

revenue, &c.—the services of a first-class official should be obtainable for the office; and there seems no reason why a central board so constituted, attached to the India Office, should not be sufficient for the disposal of the English business connected with all Indian railways.

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XX.

Another matter calling for consideration is, whether the shareholders should be guaranteed a share of the surplus profits, or whether their interest in the affair should be limited to a fixed dividend? In favour of the former plan, it may be advanced that these prospective profits ought to enable Government to raise the needful capital on lower terms than would otherwise be necessary. It has however to be noticed, that the present comparative prices of the stocks of the Indian Government, and those railways which are paying more than five per cent. dividend, seems to show that this possibility of prospective gain would not have much appreciable effect; railway stock at five per cent., with the chance of more, being at a much lower figure than government stock which does not carry this chance. A more valid reason may perhaps be found in the fact, that to vest the shareholders with a direct interest in the return obtained for the capital would, of itself, necessitate the application of that capital to the purpose for which it was raised; and that the accounts which the Government, in its capacity of trustee, would thus be bound to render periodically to the shareholders, would prevent the diversion of the money to other channels. But under any circumstances it would be desirable to guard against the possibility of such a misapplication—the greatest objection, as has already been pointed out, to the construction of railways directly by the State—by embodying the needful provisions of the matter in an Act of Parliament. One obvious provision, in such an Act, would be the submission of periodical accounts to Parliament by independent auditors, showing the appropriation by the Indian Government of the moneys raised by it for railway undertakings.

Should the
share-
holders in
railway
loans par-
ticipate in
surplus
profits?

With respect to the management of State railways

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V.
Railway
board to be
formed in
each
Indian
province
for conduct
of railway
business.

Advan-
tages of
adminis-
tration by
a board.

in India, the existing practice of a double controlling agency, by a representative of the company and a consulting engineer, would be most suitably replaced by a government board for the railways of each province. The tendency of present times is, indeed, to depreciate the employment of boards, and to substitute for them everywhere a single officer. And for executive business, especially where prompt action is required, no doubt a single agent is preferable. No one would propose to appoint a board for the command of an army. But the executive business of railways is conducted by the responsible heads of departments—the chief engineer, traffic manager, &c.; the business falling to the superintending office is of a different nature, and is consultative rather than executive. A board acts as a valuable preventive against the undue action of personal influence; while, provided the chairman is vested with the same power of control that is possessed by the governor of an Indian council, and consequently the same responsibility for all acts of the collective body, the objection commonly raised that a board is a screen ceases to be applicable. The members advise and criticise, but everything is done on the responsibility of the president. A still stronger argument in favour of a management by boards is to be found in the rapid changes of Indian official life. The substitution of individual officials for collective bodies in all branches of the administration, which has been a favourite policy of late years, may have imparted increased vigour to the actual disposal of business; but it has certainly been attended with a marked increase of vacillation and uncertainty in the policy which regulates affairs. No one conversant with the subject can have failed to notice how much time is lost, and needless work undertaken nowadays, as one official follows another in rapid succession to the superintendence of the different branches of Indian administration, each with his own prejudices and pet views on

the conduct of business, and bent on striking out a new line, or reversing the policy of his predecessors. A government by boards at least ensures some degree of consistency and fixity of policy.

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XX.

But the particular kind of agency to be employed for superintendence is, after all, a matter of quite secondary character. The most important part of the change, in regard to the efficiency of the control to be attained over railway affairs, is that, on the direct assumption by Government of their management, the whole of the railway officials, willing to accept the new conditions, would pass over to the service of Government. Such a change would probably be entirely palatable to that body; and on the conversion of these officers into government officials, the spirit of antagonism which—from a supposed but quite unreal opposition between the interests of the shareholders and the Government—now sometimes creates a good deal of needless friction in the course of affairs, would at once be replaced by hearty and loyal co-operation.

All railway officials to be transferred to service of Government.

The organisation of the Railway Service would naturally follow the same rules as regulate the other branches of government employ. First nominations would be made by the London railway board, specific appointments and promotions by the Indian boards and governments concerned.

Conditions of service.

The foregoing remarks refer to the railways already completed or in course of construction. These may, in the course of time, form only the smaller part of Indian railways; but they will—the greater portion of them—always continue to be the most important lines in the country, and any scheme of railway reform would be quite incomplete which did not provide for their transfer to the State, as well as for the construction of all new lines by the same agency. Fortunately, the contract with each company gives the Government the power to purchase the railway from them, after the expiration of

Existing railways to be purchased by State under terms of contracts.

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V.

Possible
objections
to proposal
considered.
1. That
railway
manage-
ment is
foreign
to duty
of Govern-
ment.

Analogy
from case
of common
roads.

twenty-five years from the date of the contract, and this time will expire in the case of some of the principal lines about four years hence. The proposed measure is therefore one which can be shortly set in operation.

It may here be useful to anticipate some possible objections to this proposal. First, there is the objection involved in the proposition often advanced—with less confidence, however, nowadays than was usual a few years ago—that the management of such undertakings is foreign to the proper duties of a State. Now, even if this proposition were true, it would plainly be inapplicable to the present case, in which the question is not whether the State should, or should not, assume certain new functions. These functions have already been assumed, for while the State is permanently charged with the fixed interest on the capital expenditure of the railways, a large and increasing part of the Indian revenues is derived from their net traffic receipts, the whole of which are paid into the public treasury, so that as far as its finances are concerned, the Government is already the virtual proprietor of all the railways in the country, and has the same immediate interest in their management as in that of all other branches of the public revenues. Even if it were not so, the assertion above referred to merely begs the question. A general proposition of that kind can only be true, if all the particular propositions which it combines are also true, which is just the very point involved. Now, in regard to common roads, it is never asserted that their construction and maintenance should be left to private enterprise. Even in a country like England, where local government has attained so great a development, the maintenance of roads is still held to be a public duty; it has been merely delegated to local trusts as a matter of administrative convenience, and is undertaken by them without view to profit. In almost every other country the construction of roads has always been regarded as a primary duty of the State. There is

no satisfactory way of rendering road-making directly remunerative, and therefore, if roads are to be made at all, it must be by means of the general taxes of the country, the taxpayers sharing generally in the benefit. And the circumstance which led to the first public railways being made by joint-stock enterprise, and to the extension of the practice to all English railways—namely, that the construction of railroads offered the prospect of a direct remuneration to the constructors—must not blind us to the fact that it is at least fairly open to question, whether it would not have been more advantageous to the country, if the English railways had been made on the same principles as ordinary roads, and paid for by the public generally, instead of merely by those using them. It is not merely the travellers on them who benefit by roads, any more than (as has been well pointed out) those only benefit by the establishment of law-courts and police who have injuries to be redressed. There is, of course, this difference between the two cases, that whereas on an ordinary road the traveller finds his own means of conveyance, the carriages on a railroad are supplied by the proprietors of it; and this condition, combined with the great reduction in the cost of transport effected by the new mode of locomotion, opened up a prospect of profit to be derived from the conveyance of goods and passengers, which has attracted an enormous capital to this kind of investment in England. The extraordinary development of railroads, brought about in consequence, may no doubt be regarded as more than a set-off for the disadvantage of placing the communications of the country in the hands of private monopolists, whose interests are often opposed to those of the travellers. But in India the chance of profit has proved an insufficient inducement for the purpose; capital will not seek this channel without an assured return; and therefore to place this new class of roads under the control of monopolists, and thus to introduce artificially

Railroads not necessarily a suitable object for private enterprise.

Advantage gained in England from employment of private agency,

not obtained in India.

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V.

the antagonism of interests inherent between the travellers and the joint-stock proprietors, is clearly an unnecessary complication. There can be no reason why, in a country like India, the railroads should be in the hands of private individuals any more than the roads; on the contrary, the much larger interests involved in the former, render it still more important than in the case of the latter, that they should be dealt with so as to afford the utmost possible accommodation to the people of the country.

Opposition
of interests
between
railway
share-
holders
and public.

As regards the burden on the State, it may be useful to point out that the construction of a railroad from borrowed money does not involve a greater charge than the construction of a road, on the present system, out of the surplus revenue. A road can be made for about 1,000*l.* a-mile—a railroad, including the rolling stock, for about 10,000*l.*, the interest on which, before a return is realised, will probably not exceed the former sum. With respect to maintenance, the repairs of the road fall wholly on the State, whereas the passengers on a railroad willingly contribute enough, in the way of fares, to maintain the road and carriages in repair, and defray the interest on the cost of construction; so that a railroad is actually a lighter permanent burden on the country than a road, while it is incomparably more beneficial. Not that a good deal may not be said in favour of making the use of railroads as free to the public as the use of common roads, or at most limiting the toll to a fare sufficient to cover merely the cost of conveyance. But there are practical advantages in relieving the public burdens by imposts with which people are familiar; and experience shows that while a toll on a common road is resented, and operates to diminish the use of the road, the people of India willingly pay a toll for the use of a railroad. Further, there would be unquestionable difficulties in the way of meeting the charge for railroads by any other mode of taxation; and therefore the customary mode of

defraying it, by an impost directly levied from the persons using the road, appears to be the most suitable arrangement. But it will probably be conceded that this mode of taxation, which is intrinsically as much open to objection as the levy of tolls on common roads, should not be carried further than the necessity of the case requires, which in the present instance involves only a return, from the use of the line, sufficient to defray the cost of maintenance, and the interest on the capital sunk in first construction. Any return beyond this, although the justifiable aim of a joint-stock company, is injurious to the general community, whose interests will be best served by offering it the greatest possible facilities for traffic at the lowest possible cost. This benefit can only be fully secured to a country the public ways of which are the property of the State.

Another objection, of a more practical kind, to the State management of railways, may possibly be urged on the ground that the amount of business involved would be more than the Government could satisfactorily undertake. And this objection might be held even by those who are of opinion that, abstractedly, government agency would be better than private agency for this class of business, as well as for the management of the posts and telegraph. But when the matter is considered, it should be apparent that, regarded with reference to the other functions of a Government, especially the Indian Government—which in addition to the duties ordinarily to be performed in other countries, is also the landlord of the soil—the mere addition of this class of affairs need not prove a very formidable item. And, in fact, the direct assumption of the management of Indian railways by the State, far from adding to its labours, ought to afford a very sensible relief, for a very considerable part of the business now arising out of this branch of affairs would entirely disappear, were the quasi-independent character of the different railway officials to be removed

Second objection, on score of additional labour imposed on Government, replied to.

Proposed change should involve a relief to, rather than a burden on, the Government;

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V.

by their transfer to the service of the State. That the railway business of the Indian Government is at present so little prominent and laborious, compared with the affairs of other departments, is not because the Government has not the same immediate interest and responsibility in it as in them, but because it is dealt with in a different fashion. The Consulting Engineer, who acts as the immediate agent of Government in railway affairs, has been entrusted with very large discretionary powers, enabling him to dispose of a variety of business, which in any other public department would have, according to usage, to be referred for the orders of Government. This is especially the case in matters relating to the creation of offices, in which the Consulting Engineer's powers of sanction are actually larger, in respect to railway officials, than are those of the Supreme Government with regard to the appointment of public servants. The circumstance that, in the one case, the nomination to appointments rests with the representatives of the railway company, does not affect the comparison; in either case the expenditure for which the sanction is given falls directly upon the State, for it is quite immaterial, so far as the final incidence of the charge is concerned, whether salaries be paid directly from the State revenues, or by a deduction from the railway traffic receipts, which form part of those revenues.

provided
the railway
board be
entrusted
with same
authority,

Here, then, lies the secret of simplicity in management.¹ Were the Government, on assuming the direct control of Indian railways, to import into the business the same mode of detailed attention which traditionary custom² has established for all its other departments of affairs—³ under which especially no authority, short of the Government itself, is competent to make other than the most subordinate appointment, or to sanction the most trifling expenditure—then, undoubtedly, a very serious additional burden would be placed upon it. But if, as has been here proposed, a railway board were established under

each Government, and were vested with the same degree of authority as is now delegated to the Consulting Engineer and the Agents of the railway companies, then the transfer would create no sensible amount of additional trouble; while a great deal of the friction which now arises, and is inseparable, from the peculiar relations at present subsisting between the railway officials and the Government, would henceforward disappear.

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XX.

as is now
possessed
by Con-
sulting
Engineer.

This peculiarity of the government management of its railway affairs, under which it has not only relieved itself of all detailed business, but has delegated to a functionary holding the modest position in the official world of a consulting engineer, far more extensive powers for admitting charges against the public revenues—for such is every item of railway working expenses, since it is so much deducted from the traffic receipts which form part of those revenues—than are possessed by any provincial government, or any but the finance department of the Supreme Government; this remarkable anomaly in Indian administration has not, I believe, been brought about designedly; indeed, it may be doubted whether the tendency of the arrangement has ever been distinctly apprehended. But it manifestly indicates the direction which might be given to the course of administrative business generally, as the affairs of the empire expand. The example therefore deserves consideration, as showing how the labours of the central Government in all departments may be brought within the capacity of one governing body to deal with, by the delegation of some part of its functions to a subordinate authority. A great step of the kind was made in the substitution, referred to in an earlier part of this work (page 149), of a government by departments for a government by the collective Council; but it may be doubted whether the division of labour might not even now be carried further, especially in the delegation of a certain degree of responsibility and authority to the secretaries of departments. These

Possible
extension
of system
of railway
manage-
ment to
other
branches
of affairs.

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Extent
of inde-
pendent
authority
possessed
by Indian
officials.

officers, as has been explained, occupy a position analogous to that of the Under-Secretaries of State in England, but they possess nothing like the same amount of discretionary power in the disposal of the business coming before them.

It is only proper to add, on the other hand, that if we pass beyond these central bureaux, where there appears to be from this cause considerable waste of administrative power, the different executive departments in India will be found to enjoy a much greater freedom of action than appears to be usual in the British service. There is nothing in that country, for example, resembling the extremely centralised system of the English War Department. In regard to expenditure, the subaltern in charge of an Indian outpost possesses a greater authority for incurring disbursements of money for the accommodation of troops, than does the general commanding the forces in any of the colonies. And generally, the Indian mode of dealing with the grants and estimates in all branches admits of great elasticity in meeting variations in the demands of the public service throughout the country. The acknowledged remarkable efficiency of the Indian commissariat is probably due, in great measure, to the degree of discretionary latitude permitted to the officers of that department in all grades; the same thing holds good throughout the various civil departments.

The subject is mentioned here, because it is frequently asserted, in Parliament and elsewhere, that the tendency of Indian administration is towards over-centralisation, and withdrawal of discretionary powers from the executive agents of the Government. These things are of course comparative, and whether the delegation of authority usual in India is carried far enough, may be matter of opinion. But compared with the state of things obtaining under most European Governments, it appears certain that the Indian system is remarkably flexible.

Combined with this latitude of action, however, is to be found an extraordinary degree of supervision, or endeavour to maintain supervision, by means of reports and returns. The extent to which this is carried in India is probably quite peculiar to that country. The Supreme Government sends a copy of every letter it receives and despatches to the Secretary of State; each provincial government, in like manner, sends monthly a copy of its correspondence to the Government of India;* they in turn obtain abstracts of the proceedings of the heads of departments under them, and so on throughout the official chain; while statistical returns and reports of all kinds are very freely demanded. This sort of supervision has probably grown up out of the peculiar circumstances of that country, where the great distances which separate the different provinces, and (until lately) the difficulties of travelling, rendered personal communication between officials unfrequent, and involved the disposal of almost all business by letter. The requirements on this head, which no doubt often press heavily on individual officers, although not therefore necessarily superfluous, may perhaps sometimes have been mistaken for centralisation of authority; but the two things are plainly quite different.

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XX.Indian
system of
reporting
proceed-
ings.Supervi-
sion a dif-
ferent
thing from
centrali-
sation.

[Note to Second Edition.] The policy advocated in the foregoing chapter has already [1870] been in great measure carried out. The Government has lately proclaimed its intention to undertake henceforward all further railway construction in India through its own agency, save in the case of such extensions of existing lines as are essentially parts of the original project. Already steps have been taken for giving effect to this determination by the commencement of several State railways in different parts of the country, to be constructed by loans raised for the purpose, while the approval expressed in most quarters of the measure marks the striking change which public opinion has undergone with regard to this important matter. It is hardly doubtful that this new policy will be pursued still further, and that the Government will in

* Only brief abstracts are supplied of unimportant letters. All these papers are furnished in print.

INDIAN POLITY.

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V.

a few years obtain possession of all the Indian railways, buying up each in turn as the time arrives when the contract empowers it to do so. There still remains to provide an administrative machinery suitable for the management of this great branch of public affairs, which shall combine executive efficiency with proper safeguards against that vacillation of policy which necessarily attaches to government by a succession of single individuals, and which is especially the bane of Indian administration. Believing that this safeguard may be found by a method such as has been here suggested, I have allowed this chapter, although now in some respects obsolete, to stand almost as it was written.]

CHAPTER XXI.

IRRIGATION.

THE importance of the results effected by artificial irrigation of the land in India; the prominence imparted to the matter by the recent famines in that country; and the greatness of the undertakings entered on by the Indian Governments for the extension of irrigation works throughout it, are sufficient reasons for devoting a chapter of this work to the subject. It may be as well, however, to premise that no detailed account will be attempted here, either of the works undertaken, or of the systems of irrigation pursued in India. For these the reader must consult the numerous reports and descriptive accounts which have been published on this head. All that the limits of the present work will allow, is briefly to indicate some of the most important and interesting conditions in which the subject is involved.

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XXI.

Limits of
subject to
be dis-
cussed.

Various modes of irrigating the soil artificially are practised in India. Leaving out the use of wells, in which case the earth itself acts as the reservoir, the most simple, as well as one of the most effective kinds of irrigation is derived from tanks. The ordinary Indian irrigating tank is formed by intercepting the drainage of the country by means of an embankment. If a gorge between two hills be selected for the place of construction, a single embankment across the lower part of the valley is sufficient for the purpose; but where, as is most commonly the case, the scene of operations is a sloping plane, the embankment must be constructed on three

Different
systems of
irrigation.

Tanks.

sides. In these tanks the depth of water is of course greatest against the lower embankment, and gradually becomes shallower towards the opposite end, till the bed rises above the level of the water. Sluices are constructed at the lower end of the tank, in the embankment, whence the water is led off and distributed among the fields below it.

For the construction of these tanks, a moderate and equable slope of the country is required. If the fall of the land be great, an excessive height of embankment becomes necessary; if it be slight, the shallowness of the tank, and consequently the extent of surface in proportion to its contents, causes great waste from evaporation, while the area of land occupied by the tank is disproportionately large.

The configuration of the coast of the Carnatic, or eastern portion of the Madras Presidency, is peculiarly favourable for tank irrigation, and the whole of this part of the peninsula is studded with these reservoirs, some of them enormous works, many miles in circumference. These were almost all constructed before the occupation of the country by the English, whose connection with them has been limited to their maintenance, and in some cases restoration. Tank irrigation is also largely practised in Bombay and Central India, as well as in Behar. But this last country has too small a surface-inclination to admit of the full development of the system, and the water from the tanks has there to be lifted into the irrigating channel, usually by manual labour.

Irrigation
from
rivers.
Different
systems in
Madras
and North-
ern India.

The other system of irrigation practised is by the diversion of river-waters. This is differently carried out in Upper and Southern India. What is generally known as the Madras system of irrigation, consists in the construction of a dam across the bed of a river to raise the level of the water, which is then diverted into side-channels, and thence distributed over the surface of the country. The irrigation system of Northern India is

also based on the damming-up of the rivers, but the conditions of the two cases are very different. In the Madras Presidency the most fertile lands are those adjacent to the coast, which form the deltas of the different rivers, and the use of the water commences in the immediate vicinity of the dam. The fall of the country is here extremely small; the regime of the river-channel has been thoroughly established, and the management of the water is easily under control. Moreover, the difference of level between the river and the country through which it flows is so slight that a very moderate height of dam suffices to lift the water into the irrigating channels. Similar physical conditions would be met with in the delta of the Ganges, and on a much larger scale; but this part of the country is comparatively independent of artificial irrigation, by reason of its usually abundant rainfall; it is in the upper course of the Ganges and its feeders that the use of their waters is wanted, where they flow through the comparatively dry country of the North-West Provinces. And here too the agricultural conditions are also very dissimilar from those in Southern India. On the Coromandel coast only one crop is raised in the year, and this is irrigated in the rainy season; so that the system of irrigation deals mainly with the rivers when they are in flood, and comparatively simple works effect the desired object. In Upper India, on the other hand, there are two harvests in the year, and the corn crop, which most requires irrigation, is grown during the cold season, when the rivers are at their lowest. The Ganges, after it issues from the Himalaya, runs in a valley which it has excavated for itself in the course of ages—five or six miles wide, and from eighty to one hundred feet below the level of the great plain which forms this part of India. The general slope of the country from the Himalaya to the sea is from a foot to eighteen inches in the mile, and this, which would be an excessive slope in a great river,

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V.

is counteracted by the tortuous course of the Ganges, which meanders from one side to the other of the valley within which it runs. To dam up the river at any part of this course, would therefore involve the construction of a weir across the whole width of this valley, as well as very extensive cuttings to convey the water into the adjacent country; and the level at which the water would strike the surface of the country could only be reached at a considerable distance lower down the course of the river than the site of the weir, so that the country adjacent to the upper part of the river's course would be unprovided with irrigation. These considerations led to a different plan of operations being undertaken. The waters of the Ganges are intercepted, at the point where the rivers issue from the lower Himalaya in a firm well-defined channel, whence they are carried to the centre or watershed line of the Doab,* down which the canal is conducted nearly to the point of junction of the Ganges and Jumna. This arrangement involves several considerable difficulties of construction, in the crossing of the numerous affluents of the supplying river, in order to reach the watershed. The great artificial river known as the Ganges Canal meets several of these, which are carried—some under, some over, and some through the canal, according as the levels of the country rendered one or the other plan most suitable. The watershed line once reached, the canals in that situation afford highly favourable conditions for effective irrigation. Distributive channels are constructed on each side at intervals of a few miles, whence the water is led to the surface of the country, and from these smaller channels convey it for distribution over the fields. The excessive slope of the country, beyond what is required for a moderately swift current—and

* Do, two; *ab*, water—a country lying between two rivers. The great plain between the Ganges and Jumna, which forms the greater part of the North-West Provinces, is known *par excellence* as *The Doab*.

for this a few inches per mile suffices—has to be overcome by numerous weirs, over which the waters of the canal are discharged. Although the work is spoken of as one canal, it consists in fact of a network of branches, which convey the water, right and left, over the surface of the Doab. Unlike a river, the canal becomes smaller instead of larger in its course; * and only sufficient water for the purpose of navigation is retained in the main channel, which finally, an attenuated stream, rejoins its parent river at Cawnpore.

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XXI.

The foregoing account is generally applicable to the principles of construction adopted for the other canals of Northern India—those, namely, from the Jumna and Ravee rivers. The problem in each case is to divert the course of the river, from the valley of its natural course to the crest of high land running parallel with it, and to make the force of gravitation take the place of mechanical agents for distribution of the water. Such a mode of irrigation is clearly only adapted for a flat country, where the high crest spoken of is in fact a very gentle undulation, only perceptible to the test of the surveyor's level.

Thus, what may be termed two schools of irrigation engineering have been formed in India, in the Madras Presidency and in Upper India, each of which has been accustomed to deal with the subject in its special way; and the discussion of the comparative merits of the two systems has of late occupied a good deal of public interest. There are some persons, indeed, who contend that what is termed the Madras system is not only the best for the localities where it has been employed, but that it is intrinsically superior to the other. Those who

Difference
in condi-
tions regu-
lating the
two sys-
tems.

* This is, however, not true of all Indian rivers. The Cuggur and Sur-suttee, which rise in the lower Himalaya, between the Ganges and Jumna, and at certain seasons are considerable streams, both disappear before the Indian desert is reached; partly taken up in irrigation, and partly absorbed by the sandy soil through which they run.

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V.

hold this view (of which Sir A. Cotton may be regarded as the principal exponent), urge that the system of head-works, by which the Ganges Canal is supplied with water, is radically defective; and that, instead of diverting the river at its upper and stony bed, a dam should have been constructed across the wide and sandy channel lower down; and, as a consequence, that all the other canals should have been constructed in the same way. Into this, which is purely a professional controversy, it is not desirable to enter here, further than to observe that a very competent committee of engineers, chosen from all branches of the profession, which was lately appointed to report on the subject, pronounced in favour of the method actually adopted, both as to convenience and expense.

Financial
results of
two sys-
tems not
compar-
able.

But the remarkable financial results claimed for the Madras system deserve a word of notice. The almost fabulous returns which the expenditure on irrigation-works in Southern India is said to have produced, being in some cases twice and threefold the original outlay, certainly appear to confer the palm of success over what has been effected in the North, where the most successful undertaking—the Jumna Canal—for many years paid only a modest five per cent. But this comparison can only be regarded as conclusive, provided the conditions are the same in each case. And a closer examination of the matter explains, in great measure, the reason for these striking differences. It may be noticed, by the way, that these Madras accounts are merely *ex parte* statements, which have not as yet been subjected to the process of independent verification. Anyone familiar with such matters is aware how easily figures and statistics of all sorts can be made to exhibit results varying at pleasure, although manipulated with perfect good faith. But, even taking the figures for granted, there is a very sufficient reason why irrigation in Madras should be exceptionally remu-

nerative. This is explained at once by the physical character of the country. The rainfall of India, generally, takes place during the prevalence of the south-west monsoon, a local trade-wind, which blows from May till September, and is occasioned by the sun's progress to the north in summer, combined with the rotatory motion of the earth. But the supply of moisture deposited upon the peninsula generally by this wind, is intercepted from the Coromandel coast by the mountain ranges to the west, and the time of the rainy season in every other part of India is a dry season there. For their supply of rain the districts on that coast are dependent on the north-east monsoon, a periodical wind occasioned by the return of the sun to the south, which blows from October till the beginning of the succeeding year; but this wind, which rises in the Bay of Bengal, is much less powerful and distinctly marked than the other Indian trade winds, which comes from the Southern Ocean, and it brings only a precarious supply of rain. This coast is therefore almost wholly dependent on artificial irrigation for good harvests. In Upper India, on the other hand—although there is seldom a season in which artificial irrigation, when available, is not made use of, and the demand is likely to become more extended and sustained as habit teaches the cultivators to insure themselves against the chances of the seasons—artificial irrigation must still be regarded as merely an auxiliary to the ordinary course of farming, and a palliative of occasional drought. In favourable seasons, good crops can be raised without its aid.

Here, then, we have a sufficient explanation for a considerable difference, at least, in the results exhibited at the two places. In the one the supply of water is only the first step—the next is to teach the people to use it. In the second region, on the other hand, the effect of artificial irrigation was, in the first instance, to convert barren tracts into cultivated; and for maintaining them

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in that state its use becomes an absolute necessity. Further, in many of the Madras works, the expenditure shown is merely the cost of restoring works originally undertaken under native dynasties; the cost in such cases has thus been merely, as it were, that of supplying a new bung, not of making a new cask. Lastly, and which alone explains the apparent inconsistency, the comparison is not made between like things. In these Madras returns, the whole increase of the land revenue in the irrigated districts has been credited to the irrigation works; whereas in the Upper Provinces, the only item shown as revenue has been the rate realised by the Irrigation Department for the sale of water. All comparison between the two accounts is therefore obviously impossible; but, as explained above, it is reasonable to suppose that the works in Southern India are the most remunerative, because the need for them is there more pressing, while the physical conditions of the territory are also more favourable there for economical construction. If, however, the aggregate benefit conferred by each class of works be regarded, irrespective of the interest on capital, it may be observed that the works in Northern India operate on a larger extent of territory, and which is more populous, opulent, and politically important than the irrigated districts of Southern India. Setting comparisons aside, it may be said that each class is of inestimable importance to the country.

Joint-stock enterprise in connection with irrigation.

The large profits ascribed to the Madras irrigation works not unnaturally attracted the promoters of joint-stock enterprise to the field, and two companies have, at different times, been formed for irrigation projects. The first of these, termed the Madras Irrigation Company, was formed under a guarantee of five per cent. interest from the State, on a capital of one million sterling, which was estimated to be the cost of the project undertaken—a canal from the River Toombuddra, in the Bellary district of the Madras Presidency. The capital has been spent

long before the works are completed; and in order to enable the company to carry out its design, the further aid of Government has been given by an advance to it of 600,000*l*. In the present state of the works of this company, it is not possible to say what are the precise prospects of realising a return from the outlay, but the additional capital is almost spent, and there are no tidings of the works being completed. The second company, styled the East India Irrigation Company, was formed, without a guarantee, for undertaking irrigation works from the River Mahanuddee, in Orissa. The capital raised of one million sterling sufficed only to complete a part of the projected works. No more could be obtained, while only the most insignificant returns were realised from the outlay;* and the affair was at the point of collapse when the Government came to the rescue of the shareholders, and purchased the undertaking from them.

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So much for the application of joint-stock enterprise to irrigation works. After this experiment it may be safely predicted that no more capital will be applied in this direction, unless the State assumes the entire risk, as it has done in the case of the Madras Irrigation Company, and every reason that can be alleged against the guarantee system, for the construction of Indian railways, is equally applicable to the case of irrigation works, while there appear to be grave additional objections to its employment in the latter case. The management of a railway, when completed, can at any rate be efficiently conducted by a private company, although it might be conducted much better directly by the Government. But the agency of a company cannot be safely employed for the distribution of water from irrigation works. It is admitted, even by the advocates of joint-stock agency for the purpose, that the power of withholding a commodity, which, when once made use of, becomes an absolute necessary to the

* The gross revenue in 1868-69 was 543*l*., considerably less than the cost of the establishment employed in collecting it.

people, is too delicate and dangerous a weapon to be placed in the hands of a body which is avowedly noways directly interested in the affairs of the country, but whose object is distinctly to get the largest possible return for its capital—that is, the highest possible price for the water supplied. Anyone familiar with the extortion sometimes attempted to be practised by the subordinates attached to the government irrigation works, although carefully watched, and although the water-rate is fixed intentionally at a very low figure, will readily understand how great an engine of oppression might be framed out of the management of such a concern. It was accordingly provided, in the case of the Orissa Company, that on the construction of the works being completed, the duties of the company's officers should be confined to the maintenance of the works, and that the distribution of the water should be undertaken by Government. The company, in fact, was to sell the water to the Government, and the Government to sell it to the cultivators.

When we consider that all this complication, with all the laborious negotiations that have arisen with the company, extending from first to last over several years, involving great delay in the commencement of work, and ending in an arrangement by which the Government accepts an expenditure over which it has had no control; that all this had for its object to save the Government from the responsibility of raising and spending directly one million sterling,—a sum, that is, less than what it disburses every month on its army,—the aspect of the whole affair is little short of ludicrous. The experiment, however, has not been without its use, as showing the utter inapplicability of private enterprise to undertakings of this class. It may be hoped that there is now an end of the coquetting with projectors, which has hitherto in some quarters taken the place of the political courage required to look the wants of the country fairly in the face, and to undertake their supply in a systematic and

definitive manner, in the only way that the task can be satisfactorily accomplished.

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But if any further argument were wanted on this head, it is to be found in the simple fact that irrigation works, although highly profitable to the Government, do not afford a reasonable prospect of profit to the shareholders. The latter of course look to obtaining a direct return on their capital only in the shape of water-rate, and a large profit in this form no works that remain to be undertaken are likely to give. The enormous profits ascribed to the Government works in Madras, if accurately stated, may seem to contradict this view, but then the most favourable ground has already been taken up. These returns have been obtained by utilising the waters of the deltas on the east coast—of the Godavery, the Kistna, and the Cauvery, countries where the water was most urgently needed, and where it could be supplied at an exceptionally moderate cost. No more such deltas remain to be operated on. Again, in Upper India, the great rivers Jumna and Ganges have already been taken up. And here, where accurate statistical information is available, the results are not promising for projectors. The canal on the east bank of the Jumna, which is financially the most successful of all, now yields a return of nearly nineteen per cent., but this is after it has been in work for nearly thirty years. The Ganges Canal, first opened in 1854, was worked for many years at a loss; the highest return reached in any year has been $7\frac{1}{4}$ per cent., but this was in a season of excessive drought. A considerable increase in the return may be looked for eventually, as irrigation finally extends, and the whole available supply of water furnished by the canal is purchased by the cultivators. But their thrifty habits are opposed to any sudden increase of outlay in their farming, and become only slowly adapted to the use of artificial irrigation; this final development must therefore be a matter of years (at present the water is doing but half its

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works not
a remun-
erative in-
vestment
for private
capital.

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full duty); and in the meantime the undertaking, as a commercial venture, would clearly be a failure. And if this unreadiness to make use of irrigation is manifested by the cultivators of a dry country like Upper India, where the rainfall is as often as not insufficient to produce a good harvest, much more is it likely to be exhibited in more favoured regions. The Orissa Company very soon made the discovery, that it is one thing to supply water and another to sell it; and it was one of the apologies put forward in the last report of the directors for the failure of their programme, that the cultivators would not purchase the water already made available, an apology coupled with the naive proposal, that since the Government was to act as the distributing agent, or middleman, between the company and the cultivators, it should at any rate buy the water from the former, whether or not it could find a sale for the article in turn.

It may, however, be replied by the advocates for applying the joint-stock system to this kind of enterprise, that the precedents afforded by the Government works are not conclusive; for that in the first place the Government, besides that it derives its profit indirectly by increased land-rent as well as by water-rate, in those provinces where the assessment of the land-revenue has not been established in perpetuity, has fixed that rate at a needlessly low figure; that a company might charge higher rates without imposing an undue burden on the buyers; and, secondly, it may be objected that the Government works are not of the most economical class—that the same results might have been produced with smaller outlay.

As to the first point, it is certainly the case that the Government has never put on the water the highest price it could bear. On the first introduction of irrigation into Upper India, the principle was indeed distinctly enunciated, that the Government did not look to a direct profit for its outlay, but only to the indirect one

arising out of the general improvement of the country, and the security afforded for the punctual realisation of the land-revenue; and in that view the water-rate was fixed at the lowest figure sufficient to prevent a waste in consumption. Within the last few years the price has been raised; but even now the average charge on the Ganges Canal amounts to only four shillings and sixpence the acre for a season's irrigation, and forms but a small item in the cost of cultivation. The indirect profit, arising from the increased land-revenue, is not available in the parts of India subject to the perpetual settlement. But even assuming that the maximum average return were obtained from the irrigation, including both water-rate and increased land-revenue—which maximum the Chief Engineer of Irrigation Works, North-west Provinces, assumed, in a late report, would amount to eight shillings an acre,—the Ganges Canal would now (according to the same authority) be returning for the first time a dividend of about ten per cent. on the capital sunk, twenty years after the works were first begun. Clearly this would not have been a profitable commercial speculation.

As to the other point—the professional question regarding the best mode of constructing irrigation works, the data for comparison are at present wanting. The cost of the Ganges and the other great canals in Upper India is known, but the cost of the works of the Madras and Orissa companies is not known, since only a part of either project has yet been completed. All that is known for certain about them is, that the original estimates will be largely exceeded. One element for partial comparison is however available. The cost of the works undertaken by the Madras Irrigation Company is estimated at 5*l.* per acre irrigated, while the Ganges Canal has cost less than 4*l.* per acre on the area actually under irrigation. From this point of view, then, there is not much room whereon to base sanguine expectations of profit. But, however that may be, there is one fact to be borne in mind as very

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material to the point. There is no possibility of ever again executing a great irrigation project at anything like the same cheap rate as the Ganges Canal, because, not only was that work as remarkable for the economy with which it was carried out as for the excellence of the workmanship, but it was constructed before the recent great rise of prices. It is not too much to say, that if the work had to be done over again, even under the same skilful and careful engineer, it would cost at least twice as much as the actual outlay has been. The irrigation works already constructed start, in fact, with the enormous financial advantage of having been carried out in the days of low prices, an advantage not likely to be again available.

But highly remunerative as Government undertakings.

So much for joint-stock enterprise in connection with Indian irrigation. From whichever way the matter is regarded, the probability of commercial success in connection with these undertakings appears but small. But when the matter is viewed in connection with the State, it bears a very different aspect. Besides that the Government should be able to reap a direct return from these works even greater than any private company could do—since it commands, from its position, the means of conducting such affairs more economically and under completer supervision—there is the enormous indirect benefit to be derived in the improved condition of the country, which necessarily follows from improved agriculture. But these are the smallest of the objects to be derived. That poor crops should be replaced by rich ones, or rather that a succession of good crops should be secured, independently of variations in the seasons, is, no doubt, a highly important result. But the surpassing value of irrigation in India is to be found in the insurance it effects against the horrors of famine. Twice within the last thirty years have the rains failed in the plains of the Upper Ganges. For the last seven years Western India has suffered under the calamity of successive deficient harvests, producing an

And necessary as a preventive against famine.

enormous rise of prices, which would, with a less frugal race, have caused extreme distress. The great famine of 1866, although experienced in greatest intensity in Orissa, extended, with more or less severity, from the Ganges to the extreme south of the peninsula, and the sufferings which it created must have been undergone by from fifty to sixty millions of persons. In 1869 a large part of India was again afflicted with extreme drought, producing in many extensive regions all the miseries of famine, and involving a large public outlay to keep the starving poor alive. It is to prevent, or at any rate to alleviate, the effects of these awful calamities, that irrigation works are needed in India. Even as an insurance against the direct loss of land-revenue, which must necessarily be foregone when the people have no crops to sell, such works are at once extraordinarily remunerative to the State. The famine of 1837-8 involved a direct loss of half-a-million sterling on this head; the Ganges Canal is estimated to have prevented at least as much during the famine of 1861. Yet the direct saving in land-revenue is obviously only a part of the saving which thus accrues. A great calamity of this kind cannot fall on a country without paralysing the whole course of trade and business, and the effect must necessarily make itself felt in every branch of the national revenue. The loss of public revenue, again, is but small compared with the destruction of national wealth resulting; and this it must be the duty of the Government, as representing the interests of the general community, so far as possible to prevent. And, after all, the loss of wealth, whether public or private, is surely but the lowest ground on which to base the argument for active measures. The prevention of the miseries of famine should alone be a sufficient, as it ought to be the leading motive to action. It is not as if the affair were a speculative one, and that the question were one of possible calamities and doubtful remedies. Droughts have occurred in India so frequently, that their recurrence

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before long, in some part or other of the country, is reasonably to be expected; and famine, as the certain effect of drought, can be prevented by irrigation. Here, then, is clearly one of the most important duties that can be placed before the government of any State. The task is one that only the Government can undertake; for it is not merely to carry out projects which promise to be remunerative in the ordinary sense of the word—it is to extend irrigation, wheresoever irrigation may be possible, throughout the country. Till that is done, and the danger of famine has been guarded against to the fullest possible extent, the English in India may replace anarchy by peace, and may distribute equal justice, and remove ignorance; but it cannot be said that they have fulfilled their whole duty by the people of the country.

Urgency of
demand for
extension
of irriga-
tion in
India.

So great and urgent is the need of pressing on irrigation works, in view of the successive droughts with which the country has been visited, that almost any mode of conducting the work would be preferable to standing still; and from this point of view, joint-stock companies, with all the defects inherent in that mode of agency, should be gladly welcomed and encouraged. But it may be hoped that the principle has now become distinctly recognised, that this is a duty which can best, and ought to be, undertaken by the State; and that the hesitation which formerly marked the policy of the Indian Government in this vital matter has now been finally shaken off. In the early history of the subject, this indecision of opinion and action is indeed very apparent. In Madras the great irrigation works, although enormously beneficial, and beyond doubt directly remunerative, have been pursued during the last thirty years in at best an intermittent fashion, at no time with a vigour commensurate with their surpassing importance. Two canals on the right and left banks of the Jumna, undertaken thirty years ago, were partial restorations of an old Mahomedan work. The Ganges Canal was commenced under the influence of the feelings

excited by the great famine of 1838; but progress was suspended during Lord Ellenborough's administration, and was not resumed until 1847. On the annexation of the Punjab, another great canal was commenced from the Ravee, to irrigate the Baree Doab, or country between that river and the Beas, in which are situated the great cities of Lahore and Umritsur. But a distinctly pronounced policy for the general extension of irrigation works, wherever and however feasible, was not developed till after the assumption of the government of India by the Crown, nor indeed was anything like the present rate of expenditure compatible with the comparatively small financial resources of those days. The events of the mutiny naturally distracted attention to a certain extent from the subject of irrigation, and for a time greater importance was attached to the extension of communications. The famine of 1861, in the North-west Provinces, drew attention back to the subject, and showed both how much had been done towards the mitigation of the calamity, and how much still remained to be done, to perfect the natural means of irrigation available. Since that event some time has, unfortunately, been lost in discussion, as to the best machinery for carrying out the needful works; and one great project, elaborately matured and ready to be undertaken—the irrigation of Behar—has been deferred from year to year, on account of negotiations pending with a joint-stock company, which obtained a concession for the work, but has been unable to raise the needful capital. Upon this state of affairs supervened the famine of 1866; but the Home Government has lately sanctioned the proposal of the Government of India, to carry out by state agency all needful irrigation works throughout the country; and the business has now been entered upon on a scale of operations adequate to the object in view. The different provincial governments have been informed that funds will be supplied to the required extent for every approved project

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Policy
enunciated
by Govern-
ment on
this head.

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matured under their orders ; and it may be said that progress is now only limited by the capacity of the engineering staff (which has been largely augmented), in designing and superintendence of the works to be undertaken. The grant provided during the current year for the purpose is about $2\frac{1}{4}$ millions, and the expenditure is likely to go on increasing for some years as the works advance.

Magnitude
of schemes
proposed
for deve-
lopment of
irrigation.

This great scheme, which is no less than the systematic irrigation of India—and which, if progress be maintained at the present rate, will, in the next quarter of a century, completely alter the aspect and circumstances of that country—has been entered on simultaneously with the undertaking of a large extension of railways, while arrangements are being matured for providing the means of effecting a proportionate development of common roads from provincial resources. The Indian Government has in fact entered on a policy for improving and fertilising the country on a scale of extraordinary magnitude, which is only exceeded in extent by the wants to be supplied, and which will require a great and sustained effort to bring to a satisfactory conclusion. The establishment of this vigorous policy, directed to the fulfilment of an object of surpassing importance, constitutes a marked epoch in the history of British India.*

Outline of
proposed
operations;

It may be useful to indicate here, very briefly, the nature of the works which it is proposed to undertake, in furtherance of the general plan.

in South-
ern India;

The western part of the Madras Presidency may be regarded as safe from any liability to drought. This

I cannot forbear from alluding here to the leading part taken in the introduction of this great measure by Colonel Strachey. An immense deal had previously been written and said about irrigation, but he was the first to point out distinctly the nature and extent of the obligations involved in the development of a complete system of irrigation for India ; while the force and ability with which his views were advocated, may fairly be ascribed in great part the readiness with which they were adopted by the Home and Indian Governments. But this is only one of the many obligations due by India to this distinguished man.

country receives the full force of the south-west monsoon, and always obtains an abundant supply of rain. It is on the east coast that precautions are most necessary, for the reasons already explained. The great rivers here have already been operated on, and their waters placed under contribution by the construction of dams; but a good deal has yet to be done towards the complete development of the subsidiary works. There remain the smaller rivers and the affluents of the larger ones, from which a considerable irrigation is to be obtained at some distance from the coast. In the case of the numerous tanks which are fed from the surface-drainage, or from the smaller streams which rise on the east of the backbone of mountains running through the peninsula, a failure of the periodical rains (which, as has been explained, depend on the north-east monsoon, and fall during the winter months) will also produce a partial failure of these works. And although, therefore, they are still very important, as utilising to the utmost the supply of water available in times of scarcity, the relief they afford on such occasions will be but small, compared with the effect of the great works on the Godavery, Kistna, and Cauvery, which take their rise in the Western Ghats, and are fed by a different rain-system. These rivers will be full, even when the rains fail in the country through which they pass.

Irrigation in the territories under the Government of Bombay presents quite different conditions. Here there are no deltas, but the waters of the different rivers have to be intercepted before they quit the table-land of Western India; while, from the broken character of the country, the irrigation schemes to be undertaken necessarily assume a great diversity of form. Many parts of the country are favourable for storage of the superfluous waters of the rainy season, by the formation of reservoirs, and some extensive projects of this kind are under preparation. In no part of India is irrigation

in Bom-
bay;

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in Central
India;

likely to be more valuable. The conditions of Central India are very similar. The surface of the country is too irregular to admit of the construction of long lines of canal, like those in the North, nor are there great level areas to be inundated, like the deltas on the Coromandel coast; but many parts of the country admit of the formation of reservoirs, while the water available during the rainy season, if stored up in this way, will afford means for a very large development of irrigation. The great variety of the physical features of this part of India renders the prosecution of irrigation works here peculiarly interesting to the engineer.

in North-
ern India;

In Northern India the waters of the Ganges and the Jumna have already been partially diverted into the large canals referred to in the earlier part of this chapter. Another great canal has lately been commenced for irrigating the right bank of the Jumna between Delhi and Agra, to be supplied by means of a dam across the river near the former city. A second great canal has also been projected from the Ganges, to be taken off from the river near Allyghur, which will supply an extensive irrigation as far as Allahabad. In the Punjab the only river yet operated upon is the Ravee, the canal from which was undertaken on the annexation of the country, and has been in use for some years. A large work has lately been begun for the utilisation of the waters of the Sutlej, and a project is under preparation for another canal to take off the waters of the Beas below its junction with the former river near Ferozepoor. There still remain three great rivers in the Punjab—the Indus, the Jhelum, and the Chenab—which may prove on examination to be similarly available for the construction of first-class canals. The needful detailed surveys have still to be made in these cases, but, should these investigations prove that the diversion of their waters is practicable, the whole Punjab may be converted into a magnified Lombardy. The peculiar value of all these rivers, as the basis of irrigation

projects, is that they have their source in the glaciers of the Himalaya: thus their supply is quite independent of local causes, and their waters increase at the hottest season of the year, when other sources fail.

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Another country which presents remarkable facilities for irrigation is Oudh, with the adjacent parts of the North-west Provinces, which is watered by the Gogra—a tributary of the Ganges larger than the parent stream—and several other fine rivers, and a great project for the purpose is now on the point of being undertaken. As a commercial speculation, irrigation may not prove very profitable in this part of India, where the climate is usually very favourable for agriculture, and drought is almost unknown. But even in this favoured land the certainty of artificial irrigation would probably in time obtain due appreciation; nor can it be predicted on what part of India the next great drought will fall.*

A variety of minor schemes have been, or are about to be, undertaken in Upper India, which need not be detailed here, for utilising small streams. Few of these have so far proved directly remunerative, but the indirect benefit conferred by them on the country is out of all proportion to their cost. There remains to consider Bengal. Of this country rice is the staple food, and ordinarily the rainfall is abundant. But just in proportion to the general prosperity must be the magnitude of the calamity, should a failure of the rains occur in so densely-populated a country, all dependent on one description of food, gathered in at one season of the year. Accordingly, the Bengal famine of 1770 appears to have exceeded in intensity all visitations of the kind known in India. The distress during 1866 in some parts of Bengal was also very great, although overshadowed by the events in Orissa. As a means of averting the recurrence of such a calamity, the construction of a dam

* Note to 2nd Edition.—Oudh was afflicted with a severe drought in 1860, the year after this was written.

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across the Ganges has been proposed, somewhere about Rajmahal, before the river turns in its course from the east to the south. By this means a portion of the floodwaters of that stream, here several miles wide, could be diverted over the country between it and the sea to the south. The work would be one of great magnitude and cost, involving the construction of an enormous weir several miles in length; but there appears to be nothing impracticable about the scheme. It would, however, probably turn out to be almost wholly unremunerative, since in most years artificial irrigation is not the least required in this country, and the undertaking will in all likelihood be at any rate deferred until those tracts have been ensured against the miseries of drought, where experience shows that calamity is likely to be of frequent occurrence. At any rate the scheme does not press for immediate attention, since the projects already undertaken in Bengal will afford abundant employment for a large engineering staff for some years. Of these the principal are the completion of the works in Orissa lately purchased from the East India Irrigation Company, which were taken over in a very unfinished state, and a great system of irrigation to be carried out in Behar from the River Soane. There are also some other considerable designs in course of being matured.

Such, briefly stated, are the plans which the Government of India has proposed to itself, to secure the agricultural well-being of the country. The scheme will involve a continued persistent effort, prolonged over many years, to bring it to a successful completion, and it is to be hoped that no untimely event or injudicious change of policy may occur to stop or retard the progress of the work. There remains only to notice the financial bearing of the measure, and the arrangements contemplated for meeting the great outlay to which the Government is committed. It has been explained that the funds for constructing these works are henceforward to be raised

by special loans, and it will be apparent from the experience furnished by former works of this kind, that the outlay, although highly remunerative indirectly, is not likely to give a direct return sufficient to cover the interest on the capital borrowed, at any rate for many years after the outlay takes place. During this time there will rest a large and increasing burden on the revenues of the country, unless some arrangement be provided for removing it. Experience shows also that the water-rate must be fixed at a very moderate amount if the irrigation from a new work is to be rapidly developed, while there would be grave objection to substituting a forced water-rate on the cultivators, in lieu of the present voluntary system, under which the former buys the water only when he wants it. So far therefore as regards the tenant, the means of obtaining increased returns are not available, or, at any rate, are not expedient, but it is now proposed to assess the proprietor of irrigated lands for benefits which he receives without at present contributing any return. In the districts where the demand for the land-revenue has been settled in perpetuity, and these include the whole of Bengal proper, the landlord contributes nothing towards the improvement effected by irrigation in the value of his estate; in other parts he pays nothing until his settlement expires, which may have as much as thirty years to run; meanwhile the whole charge is defrayed by the tenant who buys the water, and the general community which contributes the taxes. To remove this anomaly a Bill has lately been introduced by Colonel Strachey into the Legislative Council of the Governor-General, which provides among other things for the assessment of a rate on the proprietors of irrigated* lands, sufficient to make up any deficiency between the interest on the capital sunk on the work and the nett

* The bill says 'irrigable' lands, but the definition will certainly be limited in committee to lands which actually derive benefit from irrigation, to the exclusion of such as are merely capable of doing so.

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Value of
roads and
railroads
as preven-
tives of
famine.

return from sale of the water. Certain limitations will apparently be needed in this measure, and will, no doubt, be provided, to prevent any possible abuse of the powers conferred by it; but, on the measure being passed, the financial difficulty in the way of prosecuting irrigation works will practically be removed, as well as the objection that the whole community has to be taxed for the benefit of a portion.

In conclusion, it needs hardly be said that, in furtherance of the object for which these undertakings are proposed, roads and railways go hand-in-hand with irrigation works. The one diminishes the ill effects of drought—the other mitigates the evil, by distributing the scarcity over a larger surface. Wherever roads and railways have penetrated, there the worst forms of famine have now become impossible. It was from the want of these that the famine was experienced in such intensity in Orissa. Happily, the number of such isolated districts is yearly diminishing, and, where good roads or railways exist, it will always be possible for the Government at least to keep the people alive. Scarcity will be substituted for famine, and the calamity will be partly shared by the more prosperous districts, in the form of a rise of prices. The excellent roads intersecting the North-west Provinces, and the railway then partially completed, quite as much as the Ganges Canal, rendered it possible, in 1861, to avert from their population the worst forms of famine.

BOOK VI.

FINANCE.

CHAPTER XXII.

TAXATION.

It will be proper to explain, at the outset of this chapter, that its object is not to present a complete view of the subject of Indian taxation. To attempt this, especially as regards the various taxes which have been long established, would require much more space than can be here allotted to it. All that will be now attempted is to offer a few considerations on the general subject, more particularly with regard to that branch of it which has principally engaged the attention of Indian financiers during late years—namely, the imposition of new taxes. Those who have had charge of the Indian finances since they became the recognised business of a responsible minister, have not interfered in any considerable degree with the system of taxation they found established. The principal items of revenue up to 1859 were derived from the land-tax, which furnished a larger sum than all the other receipts put together; from salt; and from the monopoly of opium. The development which the first item has exhibited of late years, has been due, not to any financial manipulation which it has undergone, but simply to the general increase of the wealth and population throughout the country. The collection of the land-

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revenue is indeed much more than a matter of mere finance, being intimately connected with the first principles of Indian administration. The salt-tax, the only one necessarily borne by the poorest classes, does not admit practically of much enhancement. The return from opium depends on the state of the demand for that article in China, and is a matter beyond the control of the Indian authorities. The attention of the latter has then been principally directed to obtaining an increased revenue from other and new sources; and it will be interesting to inquire here what has been the result of the measures taken in this view.

Financial
crisis of
1859.

The new era in Indian finance, which is especially marked by the first introduction of direct taxation, may be considered to date from 1859. Up to that time, Indian taxation had assumed a stereotyped form; the general expansion of the revenue in its long-established channels, which took place from year to year, had been found to provide sufficiently for the growing wants of the empire, and no necessity had arisen for seeking out new modes of increasing it. But in 1859 there occurred what was deemed to be a financial crisis. Two years had then passed without any abatement of the high rate of war expenditure occasioned by the mutiny; military operations were still in progress; the army, instead of being reduced, was still in course of augmentation, as fresh reinforcements of European troops continued to arrive; while the resources of the Government immediately available in the first instance had become exhausted. How far the general impression of the intensity of this crisis was justified by the facts, will be considered presently; but it is at least certain that sufficient provision had not been made to supply the necessary ways and means for carrying on the business of government, and that a great temporary embarrassment was experienced in consequence.

New taxes
and in-

Under these circumstances, two measures for increasing the revenue were hastily brought before the Legislative

Council by the Government: a graduated licence tax on trades and professions (which, however, never passed into law), and a large increase of the customs duties. The import duties were raised from 5 per cent. *ad valorem*, which almost all classes of goods had hitherto borne, to 20 per cent. on some, and 10 per cent. on others, cotton-piece-goods being included in the latter class, while the duty on cotton-yarn was raised from $3\frac{1}{2}$ to 5 per cent. A very high duty was placed on wines and spirits, and an export duty of 3 per cent. was also imposed on the principal classes of Indian products. At the same time, Her Majesty's Government took the opportunity of the occurrence of a vacancy in the Supreme Council, to appoint the late Mr. James Wilson, the well-known Secretary to the English Treasury, to the post which had hitherto been filled by an English lawyer, with the distinct charge of the financial business of the Indian Government.

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crease of
customs
duties
proposed
in con-
sequence.

Appoint-
ment of
Mr. Wil-
son.

Mr. Wilson assumed charge of this office at the latter end of 1859, and made his first (and only) financial statement at a meeting of the Legislative Council in the following February. His financial measures were of two kinds. First, the tariff established in the previous year underwent considerable alteration. The 20 per cent. duty, as might have been expected, had caused a considerable falling-off in the imports of the articles subject to it, and was accordingly reduced to 10 per cent. At the same time, the duty on cotton yarn, which had been treated exceptionally in 1859, was raised to the latter rate, so that the Indian tariff, generally, was thus brought to a uniform scale of 10 per cent. A few trifling articles continued to be excepted altogether from duty, while the high rate was maintained on wines, beer, and spirits, and the duty on tobacco was largely increased. At the same time, the export duties levied in the preceding year on wool, hides, hemp, jute, flax, and tea were taken off, on the ground that they interfered with the industry of the country. An export duty was, however, levied on salt-

His finan-
cial mea-
sures.
Alteration
of customs
duties.

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and licence
tax.

petre, it being alleged that, as this article was a monopoly of Indian trade, the tax would fall on the consumer only, and would not interfere with the manufacturer.

The other principal measure carried out by Mr. Wilson was the imposition of an income-tax. This was fixed at 2 per cent. (or about $4\frac{1}{4}d.$ in the pound) on all incomes between 20*l.* and 50*l.*, and of 4 per cent. (or about $9\frac{1}{2}d.$ in the pound) on incomes above 50*l.* In addition to this, Mr. Wilson proposed a licence tax of 2*s.** per head on the working classes, 8*s.* on retail dealers, and 1*l.* on wholesale traders and members of professions. The Bill embodying these provisions was not however carried through the Council during that session.

Extension
of stamp-
duties.

Later in the year the stamp-duties underwent considerable alterations and additions, and their employment was extended to bills of exchange and receipts for money.

Mr. Laing
succeeds
Mr. Wil-
son.

Mr. Wilson's untimely death occurred in the autumn of 1860, and Mr. Laing, who had succeeded him at the English Treasury, was appointed in his place. The first year of Mr. Laing's tenure of office was not marked by any financial changes, but in 1862 a considerable step was made towards a return to the old Indian tariff. The duty on piece-goods and yarn—which, being levied wholly on British manufactures, was stated by Mr. Laing to be not so much a customs as a transit duty between two parts of the British Empire—was lowered to the old rates of 5 and $3\frac{1}{2}$ per cent. respectively. The duty imposed by Mr. Wilson on tobacco, which was nearly 100 per cent. on the value of ordinary kinds, and had almost extinguished the foreign trade in that article, was reduced to 20 per cent. *ad valorem*. The duties on beer and wines—which, under Mr. Wilson's tariff, were as high on many kinds as 50 per cent.—were reduced one-half, except for the higher classes of wine.

Abolition
of two per
cent. in-
come-tax.

With regard to the income-tax, it was found that while the 2 per cent. duty on incomes under 50*l.* produced only 350,000*l.* per annum, the cost of collection

amounted to nearly 30 per cent. of the receipts; this part of the tax was therefore wholly rescinded.

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A bill for a licence-tax was also brought forward by Mr. Laing, but based on a somewhat different principle from that framed by his predecessor: the tax was to be levied only from the classes not liable to pay income-tax, who were to be assessed in three grades, at one, two, and three rupees respectively, this last sum being the highest demandable from any person. But the Act embodying these provisions was, for political reasons, suspended shortly after it became law, and before it had been carried into operation.

Proposed
licence-
tax.

Sir Charles Trevelyan succeeded Mr. Laing in the latter end of 1862, and held office for three years, during which time the following financial changes were carried out.

Appoint-
ment of Sir
C. E. Tre-
velyan.

In 1863 the duty on iron was reduced from 10 to 1 per cent.; that on ale was lowered from 2 to 1 anna ($1\frac{1}{2}d.$) per gallon, at which it now stands; and a uniform rate of one rupee a gallon replaced Mr. Laing's discriminating rates on wine. The income-tax was lowered from 4 to 3 per cent.

Further
reduction
of import
duties.

In 1864 the general tariff underwent a reduction from 10 to $7\frac{1}{2}$ per cent., and the duty on tobacco from 20 to 10 per cent. *ad valorem*. The export duty on saltpetre, imposed by Mr. Wilson, which had been found to interfere seriously with the trade in that commodity, was also reduced one-half.

Income-
tax re-
duced.
Import
duties
again
lowered.

In 1865 the income-tax, which had been imposed only for a term of five years, expired, and was not renewed. The export duties on jute, wool, hides, silk, tea, and coffee, which had been imposed in 1859, and taken off by Mr. Wilson, were re-established in this year by Sir C. Trevelyan; but the measure was disallowed by the Home Government, and was immediately cancelled.

Termina-
tion of in-
come-tax.
Proposed
export
duties.

Mr. Massey became Financial Member of the Indian Government in 1865. The following year is noticeable;

Appoint-
ment of
Mr. Mas-
sey.

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reduction
of duty on
saltpetre.Licence-
tax esta-
blished.Modifica-
tions made
in it.Increase
of duty
from law-
stamps.

from the present point of view, for a further reduction of the export duty of saltpetre to the old rate of three per cent. *ad valorem*, in the hope of recovering the now languishing trade in that article. But Mr. Massey's financial administration was principally marked by the imposition of a licence-tax, introduced in 1867. This measure had, however, no resemblance to those proposed by Messrs. Wilson and Laing. The latter were designed to reach the classes not liable to the operation of the income-tax; Mr. Massey's measure, on the other hand, excluded all persons on incomes of less than 20*l.*, and the impost in fact was a sort of graduated income-tax, the lowest contribution being 8*s.* and the highest 20*l.* It was estimated to increase the general revenues of the country by about one per cent., but the actual receipts were somewhat larger. In the following year the tax was taken off all incomes below 50*l.*, and the claim on the richer classes was increased, so that it ceased to bear any resemblance save in name to a licence-tax, and became simply one on incomes.

During the year 1867 the stamp-duties on law proceedings were considerably raised, mainly in view to applying the proceeds towards increasing the salaries of the native judiciary. This measure has been opposed, on the ground that a tax on justice is objectionable. But this objection—which is based on the well-known argument, that those derive most benefit from the institution of law-courts who have least occasion to resort to them, since the necessity for having recourse to the law is evidence of a failure of the law—is not so applicable to India as to Europe. In England a person bringing an action against another, has presumably a grievance to be redressed. In India, on the other hand, the records of the courts show that the majority of suits, filed are founded on unreasonable claims. Practically, the only limit on the business imposed on the courts by the litigious people of that country is that created by the expense of the law; and were the courts made free of

cost, the whole judicial system would break down, from the stress of work brought on it. It is considered however that the duties have been fixed too high, and an Act for amending and reducing the rates has recently been passed.

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In 1868 Mr. Massey was succeeded by Sir Richard Temple, an Indian civilian. In this year the licence-tax was replaced by a certificate-tax, which in turn was succeeded in 1869 by an income-tax of one per cent.; this however was raised in the course of the year to two per cent., at which rate it now stands.* The salt-duties also were slightly increased under the pressure of a suddenly discovered deficit.

Sir R.
Temple:
Licence-
tax abo-
lished.
Income-
tax re-in-
troduced.

This completes the history of the financial measures of the last ten years. It will be seen that their course has been towards a gradual abatement of the excessive export and import duties levied in 1859, the final result being that the system now in force is almost exactly what it was before the mutiny, the only important difference being that the import duties stand at $7\frac{1}{2}$ instead of 5 per cent., and that an income-tax is levied on the wealthier part of the community. The great increase of revenue which has occurred during this time has been due almost entirely to causes independent of the fiscal measures pursued.

General
result;
abandon-
ment of
new taxes,
and return
to status
of 1858.

This statement of the case, which shows that the financial administration of India under five successive ministers has been marked by no originality of treatment, although the situation was eminently calculated to invite it, might be deemed sufficient evidence of the difficulty which in India besets any departure from the beaten track. The efforts to raise fresh taxes, under conditions which were deemed of such urgency as to require the utmost practicable enhancement of the public burdens, having resulted in the imposition of duties which proved so destructive of commerce that they had almost immediately to be remitted, and of an income-tax which affects

Difficulty
of increas-
ing Indian
taxation.

* It has just [April 1870] been raised still further to a rate of $7\frac{1}{4}$ d. in the pound.

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only the small minority and produces therefore only no very considerable return : such having been the only measures considered practicable, the difficulty of increasing the Indian revenues from new sources has thus received a practical demonstration.

This might be overcome by a new method of provincial finance.

There appears, however, to be good reason for thinking, that the difficulty which overlies the subject may possibly be due more to the restrictions with which it has been bound up than to any natural incapacity in the country for furnishing new sources of revenue. In a former part of this work* the opinion has been advanced, that the complications and political dangers which attend the levy of any new taxes that may be devised, arise mainly from the attempt, which has hitherto always been made on these occasions, to apply them to the whole of India. When this condition is attached to the measure, every new impost is discovered to be attended with special difficulties, because, whatever be its nature, there will be found some part of the country to which it is inapplicable. If this view be correct, then it would appear that, in order to obtain additional revenue, taxation must be varied, to suit the different circumstances of different parts ; while, in proportion as this variation is carried out, will the degree of risk attending such a measure be diminished. What is needed is, in short, a system of local or provincial finance, to supplement the finance of the Imperial Government. This is the change of policy which the conditions of the case appear to indicate as appropriate. What, under this view, is required is a new method of taxing, rather than new taxes, the introduction of which may fitly precede a discussion on the detailed application of it.

Two-fold advantage of decentralising finance.

A decentralisation of finance such as I have advocated—a decentralisation, be it observed, not in the sense of weakening the control and authority of the Supreme Government, but under which its labours and respon-

sibilities would be shared by the different provincial governments; such a policy would have a two-fold effect. It would not only tend to develop the resources of taxation; it would also restrain the existing tendency to extravagance in expenditure which, much more than an inelastic revenue, is the cause of present financial difficulty. The position of the Indian Government in the matter of expenditure is altogether anomalous. In other countries, the officers by whom the public money is disbursed are the immediate servants of the central government, in one or other of its departments, and are therefore completely under its control. But in India, the disbursing agencies are in effect the various provincial governments, who, being in no way responsible for the general condition of the finances, naturally make administrative efficiency their first consideration. The officers of the finance department stationed in the different provinces have no effective control over the executive departments, and their functions are practically limited to recording the transactions which occur. Even when owing direct allegiance to the Supreme Government they are not able to prevent irregular expenditure, and have little or nothing to do with the receipt of the revenue. But the so-called controlling officers, in many departments, are the servants of the provincial governments whose proceedings they are supposed to control, holding office at their pleasure, and they are not always even informed of the grants allotted by the Supreme Government for expenditure within the province.

Thus, in effect, the general finance department is dependent rather on the forbearance and loyalty of the different provincial administrations for securing adherence to its estimates, than on the action of its own officers. The law invests the Supreme Government with the most complete authority in regard to every kind of expenditure, but there is practically no means of enforcing it, for the only effectual check against an abuse of their

Anomalous
condition
now ob-
taining.

opportunities by the local authorities must necessarily be reserved for serious cases of financial insubordination. Small breaches of rule cannot be treated with this gravity, and they will always be condoned by public opinion. That a body, which in all its outward forms appears little removed in dignity and importance from the Supreme Government of India, should in reality have none of the attributes of a government, but be merely the executive agent of the central authority, is a relation hard to be distinctly apprehended by the public either in England or India, while it is one which the subordinate authority continually chafes under, and struggles to escape from. Unfortunately, the efforts at liberty are made only in one direction. The Supreme Government is perpetually embarrassed by the occurrence of expenditure which it has not authorised, or which it would fain avoid, while no spontaneous efforts are made to assist it with additional revenue. The provincial governments have a direct and very lively interest in obtaining for their share the largest possible amount of the public expenditure. Their dignity and importance, and their popularity both with the public and with the services, will be enhanced by a liberal expenditure, as will also indeed their administrative efficiency and the prosperity of the country, while the local press will always be ready to applaud any instances of outlay incurred for local purposes against the wishes of the supreme authority. On the other hand, the provincial government has no immediate interest in increasing the revenue, for any addition made will not appear in any tangible form to the credit of the contributing province, but will be merged in the general revenues. Nor is it only, or even mainly, in matters of new expenditure that this embarrassment is created. No doubt the sentiment of obedience is usually sufficient to restrain the local authorities, even although there may not be the distinct means of enforcing it. But it is, perhaps, rather in cases where reduction in existing

expenditure is desired that the Government of India feels most distinctly its financial isolation. In such cases retrenchment has usually to be carried out, not only without the co-operation of the provincial governments, but often against their vigorous opposition. On these occasions the Government of India finds itself on one side, and all the local authorities arrayed on the other; while the latter, regarding the effect of expenditure merely as it increases their administrative efficiency, and being in no way concerned with the financial result, are always armed each with abundant reasons why reduction is impossible, or why, at any rate, it should not be applicable to their own province in particular. These ill-regulated financial conditions sufficiently explain the unsatisfactory relations so often obtaining between the supreme and subordinate governments, particularly those of Madras and Bombay, where the panoply of councils and ministerial officers with which they are surrounded renders their legal financial status especially incongruous, and because the privilege which they possess of corresponding directly with the home authorities often commits the Indian Government to expenditure against its own wishes. The same thing occurs more or less in every other quarter. There is everywhere manifested the same desire to secure administrative efficiency with the same indifference about the provision of the needful means. Thus India, in its financial aspect, is a federation of a most defective kind, in which there is no proper distribution of responsibility, and where, from the nature of the case, the interests of the central and local authorities are liable to be constantly opposed. The remedy for this state of things is to be found in that re-adjustment of the financial system already advocated, under which the contribution to be paid by each province to imperial purposes should be limited to a fixed sum, and the balance of its revenues should be available for its own expenditure. Another practicable arrangement

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would be, while retaining certain sources of revenue as imperial, to place others at the entire disposal of the local government, with the proviso that certain branches of expenditure which are now defrayed from the imperial exchequer should henceforth be met from these local revenues. Under either method the provincial government would be invested with a distinct financial responsibility and interest in financial success; and while such a redistribution would not only lead the way to new methods of taxing, it presents the only effective plan for putting a stop to the administrative extravagance which is the cause of the present financial embarrassments. None but a very strong government could resist the continued pressure put on it from all parts of the country for increased expenditure in every branch of the service, and the Indian Government has often been in its financial administration exceedingly weak. But let the provincial governments be thrown on their own resources, and they will soon learn to limit their wants by their available surplus; and that zeal for material progress which is now so often found in company with a lofty disregard for the ways and means of effecting it, will no doubt be succeeded by a more business-like and sober temperament.

New taxes
how far
necessary.

But although so much stress has been placed on the importance of entering upon a new financial policy, and providing a machinery suitable both for new taxation and restraining expenditure, it is by no means to be inferred that any immediate necessity exists or is likely to occur for resorting in any very considerable degree to either course. There appears in truth to be no reason for supposing that the Indian finances are or have been in such an unsound condition as calls for any extraordinary measures of relief. The contrary opinion might indeed appear to be at first sight justified by recent events, and especially by the large deficits which occurred in the years immediately subsequent to the mutiny, which were deemed to constitute a financial crisis calling for

Nature of
financial
crisis of
1859.

the most strenuous efforts to meet. But it needs hardly be remarked that an increase of national debt is not necessarily a cause or proof of financial difficulty. There is scarcely a government in Europe but has been steadily adding of late years to the national obligation of this class, and some of the periods marked by large additions to the national debt of Great Britain were also those of remarkable commercial prosperity. That prosperity would no doubt have been still greater if the public burdens had not increased at the same time, but clearly a government is financially better and not worse off if, while the interest on the debt increases, the revenue increases still faster, and if also the ratio borne by the interest of the public debt to the whole public expenditure is continually diminishing. Now this was emphatically the case with the Indian revenues during the period in question. The Indian debt amounted in 1857 to about 59½ millions sterling; in 1861 it had become 107½ millions, and the increased charge for interest arising on this account was a little more than 2 millions. This was no doubt a large addition of debt to be made in so short a time, although, considering the magnitude of the war which occasioned it, the sum was moderate enough in comparison with the ordinary rate of expenditure in modern European warfare; and, if it had occurred simultaneously with a state of stagnant or depressed revenue, there would certainly have been cause for the gravest anxiety. And a depression of trade and diminishing revenue might certainly have been expected, as a natural consequence from so great a political convulsion. But, so far from this being the case, scarcely had the country been reoccupied by British troops, when an extraordinary expansion of trade and increase of national prosperity took place, and in five years the revenue increased nearly 30 per cent. The revenue for 1856-57 was 31,588,000*l.*; that for 1861-62 (the first year of financial equilibrium) was 43,488,000*l.*, being an increase of 11,900,000*l.* The increased annual

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Deficit
not due to
unfavour-
able con-
dition of
finances;

expenditure for interest on debt, at the end of the same period, being 2,165,000*l.*, it thus appears that, on the whole, the revenue had improved during these five years to the extent of 9½ millions. The public expenditure had also advanced almost at the same rate, but then this expenditure was to a very considerable extent under the control of the Government, since it arose in great part from undertaking public works and from enlarged establishments and improved administration in all departments of the public service, which, although very useful, were not absolutely necessary, and would certainly not have been provided if the needful money had not been forthcoming.

The supposed gravity of the financial crisis of 1859-60, therefore, disappears on examination. Even the fact that there was a deficit during the mutiny epoch would probably never have excited serious attention, but for the peculiar way in which the finances were dealt with. This deficit was as follows:—

1857-58	.	.	.	.	£8,401,285
1858-59	.	.	.	.	14,229,672
1859-60	.	.	.	.	10,769,861
1860-61	.	.	.	.	4,021,385
Total	.	.	.	.	£37,422,203

And had so formidable an amount arisen from ordinary or permanent causes it would have indicated a disastrous state of the finances; but, being simply war expenditure, it need have caused no serious anxiety, while it is equally clear, from what has been stated, that the removal of the deficit was not due to the financial measures taken, which, so far as they increased the ways and means of the Government, were altogether inadequate to meet the case. The deficit of 1859-60, stated above, was the balance resulting after the crushing import-duties had been laid on. The deficit of 1860-61 also was the balance remaining on the wrong side, after the income-tax and new stamp-duties had been imposed. So that it was not