.8100	4.5094
100.	5.0000	5.0000	4.8000	4.5000

TABLE, No. 2. Part I.

Shewing the period at which an Annuity of $1\frac{1}{2}l.$ will amount to $100l.$ when employed at the rate of interest that will enable the sum in the first column to produce $5l.$ annually; together with the present value of 5, 4, and 3 per cent. Stock, when their extinction depends on the due application of the above Annuity.

When an Annuity of $5l.$ costs	An Annuity of $1\frac{1}{2}l.$ will amount to $100l.$ in the following periods.	Present Value of the different Stocks, viz.		
		5 per Cent.	4 per Cent.	3 per Cent.
90.	28.6402	92.1260	77.9525	63.7797
90.25	28.6744	92.3274	78.1231	63.9189
90.50	28.7116	92.5285	78.2933	64.0582
90.75	28.7482	92.7294	78.4633	64.1973
91.	28.7846	92.9301	78.6332	64.3363
91.25	28.8215	93.1305	78.8028	64.4750
91.50	28.8582	93.3307	78.9722	64.6137
91.75	28.8941	93.5307	79.1414	64.7421
92.	28.9308	93.7304	79.3103	64.8902
92.25	28.9669	93.9299	79.4791	65.0285
92.50	28.9937	94.1292	79.6477	65.1663
92.75	29.0394	94.3282	79.8162	65.3041
93.	29.0775	94.5270	79.9844	65.4418
93.25	29.1116	94.7255	80.1524	65.5792
93.50	29.1470	94.9238	80.3202	65.7143
93.75	29.1833	95.1219	80.4870	65.8536
94.	29.2190	95.3198	80.6552	65.9819
94.25	29.2546	95.5175	80.8225	66.1275
94.50	29.2901	95.7148	80.9895	66.2641
94.75	29.3257	95.9120	81.1563	66.4007
95.	29.3612	96.1090	81.3230	66.5370

TABLE, No. 2. Part I. *(continued)*.

When an Annuity of $5l.$ costs	An Annuity of $1\frac{1}{2}l.$ will amount to $100l.$ in the following periods.	Present Value of the different Stocks; viz.		
		5 per Cent.	4 per Cent.	3 per Cent.
95.25	29.3961	96.2911	81.4293	66.6730
95.50	29.4313	96.5044	81.6556	66.8092
95.75	29.4670	96.6983	81.8217	66.9451
6.	29.5020	96.8944	81.9876	67.0808
96.25	29.5462	97.0902	82.1532	67.2163
96.50	29.5721	97.2858	82.3187	67.3517
96.75	29.6072	97.4811	82.4840	67.4870
97.	29.6419	97.6762	82.6491	67.6220
97.25	29.6768	97.8711	82.8140	67.7570
97.50	29.7112	98.0658	82.9787	67.8917
97.75	29.7461	98.2602	83.1433	68.0264
98.	29.7805	98.4544	83.3076	68.1608
98.25	29.8196	98.6484	83.4707	68.2951
98.50	29.8493	98.8422	83.6357	68.4303
98.75	29.8835	99.0357	83.7995	68.5633
99.	29.9365	99.2290	83.9630	68.6970
99.25	29.9517	99.4221	84.1264	68.8307
99.50	29.9861	99.6149	84.2896	68.9644
99.75	30.0207	99.8076	84.4526	69.0976
100.	30.0539	100.0000	84.6154	69.2307

TABLE, No. 2. Part II.

Shewing the rate of Interest that each of the following Stocks will produce, when purchased at prices which correspond with the Value stated in the First Part of this Table.

When an Annuity of 5*l.* costs	Interest on each 100*l.*	The following Rates of Interest should result from the Stocks, viz.		
		5 per Cent.	4 per Cent.	3 per Cent.
90.	5.5555	5.4273	5.1313	4.7037
90.25	5.5401	5.4155	5.1201	4.6934
90.50	5.5248	5.4037	5.1090	4.6832
90.75	5.5096	5.3920	5.0980	4.6731
91.	5.4945	5.3804	5.0869	4.6630
91.25	5.4794	5.3688	5.0769	4.6530
91.50	5.4644	5.3573	5.0650	4.6429
91.75	5.4496	5.3469	5.0542	4.6337
92.	5.4348	5.3345	5.0435	4.6232
92.25	5.4201	5.3231	5.0328	4.6132
92.50	5.4054	5.3118	5.0221	4.6036
92.75	5.3908	5.3006	5.0115	4.5939
93.	5.3763	5.2895	5.0010	4,5842
93.25	5.3619	5.2784	4.9905	4.5746
93.50	5.3476	5.2674	4.9801	4.5652
93.75	5.3333	5.2564	4.9697	4.5555
94.	5.3191	5.2455	4.9594	4.5467
94.25	5.3050	5.2346	4.9491	4,5367
94.50	5.2910	5.2238	4.9389	4.5273
94.75	5.2770	5.2132	4.9288	4.5180
95.	5.2631	5.2024	4.9175	4.5088
95.25	5.2495	5.1926	4.9086	4.4996
95.50	5.2356	5.1812	4.8986	4.4904

TABLE, No. 2. Part II. *(continued.)*

When an Annuity of 5*l.* costs	Interest on each 100*l.*	The following Rates of Interest should result from the Stocks, viz.		
		5 per Cent.	4 per Cent.	3 per Cent.
95.75	5.2219	5.1707	4.8887	4.4813
96.	5.2083	5.1603	4.8788	4.4722
96.25	5.1948	5.1498	4.8690	4.4663
96.50	5.1813	5.1395	4.8592	4.4542
96.75	5.1679	5.1292	4.8494	4.4453
97.	5.1546	5.1190	8.8397	4.4364
97.25	5.1413	5.1088	4.8301	4.4276
97.50	5.1282	5.0986	4.8205	4.4188
97.75	5.1150	5.0885	4.8110	4.4100
98.	5.1020	5.0785	4.8015	4.4013
98.25	5.0890	5.0685	4.7921	4.3927
98.50	5.0761	5.0586	4.7826	4.3840
98.75	5.0632	5.0487	4.7733	4.3755
99.	5.0505	5.0388	4.7640	4.3665
99.25	5.0377	5.0290	4.7547	4.3585
99.50	5.0251	5.0193	4.7455	4.3501
99.75	5.0125	5.0096	4.7364	4.3417
100.	5.0000	5.0000	4.7279	4.3333

TABLE, No. 3.

Shewing the Value of 4 and 3 per Cent. Stock, when 5 per Cent. Stock is at par; the Income of Sinking Fund being considered as the means of Liquidation, and the Value of Stock as permanent during the whole of the period.

When the Sinking-fund produces Annually the following rate on the debt.	The Debt will be paid in the following periods, viz.	Value of 4 per Cent. Stock.	Rate of Interest that it will produce.	Value of 3 per Cent. Stock.	Rate of Interest that it will produce.
1 per Cent.	36.7237	83.3333	4.8000	66.6666	4.5000
1¼ per Cent.	32.9868	84.0000	4.7619	68.0000	4.4118
1½ per Cent.	30.0539	84.6154	4.7273	69.2307	4.3333
1¾ per Cent.	27.6680	85.1851	4.6956	70.3703	4.2631
2 per Cent.	25.6765	85.7142	4.6666	71.4285	4.2000
2¼ per Cent.	23.9817	86.2068	4.6400	72.4137	4.1428
2½ per Cent.	22.5170	86.6820	4.6145	73.3640	4.0892
2¾ per Cent.	21.2356	87.0967	4.5926	74.1935	4.0435
3 per Cent.	20.0982	87.5017	4.5713	75.0034	3.9998
3¼ per Cent.	19.0931	87.8785	4.5517	75.7570	3.9600
3½ per Cent.	18.1861	88.2390	4.5331	76.4781	3.9227
3¾ per Cent.	17.3663	88.5714	4.5161	77.1428	3.8889
4 per Cent.	16.6207	88.8888	4.5000	77.7777	3.8571

TABLE, No. 4.

Shewing the present value of 40*l.* redeemable at the remote period stated in the first column; the value thereof being computed at the rate of 5 per cent. interest.

Distance of Payment.	Present Value.
37 years	6.57744
38	6.26420
39	5.96592
40	5.68184
41	5.41128
42	5.15360
43	4.90816
44	4.67444
45	4.45188
46	4.23988
47	4.03796
48	3.84568
49	3.66256
50	3.48816
60	2.14144
70	1.31464
80	0.80708
90	0.49548
100	0.03041

TABLE, No. 5.

Shewing the value of 3 per cent. stock at different periods, antecedent to the period of its discharge; supposing the value of money to remain uniformly to be 5 per cent., and the debt to be paid off at par.

Distance of Payment.	Price, or Value.	Distance of Payment.	Price, or Value.
50 yrs.	63.4882	24	72.4027
49	63.6625	23	73.0228
48	63.8457	22	73.6740
47	64.0380	21	74.3577
46	64.2436	20	75.0755
45	64.4519	19	75.8290
44	64.6744	18	76.6208
43	64.9082	17	77.4518
42	65.1536	16	78.3244
41	65.4113	15	79.2407
40	65.6818	14	80.2025
39	65.9659	13	81.2128
38	66.2642	12	82.2739
37	66.5774	11	83.3872
36	66.9063	10	84.5565
35	67.2516	9	85.7844
34	67.6142	8	87.0736
33	67.9949	7	88.4271
32	68.3946	6	89.8486
31	68.8144	5	91.3410
30	69.2551	4	92.3181
29	69.7179	3	94.5535
28	70.2036	2	96.2812
27	70.7139	1	98.0953
26	71.2500	0	100.
25	71.8120		

TABLE, No. 6.

Shewing the amount of an annuity of 6*s.* 8*d.* at the end of the following periods; supposing it to have been employed at 5 per cent. interest.

Distance of Payment.	Amount.	Distance of Payment.	Amount.
37 yrs.	33.8760	51	73.6051
38	35.9031	52	77.6153
39	38.0316	53	81.8329
40	40.2665	54	86.2579
41	42.6132	55	90.9042
42	45.0772	56	95.7827
43	47.6644	57	100.9052
44	50.3473	58	106.2838
45	53.2333	59	111.9313
46	56.2283	60	117.8612
47	59.3731	70	196.1761
48	62.6751	80	373.9300
49	66.1422	90	531.5324
50	69.7826	100	870.0083

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