

GOVERNMENT OF INDIA

R E P O R T

BY

SIR A. LOWES DICKINSON, M.A., F.C.A.

ON THE

**SYSTEM OF ACCOUNTING,
AUDIT AND STATISTICS
OF THE RAILWAYS
OWNED AND MANAGED
BY THE GOVERNMENT OF INDIA**

1926-27.

Part I.

GOVERNMENT OF INDIA

REPORT

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AUDIT AND STATISTICS
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Part I.

4. To consider and report on the form of the various accounts rendered by Railway administrations to the Accountant-General, Railways, and to make recommendations thereon.

5. To consider and report on the experimental system in force on the East Indian Railway of the separation of accounts from audit and to make recommendations thereon.

6. To examine and report on the methods now in process of adoption for the establishment of a Railway Clearing House, and to make recommendations thereon.

7. To examine and report on the methods in force for the preparation of statistics ; to suggest improvements therein where possible ; to examine the statistics now prepared with a view to eliminating and that may be superfluous or to suggesting additions of value, having regard to the purposes for which alone statistics are required, *viz.* :—

(I.) to assist the administrative and executive officers in the efficient management and operation of the Railways.

(II.) to enable the Railway Board to watch and control the management and operation of the Railways in the direction of efficiency and economy.

(III.) to furnish the Government of India and the Auditor-General with such information and returns as are required by them.

8. To examine and report on the advisability of the more extended employment of machines in the Accounts, Audit and Statistical Offices of Railways, and to make recommendations thereon.

9. To examine and report on the system of workshop accounts in force on the Bombay, Baroda and Central India Railway.

10. To report upon any other matters arising out of the investigations and pertinent to the above specific Terms of Reference.

11. To report whether the realised surplus of any considerable amount resulting from the disposal of a fixed asset should be treated as a receipt on capital account or credited to revenue account.

My report is divided into three parts, the arrangement of which is as follows :—

ARRANGEMENT OF REPORT.

Part I contains the Introduction and the following chapters :—

Chapter I.

Which contains references to and extracts from the Reports made during recent years by Mr. G. W. V. de Rhe-Philipe (paragraphs 19 and 20), Sir William Acworth (paragraphs 22 to 24), and Sir Vincent Raven (paragraphs 25 and 26), in so far as they have relation to accounts and statistics.

Chapter II.

Which comments upon the general conditions disclosed by my investigation. (Paragraphs 27 to 50.)

Chapter III.

Which describes the general principles to be observed in a sound and efficient system of accounting. (Paragraphs 51 to 60.)

Chapter IV.

Which outlines the proper organisation for the Accounting and Statistical Departments and for the Government Audit. (Paragraphs 61 to 87.)

Chapter V.

Which describes the proposed new system of cash receipts and disbursements. (Paragraphs 88 to 113.)

Chapter VI.

Which describes the proposed new system of audit. (Paragraphs 114 to 130.)

Chapter VII.

Which deals with the proposed new forms of annual accounts for individual Railways, including balance sheet for each, and of a consolidated income account and balance sheet for the whole of the Railway administration. (Paragraphs 131 to 164.)

Chapter VIII.

Which deals with the proposed new system of traffic accounting. (Paragraphs 165 to 193.)

Chapter IX.

Which deals with the proposed new system of stores accounting. (Paragraphs 194 to 214.)

Chapter X.

Which deals with the proposed new system of workshop accounting. (Paragraphs 215 to 239.)

Chapter XI.

Which describes the new general accounting system. (Paragraphs 240 to 252.)

Chapter XII.

Which outlines the proposed new system of accounting for collieries. (Paragraphs 253 to 269.)

Chapter XIII.

Which discusses the question of depreciation. (Paragraphs 270 to 288.)

Chapter XIV.

Which deals with the form of budget of the Railways and with proper tests in comparing the budget with the actual expenditure. (Paragraphs 289 to 300.)

Chapter XV.

Which deals with the methods of compiling statistics and discusses those which are at present prepared with suggested amendments thereto. (Paragraphs 301 to 338.)

Chapter XVI.

Which deals with the freight on stores and supplies for use on the Railways. (Paragraphs 339 to 343.)

Chapter XVII.

Which deals with mechanised accounting. (Paragraphs 344 to 352.)

Chapter XVIII.

Which deals with the installation of a new system. (Paragraphs 353 to 364.)

Chapter XIX.

Which contains a summary of my recommendations. (Paragraphs 365 to 380.)

Chapter XX.

Conclusion. (Paragraph 381.)

Part II contains the Appendices, to which reference is made throughout Part I.

Part III contains the forms for use in the New Accounting and Statistical Systems recommended in the report and detailed in the Appendices.

A complete Index to the Appendices and Forms will be found at the opening of Parts II and III respectively.

In Chapter XIX of the Main Report there is embodied a summary of my recommendations, and these are as follows :—

SUMMARY OF RECOMMENDATIONS.

Separation of Audit and Accounts.

1. That the principal Accounting Officer of each State Railway be styled " Chief Accountant," and be directly responsible to the Agent of each Railway, but appointable and removable only by the Railway Board. Chapter II, paragraph 33.)
2. That the accounts of the Railway Board at present kept by the Accountant-General Railways be handed over to a chief accountant appointed by and responsible to the Railway Board. (Chapter IV, paragraph 62.)
3. That the title " Accountant General Railways " be altered to " Chief Auditor Railways." (Chapter IV, paragraph 62.)

4. That the independent post-audit of all Railway accounts be carried out by the Auditor-General, who would have no power or authority to hold up payments or accounts but only to report thereon. (Chapter VI, paragraphs 116 to 122.)
5. That the efficiency be judged by the relation between the earnings and the operating expenses ; by the value to the community of the services rendered, and by the efficiency and economy with which they are rendered. (Chapter II, paragraph 37.)

General Accounts.

6. That the Accounting Department of each Railway be reorganised as shown on the chart on page 22. (Chapter IV, paragraphs 62 to 85.)
7. That an entirely new and modern system of general accounting be introduced with a proper system of control accounts. (Chapter XI, paragraph 249.)
8. That the Railway Accounts be kept upon the basis of work done and services rendered by the Railways and of work done for the Railways, both expressed in money values and entered in the books as at the time when the services are performed and the work done and whether paid for at that time or not. (Chapter II, paragraph 37.)
9. That a system of rewards for any suggestions made and adopted for improvements in accounting methods be introduced. (Chapter IV, paragraph 86.)

Expenditure Abstracts.

10. That the Expenditure Abstracts be remodelled as indicated in Appendix III. (Chapter VII, paragraphs 141 to 144.)
11. That a separate abstract be prepared to include all expenses connected with stores. (Chapter VII, paragraph 145.)
12. That a separate abstract be prepared for all expenses of the Electrical Department. (Chapter VII, paragraph 146.)

Capital and Income Accounts and Balance Sheet.

13. That the Capital and Income Accounts rendered by each Railway be revised in accordance with the new forms attached to Appendix III. (Chapter VII, paragraphs 135 and 136.)
14. That the Suspense Account be treated as working capital and included in Capital Expenditure instead of in Income. (Chapter VII, paragraphs 138 and 139.)
15. That payments to worked lines in respect of net earnings of those lines under the terms of the contracts be treated as a charge to Income and not as at present deducted, as to Receipts, from Gross Earnings, and, as to Expenses, from Operating Expenses. (Chapter VII, paragraph 151.)
16. That each Railway prepare monthly and annually a balance sheet in the form set out supported by exhibits showing how the various assets and liabilities are arrived at. (Chapter VII, paragraph 155.)
17. That the Railway Board prepare an income account and balance sheet recording their activities apart from those of individual Railways, and that from these accounts and from the income accounts and balance sheets of individual Railways, a consolidated income account and balance sheet of the Railway Department be prepared monthly and annually. (Chapter VII, paragraph 136.)

Cash System.

18. That the Controller of Currency act as banker and keep separate accounts for each Railway system, crediting to this account all the receipts and charging to it all the payments. That the Treasurer of each Railway send daily to the Controller of Currency a statement of the Railway receipts showing the bank or sub-treasury to which they have been paid over, and a statement of all cheques drawn against authorised credits. (Chapter V, paragraphs 90 to 101.)
19. That all accounts between the Railways and other Government Departments or Provincial Governments and other Railways be settled by cheque instead of by transfers as at present. (Chapter V, paragraphs 102 to 109.)

Traffic Accounting.

20. That the Railway Clearing House at Lahore be converted into a Central Station Accounting Office and moved to Delhi ; that, in addition to dealing with the foreign traffic between the four State Railways, it should also handle the local traffic of those Railways, commencing first with that of the North Western Railway ; that branch offices be established at Howrah, Wadi Bunder and Karachi for the traffic audit at those stations, these branches to be under the control of the Central Station Accounting Office at Delhi ; and that the methods of audit worked out by Mr. W. H. Scott be gradually extended to comprise the whole system of State Railways. (Chapter VII, paragraphs 176 to 181.)

Stores Accounting.

21. That all Railway stores, except imprest stores of small amount at running shed and engineers' depots, be placed under the control of the Controller of Stores, and that he keep detail quantity records thereof; that quantity and money records be kept of all stores by the stores accountants; and that an entirely new system of accounting for stores receipts, issues and balances be adopted. (Chapter IX, paragraphs 198 and 199.)
22. That the whole cost of purchasing and handling stores, including all administration and clerical expense, be added to the cost of stores by a percentage addition to all purchases, so that departments using stores may be charged with the full cost thereof. (Chapter IX, paragraph 211.)
23. That an official price list of stores be established for all issues, and be varied from time to time so that divergencies between money value of stores on hand in accordance with this price list and the book value may be kept within small limits. All such differences should be written off whenever there is a change in price. (Chapter IX, paragraph 212.)
24. That the purchasing of stores be entirely separated from their custody and be entrusted to a supply officer who would purchase on requisition from the Controller of Stores or other authorised officers. (Chapter IX, paragraph 197.)

Workshop Accounting.

25. That a system of planning, progressing and scheduling be adopted in all Railway workshops, and that a new system of cost and general accounting be put into force under a workshop accountant. (Chapter X, paragraphs 215 to 239.)
26. That all expenses incurred in connection with the workshops which cannot be allocated direct to any specific job or jobs, viz. : repairs to plant and machinery, superintendence and depreciation, be included as overhead expenses and distributed over the output as a percentage addition to the direct labour costs. (Chapter X, paragraph 230.)

Statistics.

27. That a "Deputy Agent Statistics" be appointed on each Railway as an assistant to the Agent to study the statistics submitted by the Chief Accountant and other Railway Departments. (Chapter XV, paragraph 302.)
28. That a statistical committee be set up, consisting of the Director of Finance to the Railway Board, the Assistant Director of Statistics to the Railway Board, and representatives of the operating departments, and of the statistical offices of the various Railways to decide from time to time upon any variation in the matter to be tabulated and the methods of tabulation. (Chapter XV, paragraph 302.)
29. That machine methods be adopted to a much greater extent in the preparation of statistics. (Chapter XV, paragraph 304.)
30. That some revision be made in the statistics with a view to their improvement by eliminating duplication and some tables of small value. (Chapter XV, paragraphs 305 to 310.)

Depreciation.

31. That the present plan of providing for depreciation be continued, except that :—
- (1) Additional cost of replacing any unit be a charge to revenue and not to Capital.
 - (2) That the life of any unit be not estimated to exceed 50 years, and in case of electrical units 25 years.
 - (3) That capital expenditures to the extent to which they do not increase operating revenues or decrease operating expenses be written off to surplus income under the term "Betterments." (Chapter XIII, paragraphs 270 to 288.)
32. That the realised surplus over original cost, less accrued depreciation, resulting from the disposal of a fixed asset should be credited to a capital reserve account, to which should be charged any losses due to sales of a similar asset for sums less than the difference between the original cost and the amount standing to the credit of Depreciation Fund in respect of this asset. (Chapter XIII, paragraph 287.)

Coal Mines Organisation and Accounting.

33. That the Railway Collieries be removed from the control of the separate Railways and concentrated under the control of a director of collieries responsible to the Railway Board ; and that a new system of cost, stores, workshop and general accounts be introduced. (Chapter XII, paragraphs 254 to 268.)
34. That all coal shipped to State Railways be charged at cost including depreciation, sinking fund and administration expenses, and in addition a sum calculated to yield approximately 6 per cent. interest per annum on the capital at charge to the Collieries. (Chapter XII, paragraph 268.)

Railway Budget.

35. That the Budget submitted to the Legislative Assembly continue in its present form, but be supported by a revised set of income and capital accounts and a consolidated balance sheet of the Railway Department. (Chapter XIV, paragraphs 294 to 297.)
36. That in comparing Budget figures with actual results regard be had to any variations in expenditures that might be expected on account of variations in gross earnings. (Chapter XIV, paragraphs 298 and 299.)

Charges on Transport of Railway Supplies.

37. That all goods carried by a Railway for its own use be charged for transportation at 60 per cent. of the full rates. (Chapter XVI, paragraph 341.)

Mechanised Accounting.

38. That machine methods and loose leaf ledgers be employed in the new accounting systems, and that the machines be installed under suitable conditions of housing and with an undertaking on the part of the suppliers to give effective service in the way of supervision and repairs. (Chapter XVII, paragraphs 344 to 352.)

Installation of New Systems.

39. That in order to instal the new systems of accounting the following staff should be engaged for a term of five years :—
- 4 Chartered accountants, at Rs. 2,000 per month, rising to Rs. 2,400.
 - 4 Cost accountants, at Rs. 1,200 per month, rising to Rs. 1,600.
 - 4 Production engineers, at Rs. 1,200 per month, rising to Rs. 1,600.
- (Chapter XVIII, paragraphs 358 to 361.)
40. That chartered accountants be instructed to audit the present records, and prepare balance sheets of each Railway as of the date at which the new accounting system is to be installed and the new books opened on each Railway. (Chapter XVIII, paragraph 364.)

I am, Dear Sir,
Yours faithfully,
A. LOWES DICKINSON.

PART I.

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3, FREDERICK'S PLACE,

OLD JEWRY,

LONDON, E. C. 2.

10th August, 1927.

THE SECRETARY,

RAILWAY BOARD,

GOVERNMENT OF INDIA,

DELHI,

DEAR SIR,

INTRODUCTORY.

1. In September, 1926, I received instructions from the Government of India, conveyed to me through the Secretary of State for India in London, to take up an investigation of the system of Accounting, Audit and Statistics in the Railways owned and managed by the Government of India. Arrangements were made through Messrs. Price, Waterhouse & Co. of London and New York, to place at my disposal two of their principal assistants. One of these had special experience not only of English Railways and their methods of accounting but also of conditions in India, having spent the greater part of two years there on other investigations for the Government of India. The other came from America where he had had considerable experience in Railway methods and the organisation of accounting systems for several of those Railways, and also had been frequently engaged on the reorganisation of the accounting systems in large engineering shops both for Railways and for commercial concerns.

2. My two assistants proceeded to India in the early part of October, and reached Bombay and Karachi respectively one during the third week in October and the other in the first week of November. They were met there by instructions from the Railway Board to take up first the investigation of the East Indian Railway in Calcutta, and after visiting members of the Board at Delhi and Simla they proceeded to that city. I was unable to leave England until October 22nd, but had already furnished my assistants with general instructions as to the line of work they were to take up. I reached Bombay on November 12th, where I was met by the Agent for the Bombay, Baroda and Central India Railway and by Rai Bahadur B. D. Puri, the representative of the Railway Board who had been appointed to act as liaison officer between myself and the Railway Officials. After spending a few days in Bombay in meeting the officials of the Great Indian Peninsula Railway (State owned and managed) and the Bombay, Baroda and Central India Railway (State owned but Company managed) and getting a general idea of their organisation both as to accounting, traffic, shops and stores, I proceeded to Delhi where I had the pleasure of meeting the Chief Commissioner of Railways and other Members of the Railway Board, the Auditor General to the Government of India, and the Accountant General, Railways as well as the Director of Finance and other officials attached to the Railway Board.

3. Up to the time of my arrival in Delhi, I had no very definite instructions as to the scope of the investigation it was desired I should make, but on arrival there this matter formed the main subject of discussion and my instructions were eventually embodied in the official "Terms of Reference" prepared by the Railway Board, approved by the Auditor General, and endorsed by the Minister of Commerce and Railways. These Terms of Reference were as follows :—

1. To examine and report fully on the system of Accounting and Audit in respect to all classes of both Capital and Revenue Receipts and Expenditure in force on the State worked Railways and to make recommendations for revised and improved methods :

- (a) with the aim of a better presentation of the commercial results,
- (b) for earlier preparation of the accounts, and
- (c) for their compilation in their various details in forms that will best assist the executive and administration to secure efficiency and economy in working.

2. To examine and report particularly on the system in force on State worked Railways in the following matters and to make recommendations thereon :—

- (a) The system of accounting in the Workshops and the preparation of cost accounts.
- (b) The system of accounting for the expenditure and outturn of Railway Collieries.
- (c) The system of Stores accounts.

(I) The recommendations should contain proposals for a system of cost accounts for workshops with special reference :—

- (1) to assisting the administration to exercise proper control over unit and aggregate costs and effecting economies in all operations of the shops.
- (2) to devising a method for determining the proper cost of articles manufactured in the shops.

(II) The recommendations in regard to colliery accounts should contain detail proposals for the pricing of the output of the collieries.

(III) The recommendations in relation to stores accounts should deal *inter alia* with (a) the pricing of the balances held in stock, (b) the issue price of stores.

3. (a) To consider and report on the feasibility of the preparation of a proper annual balance sheet and profit and loss accounts for individual Railways ; for separate organisations such as collieries ; and for the whole of the receipts and expenditure of the Government of India relating to Railways.

(b) To advise as to the forms to be adopted for the balance sheets and profit and loss accounts if the preparation of such is recommended.

4. To consider and report on the form of the various accounts rendered by Railway administrations to the Accountant General, Railways, and to make recommendations thereon.

5. To consider and report on the experimental system in force on the East Indian Railway of the separation of accounts from audit and to make recommendations thereon.

6. To examine and report on the methods now in process of adoption for the establishment of a Railway Clearing House and to make recommendations thereon.

7. To examine and report on the methods in force for the preparation of statistics ; to suggest improvements therein where possible ; to examine the statistics now prepared with a view to eliminating any that may be superfluous or to suggesting additions of value, having regard to the purposes for which alone statistics are required, *viz.* :—

(I) To assist the administrative and executive officers in the efficient management and operation of the Railways.

(II) To enable the Railway Board to watch and control the management and operation of the Railways in the direction of efficiency and economy.

(III) To furnish the Government of India and the Auditor General with such information and returns as are required by them.

8. To examine and report on the advisability of the more extended employment of machines in the Accounts, Audit and Statistical Offices of Railways, and to make recommendations thereon.

9. To examine and report on the system of workshop accounts in force on the Bombay, Baroda and Central India Railway.

10. To report upon any other matters arising out of the investigations and pertinent to the above specific terms of reference.

11. To report whether the realised surplus of any considerable amount resulting from the disposal of a fixed asset should be treated as a receipt on capital account or credited to revenue account.

4. During my week's stay in Delhi I was able to obtain a general idea of the Railway organisation and of the operating and income accounts and statistics prepared by the Railways for submission to the Railway Board and by the Railway Board to the Government of India.

5. On leaving Delhi I proceeded to Calcutta and took up with my assistants (who were already engaged thereon) the investigation of the East Indian Railway. This investigation covered the accounts and statistics of the transportation, traffic, workshops, stores and coal properties. We also took up in a more general way the investigation of the same questions on the Eastern Bengal Railway, and made enquiries of the Bengal Nagpur Railway so far as necessary to bring out any important differences of principle. This work occupied me in Calcutta until January 15th, 1927, and my assistants for about a week later.

6. I then proceeded to Madras, where I spent three days with the Agent, the Chief Auditor, the Stores Accountant, and the Chief Engineer of the Madras and Southern Mahratta Railway, in visiting the shops and stores of that Railway, and obtaining an insight into the general principles of their accounting and statistical organisation, particularly having regard to any differences in the methods from those which had already been investigated on the other Railways already mentioned.

7. On January 21st my assistants and myself reached Bombay, where we took up an investigation on the same lines to those already indicated of the Great Indian Peninsula Railway, and in a more general way of the Bombay, Baroda and Central India Railway, with special attention in the case of the latter Railway to the system of workshop accounts.

8. I left Bombay on February 10th and, stopping on my way at Ajmeer to visit the narrow gauge workshops of the Bombay, Baroda and Central India Railway, reached Delhi on February 16th, in order to be present at the debate on the Railway Budget in the Legislative Assembly.

9. From Delhi I proceeded, on February 25th, to Lahore, where both my assistants were by that time engaged, and there I had an opportunity of discussing fully with Mr. W. H. Scott, the Director of Clearing House Accounts, the development of machine methods of accounting to which I had myself given considerable attention both before and during my visit to India and with which Mr. Scott, who had devoted some years almost exclusively to this subject, was particularly familiar. The result of these conferences will appear in the course of this report.

10. On the completion of our work at Lahore, we returned to Delhi on March 7th, and as our plans for the new accounting system were by that time well advanced it was deemed advisable to have a conference at Delhi with the Railway Board in order to discuss with them the general plans which I had in mind, and, in particular, to bring out any objections which they might wish to raise in view of their long experience, both of general conditions in India and of railroad administration.

11. The remainder of March was spent in Delhi on an investigation of the accounting methods and annual reports of the Railway Board and the Accountant General Railways, and of the statistics prepared for the Railway Board; and in formulating on general lines the systems of organisation and accounting which seemed best fitted to the needs of the Railways. This occupied our time until the end of March, and on April 2nd, we left Bombay on our return journey to England.

12. In the course of our work in India a great deal of information had been obtained and put aside for further examination, and on the return voyage and for some four months thereafter we were fully occupied in considering the results of our investigations, working out in complete detail the systems of accounting to be recommended, with all the accompanying statements and forms, and in preparing the final report thereon.

13. This work was eventually finished by the end of July, after which the complete report with its appendices, exhibits and forms, was handed to the India

Office to be printed. The necessary proof reading and final corrections were finished and the report signed on the date appearing at the head of this introduction.

14. The arrangement of the report is as follows :—

Part I contains this Introduction and the following chapters :—

Chapter I which contains references to and extracts from the Reports made during recent years by Mr. G. W. V. de Rhe-Philipe (paragraphs 19 and 20), Sir William Acworth (paragraphs 22 to 24), and Sir Vincent Raven (paragraphs 25 and 26) in so far as they have relation to Accounts and Statistics.

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CHAPTER I.

REFERENCES TO AND EXTRACTS FROM THE REPORTS MADE DURING RECENT YEARS BY MR. G. W. V. DE RHE-PHILIPPE, SIR WILLIAM ACWORTH AND SIR VINCENT RAVEN IN SO FAR AS THEY HAVE RELATION TO ACCOUNTS AND STATISTICS.

18. Prior to my investigation certain other enquiries had been made during the last six years which have a bearing upon my Terms of Reference and which it may be useful here to note briefly.

19. In 1920-1921 a Committee, under the Chairmanship of Mr. G. W. V. de Rhe-Philipe was appointed to visit England and America and to examine among other things the methods of Railway Accounting and Procedure in those countries. Their Report entitled

“ Report on the Systems of Station Accounts and Audit Procedure in force on Railways in England and America and to be adopted on Indian Railways and on the Establishment of a Clearing House in India, by the Indian Railway Accounts Committee, 1920-21,”

is a most useful document dealing with matters which are, in my opinion, of the utmost importance if the accounts of the Railways are to be properly and efficiently kept in the future. Some of these recommendations have, I am informed, been adopted, but the great bulk of them appears to be still under consideration or to have been dropped.

I would call special attention to the following extracts :—

“ *Station to Station Rates.*

(Par. 16.) “. . . . In India, the goods clerk, before he can book a consignment, (and especially one to a foreign railway station) has to puzzle out various intricacies of classification and exceptions and routes and work out the freight rate for the distances over the several lines concerned, and so finally arrive at the through freight chargeable to destination. Both in England and America the principle is to remove practically all responsibility from the staff at stations. Station to station rates are worked out in the rates branches of the traffic offices ; if more than one railway is concerned, the point to point rate and route are settled by the respective Traffic Departments by agreement. The men who deal with the subject are experts ; all responsibility lies on them and their quotation, which takes the form of a through rate, i.e., a rate per weight unit for the entire distance from station to station, is final. There is no scrutiny of the quotation in the Audit office”

(Par. 17). “ The effects of this system, apart from any question of simplification of the classification, are far reaching. A most prolific source of error in station accounting is closed ; and the greater reliance which can then be placed on station work removes the need for much close and therefore elaborate check throughout the subsequent audit of the returns. . . . Finally, the station to station rate furnishes traders with a firm quotation on the correctness of which they can rely and secures them from the annoyance connected with over and undercharges. The advantages thus gained are, the Committee thinks, most substantial.”

(Par. 18.) “ The Committee is convinced that unless and until radical changes in the direction of supplying station to station rates are made in India, no really important revision of the system of accounting is possible ; and the important reforms recommended are contingent on this being done. . . . What is wanted, and wanted early, is the possession by every goods booking station of a *rate book from which can be obtained the authorised rate for each class of commodity to every station in India to which it may ordinarily be expected to book goods.*”

(Par. 21.) “. . . . In England and America the station master has nothing whatever to do with the proportions which may be due to other railways from interchanged traffic. He merely deals with the total charge, concerning himself primarily with the debit to his station in his accounts ; all work of apportionment is left to the audit office or the Clearing House. The fact that he has not, in his invoices, abstracts and summaries to bother about what proportion of the freight may be due to another line is an enormous relief.”

“ Statistics.”

(Par. 34.) “ The Committee believes that a very appreciable saving in staff would result were Indian Railways to follow the English and American method and do away with the regular compilation of station to station figures.”

“ Passenger Traffic.”

(Par. 67.) “ In this country tickets are issued to any station ; and it thus happens that a booking clerk called on to issue a ticket to some distant and little known station on a foreign railway has first to ascertain the quickest route, then to refer to various tariffs and work out the sum of the local fares before he can make out the ticket. It is not to be wondered that, in the haste of booking, he sometimes makes mistakes, and indeed an appreciable proportion of the errors in rates which occur in Indian station accounting are attributable to this cause. The Committee considers that, where this is not already done, fares should be fixed and published by the Traffic Department from each station to all home line stations, and stations to which the home line has running powers, and to such foreign railway junctions and stations to which bookings may reasonably be expected. A list of these stations and fares thereto should, as in England (where it is a statutory obligation) be exhibited at the station where it would serve also as the station to station fare table. Stations should be empowered to issue tickets only to the stations shown in this list and to no others. If a ticket to another station is demanded by a passenger, he should be given one to the nearest junction point to his destination to which a fare has been quoted, and told to rebook from there.”

(Par. 68.) “ The Committee has laid stress upon the importance of relieving station staff, which in India is not so reliable as in England, from all responsibility in the calculation of rates. The same principle is in question here”

“ Miscellaneous Coaching Traffic.”

(Par. 91.) “ On English and American Railways separate returns are not required for Government passengers, Government baggage and Government horses, carriages, dogs, etc., as in India. Any such traffic that does present itself is booked in the ordinary way and included in the appropriate account of the station. The Committee is unaware of any particular purpose to be served by Government requirements in this matter and would suggest for their consideration that the differentiation be dispensed with.”

“ Goods Traffic.”

(Par. 132.) “ The Committee is aware that large strides have been made towards the simplification of the Indian Goods Classification, and that the matter is still receiving attention. But progress so far has not been very rapid ; and, seeing the uniformity which has been obtained in England, and to a considerable extent in America, and the good results accruing therefrom, the Committee urges that no efforts should be spared towards the attainment of a similar position in India.”

(Par. 138.) “ Having seen the very marked advantages of through ‘ station to station ’ rate tables on English and American lines, the Committee attaches special importance to their early introduction on Indian Railways. The adoption of this principle obviously means that the duty of making up the through station to station rates must be undertaken by the Rates section of the Traffic Department, and that the practice hitherto followed of supplying stations with tariffs and rate lists showing the rate per maund per mile should cease. The through rate per maund for each class for each station to every other station to which it books goods should be calculated by the Rates branch—in consultation with other Railways, where foreign traffic is concerned—and advised to the station as a through station to station rate. The station on receiving this will enter it up in a Rate Book to be kept at each station as in the English system, and will use the figure so advised for all bookings. Where goods are tendered for despatch to a station to which a rate has not been quoted, the arrangement of a ‘ particulars to follow ’ invoice can be adopted and a through rate at once asked for from the Traffic Department.”

(Par. 150.) “. The Consignment Note is both in England and America a document of the first importance. As used, it becomes the complete evidence of the contract between the consignor and the Railway, and embodies all the terms and conditions of the contract, all separate risk notes being dispensed with.”

(Par. 151.) “ There is much to be said for this system as an improvement on the Indian plan, with its numerous and separate risk notes which are always a source of various kinds of trouble. It seems to the members of the Committee that much advantage would be derived from an adoption of the English and American principle of making the consignment note a real and complete document of contract and this and the abolition as far as possible of separate risk notes are commended to the notice of the Indian Railway authorities.”
 “ *Cash Remittances.*”

(Par. 190.) “ The system has distinct advantages, but would not be practicable to anything like the same extent in India. The number of treasuries there is limited, and, where they exist, are not always conveniently situated for railway purposes. The Civil Department, moreover, does not as a rule favour the use of district treasuries for the deposit of Railway earnings. Could this attitude be modified and arrangements made which would not be inconvenient to Government or expensive to the Railways, it would probably be possible to use the treasuries to some extent and thus avoid some unnecessary movement of cash. The use of local banks for that purpose is, under present Government restrictions, not permissible.”

“ *Foreign Goods Traffic.*”

(Par. 249.) “ The English system of dividing on mileage is of course by far the best and quickest of those seen by the Committee, as not only are the calculations easy, but all invoices between any two points can be grouped and one calculation made for the lot irrespective of commodity, as against separate calculations for each invoice. It is the basis of apportionment now followed in India for the division of parcels traffic, and, given a similar position for goods, all division work can easily be done in the Audit office, without involving stations in calculations. It is, however, anticipated that there will be considerable difficulty and opposition to the introduction of a mileage basis of division for goods so long as classifications and rates vary to the extent they do on different lines in India. Mileage division is, at the same time, a goal which the Committee urges should be kept in view ; and perhaps the time may come when, as classifications and through rates become more simplified, it can be introduced, not necessarily on all lines, but even between pairs of lines.”

21. Further reference to these matters will be found in Chapter VIII dealing with the proposed Traffic Accounting System.

22. In November, 1920, a Commission was appointed under the Chairmanship of Sir William Acworth to report on the Indian Railways. This Report, entitled

“ Report of the Committee appointed by the Secretary of State for India to enquire into the administration and working of Indian Railways ”

is in the main concerned with the operating side of the question, but there are certain sections which touch very closely upon my Terms of Reference, and were perhaps largely responsible for my appointment. The following paragraphs in that Report are most pertinent to my enquiry, and will bear repetition :—

“ *Finance and Financial Control.*”

(Par. 30.) “ Witness after witness told us that the present financial methods need drastic revision, and that the basis of the reform is the complete separation of the Railway Budget, in respect both of capital and revenue, from the general budget of the country. The Associated Chambers of Commerce of India and Ceylon expressed the general opinion in the following resolution, which they passed at their annual meeting held in Calcutta on the 24th and 25th January, 1921.

“ That this Association is strongly of opinion that the present method of financing the annual capital expenditure programme of Railways in this country, and the general system of control exercised by Government over their administration, are in urgent need of revision and

reform. This Conference further considers that, as an essential condition precedent to such reform, immediate steps should be taken to render the railway administrations independent of the provisions of the general budget and to secure for them a separate budget of their own.' ”

(Par. 31.) “ This resolution under both its heads embodies conclusions at which we have independently and unanimously arrived. To explain our reasons, it is necessary to describe the system that has hitherto prevailed and the results to which it has led.”

(Par. 32.) “ The financial methods of the Government of India are closely modelled on their English prototype. The English Government, as is well known, does not present a balance sheet comparable to that of an ordinary business. The Budget is merely what an accountant would call a cash statement. It is on the one side a summary of the actual money received, and, on the other side, of the actual money paid out during the financial year. It takes no account of moneys receivable on the one hand nor of accounts due on the other in respect of transactions closed within the current year. Further, the Budget appropriates to each Department of Government a certain sum ; and whatever portion of this appropriation is not spent within the year automatically lapses, and the power of the Department to spend only arises afresh when a new appropriation for the ensuing year is made. We need hardly emphasise the difference between this system and the methods of a commercial company which takes stock of the position year by year in its revenue account and balance sheet. A company treats its business as a continuously going concern with a carefully thought out programme, both of revenue and capital expenditure, for years ahead, and with provisional financial arrangements calculated to correspond.”

(Par. 58.) “ In the circumstances it is perhaps permissible to say that the Committee was appointed to consider, and did in fact consider, not so much what form of financial administration was best adapted to the needs of a great commercial enterprise, as how best railway management could be fitted in to the rigid framework of the existing financial system of the Government of India. We have said that we do not believe that it is possible so to fit it. We do not think that the Indian Railways can be modernised, improved and enlarged so as to give to India the service of which it is in crying need at the moment, nor that the Railways can yield to the Indian public the financial return which they are entitled to expect from so valuable a property until the whole financial methods are radically reformed. . . . ”

“ *Accounts and Statistics.* ”

(Par. 129.) “ There are, however, important respects in which the existing organisation does not provide for the exercise of adequate supervision and control over the railways. Economical Railway management cannot be ensured without a proper system of Railway accounting. Apart from a mere audit check of receipts and disbursements, a railway requires a large number of financial returns of various kinds ; not in order to say whether expenditure incurred has been duly authorised, or receipts duly accounted for, but to say whether expenditure is being wisely incurred, whether retrenchment of habitual expenditure is possible under one head, whether new expenditure under another is proving profitable, or even whether a larger expenditure would be likely to be fruitful ; and so on. These are not matters to be left to an outsider. A practical railway man who knows what he is doing in the present, and what changes he is meditating for the future, is alone competent to prescribe and to make use of returns of this kind. But the accounting staff controlling the Indian Railways, from the Accountant General Railways at Delhi down, in the case of the State managed Railway, to the latest joined clerk in a local office, are officials, not of the Railway Board, but of the Finance Department. No doubt these officials gradually get to see the railway point of view, but they must be guided by rules laid down by the Finance Department, framed largely in view of the requirements of the non-commercial departments of Government.”

(Par. 130.) “ At present the Railway accounts are very complicated ; some portions are produced in different forms for the use respectively of the Railway and of the Finance Department. And when, as has

happened in the case of the Committee, enquiries are based on the statements made in the Railway Administration Report, and reference is made to the corresponding portions of the finance and revenue accounts of the Government of India, there is great difficulty in reconciling the two sets of figures. We are quite sure that if the whole matter were under the control of a single department, simplifications could be introduced which would not only make the accounts more intelligible, but result in considerable saving of expenditure. The Report of the Auditor General would continue available as at present to secure the financial rectitude of the Railway Administration."

(Par. 131.) "We recommend that the Railway Department should be responsible for its own accounts. We do not exclude, of course, such independent and separate audit as the Government of India may think proper to make, on the same principle that obtains in any commercial company, where the shareholders appoint an outside firm of accountants to check and report on the books which are kept by the servants of the directors, the ordinary accounting staff. We think also that the present form of accounts should be examined and reported on by experienced railway accountants conversant with modern practice in England and America."

(Par. 132.) "Statistics are closely connected with accounts. In volume we believe the Indian Railway statistics surpass those of any other country. Their value is not proportionate to their volume. The present form of statistics was, we understand, introduced about the year 1880, a period in railway history which may be described as mediaeval. They have not been revised since. The Members of the Railway Board are in full agreement with us in thinking that the time for revision is overdue. It is admitted that the time of a large number of clerks is occupied in their preparation, and that much money is spent on their printing, and that when duly prepared and printed little use is made of them for any practical purpose. Further, we gather that these statistics are not always what they purport to be, arithmetical calculations from accurately recorded figures; that in some cases at least they are no more than computations of averages based on data inadequate both in width of scope and length of time."

(Par. 133.) "Adequate statistics are urgently required, not only to enable the Railway Board to control the management of the Railways for which it is responsible, but to enable the managers themselves and their officials to see how the work which they are doing compares with the work done elsewhere; and also to see that they are not retrograding, but improving in efficiency year by year. Such statistics are not produced for Indian Railways. In some cases, but not in all, useful comparative figures can be extracted from the tables furnished in the present Administration Report, but they are not given, as they should be, as comparisons in the Report itself. A keen manager of an individual railway may extract such comparisons for his own use; but they remain available for himself alone. Other managers in ignorance of what their neighbours have accomplished, lag far behind the achievement which they might reach were they stimulated by knowledge of the results attained elsewhere. Moreover, if the Railway statistics were adequate and if the Members of the Railway Board themselves had leisure to study them, and then apply the results they had ascertained to the case of an administration that was backward in improving the State property entrusted to its management, we are persuaded not only that more traffic could be carried even with existing facilities, but that State profits would be largely increased.

(Par. 135.) "There is another reform which is urgent. We do not think that the ordinary Civil Service Regulations and practice are suitable for application in so specialised a concern as a railway. The relations between the employer and the staff should be more in conformity with ordinary commercial practice. In particular, the weight attached to seniority in the appointment of men in the State Railway service to vacancies is at present too great. We have had brought to our notice cases where an officer with only quite a short period of service before his date of retirement, has made good his claim to be transferred from his own railway to another State railway, where the corresponding grade

carried a slightly higher salary, on the ground of seniority. Again, there have been cases where an officer of high proficiency in his own technical branch on one railway has been transferred to another railway as agent, though lacking in general administrative experience. Transfers such as this do not promote efficiency."

23. On the recommendations quoted above, the separation of the Railway Budget from the General Budget has been adopted, but there is still no complete or even partial separation of Railway cash from that of the Government of India, as more fully explained in Chapter V of this Report. The final accounts of the Railways are still made up on a cash instead of a commercial basis, nor has any Railway balance sheet been evolved out of the somewhat chaotic returns still in force.

24. On the other hand, most useful work has since been done by the Railway Board in revising the Railway Statistics, to which full reference is made in Chapter XV of this Report. The work remaining to be done is to improve the methods of their preparation and to limit the variety of statistics prepared so that those and those only which are really of use in operating the Railways or in judging of the efficiency and economy of the management may be regularly and speedily prepared. The remarks in paragraph 135 of the Acworth Report as to promotion by seniority have particular force in the various Accounting Departments.

25. The third report to which reference should be made is that of Sir Vincent Raven, entitled

" Report of the State Railways Workshops Committee, 1926 "

on the workshops organisation of the East Indian Railway, the North Western Railway, the Eastern Bengal Railway, and the Great Indian Peninsula Railway. This deals mainly with the technical operating side of the question, but the following bear on the accounting side :

" *Comparative Costs of Maintenance and Repairs.*"

(Par. 155.) " The most noticeable shortcoming appears to be the absence of regular progressive correlation between the cost and statistical data that are being worked out, year in, year out, at the expense of much time and money. Reliable information on points of fundamental importance, such as the comparative repair costs of different classes of engines and the cost of workshop repairs per engine mile run between periodical overhauls is, in most cases, not to be had at all. Locomotives of improved types are being purchased from time to time, but no attempt appears to have been made to keep track of the expenditure incurred on the maintenance and repairs of these locomotives. Increasing amounts are being spent upon improved mechanical plant and up-to-date machine tools with the object of reducing the repair costs, but little has been done to have the effect of such additions reflected in the costs themselves. The monthly returns of expenditure that are being put up to the Chief Mechanical Engineer are such as would merely enable him to watch the progress of expenditure against the grant for the year under the various heads of account ; they fail to bring the expenditure incurred during the month in juxtaposition with the amount of work turned out in the period. The inevitable result of this arrangement is that, provided the grant for the year is adequate, there is little to induce the Chief Mechanical Engineer to take any particular trouble. We consider this extremely unfortunate as it leads to uneconomical expenditure in times of easy money, regardless of the adequacy of the results achieved. We feel sure that were greater discrimination exercised, costs could be kept down."

(Par. 156.) " We cannot take exception to the existing fabric of workshop accounts, which is apparently cast on more or less up-to-date models, but we consider it necessary to express our disapproval of the practice that has in recent years been adopted of charging all repairs to engines to one Standing Work Order. This has practically resulted in the costing system running to seed and in the Standing Work Orders for repairs being used as a dumping ground for outstanding balances. It is a pity that, while history sheets of locomotives appear to be carefully maintained and show mileages and details of periodical overhaul and of other repairs, the lumping up of work orders has rendered it impossible to indicate simultaneously on the history sheet the cost of such repairs. The extra expense that may be involved in the cost of allocating charges to each locomotive or various types of locomotives would, in

our opinion, be fully justified, as the extremely valuable information that will be rendered available thereby would allow of a close and incessant watch being kept over the expenditure on repairs. . . .”

(Par. 157.) “ The analysis of the expenditure incurred in the shops as between labour, stores and general charges is not being carried out as completely as it might be. In distributing the general charges as between labour and stores, an arbitrary ratio is adopted on some Railways which vitiates the significance of the analysis of expenditure as between wages and materials. Nor are the general charges of the different Railways either worked out or distributed on a uniform basis. This lack of uniformity in accounting procedure has made it exceedingly difficult for us to institute comparisons between the rates at which the different workshops have been turning out spare parts of manufacturing articles in bulk. The variations in the prices at which stores are charged to manufacture render it necessary to compare the expenditure incurred under all the three elements of cost, *viz.* : labour, materials and general charges ; and this can be done only when a uniform method of compilation is in existence.”

(Par. 158.) “ We recognise the difficulty in defining a standard heavy repair and fully appreciate the action taken by the Railway Board in arriving at a formula for this purpose. This standard unit of heavy repair should be adopted ; and the work out-turned by the Mechanical Workshops should be analysed in such a manner as to distinguish between the heavy repair unit in connection with periodical (scheduled) overhauls and the units of other work, of a light or special nature. The different and hazy notions that now exist as to what may be a light, a medium, a special or a heavy repair, must give way to a single and well known concept of a standard unit of heavy repair, with the aid of which the units of work done on scheduled overhauls may be measured separately, at the same time as other work of a lighter nature.”

(Par. 159.) “ Repairs to machinery and plant in railway workshops total up to large sums of money per annum for each Railway and affect directly the costs of maintenance and repairs of rolling stock. The recognised practice in works costing is to treat these charges as elements of oncost that would enter finally into the cost of repairs. The practice that obtains of allocating these charges to a final head of account in the Financial (as distinguished from Cost) Accounts is responsible for this important factor being lost sight of in considering the cost of a unit of heavy repair. It would certainly be more satisfactory if a method were devised to allow the expenditure on repairs to machinery in workshops to be included in arriving at the cost of repairs.”

(Par. 160.) “ There are other similar items of expenditure which find their way to different detailed final heads under different ‘ Abstracts ’ of Revenue Expenditure, which may profitably be worked into workshops repair costs, for instance, provident fund bonus to workshop employees and customs duty and freight charges incurred on stores supplied from Stores Depôts for work on revenue account. Expenditure incurred in the Stores and Accounts Departments, with respect to the services rendered by these departments to the workshops, as well as expenditure on certain classes of superior supervising and clerical staff, now charged to ‘ General Administration ’ may perhaps be susceptible of like treatment in accounts. In any case, such charges have to be considered in instituting comparisons as between any two workshops with regard to the economy and efficiency with which repair work is being carried out. Further, were the indirect charges of the nature we have spoken of above caught up in the routine of costing and presented to the Chief Mechanical Engineer he would have, in our opinion, considered it in many cases cheaper to replace with new stock than to carry out repairs”

(Par. 161.) “ These are not the only difficulties we have experienced in attempting to institute comparisons as between railway workshops. The want of uniformity in the classification of labour, in the nomenclature of trades, skilled, semi-skilled and unskilled, and in the accounts forms in use, have all presented to us problems less only in degree than the diversity in accounting procedure. We would emphasise the importance of the necessary spade-work being commenced without delay in order that the different problems in accounting organisation and methods we have mentioned incidentally may be either solved or kept readily assimilated.

in suitable form for examination by the firm of chartered accountants who are expected shortly to examine and report upon Indian Railway Accounts."

(Par. 179.) "It is not impossible to separate from the workshop accounts of each railway the expenditure incurred in each workshop on the maintenance and repairs of rolling stock under the heads—labour, stores and general charges. We had this done with respect to the Eastern Bengal Railway, but finding that the items of expenditure allocated to the work orders for 'general charges' and the methods of distribution of such expenditure among the other work orders differed on different railways, we did not consider it useful to have the like figures for other railways worked out."

"Costing of Repetition Work."

(Par. 363.) "We consider it of the greatest importance that, wherever the manufacture of spare parts and components of spare parts, or the construction of rolling stock, is carried out, the system of accounts should be so modified as to clearly bring out in fullest detail the expenditure that is being incurred per unit turned out. We have recommended elsewhere the need for revising the existing system of workshop accounts, and we wish to emphasise here the importance of being in a position to compare on the one hand the actual cost of production of items that are being manufactured on a comparatively large scale with quotations that it may be possible to obtain from outside firms either in India or abroad and on the other hand to keep a watch on the economies effected by the installation of expensive labour-saving machinery. The cost accounts that have to be maintained for repetition work are by nature comparatively simple and the difficulties experienced in accurate cost keeping for repair operations will not arise."

"Stores in Running Sheds and Workshops."

(Par. 423.) "We feel it necessary to place on record the difficulties we experienced in our investigations owing to the general practice that has obtained on all the Indian State Railways of keeping a fairly considerable stock of stores in running sheds and other places, which had been 'charged off' and debited to running expenses. This procedure of charging off imprest stores not only upset greatly the accuracy of the progressive figures of revenue expenditure, being responsible for the great fluctuations in the monthly repairs bill, but is conducive to waste and leakage of material. . . . Distinct minima and maxima of stock should be prescribed for all important running sheds and carriage and wagon sub-stores and these should be watched as in the case of other stores by the Stores and Audit Departments. Whatever may be the detailed arrangements that may be adopted as a result of this recommendation . . . there should in our opinion exist a continuous and concurrent check on these stores, and the stores themselves should not be charged off to final heads of revenue account until actually required for use."

(Par. 424.) "The above remarks apply with even greater force to workshops, as these latter are usually situated in close proximity to the Central Stores Depôt on each railway. The accumulation of raw and finished material in mechanical workshops complicates accounting and makes it extremely difficult for the requisite check to be exercised on the allocation of expenditure as between work orders. . . . We would also recommend that ordinarily no manufactured articles, spares, component parts, etc., should pass out of the workshop except through the Stores Department. Further, where stocks of manufactured material are held, whether they are in a finished or a semi-finished state, these stocks must be under the control of the Stores Department. . . ."

26. As a result of this Report, a reorganisation both of stores and workshops is in progress, and the recommendations which I make in Chapters IX and X have been prepared with due regard thereto, and after consultation with the officers engaged on these reorganisations, so as to fit in with the new methods of operation which they have in mind.

CHAPTER II.

COMMENTS UPON THE GENERAL CONDITIONS EXISTING IN ACCOUNTING DEPARTMENTS.

27. The State owned Railways in India consist of two well defined groups :—

- (a) Those operated by the State.
- (b) Those operated by Companies under contract.

For many years past, the North Western, Eastern Bengal, and Oude and Rohilkund Railways were alone in the first group, but there have now been taken over and added to that group the East Indian and Great Indian Peninsula Railways. The organisation of accounts and audit in the two groups has in the past been radically different.

28. In the first group the Chief Accounting Official, known as Chief Auditor, has always been appointed by and responsible to the Accountant General Railways, who is himself responsible to the Auditor General to the Government of India. His duties have been limited to the accurate keeping of the accounts, to the payment of wages and bills, after they have been audited by his own staff, to the prevention, as far as possible, or to the discovery (if prevention has not been successful) of frauds and irregularities or infringement of what are known in his department as the "canons of financial propriety" or of other provisions of the audit code. The agent and other railway officials who are responsible for the economic and efficient operation of the railway have no control over their own accounts or their Chief Auditor, and while the latter is expected in a general way to assist the operating officials, my experience and observations have led me to the conclusion that there has never been that close co-operation between the two that would have existed under a different organisation.

29. In the second group the Auditor (so-called) has always been an official of the Railway Company, responsible to the Agent and the Board of Directors, and his relations with the Accountant General, Railways, have been limited to furnishing him with such information as to accounts and in such form as he may require. The internal, or check, audit has been part of the accounting system, while the independent or Government audit has been carried out continuously by inspectors appointed by and responsible to the Accountant General, Railways.

30. When the operation of the Great Indian Peninsula and East Indian Railways was taken over by the Government, the auditor of the former came at once under the jurisdiction of the Accountant General, Railways and his responsibilities to the agent ceased ; while the Auditor of the East Indian Railway was made Chief Accountant of that Railway responsible to the Railway Board ; a new departure taken as an experiment in the direction of giving the Railway Executives control of their own accounts, a change which was not complete as it deprived the Agent of the control of the accounts of his own railway.

31. At the same time the Auditor of the Great Indian Peninsula Railway took on the functions of the Inspectors and became in fact auditor of his own accounts as in the original State operated Railways, while in the East Indian Railway a Chief Auditor was appointed, independent of the Chief Accountant and responsible solely to the Accountant General, Railways.

32. The experiment initiated on the East Indian Railway is undoubtedly a step in the right direction, as the combination of the duties of Accountant and Auditor under the control of the Accountant General, Railways is open to many objections which may here be shortly summarised :—

- (1) The activities of the Audit Department under the Accountant General, Railways consists mainly in the compilation of accounts in accordance with rigid principles laid down in the Codes and their presentation to the Auditor General in the form which best suits that authority. It is clear that the information which he requires may be quite different from that required by the Agent ; and yet the Chief Auditor, owing no allegiance to the Agent and being entirely divorced from the operating side of the undertaking, is not in a position either to appreciate administrative needs or to alter accounting procedure to conform thereto. In fact the requirements and ideals of the Auditor General on the one hand and the Agent on the other have been so divergent, while the separation of the two departments has been so complete, that it has only been through the personal interest of individual audit officers that the officials operating the railways have been able to get in the necessary form the financial information which it is imperative they should have.

(2) In spite of explicit instructions in the regulations, it does not seem to be fully realised in actual practice that the relations between the Chief Auditor of the railway, who is also Chief Accountant, and the operating officials should be of the most helpful kind, as in the case of commercial concerns, and that the first business of the accountant is to prepare and furnish to the operating officials such accounts and statistics as they may require, and to help them in every way in the efficient operation of the railway.

(3) That an audit of the accounts made in effect under the same authority as that which keeps the accounts is not an independent audit.

(4) That the complete divorce of accounts from operation has contributed to the delay in presentation of accounts, with the result that operating officials have been forced into keeping more or less accurate accounts for themselves which should have been regularly supplied by the Accounting Department.

(5) The duties of accounting and audit are entirely separate and dissimilar. Accounting is the handmaid of operation and should assist it in every way possible both in form and substance in the nature of the records kept and in the speed with which results are obtained ; speed in this case being more important than meticulous accuracy. Audit should always be carried out by an outside authority independent both of the Chief Accountant and of the operating officials, and should be a salutary check on both ; firstly, to see that the accounting and checking system is a proper one and is faithfully carried out ; secondly, that expenditures are not incurred improperly or without the sanction of the operating officials (where such sanction is within their power) or of the Railway Board ; thirdly, that the administration is economical and efficient ; and lastly, that the accounts submitted periodically to his principals are properly drawn up so as to set forth in intelligible form all the facts which they are entitled to know.

(6) Under the present organisation confusion has arisen in the use of the word "audit." Under any proper system of accountancy it is the duty of the Chief Accountant to satisfy himself and his superior officers that a sound system of accounting exists ; that proper checks are instituted to prevent errors or frauds ; that this system of check is in fact carried out ; and that as a result the operating head of the undertaking may reasonably be assured that the earnings have all been duly accounted for, and that no unauthorised expenditure has been incurred. A good deal of this necessary work which is done in all commercial concerns by the accounting officers is, in the phraseology of the Indian Accounting Code Books, described under the term "audit," but, in view of the misuse of this term in the case of Indian Railways, it is suggested that it now be abandoned in favour of the term "internal check." Internal check is in all systems of accounting performed by separate sections under the charge of the Chief Accountant.

33. Having regard to the drawbacks of the existing combined system as set out above and the absolute necessity that the accounts of the railways should be kept primarily for the use and assistance of the operating officials, I have no hesitation in recommending strongly that the external, as opposed to the internal, audit which the accounting department must carry out be entirely separated from the accounting functions, and that the Chief Accountant of each railway undertaking be directly responsible to the agent. The organisation proposed will be found in full detail in Chapter IV.

34. The adoption by the State owned and managed railways of the Government system of accounting has resulted in serious defects in railway accounting, and has prevented these accounts from being kept on a proper commercial basis as in the case of privately owned railways in other countries. The State system of accounting is based upon the fact that Government activities in the past and in the main have been those only of the administration of certain services into which no question of profit or loss arises. The usual Government Departments, with the exception of the Post Office, are not earning departments, and none of the tests of efficiency which can be applied in privately owned profit earning concerns are applicable in these cases. It follows that a system has had to be introduced of controlling expenditures and testing efficiency quite foreign to those of commercial businesses, the ultimate test of whose efficiency is the amount of the profit or loss which they make on their operations.

35. The State bases the whole of its administrative accounts on cash receipts and cash payments, and not upon revenue and expenditure. In other words, no financial account is taken of any items of revenue or expenditure until the revenue has been collected or the expenditure paid. Outstandings are only brought into the accounts at the end of the financial year by keeping them open until the outstandings have been actually paid or collected, thus causing considerable delay in the presentation of results. A commercial undertaking is continuously performing services and incurring expense in the performance of those services, and while amounts due for the services and the cost thereof have necessarily in due course to be realised or paid in cash, the results of the operations of such a concern can only be judged by a comparison between the value of the services rendered and the cost of those services, whether paid for or not ; in other words, by a comparison of the value of the services rendered by the railways with the value of those rendered to them.

36. Under the existing system, amounts due to the railways in respect of services performed cannot be placed upon the books until they have been realised in cash or its equivalent ; while no liability of the railways to any person can be entered in the books of account until a cheque or other document has been actually issued in payment thereof. The result is seen in the delay in presenting to the officials the periodical results of operations, which, so far as the Indian State managed railways are concerned, is generally from six to eight weeks after the close of the period to which they relate, whereas in the United States complete operating results for a month are usually in the hands of the officials and directors not later than the tenth of the following month. Delay is also caused by the ineffective and obsolete system of accounting and by the low efficiency of the general office staff.

37. In order that the accounting of the railways may be placed upon a sound commercial basis, the following amendments of the present system are essential :—

(1) The accounts must be kept on the basis of work done and services rendered by the railways and of work done for the railways, both expressed in money values and entered in the books as at the time when the services are performed or the work done, and whether paid for or not.

(2) Efficiency must be judged by the relation between the earnings and the operating expenses ; by the value to the community of the services rendered ; and by the efficiency and economy with which they are rendered. For this purpose there must be available at an early date accounts in money values of earnings and expenses, and statistics of performances in the various spheres of railway work. Efforts have been made, and with some measure of success, to obtain many of these figures at earlier dates, but there is still too great a delay in their presentation.

38. Important reforms in the accounting systems of the railways involve the question of personnel. One result of my enquiries and investigations and those of my assistants has been to satisfy me that the great bulk of the clerical labour in the lower grades is inefficient, while much of it is unreliable and untrustworthy. This point has been emphasised by Sir Vincent Raven in his Report on the Workshops as regards manual labour ; but my observations force me to the conclusion that it is equally true with regard to clerical labour. While a gradual improvement in this class of labour may be hoped for and even expected, this is a matter for the distant future and present efforts should be concentrated on attracting a larger proportion of the better educated classes into the railway clerical service, supplementing this by an extension of machine methods of accounting and by eliminating the mass of duplicate and superfluous records which are at present maintained. In this way it will be possible to simplify and concentrate the mass of rules and regulations which hamper administration and so leave the management of the various divisions and sections of the accounting department (subject to a few broad regulations of principle) to carry out the detailed management thereof.

39. The adoption of machine methods must inevitably displace some of the lower grade clerical labour, but it must be remembered that the object of the Railway Administration should be, and must be, not to employ some thousands of inefficient persons but to give the most efficient service possible to the hundreds of millions of the travelling and commercial communities. This can be done only by insisting upon thorough efficiency throughout the railway service from the highest to the lowest employee, and in particular in the accounting department upon the work of which the operation of all railways is so much dependent.

40. In order to attract the better and well educated class of Indians, it will be necessary to offer conditions of service and emoluments equal to those offered by other services which are open to them, both commercial and professional and in view of the present limited supply it will be necessary for some time to come to rely upon European supervision in the posts of heads of departments, divisions and sections.

41. To ensure the best results, promotion throughout must be based on merit and never on seniority, and a regular system of proving merit by results of work and by some kind of test examination should be adopted. Such examinations have been adopted to some extent in the Auditor General's Department, but the scope should be widened so as to cover modern principles and methods of accounting, cost accounting and the use of machines, as well as the broad outlines of railway operation. It must always be remembered that success in examinations is only a partial test, and promotion should always be regulated by the consideration as well of personal character and proved intelligence and efficiency in office work.

42. While I have felt it necessary to make this comment on the unskilled clerical staff, I must at the same time bear testimony to the number—small in proportion to the mass of employees—who have proved their capacity and competence by their valuable services in the departments to which they are attached. It is in the steady, if gradual, increase in the number of these selected and capable Indians that the hope of steady improvement in the accounting organisation must lie.

43. Another matter to which attention should be directed is the short hours now worked in the accounting and audit departments and the laxity shown in enforcing even the short nominal hours of work. These hours vary somewhat in different places, but in general it appears that they are nominally from 10-30 a.m. to 4-30 p.m. with no interval for lunch, although in practice time is taken off in the middle of the day for this purpose. The general result of my enquiries is that the time normally worked does not exceed five and a half hours, and is frequently only five hours. The anomaly is also found in some places that the supervisory and clerical staff in other departments is working shop hours, i.e., 48 hours per week while the clerical staff in the accounting and auditing departments is working only from 29 to 35 hours. There seems to be no good reason for this wide discrepancy, and when the frequent occurrence of holidays is noted it would seem that the hours of work in the accounting and audit departments should be materially increased. In England a seven hour day for clerical staff is the most common unit, and, even allowing for the more unfavourable climatic conditions in India, it would seem that a minimum of six hours work per day, exclusive of meal times, might be prescribed and enforced.

44. While the clerical labour at present employed is to a large extent in receipt of low pay, this is not in itself any ground for the suggestion that the pay is too low for the services performed. On the other hand, it is questionable whether inefficient service is worth any pay, and the real remedy for this inefficiency is to be found in the recruiting and training of a higher grade of employee so that by the results of his work he may justify a claim for higher pay. I am satisfied that the results of such a gradual evolution in the equipment of the staff and the employment of a modern and efficient system of accounting will mean a considerably smaller clerical staff, better pay, and a substantial saving in the cost of the accounting and statistical departments with greater efficiency than exists at present.

45. On every Railway system it is necessary to advise measures to secure the integrity of cash receipts and the propriety of cash payments. In India these measures have taken the form of increasingly elaborate methods of duplication and triplication of records to the neglect of control methods of book-keeping which have long been in force as labour saving devices in European countries. In other words, the Indian Railway system of accounting, based as it is on Governmental rather than on commercial methods, has failed to avail itself of methods of check and countercheck well known in well organised commercial concerns, and each time any serious error or defalcation has occurred duplicate or additional statements have been called for in place of changing the system and adopting improved book-keeping methods.

46. The remedy is the far greater use of mechanical appliances, such as typewriters, calculating, sorting and tabulating machines, and the training of a limited number of skilled operators to handle these machines and so avoid the

preparation by hand of the mass of (so called) abstracts and other statements, which by their very multiplicity conduce to further error and a greater volume of work to ensure ultimate accuracy. At the head of each such installation of machines there should be a highly technical and skilled employee with a thorough knowledge of their working and of the results to be obtained, with ability to control and organise his staff, and, while at the same time caring for their comfort and health, so to direct their work as to obtain adequate results in a reasonable time and ensure their accuracy by means of controlling accounts rather than by the multiplication of forms and returns. The methods proposed to obtain these results are set out in subsequent Chapters of this Report.

47. In the investigation of the system of accounting in different Railways I have naturally found divergent results both in methods and efficiency. Where all the officials from the agent downwards have afforded me every facility for the examinations which my assistants and myself have made, it would be invidious (and is not, as I understand it, contemplated in my Terms of Reference) that I should in this Report make any special reference to the system of any particular Railway or to defects therein which have come to my notice. I think it well, however, in dealing with the existing conditions to call attention in a general way to a few matters which have come before me and which are of sufficient importance in their adverse effect upon the efficient operation of the Railways to deserve mention.

48. One of the State Auditors under the Accountant General Railways has called my attention to a number of errors, some of them serious, which have been discovered by his audit staff, and which clearly under an efficient system of internal audit should have been discovered by the Railway accounting staff. The discovery of these errors has naturally forced him to extend materially the scope of his audit, at considerable expense to the Government of India.

49. Methods of supply and issue of stores are in some cases most inefficient, and I have heard complaints of delay in fulfilling requisitions extending back for many months which have seriously hampered works for which the stores were urgently required.

50. I have found discrepancies between final accounts prepared in different forms, which can only be due to errors which could not have occurred under a proper system of control accounting. Instances of these will be found in subsequent Chapters.

CHAPTER III.

GENERAL PRINCIPLES TO BE OBSERVED IN A SOUND AND EFFICIENT SYSTEM OF ACCOUNTING.

51. It is desirable before considering the system of accounting which should be adopted for the Railways to study shortly the object of those accounts. The tendency has been, and still is, to consider these accounts and the officers who administer them as a check upon the operating officials in all divisions of the Railway rather than as an aid to them in its efficient administration. It cannot be too strongly emphasised that the main and principal object of accounts in a business concern is to place before the officials, as soon as possible after the transactions have taken place, the results of those operations so that they may be able to check without delay any tendency to extravagance or inefficiency in their subordinates.

52. For this purpose it is essential, firstly, that the form in which the results are presented should be such as will best convey to the operating officials the information which they want. The accounting officers are specially skilled in accounts and figures, and in the mode of their preparation and presentation, and it is their duty to use their special qualifications in the first instance solely for the purposes indicated. Secondly, in order to be of use, this presentation must be made with as much speed as possible so that the operating officials may see the results of their work promptly and so be enabled to remedy any errors in administration (technical or commercial) which may be disclosed by these figures.

53. If the accounting officers have not this first and most important duty clearly before them, it must result (and, in fact, has resulted in the past in the case of the Indian Railways) that the operating officials will endeavour to get out for themselves, and without the assistance of skilled accountants, the figures which they require. The figures so obtained are duplicated by the accounting staff at a much later date, and thereafter time and money is expended in agreeing the two sets of results. A proper system of accounting would avoid this duplication, and, at the same time, would give the operating officials of the Railway accurate, or approximately accurate, results at an earlier date than the unproved figures which they have been in the habit of preparing.

54. It is clear that in the past, although there are conspicuous exceptions, not only has this function of the accounting organisation been ignored, but the suggestion of it has been resented, and this condition has undoubtedly resulted largely from the Government organisation, which has described the Chief Accountant as "Chief Auditor," and has settled on him as his principal duty that of auditing the accounts, and included as a subsidiary duty that of preparing them. In fact, his functions have been reversed, and it is difficult to say where his audit ceased and his accounting commenced.

55. If a large institution like a Railway is to be operated under the most successful conditions, it is essential that every division of its business should work harmoniously with every other, and that the heads of departments should confer frequently with each other so that the needs of one department may be assisted where necessary by the technical knowledge of the others. This principle no doubt subsists in the operating departments, and it is equally essential that it should subsist between every one of those departments and the accounting department. If this is not thoroughly understood and acted upon, the other purposes for which the accounting organisation exists, and which are subsidiary to the main one, are really of little use.

56. The second object of accounts in the case of the Indian Railways is to afford the Railway Board, who take the place of the Directors of an ordinary commercial company, such information as is necessary to enable them to judge of the efficiency and economy, both actual and comparative, of the operations of the Railways under their administration.

57. While the operating officials will necessarily require statements and reports from the accounting organisation in considerable detail, and can absorb such detail because the study and use of it is divided up between a number of different departments it is clear that the information to be submitted to the Railway Board must be considerably condensed if they are to be able to make use of it. For this purpose great care and attention is necessary in devising the forms in which these final figures should be presented. A

study of the accounts is only one of many duties which the Railway Board have to perform, and it cannot occupy an undue proportion of their time without seriously interfering with their other duties.

58. The accounts, statements and statistics for the Railway Board should show only the main results. If these disclose adverse conditions in any form, the operating officials should be called upon to explain and account for them, and this they are able to do in detail from the figures and accounts in their possession. While speed in the preparation of the Railway Board accounts is always desirable, it is not so absolutely necessary as it is in the case of a return to be submitted to the operating departments, and for this reason the latter should always be given precedence. It is upon them that the efficiency of the operations largely depends; whereas the use of the returns submitted to the Railway Board is to show whether a sufficient degree of efficiency has in fact been attained in the near past, their need of information upon the immediate operations being considerably less.

59. The third object of the accounts in the case of the Indian Railways is to submit to the Government, as owners of the Railways in much the same sense as the shareholders of a commercial concern are the owners, periodical statements by which they may judge of the efficiency of the control exercised by the Railway Board who are their directors and managers. Here again the results submitted may be at longer intervals and in a much more condensed form than those submitted to the Railway Board. The usual practice of railway companies in England and the United States is to submit accounts yearly to their shareholders. The State and the legislative bodies to whom these accounts must appeal in India are not a technical body, and a great deal of the information submitted to the Railway Board would be quite unintelligible to them. The ideal to be kept in view in devising the form of these statements is that they should deal only with facts which have a bearing on high points of public policy and such statistics as to the earnings and expenses and the capital employed as an intelligent investor would expect to have placed before him.

60. The fourth purpose of the accounts is to enable a Budget or estimated statement of future earnings and expenses to be periodically submitted to the legislative bodies with whom alone rests the power of authorising capital or revenue expenditure. In the case of revenue expenditure, considerable latitude should be allowed, and at the present time the Votes for all Railways in India are made as regards revenue expenditure under five headings only, viz.:-

Administration.

Repairs and Maintenance.

Operation.

Depreciation.

Expenditure out of Depreciation Fund.

While details are submitted under each heading, it is understood that the Railway Board are not bound to do more than see that the total expenditure under each heading does not exceed the estimate. This is, on the whole, a satisfactory method of dealing with the matter; but its consideration with particular regard to the form in which the estimates should be submitted will be taken up later.

CHAPTER IV.

ACCOUNTING ORGANISATION.

61. Assuming that my recommendations for the separation of audit and accounts are adopted, it remains to consider the best form of organisation for the accounting department both of the Railway Board and of the individual Railways and the variations from the present system.

62. The accounts of the Railway Board are at present kept by the Accountant General Railways and are incorporated in the Railway section of the accounts of the Government of India. In future, these accounts should be handed over to a Chief Accountant appointed by and responsible to the Railway Board. This official should also take over the work of summarising and consolidating the accounts of the individual State owned Railways and the Railway Board, and the preparation of the new Consolidated Income Account and Balance Sheet recommended in Chapter VII of this Report. This transfer will relieve the Accountant General Railways of all his functions relating to railway accounts, except those of audit. Under these circumstances, it would seem desirable that his title should be altered from "Accountant General Railways" to "Chief Auditor Railways."

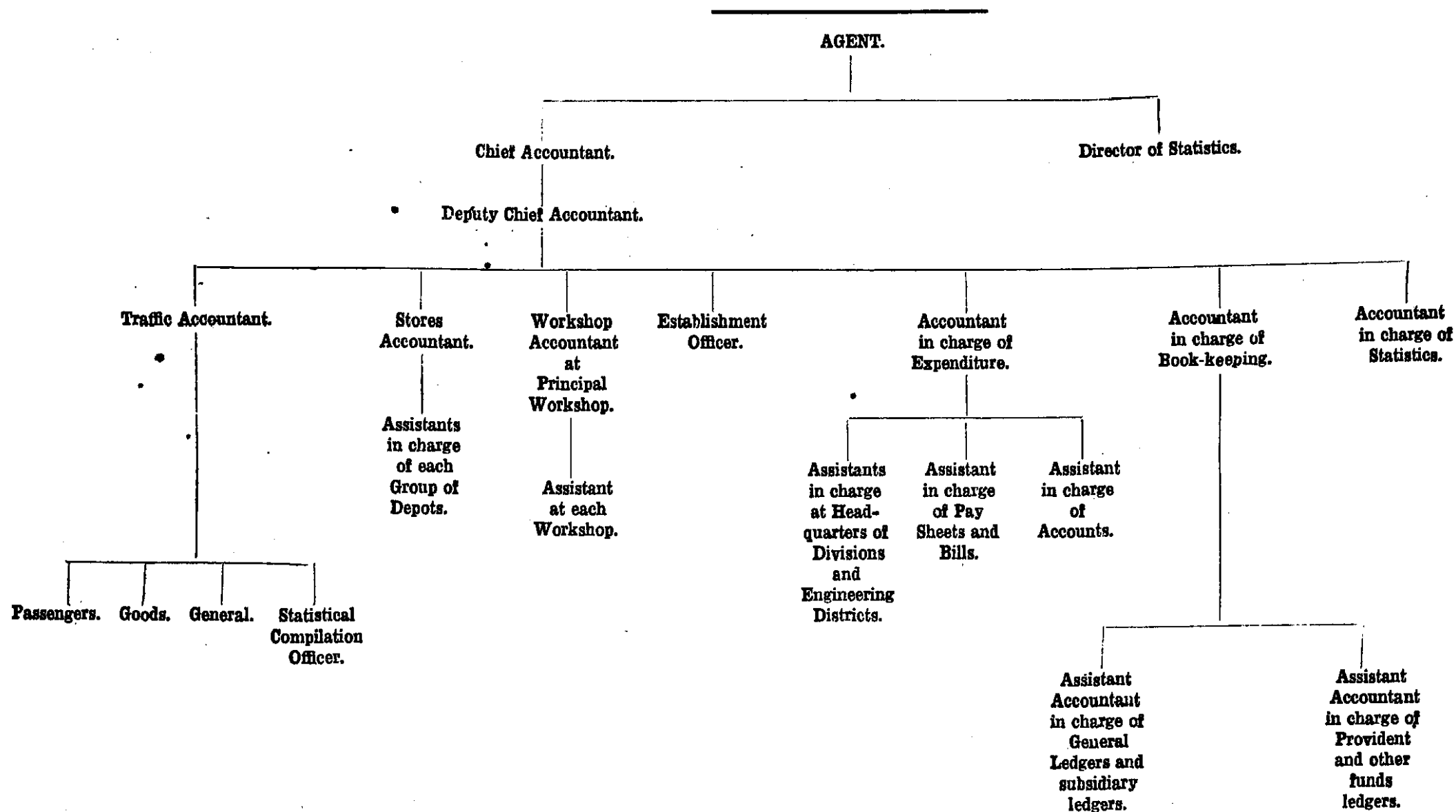
63. The Chief Accountant Railway Board should be appointed by the Railway Board and made directly responsible to that Board's Director of Finance. He would receive direct from each railway its monthly Income Account and Balance Sheet, and would prepare therefrom Consolidated Statements of all State Railways and the Railway Board in the forms provided in Chapter VII of this Report. He would also be authorised to obtain from the Chief Accountant of each railway such additional information and such explanations as he may think necessary, and would be the medium of communication between the Railway Board and the Accounting Department of each railway. He would make a monthly report to the Railway Board when issuing the monthly Consolidated Accounts.

64. The organisation of the Accounting Department of each State Railway would be as shown on page 21.

65. The Director of Statistics would hold the position of personal assistant to the Agent, and his duties would be to receive and study and interpret all Statistical data furnished by the Accounting or Operating Departments, and to report to the Agent any results derived therefrom that appear to require his attention or to be of sufficient interest or importance. He will not be in any way responsible for the preparation of Statistics, which will be carried out by the Accounting Department so far as they are of a financial nature; but he should act as Chairman of a small Statistical Committee consisting of the Chief Accountant or his Deputy and representatives of the other operating departments which should meet periodically to consider any questions relating to Statistics and to receive instructions from and make recommendations to the Central Statistical Committee of the Railway Board (see Chapter XV).

66. In considering the organisation of the Accounting Department, it is necessary to consider the effects of the long leave of absence periodically granted to all European officials. Under the present arrangements, these effects are often serious. The temporary officer may come from another railway or from another department of the same railway, may have neither a knowledge of the system for which he is to be responsible, nor time to familiarise himself with it, and the result may well be dislocation of the whole organisation due to lack of co-ordination, loss of time, and inability to pick up the threads of a complicated and unfamiliar system. To avoid these disadvantages as far as possible every European officer should have a deputy who can at once take his place in any emergency due to leave or other causes, and so carry on the work without any interruption or lack of continuity.

CHART OF ACCOUNTING DEPARTMENT ORGANISATION.



67. The control of the accounts of each railway would be vested in a Chief Accountant, who would be appointed by and removable by the Railway Board only, but would be under the control of the Agent of the Railway and responsible to him for the proper performance of his duties and for furnishing to him and his subordinates all information in connection with accounts and statistics that may be required. In the event of a difference of opinion on any point between the Agent and the Chief Accountant, the latter should have the right of access to the Railway Board, and it should be the duty of the Agent to lay before the Railway Board the fullest information as to the matters in dispute.

68. The Chief Accountant would have under him a Deputy Chief Accountant who in the ordinary course when both are on duty would relieve the Chief Accountant of a great part of his duties of supervision and leave him free to deal with important questions of principle that may arise, and leisure to devise, consider and recommend changes in the system of accounting and the compilation of statistics, and even in such technical matters of operation as may come to his notice from his close contact with the heads of other railway departments. The Deputy Chief Accountant should be appointable and removable only by the Railway Board, but on the recommendation of the Agent, and, so far as possible, by promotion from the accounting staff on that Railway. The Deputy Chief Accountant should have, as a result of his ordinary duties, such a full and complete knowledge of the whole administration and of the details of the work of the accounting department that he could, without difficulty, fill the place of the Chief Accountant when the latter is absent on leave.

69. It is essential that as little change as possible should be made in the positions of Chief Accountant and Deputy Chief Accountant. They should preferably be appointed in the first instance by a selection from the best material available in that particular railway, and when once appointed to their position should hold it, subject to efficiency, for the remainder of their term of service in India.

70. Under the present experimental system on the East Indian Railway, the Chief Accountant is made responsible to the Railway Board and not to the Agent. This arrangement in part carries on the old State Railway system under which the Railway administration has no control over their own accounts. It would seem to be equally important in an individual railway that the Agent should have control of his own accounts under proper safeguards. There seems to be no adequate reason why the Chief Accountant and the Deputy Chief Accountant should not each be servants of the particular railway system to which they are attached, and as such responsible to the Agent of that system just as all other railway officials. The suggested reservation to the Railway Board of the power of appointment and dismissal, and right of access to the Railway Board by the Chief Accountant (or his deputy when acting as Chief) are quite sufficient safeguards against any abuse of his powers by the agent.

71. The remaining accounting staff should be directly responsible to the Chief Accountant and his deputy and through them to the Agent, and their appointment, promotion and dismissal, and other terms of service, should be regulated and controlled by the Agent under similar powers to those which he holds in respect of all other rank and file of the railway staff. It is only by building up such an accounting organisation, similar to those of engineering, traffic and transportation, that the accounts department will feel that they are a part of the railway and equally responsible with other departments for its efficient and economical operation.

72. The next grade of official would be the Accountants, of whom there should be five, each one being the head of a division as hereinafter described.

73. The Traffic Accountant would be in charge of the checking of and accounting for all revenue, and under him would be four Assistant Accountants, *viz.* :

Assistant Traffic Accountant, Passenger.		
"	"	Freight.
"	"	General.
"	"	Statistics.

The Traffic Accountant should be charged with the primary duty of organising and supervising the internal audit of traffic receipts and of the compilation of the statistics relating thereto. In view of the system recommended in Chapter VIII, by which this audit would be performed mainly by the use of electrical sorting and tabulating machines, it is essential that he should have a thorough

knowledge of the principles of all these machines and be able to design the cards for recording the different facts and operations, and to amend these from time to time in accordance with improved methods or with changes in operating details. He should keep in the closest possible touch with the Director of Statistics and any others who make use of the various compilations of traffic receipts, so that their requirements may be met speedily and accurately. The compilation of traffic statistics is so closely related to the audit of traffic receipts, the same machine methods being used for both, that it is desirable that both the internal audit and the compilation of traffic statistics should be under his charge. He should have sufficient available time to deal with all questions relating to station agents' accounts, and accounts due from the Government departments and the general public, and should at the same time have his finger on the pulse of his deputies and their staffs, and should deal with the many questions which they must from time to time bring to him for consideration.

74. The detail work of the Assistant Traffic Accountants will be dealt with in describing the system of Traffic Audit and Statistics (Chapters VIII and XV). It is sufficient here to add that it is desirable that each of them should know and thoroughly understand the work of the others, so that when the Traffic Accountant or any one of his deputies is away on leave one of the others can take the place of either. The periods of leave should, as far as possible, be arranged so that not more than one of these five officers is away at any one time.

75. The same remarks as to continuance of employment and selection from the ranks of the same Railway in the first instance will apply to the Traffic Accountant as in the case of the Chief Accountant and the Deputy Chief Accountant. It is not quite so important in the case of the four deputy traffic accountants, as their work would be the same on every Railway, and the disadvantages of a break in continuity would be chiefly limited to a lack of acquaintance with their subordinate staff. At the same time, this latter point is of sufficient importance to make it desirable that changes should not be made from Railway to Railway unless this is absolutely unavoidable.

76. It will be seen in Chapter VIII that the plan of traffic audit there set out contemplates the eventual centralisation of internal traffic audit for all Railways at certain central points, and that this whole organisation would be responsible directly to the Railway Board. As this system is brought into effect on any one Railway or group of Railways the accountant in charge of traffic and his deputies will be transferred to the central organisation.

77. The Stores Accountant would be responsible for the whole of the priced store ledgers and for seeing that these ledgers were, at least twice in each year in respect of every commodity at every depôt, agreed both with the quantity cards kept in the stores by the storekeeper and also with the physical stock on hand. He would have an assistant in charge of each group of depôt priced stores ledgers, who would be responsible under him for the details of the work, leaving the Stores Accountant with sufficient free time to devote to the consideration of all important points that are submitted to him; to devise and test possible improvements in the system, and in particular to keep a careful watch over the prices of issue and the agreement of balances. As in other divisions, one of the assistants should be appointed to act as Stores Accountant during the absence of his superior, and one of his assistants should be appointed to act as deputy during such period.

78. The Workshops Accountant would have charge of the whole of the staff keeping the workshop records and cost accounts. Under him would be assistant workshop accountants in charge of the accounts at each workshop who would be responsible for the detail organisation and work at each point, the preparation of pay rolls, stores distribution, and cost accounts. One of the main duties of the Workshop Accountant would be to review continuously the orders for which costs are being obtained, and in consultation with the superintendents of workshops and other operating officials to consider what enlargement or curtailment of these order numbers is desirable in the interests of efficiency and economy. He would also review all costs prepared by his Assistants, and compare costs at different workshops and be available at any time to take up and discuss important questions of principle that may arise. In the absence of the Workshop Accountant, the Chief Accountant would appoint one of his deputies to act in his place, and would also appoint the most efficient of the clerks under the deputies to act as deputy. Further reference to the workshops will be found in Chapter X.

79. The establishment on each Railway should be controlled by establishment officers responsible to the Agent in each case and governed by rules made by the Railway Board, as to salaries, allowances, leave and promotion. The Railway Board establishment and that of agents, deputy agents and chief accountants and deputy accountants should be similarly controlled by the Director of Finance. The audit carried out by the Auditor General Railways should be a post audit only, and in accordance with the procedure enunciated in Chapter VI of this Report.

80. The Establishment Officer would continue to perform all his present non-accounting duties with regard to staff. He would verify after payment all pay sheets received from divisions, workshops, stores and other points where payment is made without a previous Central Office check. He would verify all Central Office and other pay rolls before audit, except those just mentioned, and would prepare the pay rolls for administrative officials and for the establishment section itself. These last two would be sent to the Deputy Chief Accountant for verification before payment. Full details of the preparation and verification of pay rolls will be found in Appendices VI, VII and VIII.

81. The duties of the Accountant in charge of Expenditures would be, through his organisation, to receive from the originating departments all accounts payable for stores, supplies, salaries, wages, and other items of expense; to satisfy himself that these documents have been examined by the proper officers, and that all certifications and approvals have been made; and to verify the arithmetical calculations. He would then prepare the bill and pay sheet statements, have them signed by the Chief Accountant or his deputy and forwarded to the Treasurer for payment. He would also be responsible for the keeping of the necessary records. He would have under him two Assistant Accountants, of whom one would be in charge of pay sheets and bills and the other of the necessary records relating thereto. He would also have under him an Assistant Accountant at each operating division who would under his supervision carry out the same work in respect of all pay rolls and accounts which are paid at the divisions. In the case of absence on leave, or for other causes, of any of the accountants, the best official of the next lower grade, irrespective of seniority, should be appointed to act temporarily for him. By this means continuity of administration should be assured. The details of this system will be found in Appendix VIII.

82. The Accountant in charge of General Book-keeping would have charge of all the general books of the Railway, which would be written up from the Journal and other entries prepared in the different accounting divisions. He would be responsible for verifying all these entries and satisfying himself that they are properly prepared, and he would also be responsible for the preparation of the periodical accounts of Traffic earnings (as received from the Traffic Division) and operations of the Railway. He would maintain subsidiary ledgers controlling the accounts of the different divisions *e.g.*, Traffic, Vouchers, Stores, and Workshops. His organisation would be the same as in other cases, *viz.* : a Deputy who would be responsible for the detail working of the division and would take the place of his superior officer when on leave, one of his subordinates being appointed to act as Deputy at such times.

83. The Statistical Compilation Officer would have charge of the compilation of the whole of the Financial Statistics of the Railway other than Traffic. It would be his duty to compile the same as rapidly as possible and to see that they reach the Director of Statistics and other officials interested therein at the earliest possible date. He would have a Chief Clerk, who would be in charge of all the punching, sorting, tabulating and auxiliary machines required for statistical purposes, and who would be responsible for the detail working thereof. He would also take the place of his senior when absent on leave, one of his assistants being appointed to act as temporary Chief Clerk during such absence. Further reference to the work of this Division will be found in Chapter XV.

84. The relation of the heads of the various divisions of the Accounting Department to the Chief Accountant are of considerable importance. Each head of a Division should be the superior authority in such Division and be held responsible to the Chief Accountant for its proper conduct. All results which he produces, so far as they have to be sent to other departments, must, in theory, come through the Chief Accountant; but the latter should have sufficient latitude to enable him to authorise any division to send results to those in other departments who require the same, under such conditions as he may lay down, and providing always that copies are sent to himself.* This procedure is absolutely essential to avoid red tape and to ensure the presentation of accounting statements to those who require to use them for operating purposes without

the lightest unnecessary delay. The Deputy Chief Accountant and the Accountants in Charge of Divisions, in the event of a disagreement with any ruling of the Chief Accountant, should have the same right of access to the agent as the Chief Accountant has to the Railway Board.

85. Each Division would be subdivided into sections, some of which are indicated above. The section head would be held responsible by the accountant in charge of the Division for the proper conduct of the work of his section, and, in the event of disagreement between them, would have the right to refer the matter to the Chief Accountant. One of the main reasons for the unsatisfactory conditions found in some accounting divisions is undoubtedly want of proper supervision in each section of the work, and great care should be exercised over the appointment of section heads. This is a matter which must receive the continuous attention of both Chief and Division Accountants.

86. It is important that in such an organisation encouragement should be given to the heads of divisions and sections to make suggestions for the improvement of the service, and a system of premiums should be established by which any employee making a suggestion of a valuable nature which is accepted and acted upon should receive some pecuniary reward. At the present time throughout the Railway Accounting organisation there appears to be a scarcity of suggestions for improvements in the system of working from those who are in charge of the work. The general attitude is one of indifference and *laissez faire*. Suggestions even when made are frequently blocked by reference to provisions of the Code which do not appear to permit any change, and the general attitude of the whole staff is to maintain the *status quo* rather than to suggest improvements which may lead to discussion and opposition. To combat this condition of mind in India is of the utmost importance, and I would suggest it can best be done by such a system of rewards as I have mentioned above. It should be understood that every employee down to the lowest grade is entitled to make suggestions to his immediate superior officer; that these suggestions when made should be reported to the head of the section, and by him, with his comments, to the head of the division. The head of the division should have discretion as to whether he proceeds further with the suggestion or not, and if he refuses to proceed he should give his reasons therefor. The head of the division, in his turn, would forward the suggestion with his comments to the Chief Accountant who would consider the matter and if within the limit of his authority either authorise or reject it. If he wished to carry the suggestion out, and it was, in any way in conflict with his authority, he would take it up firstly with the Agent, and thereafter if necessary with the Railway Board. There is nothing new in such a practice; it has been adopted for years in many of the most progressive works both in England and America, and, so far as my experience goes, has always been found of great benefit to the whole organisation.

87. Another point of importance in connection with both audit and accounts is the bulk of the regulations contained in volumes called "Codes." In the past, the codes of the different departments of the railway service may have been short and simple in their form, but they appear to have been compiled on the principle that whenever a mistake is found a new provision must be inserted in the code to prevent it being repeated. Such a method is not based upon right principles. Instructions in the methods of keeping accounts and the methods of audit should be strictly limited to general points of principle. A fairly free hand should be left to the accounting officers and auditors (who should be responsible officials) to carry out the broad principles in the best way they can. There may well be differences in the methods adopted by the different railways, both in the accounting department and in the audit, but these differences in method are all for the good, and, provided, they are brought up and discussed at periodical meetings of accounting officers, they will tend continuously to improve both systems and will keep the whole of the staff up to a higher standard of efficiency. Nothing can be so deadening to the initiative, enterprise and keenness of a competent officer as a strict code, outside the limitations of which he cannot proceed in the minutes particular. One accounting officer has reported to me that on taking up his duties on a certain railway he was confronted with 35 volumes of codes and manuals, all of which he was expected to absorb. It is a slur on human intelligence that responsible officials should be placed under such a system, and, so long as it continues, there can be no progressive improvement in methods such as is absolutely necessary if a commercial enterprise like a railway is to be kept up-to-date and to maintain its efficiency. I have frequently heard the remark by officials that they have not the time to read the codes, and consequently to a great extent ignore them until some improvement is suggested, when a provision in the code is quoted which seems entirely to prevent its adoption.

CHAPTER V.

NEW SYSTEM OF CASH RECEIPTS AND DISBURSEMENTS.

88. Under the present practice, the entire gross earnings and other receipts of the State Railways are paid to the Central Government ; and all disbursements are met out of credits opened by the Central Government for the Railway disbursing officers under the authority of the Railway Budget Votes of the Legislative Assembly.

89. The complete separation of the Railway Finances from those of the Government of India, which was recommended in the report of the Acworth Commission, would seem to require that this practice be entirely abandoned ; and that each Railway should keep control of its own receipts and out of these receipts should pay all expenses, subject only to the limitation that the Budget Votes for expenditures are not exceeded. It may, however, be the case that for various reasons it is not yet considered advisable to make this complete separation.

90. On this assumption, I recommend, as an alternative, that the Controller of Currency be constituted the Banker of the Railways, and that the various branches of the Imperial Bank and the sub-treasuries of the Government of India be treated for Railway purposes as branches of the Controller of Currency.

91. As soon as the Railway Budget has been passed by the Assembly, the Railway Board would divide the aggregate Vote between the Railway Board proper and each separate Railway and would send this allocation to the Controller of Currency with a request that he open credits accordingly.

92. The Controller of Currency should open on his books one account for each Railway by a credit with a branch of the Imperial Bank for such amount as has been allocated to that Railway by the Railway Board.

93. On these credits each Railway agent would then be free to draw cheques as required, and, at his discretion, to open working or imprest accounts for use by the various disbursing officers. The Railway Board would be limited in their allocation by the aggregate of the Budget Votes ; the Railway Board and each agent would be limited in their expenditure by the Budget authorisation of the Legislature in the case of the former and by the Railway Board in the case of the latter ; and each disbursing officer would be similarly limited by the amount which he has been authorised to expend. The Controller of Currency will only require to satisfy himself that the aggregate of the credits which he opens is equal to the total Votes of the Railway Budget.

94. There will be no need to keep different banking or cash accounts for each separate Vote, as the progress of expenditure under Vote Heads will be clearly shown in the monthly accounts of expenditure prepared by the Railway Board and by each Railway and consolidated into one statement by the Chief Accountant, Railway Board.

95. Railway traffic and other receipts would continue, as at present, to be paid in to the Central Government. In some cases, all collections are sent down by train to the city in which the Railway Central Office is situated and then paid into the Imperial Bank for the credit of the Controller of Currency. In others they are paid in locally either to Branch Banks or to sub-treasuries. Similarly, currency required for cash disbursements of wages, etc., are sent up as needed from the Railway Central Office, or drawn from Branches of Local Banks or from sub-treasuries as may be most convenient. Cheques are always drawn on branches of the Imperial Bank.

96. There is no reason to interfere with these arrangements. All receipts and expenditure will be under the control of the Treasurer of the Railway until the former are paid over to the Government or cheques are drawn against credits opened by the Controller of Currency. Disbursing officers should be furnished with moneys from time to time as may be required, either on imprests or as working funds for which accounts are opened in their names in Local Banks by cheques drawn against the credits opened by the Controller of Currency.

97. The Treasurer will thus have to deal with two classes of accounts :—

- (1) The account with the Controller of Currency for moneys paid into Government account and for cheques drawn against credits.

- (2) The accounts with disbursing officers which should always be in credit and which he will check and verify by statements received periodically and by certificates of balances from the various Bank accounts or verification by count by travelling inspectors.

98. The Treasurer would keep separate books for receipts and disbursements respectively. His receipts would consist of :—

- (1) Remittances from stations, and other outside agencies.
- (2) Remittances received direct by the Treasurer in settlement of debtor accounts, etc.

The former may be paid in to Banks and sub-treasuries at various points, and his books must show date of receipt and amount debit to the Controller of Currency and also the Bank and sub-treasury to which it has been paid. The latter would all be paid into the Imperial Bank at the Central Office city. These remittances should be written up daily on separate cash sheets with two carbon copies, one of which would be sent daily to the Chief Accountant to check with his accounts and the other to the Controller of Currency. The latter should have a perforated slip attached on which the Controller of Currency would (1) enter any amounts of which he had not yet received advice from his agents and (2) sign and return to the Treasurer.

99. For his payments by cheque the Treasurer would write up a disbursement sheet giving number of cheque, amount, and Bank on which drawn if more than one is in use in respect of his credit. This also would have two carbon copies as for the receipts, one for the Chief Accountant and the other with slip attached for the Controller of Currency who would return the slip signed with a list of cheques not presented.

100. The Controller of Currency, with these daily accounts with each Treasurer, should have no difficulty in maintaining in his own books accounts showing the balance at the credit of each Railway and of the Railway Board.

101. The Treasurer would carry the daily totals of his receipt and expenditure sheets into a General Cash Book, the balance of which should always agree with the balance in the " Controller of Currency " account in the General Ledger, kept by the Chief Accountant.

102. Another change in the present system which will much simplify the accounting is that all accounts due to the Railway Board or separate Railways by the Central or Provincial Governments or Departments thereof for services rendered of any kind should be paid regularly by cheque as soon as possible after they are rendered and these cheques treated as cash receipts. Similarly, all payments due by the Railway Board or separate Railways for services rendered by Central or Provincial Governments or Departments thereof should be paid by cheque. This procedure will avoid the present complicated procedure of settling these accounts by transfers in the books of the Central Government, such transfers having to be accepted by both parties before any settlement can be made.

103. There are, however, some special cases in which a different procedure must be followed, *viz.* : (1) English Indents and salaries and allowances paid in England to Officers on leave, etc., and (2) payments at the end of the year to the Railway Board and the Government of India in respect of Depreciation Fund, Interest and Share of Surplus.

104. In the case of English Indents, each Railway will in due course receive invoices which will be verified in the usual way, and these should then be charged to English Consignments and credited to an account entitled English Indents. On receipt from the Government of India of their statements of accounts taken up by them in their current account with the India Office, the Railway should draw a cheque upon its credit in favour of the Government of India, so settling the matter.

105. In the case of allowances to officers on leave, the amounts and the due dates being known, they should be entered in the books, just as are all other expenses, and credited to the officers concerned. On advice from the Government of India that the amounts have been taken up by them in their current account with the India Office, cheques would be drawn in favour of the Government of India and the officers accounts cleared as in the case of indents. A subsidiary ledger would be kept for all English accounts above mentioned, over which the account of the same name in the general ledger would be a control.

106. At the end of each year each Railway has to pay over to the Government of India interest on capital at charge and to the Railway Board the excess

of the contribution to its depreciation fund over the payments made thereout and the surplus income of the year. The Railway Board have to pay to the Government of India the share of surplus to which the latter is entitled under the convention of February 20th, 1924, made with the Legislative Assembly. Under the present system by which gross earnings of the Railways are considered as income of the Government, no votes are made in respect of any of the above items, and until a complete separation of Railway from Government cash is made there will be no votes or credits against which the Railways or the Railway Board can draw cheques to meet them. The following procedure is, therefore, recommended.

107. As soon as the Government audits* of the accounts of the Railways and Railway Board are completed, which should, under the new procedure, be within six weeks of the close of the year, the Chief Auditor Railways should issue the following certificates in quadruplicate, one for his office copy, one to be sent to the Railway concerned, one to the Railway Board and one to the Controller of Currency.

1. I certify that the following amounts are due from the
 Railway to the Railway Board for the year ended March
 31st, 19. . . . in respect of

(a) Excess of provision for depreciation over expenditure made out of
 the Depreciation Fund. Rs.

(b) Net surplus of earnings over expenses, including as expenses Depre-
 ciation Fund and Interest. Rs.

2. I certify that the following amount is due from the
 Railway to the Government of India for the year ended
 March 31st, 19. . . . in respect of Interest on Capital at Charge, as per
 statement below. Rs.

The Chief Auditor Railways should also issue in triplicate the following certificate, one copy for his office use, one copy to be sent to the Railway Board, and one copy to the Controller of Currency.

3. I certify that the following amount is due from the Railway Board
 to the Government of India in respect of Surplus Profits of the State
 owned Railways for the year ended March 31st 19. . . . as per statement
 attached.

Rs.

108. In the meantime, before the issue of these certificates, each Railway will have credited the Government of India with the interest due on capital at charge and the Railway Board with the amounts due in respect of excess depreciation and surplus profits, and the Railway Board will have debited the Railways and credited Depreciation Reserve for each Railway and its own Reserve Account on advice from the Chief Accountant of each Railway concerned.

109. On receipt of the above certificates from the Chief Auditor Railways, they will be treated as cheques payable by the Railway and receivable by the Railway Board in respect of No. 1, and payable by the Railways and the Railway Board and receivable by the Government of India in respect of No. 2 and No. 3, and the cash accounts will be adjusted accordingly by the Railways, the Railway Board and the Controller of Currency.

110. When the new system of accounting is initiated, assuming this to be at the beginning of a financial year, the Railway Board account with the Controller of Currency should be opened as soon as the figures are ascertained with a balance equal to the sum of

(a) The Reserve Account

(b) The Unexpended Depreciation Reserves of the various State owned
 Railways

as at the end of the preceding year, less any amounts which have been specifically invested by the Government of India in respect of Railway Reserves. It will not be necessary for the Railway Board to credit any of these balances to the separate Railways, with the exception perhaps of Company managed lines when any provision of the contracts with the Government must be observed. Investments made by the Government of India of Railway Reserve Fund should also be taken up in the books of the Railway Board. The individual State owned Railways will thus have no opening balances of cash, but they will have credits opened as of the first day of the new financial year for the amount of the votes which have been allocated to them by the Railway Board.

111. At the end of the last financial year under the old system the Balance Sheet for each State owned Railway and for the Railway Board when prepared would take up all the known outstandings both debit and credit with other Government Departments, and these amounts should be thereafter under the new system settled by cheque, all these cheques being chargeable against the Vote for Working Capital. The opening of the new books will necessarily have to be deferred until the closing Balance Sheets are completed, but this will not prevent their adoption for all current transactions as on the first day of the new year.

112. Further details of this Cash System with the necessary forms will be found in Appendix I.

113. The adoption of the recommendations in this Chapter will do much to simplify Railway Accounting, will enable the books to be closed at earlier dates after the close of each year, and will entirely avoid the necessity of any current account with the Government of India other than the quasi Bank Account with the Controller of Currency. Moreover, it will enable the complete separation of Railway Finance and Financial Accounts from those of the Government of India to be carried through without in any way disturbing the system here recommended.

CHAPTER VI.

NEW SYSTEM OF AUDIT BY AUDITOR GENERAL'S DEPARTMENT.

114. Under the present system the functions of Accounting and Audit in the State owned and managed Railways, with one exception, are centred in the Accountant General Railways, who is responsible to and controlled by the Auditor General. The Auditor General in India has supreme powers, and is responsible only to the Secretary of State in London. The one exception is the East Indian Railway whose accounts have been separated from Audit and placed under the control of the Railway Board, the functions of Audit remaining with the Accountant General Railways. In the State Railways managed by Companies the accounts are under the Chief Auditor who is responsible to and controlled by the Agent, while the Audit functions are carried out by Inspectors of Accounts responsible to and controlled by the Accountant General Railways.

115. In Chapter II, I have recommended that the Chief Accountant be responsible to the agent for all Accounting functions, including the internal check upon receipts and expenditures, and that the Audit functions be limited to a post-audit and carried out by a staff responsible to and controlled by the Auditor General.

116. It remains to lay down in more detail the plan of Audit which should be carried out by the Auditor General under the new system ; this may be divided into three sections, *viz.* :—

1. A critical examination of the accounting and internal check system in force, with a test sufficient to show that this system is in fact being carried out. This may be sub-divided into :—

- (a) Expenditures.
- (b) Traffic.
- (c) Stores.
- (d) Workshops.
- (e) Provident Fund.
- (f) Collieries.

2. A detailed audit of all expenditures charged to Capital Account by examining the sanctions therefor and determining the correctness of the allocation.

3. A test examination of other expenditures, with the sanctions and vouchers therefor.

4. A complete annual verification and critical examination of the Revenue Account and Balance Sheet with particular regard to the accuracy of the allocation to each account heading, the value as a going concern of all current assets and the proper inclusion of all liabilities.

117. The following general principles should apply :—

The audit should be a post audit, *i.e.*, the Auditor should have no power or authority to hold up payments pending his audit. His remedy in case of objection to any payment would be :—

- (a) To take the matter up firstly with the Chief Accountant, and secondly with the agent.
- (b) In the event of disagreement resulting, he would report the matter to the Auditor General who would take it up with the Railway Board.
- (c) In the event of disagreement again resulting, the Auditor General would report to his superior officer (at present the Secretary of State) who would take such action as he thought fit.
- (d) The Auditor General should certify the Annual Revenue Account and Balance Sheet of each separate Railway system, and the corresponding Consolidated Accounts of the Railway Administration, and his certificates, together with copies of any special reports he may have made to the Secretary of State, should be made part of the Annual Report of the Railway and submitted with it to the Legislature.

The Auditor would have power to make suggestions to the chief accountant or the agent for any amendments or improvements in the system of accounting and the methods of carrying them into effect. If, in his opinion, defects exist which may permit of loss, theft or even extravagance, it should be his duty to take the matter up immediately with the Chief Accountant or the Agent, and if his recommendations are not adopted or disposed of to his satisfaction to report the matter to the Auditor General. This applies also to any lack of an effective internal check by the Chief Accountant's department which may be disclosed by the test audit ; this should be reported immediately to the Chief Accountant and, if of sufficient importance, also to the agent and the Railway Board.

118. Except as provided in the preceding paragraph, neither the Auditor nor the Auditor General would have power to enforce their views upon individual Railway systems or upon the Railway Board.

119. To carry out the above duties effectively, requires not only considerable tact on the part of the Auditor but also a well thought out organisation among his staff. In particular, he should not permit any of his staff, unless authorised by himself, to discuss any matters of principle with the staff of the Railway, and he should be most careful only to give such authority to selected members thereof.

120. It is not the duty or the right of the Auditor to interfere with the discretion of any Railway official, provided that the latter is acting within the powers delegated to him by or with the authority of the Railway Board.

121. While it is the duty of the Auditor General to see that the expenditures of the Railway Department as a whole do not exceed the Demands authorised by the Legislature in voting the Railway Budget, it is only the duty of the Auditor of each separate Railway to see that the expenditures do not exceed the amount authorised by the Railway Board.

122. Detailed Programmes of Audit for Capital Expenditures, Revenue Expenditures, Revenue Account and Balance Sheet, Traffic Receipts, Stores, Workshops, Establishment, Provident Fund, and Collieries, will be found in Appendix II.

123. In addition to the General Audit as set out in the preceding sections, there are other functions of the Auditor General which should be exercised by the Auditors on his staff. These functions have been set forth within the last two years somewhat tentatively under the phrase "Higher Audit," and reference is made to them in a document entitled "Office Order No. 1," issued over the signature of the Chief Auditor of the East Indian Railway under date 30th November, 1925. The following paragraph is worth quoting :—

"The more important portion of the work of the new Audit office will, however, be in the sphere of Higher Audit. The Audit Officer in this capacity is expected to watch on behalf of the taxpayer (or of the shareholder, if the Railway were a Joint Stock concern) that the Railway is run on the most economical lines possible, and that there is no loss or waste of public money or of Railway Revenues. He has then to encroach upon a number of grounds which were hitherto considered as too sacred for him and as reserved for the Executive and the Administrative. The tradition of Railway Audit has to be changed, and one cannot be too careful in the transitory stage. A number of points for Higher Audit has been given in the confidential Annexure. These are by no means exhaustive, nor are they quite practicable in every case to start with. They are merely given by way of illustration, and Section Officers should examine them carefully and report as to their desirability and feasibility in actual working in every case. They should also suggest other points which suggest themselves to them, and should exercise the greatest care in their application. Above all, the utmost care should be exercised by all concerned to prevent friction, and anything to be done in the sphere of Higher Audit will have to be done gradually and not all at once. The points to be looked into should be determined by the Section Officer personally in consultation with his Accountant and with the Government Auditor. And in no case should any objection on the ground of Higher Audit be preferred to the Accounts department until the same has been examined and approved by the Government Auditor."

124. No objection can be taken to the phraseology of this extract or to its tone, particularly in its reference to the necessity of avoiding friction and of obtaining the sanction of the Chief Auditor before any objection is raised. It is,

however, open to criticism in that the references to economy and to loss and waste of public money may trench upon the powers and duties of the agent on technical matters upon which the auditor is hardly qualified to comment. Such matters, for instance, as the following would hardly seem to come within the sphere of even a Government auditor :—

- (a) The necessity for any item of expenditure.
- (b) Justification for incurring law charges.
- (c) Criticism of works executed which involves technical engineering or workshop knowledge.

125. I have had an opportunity of fully discussing audit methods and programmes with the Chief Auditor, East Indian Railway, and am satisfied that his general ideas, particularly on the subject of " Higher Audit " are, on the whole, sound and will be of value not only to the Central Government but also to the Railway Executives, provided that the limits indicated in this Chapter are observed ; that the greatest possible tact is employed in the investigation and the report thereon ; that this report is made in the first instance to the agent, and secondly, if necessary, to the Railway Board with the agent's comments and that no attempt is made to hinder or in any way interfere with the discretion of the operating official.

126. " Higher Audit " work should only be entrusted to a staff specially selected for their skill, ability and tact, and no work should be undertaken which forms part of the regular routine of internal check by the Chief Accountant's department, beyond the usual tests to which reference has already been made.

127. Under the conditions which exist in India, it is desirable that the allocations of the Audit staff to particular branches of the audit work should be altered at frequent intervals and that as far as possible the special examinations which " Higher Audit " involves should be carried out by surprise visits.

128. It is also desirable that the audit programmes prepared for the use of the staff should be in very general terms only, but each audit official should be required to return with the results of his work a complete detailed programme of what he has done. By this means it will be easier to discover any errors or omissions in his audit work.

129. These powers are perhaps wider than those which are in fact exercised by the auditors of public companies, but in view of the position of the Government of India as the sole shareholder and owner of the railways it cannot be said that they exceed in any way what the Government has a right to demand. The Government should, however, remember that it has with much care and discrimination selected able men to sit upon the Railway Board, that the Board has in turn, with the approval of the Government, selected able men as chief executives of the different railways, and it is incumbent that an auditor, in the somewhat wide scope outlined above, should have due regard to the technical knowledge and ability of these officials and should take up with them with the utmost tact and discretion any matters on which it might appear that they have exceeded the powers delegated to them.

130. My general conclusion is that an audit as laid down and limited in this Chapter, and with due care to avoid duplication and interference with the proper exercise of the functions of the Railway Executives, can only be productive of good results and of considerable value to the agent and the Railway Board as well as to the taxpayer who is the ultimate beneficiary of the Railways.

CHAPTER VII.

NEW FORMS OF ANNUAL ACCOUNTS FOR INDIVIDUAL RAILWAYS, INCLUDING BALANCE SHEET FOR EACH, AND OF CONSOLIDATED INCOME ACCOUNTS AND BALANCE SHEET FOR THE WHOLE OF THE RAILWAY ADMINISTRATION.

131. *Financial Accounts.*—The following accounts are at present published annually by each separate Railway, *viz.* :—

1. The Annual Report issued in July.
2. The Finance Accounts.
3. The Revised Estimate for the current year and Budget Estimate for the succeeding year.

Neither of the two last documents bears any date of issue or publication, but it is understood that they are issued about the end of December or early in January. The first of these three volumes is the most important, and if revised in certain particulars it should not be necessary to produce the second, while the third will be considered in Chapter XIV on Budget.

132. The accounts contained in the Annual Report comprise :—

1. Capital Accounts.
2. Revenue Accounts.

The former, if considered in connection with similar accounts in the second volume, involve a considerable amount of duplication and can be much simplified. There is no proper balance sheet, the nearest approach to it being a statement entitled "Capital Account" the total of which, however, does not agree with the details given on previous pages.

133. To show the lack of consistency between various published statements and the consequent difficulty of extracting accurate information I quote figures of capital at charge and capital expenditure as separately given in the following statements for the Great Indian Peninsula Railway as at March 31st, 1926.

<i>Capital at Charge.</i>	<i>Thousands of Rupees.</i>
As given in Statement No. VII of G. I. P. Annual Report ..	1,07,93,89
As given in Railway Board Annual Report :—	
Statement 5	1,11,88,19
Statement 2 (a)	1,08,41,07
As given by Accountant General Railways Government Accounts,	
Statement 24	89,99,62

Capital Expenditure.

As given in G. I. P. Annual Report, Statement VI 1,05,55,32

With such discrepancies which will be similarly found in the case of other Railways, it is hopeless to attempt to prepare any balance sheet without a complete investigation of the accounts.

134. It is essential to the rendering of clear and accurate statements of capital expenditure and income accounts that one form only should be prepared from a proper set of books for each Railway, in which case it would not be possible to prepare such a variety of figures as those set out in the preceding paragraph in order to record one definite fact, *viz.* : the amount of money that has been expended in constructing a Railway.

135. Each Railway system should prepare from its books of account at the end of each month a balance sheet and income account with detailed explanatory schedules. This would be an approximately accurate statement at interim periods ; but at the end of the year by keeping the books open for a sufficient length of time (say one month) to include all material items it should be treated as a final document not subject to alteration, any adjustments that may be subsequently found necessary being made in the accounts of the succeeding year.

136. The accounts prepared monthly and annually for the Railway Board should be built up by a consolidation of the balance sheets of the separate State Railways, whether State or Company managed, each of which would be in

identical form. These statements combined with the balance sheet of the Railway Board would together make the consolidated balance sheet for the whole of the State Railways and the Railway Administration.

137. The most important document to be prepared in support of the balance sheet are :—

1. A statement of Capital Expenditure.
2. A statement of Income Account.

These statements should be in standard form for all Railways, and their consolidation annually with similar statements for the Railway Board will furnish the corresponding statements for the whole Railway Administration.

138. For the purposes of the Central Government it has been customary in the past to convert the Railway accounts, which are necessarily prepared on a revenue basis, to a cash basis by an adjustment under the name of suspense account. The difference between the two forms may be thus illustrated. The revenue for the year consists of the cash collections less so much of them as represents services performed in the previous year and with the addition of the value of services performed during the year for which cash was received in the succeeding year. Similarly, expenditures represent cash payments made during the year, less those which accrued in the previous year and plus those accrued at the end of the year ; and, in addition, there must be taken into account stores and workshops expenditures incurred in the preceding year but applying to the current year, while those incurred in the current year but only used for operation in the next year must be excluded.

139. It will thus be seen that the item suspense account which appears in all the financial accounts of Railways prepared by the Accountant General Railways and also in the Budget submitted to the Legislative Assembly is made up of the difference between outstandings, *viz.* : debtors, creditors, stores and workshops at the beginning and end of the year respectively. These are the items which with cash balances make up the working capital of the Railways which will fluctuate from year to year, with a general tendency to increase as the mileage of Railways increases.

140. This distinction between Government and Railway Statements of Railway Accounts should be abolished, and the Government should in all their statements adopt the Railway figures. All that is necessary to accomplish this is that the variation in the so called " Suspense Account " should be treated as an addition to or deduction from Capital Expenditure under the heading of " Working Capital Variation " supported by a statement of its composition which would agree with the relative figures in the Annual Balance Sheet.

141. Certain changes are desirable in the form of the revenue accounts, particularly in the abstracts of expenditure which contain all the Railway working expenses. The grouping at present varies slightly in different Railways, but in none of them is it made according to a scientific plan.

142. The present Abstracts are seven in number, lettered from A to G, *viz.* :—

- A. Maintenance of Structural Works.
- B. Maintenance and Supply of Locomotive Power.
- C. Maintenance of Carriage and Wagon Stock.
- D. Maintenance and Working of Ferry Steamers and Harbours.
- E. Expenses of Traffic Department.
- F. Expenses of General Departments.
- G. Miscellaneous Expenses.

Each of these has four main divisions where applicable, *viz.* :—

- I. Administration.
- II. Repairs and Maintenance.
- III. Operation.
- IV. Depreciation.

The Expenditures are shown in three columns :—

Cash
Stores
Total

a division which does not appear to serve any useful purpose. It may have been intended originally to show the total paid in salaries and wages as distinct from other expenses, but it is quite impossible to give this information on the abstracts owing to the manner in which labour and material enter into all repair and many other accounts, and cannot be segregated in the form in which the abstracts are prepared. In the new system of accounting described in Chapter XI provision is made for preparing in a simple way such a statement of salaries and wages by departments, divisions and sections of Railway work as will be accurate and useful.

143. The ideal division of Railway working expenses would seem to be as follows :—

Department 1. Maintenance of structural works, charged with maintaining the whole of the permanent way, and the buildings and structures thereon and connected with it, in a fit condition for the traffic.

Department 2. Maintenance of rolling stock, charged with the duty of providing and maintaining all the rolling stock necessary to convey the traffic.

Department 3. Traffic or Commercial Department charged with the business of providing traffic, both passenger and goods, delivering it to and removing it from stations, and determining the rates at which it should be carried.

Department 4. Transportation Department, using the Railway facilities provided by the first and the equipment provided by the second to convey the traffic provided by the third from the point where it enters the station until it is discharged from another station at destination.

Department 5. The General Departments of the Railway, *viz.* : supervision, accounting, welfare and police, which are common to all other departments and deal with general questions involving the whole of the Railway organisations.

144. Subject to a few minor differences, that is, in effect, the method which has been adopted for years on the Railways in the United States, and, as a matter of accounting, it shows more clearly than do the present abstracts the real processes of operating the Railway. Whatever method of organization may be adopted on the operating side, the financial accounts should preferably be kept in the form above suggested, and the abstracts of working expenses, while preserving almost in their entirety the sub-headings of accounts as they already exist and so enabling comparisons to be made continuously, should be recast and relettered in the order above given as Abstracts A. B. C. D. and E. Old Abstract D, dealing with steamers and harbours, should be relettered Abstract F.

145. In the past it has been the custom to charge out stores to working accounts without including therein any proportion to represent freight and other charges thereon or the expense of the stores organization and administration. This method is incorrect as it gives a false idea of the value of the materials which are used in different departments. In future, a separate Abstract G. should be kept for the whole expenses in connection with stores, and a percentage addition should be made to the cost of all stores purchased to provide for this cost. The issue price will thus automatically include the estimated cost of handling charges and administration.

The percentage addition should be credited in the general books to an expense account which will be debited with the whole cost in the new Abstract G. The percentage to be added would be determined in the first place by the ratio of the expenses under Abstract G to the total stores purchased in the previous year, and would be varied in future years according to results observed. This account must be carefully scrutinised and any tendency to an increasing balance on either side checked by varying the percentage. At the end of each year any balance remaining should be written off in Abstract E.

146. Electrification is taking place on some lines and is likely to increase, and the abstracts should be arranged to provide for the expense of maintaining and working the electric tracks and equipment. These should be included under the same abstracts as for steam worked lines, with the exception that there should be a new Abstract H Electric department, containing all expenses of supplying the power for electric trains, for workshops and for other purposes, and the expenditure on repairs, etc., of electric equipment. This cost would be divided out each month over the various Railway departments to which power is supplied or for which work is done. Maintenance of structural works (Abstract A) should include under appropriate sub-accounts the maintenance of electric overhead

wires and other items, and also maintenance of telegraph and telephone lines connected with permanent way structures. Maintenance of rolling stock (Abstract B) should include under separate and appropriate headings the maintenance of all the electrical equipment. The operation of the telegraph and telephone lines is an essential part of transportation and should be included under Abstract D, transportation.

147. Greater sub-division is necessary in some of the accounts under each abstract to give more information on important items, and in addition to facilitate the annual division of Railway expenses between passenger and goods traffic, to which reference is made in Chapter XV.

148. Under the heading of "Payments to Other Railways" in the present abstracts appear the following items, *viz.* :—

Payment for running powers

Haulage of trains

Hire of locomotives

Hire of vehicles

being the excess of expenditure over income in each case. If, however, the income exceeds the expenditure, the items are included in miscellaneous earnings, which is not a consistent treatment. They should not, according to the practice of Railways in other countries, be treated as working expenses, being payments for hire or use of capital facilities, but should appear in the income account as a deduction from or addition to net earnings.

149. The remaining items under this heading :

Traffic expenses at joint stations

Rent of stations jointly occupied

should be consistently entered in the new Abstract D, whether debits or credits and not in miscellaneous receipts.

150. Freight and charges on fuel are, as they should be, already treated as a transportation expense. Fuel used by other departments should be charged to those departments at cost price to the Railways, plus a percentage to cover freight and handling charges, which should be credited to fuel expense in this abstract.

151. It has been customary to deduct from each expenditure abstract the expenses incurred on certain lines worked by the Railways but not owned by the State, and, in the same way, from each of the earnings abstracts the gross earnings of these lines are also deducted. This method of stating the accounts is confusing. The officials of the Railway are engaged in operating the whole of the lines, including these worked portions, and the statistics and accounts should be based on the total expenditure and receipts of the entire system. The arrangements made with these worked Railways are, it is understood, of various kinds and are all covered by agreements. They may receive gross earnings less a fixed percentage for expenses ; gross earnings less approximate actual expenses ; or a fixed payment in lieu of share of traffic. In whatever way the amount is arrived at, it is in effect a rental paid by the Railway to the owners of these lines for the right to use them as part of the system. The net amount payable to them should therefore be shown as one item in the income account of each Railway under the heading of "Payments to Leased and Worked Railways" and be supported by a schedule giving the details.

152. The gross earnings are shown in detail in Abstracts I, III and II, giving the totals thereof under the headings of coaching, goods and miscellaneous ; the only change suggested is consequential on the preceding remarks with regard to joint services, hire of equipment and payments to worked lines.

153. Abstract IX, which will be re-numbered as Abstract IV, contains a summary of the abstracts A to G in columnar form, so as to give the total expenditure under abstract heads and also under the four main divisions of each abstract, *viz.* :

Administration.

Repairs and Maintenance.

Operation.

Depreciation.

Two changes are suggested in this Abstract, the first of which is only necessary to conform to the amended abstracts already suggested. The other requires some explanation. In order that issues from stores and charges from workshops may be correct, it is recommended in this report (Chapters IX and X) that all administration, depreciation and other charges relating thereto be included in the overhead of those departments and also of the electrical department. The result is that expenditure under these headings in new Abstracts A to F, and the whole expenditure in Abstracts G and H, will be included again in the accounts under stores, workshops and electrical charges to those abstracts. Abstract IX (re-numbered IV) serves a useful purpose, and I do not therefore suggest that it be abrogated; but it is necessary to correct the duplication by deducting at the foot of this Abstract the administration and depreciation of shop equipment in Abstract B and the whole of Abstracts G and H, part of which are included elsewhere in the abstracts and part in stores on hand and work in progress in workshops.

154. The preceding paragraphs lead up to the new form of income account, which I suggest for the use of all State Railways, and which is of sufficient importance to be set out in full overleaf.

INCMOE ACCOUNT.

(Based on the Great Indian Peninsula Railway Accounts for 1925-26).

Year ended March 31st, 1925.		Budget Estimate.	Year ended March 31st, 1926. Thousands of Rupees.
	GROSS EARNINGS.		
	Coaching (Abstract I)		
	Goods (Abstract II)		
	Miscellaneous (Abstract III)		
	<i>Deduct</i> Working Expenses (Abstract IV)		
	<i>Add</i> Miscellaneous earnings from other Rail- ways (Abstract V)		
	<i>Deduct</i> Payments to Worked Lines, Earnings less Expenses (Abstract VI)		
	Net Income		
	<i>Deduct—</i>		
	Surveys written off (Abstract VII)		
	Appropriated for Betterments		
	Interest charges:		
	On Provident Fund Deposits		
	On Capital Outlay (Abstract VIII)		
	Surplus for the year		
	Proportion accruing to operating Company (Abstract IX)		
	Balance carried to the credit of the Railway Board		

The only item in this account which requires further explanation is the appropriation for "Betterments" which will be found fully described in Chapter XIII.

155. It remains to set out the form of Railway Balance Sheet, which will be as follows:—

RAILWAY.

Dr.

BALANCE SHEET

AS AT.

LIABILITIES.				ASSETS.			
<i>Capital Contributions.</i>				<i>Road and Equipment</i> .. Schedule I			
Loans specifically raised for Railway purposes Schedule VII				<i>Working Assets</i>			
Loans and Stock of Oper- ating Company .. Schedule VIII				Stores on hand .. Schedule II			
Government of India, amount contributed Schedule IX				Fuel on hand .. Schedule III			
<i>Depreciation Fund</i> .. Schedule X				Work in Progress in Shops Schedule IV			
<i>Provident and other Funds</i> (detailed)				Debts due to the Railway—			
<i>Working Liabilities</i>				Government of India			
Government of India				Provincial Government			
Railway Board				Traffic Balances .. Schedule V			
Operating Company				Station Balances .. Schedule VI			
General Bills				Miscellaneous Accounts and Advances			
Miscellaneous Accounts				Railway Board Deposits			
Sundry Deposits				Cash with Controller of Currency			
Interest due and unpaid				Cash in Transit			
Accrued Liabilities				<i>Miscellaneous Deferred Accounts</i> ..			
Unadjusted Balances							
			Rs.				Rs.

CHAPTER VIII.

NEW SYSTEM OF TRAFFIC ACCOUNTING.

165. Under the present system, Traffic Accounts are prepared from the Balance Sheets submitted monthly by each station to its audit office. Each Balance Sheet shows the earnings of the submitting station from all sources for the month, and these may be grouped conveniently under four main heads :—

- Goods.
- Parcels.
- Passengers.
- Miscellaneous.

The audit of all earnings other than those arising from foreign traffic between the four state railways is conducted in the Audit office of the Home Railway. This traffic is termed either "local" or "foreign Non-Clearing House" as the case may be. Foreign traffic between the four State-managed Railways, is termed "Clearing House Traffic" and is audited in the Railway Clearing House, Lahore.

166. In respect of the local and foreign Non-Clearing House Traffic, each Station appends to its Balance Sheet and submits monthly to its audit office, the following returns and documents in support of the entries in the Balance Sheet :—

- | | |
|----------------------------|--|
| For Goods Traffic | Abstracts and Summaries of Goods Traffic forwarded.
Abstracts and Summaries of Goods Traffic received together with the copies of the invoices received from the Forwarding Stations. Large Stations forward these invoices on the 12th, 24th, and end of each month, but small stations send them monthly. |
| For Parcels Traffic | Abstracts and Summaries similar to those rendered for goods traffic, and also the copies of the received parcels waybills. |
| For Passengers' Traffic. | Classification and Summaries of tickets issued. |
| For Miscellaneous Traffic. | Such returns and documents as are appropriate. |

167. In respect of the Clearing House Traffic, each station on each State Railway prepares and submits monthly to the Clearing House at Lahore the following returns and documents :—

- | | |
|----------------------------|--|
| For Goods Traffic | Abstracts and Summaries of Goods Traffic received.
Abstracts and Summaries of Goods Traffic forwarded, together with copies of the forwarded invoices. Large stations submit these forwarded invoices on 12th, 24th, and end of each month, but the small stations send them monthly. |
| For Parcels Traffic | Abstracts and Summaries similar to those rendered for goods traffic, and also copies of the forwarded parcels waybills. |
| For Passengers' Traffic. | Classifications and Summaries of tickets issued. |
| For Miscellaneous Traffic. | This traffic is not audited in the Clearing House. |

The Clearing House notifies the audit office of the railway concerned of any differences detected in the audit of this Clearing House traffic in order that the Balance Sheet of the Station concerned may be adjusted. The Station is also advised of the discrepancy.

168. The returns checked in the Clearing House are similar to those checked in the Audit Offices of the various Railways, but the methods employed in the Clearing House are greatly superior to those obtaining in the Audit Offices. Of these returns those relating to Goods Traffic are the most important and the necessity of a check of invoices within a few days of their issue cannot be stressed

too strongly. Parcels traffic is allied closely to goods in all respects and what applies to goods would also apply to parcels. Passenger traffic is comparatively simple and does not call for any detailed comments. In organising the Clearing House, Mr. W. H. Scott, Director of Clearing House Accounts, introduced modern mechanical accounting appliances and has shown in actual practice the value of these mechanical aids towards the audit of the Clearing House Traffic Returns, the preparation of division sheets and the preparation of statistics. He has also made a great step in advance by working from Forwarded Invoices.

169. The returns received in the various Audit Offices are checked by the "Head and Hand" method, except that comptometers are used in several railways for checking arithmetical calculations. As the Audit Offices work from Received Invoices, a delay is incurred in waiting for these invoices to come to hand. When all returns have been checked the statements of earnings and the division sheets are next prepared by hand. The result is that it is six weeks at least after the close of the month to which they relate before any statement of earnings is available and the statistics are even later in their production.

170. Viewed from any standpoint, the advantages of having the entire Traffic Accounts of all Railways audited and the resultant Statement of Earnings, etc., prepared on the methods now obtaining in the Clearing House are so superior to the existing procedure obtaining in the various Audit Offices, that I strongly recommend this extension of the Clearing House system. The services which Mr. Scott has rendered in organising this Clearing House as well as in certain improved methods of preparing ton mile and station to station statistics are invaluable to the Railways. He has applied the practical test to sound theoretical methods and has proved their value. At the same time he has shown the way to improvements. It is in the further development and extension of the methods thus instituted to the entire audit (or check) of Traffic Receipts that a remedy can be found not only for the delay in the preparation of accounts and statistics but also for the mass of clerical work, errors and other difficulties that persist in this division of the accounting work.

171. The ideal system would require that all forwarded invoices from every station should be sent to a Central Station Accounting Office every day, where they would be checked and mistakes found and notified to the stations at once, thus avoiding the confusion due to the many mistakes that at present occur. In time this may be found possible but for the present a less ambitious scheme is the only one practicable.

172. The main cause of these errors is the same as it was at the time of the Rhe-Philipe Report, extracts from which are given in Chapter I, *viz.* : the want of a uniform classification and the absence of a book of station to station rates for each classification. The consequence is that station clerks have to compile rates for every foreign consignment and this somewhat complicated operation is a continuous source of error. It is to be feared that it also affords opportunity for frauds, not always, nor perhaps in the majority of cases at the expense of the Railway, although to the gain of the station official. I cannot too strongly endorse the recommendation of the Rhe-Philipe Committee made five years ago that immediate steps should be taken to remedy this serious defect by a uniform classification and the publication of station to station rates for foreign traffic.

173. Another disadvantage of the present system is the amount of work thrown upon station clerks in preparing voluminous accounting returns. There is some urgency for a plan which will reduce this work and diminish the large and somewhat inefficient staff at big stations while relieving the officials at small ones and leaving them more time for their proper duty of the efficient operation of their stations. The tendency in the United States is all in this direction and the plan of Central Station Accounting Offices which will relieve station masters of as much as possible of their clerical work is growing in favour. This change has not yet progressed very far but in my opinion the best plan for the Indian Railways is to pursue and develop, in the manner outlined hereafter, the organisation which Mr. Scott has already evolved. I may be allowed to express the hope that he will be able to continue to devote his energy and ability to this work until it is sufficiently developed in method and particularly in personnel to become a standard department of the Railway organisation.

174. From these preliminary notes the following facts emerge :—

1. That classifications must be standardised and station to station rates for foreign traffic published.
2. That station masters at the average station should be relieved as much as possible from clerical work.

3. That invoices must be checked more speedily and if possible within a few days of their issue.
4. That completed financial statements of earnings must be available much earlier, say within two weeks of the close of the month.
5. That the Clearing House as established at Lahore has shown the way to attain these ends and is now ripe for expansion.

175. The establishment and the successful functioning of this Clearing House has shown that mechanical appliances can be used to a large extent in connection with the audit and subsequent preparation of traffic earnings and accounts. This being an established fact it is desirable that the use of mechanical appliances be extended to the audit and accounting work necessary in connection with the compilation of all earnings of all railways in order to expedite the ascertainment of results.

176. For the convenience of the Railways and also for the sake of economy, it would be desirable to open a Central Station Accounting Office in which all this work would be done. It is necessary that this office be centrally situated, that it be equipped with all modern mechanical accounting appliances and that it be staffed by men capable of using these to their utmost advantage. The ideal centre for such an office is Delhi, as it is a common station for three of the four State-managed railways and also for the Bombay, Baroda and Central India Railway.

177. It is realised that it would not be practicable for the Central Station Accounting Office to deal with all traffic of all railways when it was first opened. It has been proved, however, that with a Central Office at Delhi, the local traffic of one State Railway, preferably the North Western, could be dealt with in conjunction with the work that is at present done in the Clearing House for foreign traffic between the State Railways.

178. In order to expedite further the ascertainment of earnings the next step would be to open branches of the Central Station Accounting Office at large stations such as Karachi Bunder, Howrah and Wadi Bunder (Bombay). These branch staffs would be members of the Central Office and not under any circumstances members of the station staff and the greater part of the present station accounting staff at these places would be dispensed with. These branch offices would in addition to the work now done at the Clearing House prepare the station abstracts and summaries and furnish to the station clerks the periodical debits for insertion in their balance sheets which again would be verified by the branch office staff. This arrangement would mean not only that all work would be done on the spot and these three large stations thereby relieved of the listing, bundling and despatching of numerous documents to the Central Station Accounting Office with the ever attendant risk of their being lost in transit, but it would also mean that the Central Office would receive complete audited figures of these large stations checked by its own staff, on approximately the same date as it would normally receive the unaudited documents. These three stations prepare between 15 and 20 per cent. of the total number of forwarded invoices of their respective Railways and with such a volume of work the methods in use at Lahore could be duplicated at each one, thus conducing to a speedy audit of invoices and station balance sheets and expediting the ascertainment of earnings and the subsequent writing up of the financial books.

179. The next step would be for each of these branch offices to take over the same work for a group of adjacent stations and to advise monthly to these stations the totals of the various classes of traffic for the month. The stations would enter these figures in their balance sheets, but the preparation of the abstracts and summaries relating thereto would all be done in the branch office, and the stations thereby relieved of this clerical work. At the same time greater accuracy and speedier results would be ensured.

180. A third step would be to open other offices at convenient centres in which would be compiled the earnings of groups of stations of a sufficient volume to justify the use of the clearing house machine methods. The staffs at each of these centres would be directly under and responsible to the central station accounting office at Delhi and would send to Delhi complete tabulated results of these respective groups.

181. It may be suggested that this process is one of decentralisation while the ideal to enable a proper use of machine methods would be centralisation. To a certain extent this is true but I am satisfied from my conference with Mr. Scott that complete centralisation is at present impracticable ; that the first step

should be to centralise the work of groups of stations ; that this may soon lead to a grouping of the returns and audit of all the stations on the three State-managed lines entering Delhi into say from six to ten centres and that ultimately it will be found as the organisation is completed and working smoothly in these centres that they can be further centralised into a lesser number always looking to the ultimate ideal of one central station accounting office at Delhi for the four lines entering that station.

182. At present the company-worked railways do not have their foreign traffic earnings apportioned through the clearing house, but continue to make these apportionments by what is termed the " Head and Hand " method, i.e., without the aid of mechanical appliances. Unless the Railway Conference decides that the traffic of these Railways shall be dealt with through the clearing house (the central station accounting office under the proposed scheme), it will be necessary to continue the present methods. It is thought, however, that when the central office has been running some little time, the advantages to be derived from having all this work done with the aid of mechanical appliances will be so obvious, that these Railways will avail themselves thereof and that in a short time each of them would adopt a similar system of group centralisation. With this comprehensive ideal in mind as an ultimate goal, but always subject to change in accordance with experience gained as the scheme proceeds, it remains to consider practical details.

183. My investigation has shown that one of the greatest difficulties with which audit and accounts officers have to contend is the inaccurate documents received from stations, particularly in respect of goods traffic. Until invoices are accurately prepared by stations these incorrect balance sheets and supporting returns will continue to be submitted. It has been stated consistently by the accounts and audit officers of the Railways visited that approximately 15 per cent. of all invoices contain errors, the majority of which are due either to mistakes in rating or mistakes in calculations of freight. Consequently, all the abstracts, summaries, etc., prepared from these invoices also have to be adjusted and the work and correspondence involved in effecting these adjustments is very great.

184. With regard to errors in rating, it is suggested that every station of sufficient size should have a rate Checking section comprised of one or more competent rate checkers and that the rate entered on every consignment note be checked at once by this section. The rate checked consignment note should then be passed to a special clerk who would make the freight calculations on a Dalton (or a similar type) machine. This being done, the calculator would tear off the strip, pin it to the consignment note and send both to the invoice preparer for the invoice to be typed. The invoice preparer would then gum the Dalton strip to the central office copy of the typewritten invoice. As many stations as possible should prepare their invoices with the aid of typewriters. During this investigation many manuscript invoices have been examined and found so illegible that it has not been possible to decipher the entries. These illegibly prepared documents provide a fruitful field for errors. It must be remembered that the invoice is the prime document in connection with both goods traffic accounting and statistics, and the necessity of it being accurate and legible cannot be over emphasised. It is conceded that many stations would be too small to warrant the expense of either a typewriter or a Dalton machine. These stations, however, handle a very small proportion of the traffic of the Railway.

185. As an additional means of ensuring accurate returns being received from the stations, it is suggested that the central and branch station accounting offices prepare monthly lists showing the number and value of errors made by each station. This list could then be used for disciplinary purposes and if the errors continue to be serious, penalties should be inflicted on the staff at the offending station. In view of the possible source of income to the offender from a continuing series of mistakes in a manner well known to be practised, it is most important that serious notice be taken of continuous errors at any one station and in extreme cases even a penalty of dismissal would be justified.

186. It is explained in Appendix IV how branch offices would punch a card for every invoice both local and foreign. Having punched the card from a correct invoice it would only be a matter of tabulating to obtain with first time accuracy any required result or combination of results. This is the ideal to which the Railways should work and the plans here outlined coupled with a strict control over the station accounting staffs should permit it being achieved.

187. In addition to traffic, the central station accounting office would have to audit and compile earnings by stations from all sources. This means that each station other than those having branch station accounting offices attached, would

send its monthly balance sheet and supporting documents to the central station accounting office, and the complete audit of the remaining items in the balance sheet would also be conducted there. The branch office would completely audit the balance sheets of the stations allotted to them and thereafter send these audited balance sheets to the central station accounting office for their figures to be included in the total earnings.

188. Details of this work as well as of the methods to be adopted under the new system recommended for the general accounting in the financial books of all traffic receipts and outstandings are given in Section 1 of Appendix IV. The plans to be followed in the detail work are those which Mr. Scott has worked out as a result of his practical experience at Lahore. I have asked him to prepare for the purposes of this report an account of the procedure followed. This he has kindly consented to do and these documents will be found set out in full in Sections II and III of Appendix IV and the forms relating thereto will be found in Part III.

These sections show clearly :—

- (a) The procedure adopted by the clearing house (which would be followed by the central station accounting office) in auditing and apportioning the foreign traffic between the State Railways.
- (b) The experimental work which has been conducted in the clearing house in connection with the audit and compilation of earnings of the North Western Railway local traffic.

I have discussed these methods fully with him and it is sufficient for me to add here that I consider his work a most valuable contribution towards accounting efficiency ; that I thoroughly endorse his methods and recommend that they be extended under his supervision on the lines already indicated.

189. It has been observed that many of the forms and books furnished to stations are of poor quality paper and the printing thereof also leaves much to be desired. The quality of the paper may be governed by reasons of economy, but it is thought that more attention could profitably be given to the printing. When staffs are furnished with forms and books of indifferent paper, irregularly ruled and badly spaced, they can plead that this is a contributing factor to some of the almost illegible documents which they prepare. I have suggested that mechanical aids be used as much as possible. For this purpose it is most essential that all forms be carefully and accurately spaced, and I strongly recommend that the representatives of the companies furnishing these machines be asked to assist in the designing and spacing of the necessary new forms.

190. Although the returns and balance sheets prepared by all stations on each Railway visited contain the same information, the manner in which it is presented varies with the Railways. Similarly, the books of account kept at the stations also vary. With the introduction of the clearing house, standard forms and returns were prepared for the information required by the clearing house in respect of foreign traffic. When the stage is reached that all local traffic is handled through the central station accounting office, standardisation of the local traffic returns also will doubtless be introduced. That would leave only the forms and books maintained by the stations and in this connection it is recommended that the chief accountants of each Railway confer with the object of also standardising these.

191. As the central station accounting office will be dealing with the accounts of more than one Railway system it is important to consider where it will fit in with the general scheme of Railway organisation. The Director of the Traffic Accounting and Auditing Department clearly cannot be made responsible to any one agent or to all. The only possible alternative is to make him an officer of the Railway Board directly responsible to them and charged with the duty of furnishing to the Chief Accountant of each Railway system, at dates to be laid down in agreement with him, the summaries of traffic receipts and outstanding balances and all primary statistical compilations derived from traffic figures and documents. For these purposes he must keep in the closest possible touch with those officers.

192. After consultation with Mr. Scott I would suggest that the following dates be provisionally fixed for sending in the final returns :—

- (1) For furnishing each chief accountant with statements of earnings and summaries of station balance sheets—12th of each month.

- (2) For furnishing each chief accountant with ton mile statistics—15th of each month.
- (3) For furnishing each chief accountant with commodity statistics—20th of each month.

193. I am satisfied that if the plans here outlined are carried out and thoroughly organised under the capable supervision of Mr. Scott, an enormous improvement in this side of Railway accounts and statistics will be realised in a comparatively short time with considerable saving in expense.

CHAPTER IX.

NEW SYSTEM OF STORES ACCOUNTING.

194. A proper system of stores accounting depends closely upon the system in force for purchase and control of stores. This latter question has recently been the subject of a report by Mr. Victor Bayley, C.I.E., C.B.E., and I have had an opportunity of reading this report and discussing it with him. A good deal of it is outside the scope of my terms of reference, but on the following recommendations it touches them closely, *viz.* :—

1. That the stores department be divided into three sections :—

1. Supply,
2. Inspection,
3. Control,

and that the supply Officer exercises the Agents powers of purchase.

2. That all parts manufactured in shops be on completion put into stores for distribution as required.
3. That such parts be manufactured on requisitions from the Supply Officer.
4. That all stores should be kept under central control either by the Stores Custody Officials or by an imprest system.

With the spirit of these recommendations I find myself in complete agreement.

195. Under the present system in force on the Indian Railways the Controller of Stores not only has the custody, through his subordinates, of most, but not all, of the stores, but also places orders for their replenishment when necessary, either with or without the sanction of the Agent, as the rules may provide. This double duty vested in the same official undoubtedly does away with one of the checks upon the proper purchase of stores. In other countries, in large organisations, purchases are made by an official entitled the "Purchasing Agent", whose duty it is to attend to all requisitions of storekeepers and other officials authorised to control supplies, and to purchase the stores in the cheapest market. An immediate check is obtained on the quality of the stores purchased by this purchasing agent, as on delivery all supplies have to be inspected and passed by the Storekeeper. Should they not be in accordance with his requirements as shown in his requisition, he is in a position to take the matter up firstly with the Purchasing Agent, and secondly, in the case of a deadlock, with his superior officer, and have the matter adjusted. Where the Controller of Stores and the Purchasing Agent are the same person, this check does not exist, and the only check on the quality comes when they are issued to the operating officials and are found not to meet the purpose for which they are required. There are also under the present system opportunities for collusion, which are avoided under the system indicated.

196. I am informed that many purchases are now made through the Indian Stores Department, which acts as the principal supply officer of the Government of India. This department is entirely independent of the Railway Board, so that the latter has no control over the purchases of materials required for the Railways for which it is responsible. Moreover, the Indian Stores Department has no special knowledge of Railway requirements and specific instances have been brought before me of unsuitable stores having been purchased and passed by that Department. Mr. Bayley expressed the opinion that even the purchases for one Railway are sufficiently large to occupy fully one supply officer, but in any case one supply Department for all the State Managed Railways would be a sufficiently large Department.

197. Under all these circumstances I am prepared to go further than Mr. Bayley, and to recommend the complete separation of the functions of purchase and custody of Stores by constituting a Chief Supply Officer immediately responsible to the Agent and authorised to exercise all the latter's powers of purchase. He would act upon requisitions made by the Controller of Stores and, in the case of new construction work, by the Chief Engineer. If it should be decided to constitute one Purchasing Department for all State Railways, then the Chief Supply Officer should be an Official of the Railway Board and directly responsible to them.

198. The Controller of Stores would be limited to the duties of maintaining an adequate supply of stores and materials to meet the needs of the Railway, consistently with the regulations of the Railway Board. He would also have a staff of Inspectors who would inspect all new stores received, either from suppliers or from Railway Workshops, and satisfy him that they are in accordance with the purchase order, of the right quality and quantity, and suitable for the purposes for which they are required. He would maintain records in quantity only of all stores under his custody in main stores, shop stores, sheds and all other points which cannot be put upon the imprest system suggested by Mr. Bayley. He should have a representative at all places where stores are kept, including new construction works, and this representative should be responsible to him for the receipt, safe custody and issue of all stores at these points and should keep the quantity records thereof. He should also be responsible for keeping a list of construction plant in use and for seeing that it is properly disposed of at the end of the work.

199. The accounting department will maintain both money and quantity records over all stores wherever kept, with the exception of those stores held by Permanent Way Inspectors, etc., as specified in Appendix V., for each of which an account in money only will be kept by the Stores Accountant, and agreed monthly with the value of the actual quantity of stores on hand at the appropriate depot worked out at issue prices.

200. As to issues of stores, some special considerations arise which require notice. In the workshops it frequently happens that articles requisitioned for work order numbers are taken out of store some considerable time before they are required or used on the work. In some cases these stores go off the books altogether and are charged to operating expenses. In others, a better system prevails and they are placed in a sub-store under order numbers, being still maintained on both quantity and money records; but any foreman can move these stores from the custody store on a simple requisition, provided they are for use on the order for which they were originally issued. This system is a sound one and should be extended to all kinds of material, which for purposes of convenience, are put in the shops, as it is only by some such means the wasteful and unnecessary accumulation therein can be prevented.

201. Stores issued for use on the permanent way or for construction works, are in most cases charged off to operating or construction account as soon as issued and treated as if they had been used, although they may remain unused at the site of the work for many months, and during that period do not appear on the stores records. In some cases, accounts of these stores are maintained by the Engineers, and occasionally they are verified by the Inspectors of the Controller of Stores. In other cases, stores so issued are placed in a sub-store and partial records are maintained, sometimes by the Controller of Stores, sometimes by the Works Officer. In other cases, again, consignments of heavy material are made direct to the Permanent Way Officials without ever passing through the stores accounts. These practices, are however, neither universal nor similar.

202. The method is wrong, and the absence of control by the Controller of Stores and the accounting department has been found in certain cases, to lead to waste and loss and even to misuse and misappropriation. In my opinion, the Controller of Stores should be charged with the duty of keeping accounts for all permanent way and construction material as received, until by periodical returns received from the engineers in charge they are shewn to have been actually used up on the works, in hand. In the case of small permanent way material, this may involve the construction of a central store on each division, from which such materials can be drawn, and for this central store a stores accounting system should be maintained both by the Controller of Stores and the Accounting Department. The same remark will apply to the small material on construction work. Heavy material, both on the track, and on construction, must necessarily mainly be under the custody of the engineers in charge, but the amounts delivered to them should be kept on the stores accounting records and the engineers should be required to render monthly returns of the amounts consumed and also of the amounts, such as old rails and other material, which have come back from the permanent way or construction works. To some extent, as recommended by Mr. Bayley, these irresponsible methods may be overcome by the introduction of an imprest system, but this can only apply to small depots. In all other cases, the control of quantities by the Controller of Stores, and of quantity and money by the Accounting Department, should be insisted on.

203. It may seem at first sight that to keep quantity records in the stores and to duplicate these quantity records with the addition of money values in the Accounting Department is an unnecessary complication, and a different practice has been frequently adopted in other countries, by which money records kept in the accounting department are maintained only for groups of store classifications. This would reduce the number of accounts to be kept in the Accounting Department of any one Railway from something like 35,000, which is the approximate number of store classifications in use, to from 1,000 to 1,500 group classifications. Under this system control over the stores quantity records is maintained by taking stock of the stores contained in each of the money groups periodically, working them out at issue price values, and seeing that the difference between this value and the value of the balances on the corresponding group accounts are not material.

204. Under the conditions prevailing in India, I am satisfied that such a system, although more economical in theory, would not be found economical in practice, by reason of the greater opportunities for loss and waste that would be available, and the difficulties that would arise in agreeing the quantity and money records. Moreover, machine methods of accounting enable detailed quantity and money records to be kept with less labour than was necessary before these methods were made effective. With the complete adoption of these labour saving methods a duplicate system can be maintained at a lower cost of operation and will materially minimise loss and waste.

205. In investigating the stores accounting system, I have been much impressed on some, but not on all Railways, by the delays which occur (in some cases extending to many months) in the supply of stores to workshops. There is no doubt that these delays have materially affected the efficiency of the workshops themselves ; have delayed the output of necessary equipment ; and as this equipment is presumably necessary for the requirements of the Railways, must have affected their efficient operation.

206. It has been suggested to me that this delay in the receipt of supplies is partly due to too low a limit having been placed on the amount of the stock of different commodities which the stores depôts are allowed to carry. For stores of Indian manufacture the minimum supply is six weeks, and the maximum three months ; for stores of English manufacture purchased in India the limits are three and six months respectively, and for stores purchased in England six and nine months respectively. It appears that the company operated lines are allowed a greater latitude in the amount of stores they can keep on hand than are the State lines ; and certainly in one case before me the limits for that particular line are larger than those laid down in the State Railway Code. Although in certain cases that have come before me it is clear that the main cause lies in the inefficiency of the system for replenishing and issuing stores, yet it is worth consideration whether in the case of Indian stores, the limits might not be increased, and further whether such limits should not be applied more in relation to the nature of the stores themselves and the time requisite for their manufacture. Moreover, a better and speedier system of distribution of stores, with equally good control over the quantity maintained, might be obtained by placing a maximum limit upon the value of the stores which each store depôt was entitled to maintain, leaving to the discretion of the superintendents of stores the manner in which this maximum limit should be distributed over the different items. The principle of throwing greater responsibility upon the officials for carrying out generally the views and requirements of the Railway Board, would, in my opinion, be a far better one than that which at present exists of tying them up within rigid limits and leaving them no discretion under which they can meet immediate manufacturing needs promptly.

207. There are other causes besides stock limits which have a bearing upon this question, and which should be avoidable, *e.g.* :—

- (a) Delays in transportation of stores to their destinations.
- (b) Delays in requisitioning by depôts, requiring replenishments.

In an actual but not specially selected case investigated on the Eastern Bengal Railway, the time that elapsed between the date of issue of the stock recoupment and the delivery of the goods by the firm was 25 days, made up as under :—

- (a) The stock recoupment was prepared on January 1st,
and after filtering through depôts, it reached the
Controller of Stores on January 8th 7 days

(b) The item was included in the tender list in the Exchange Gazette of January 15th	7 days
(c) The time allowed for the forwarding of tenders, subsequent opening, abstracting, examining and accepting thereof, and the placing of orders brought it up to January 22nd	7 days
(d) The time the orders were in the post, the receipt thereof by the supplier, and the preparation and despatch of the goods by the supplying firm took four days	4 days
Total	25 days

To this total of 25 days must be added the period the goods would take in getting to the first destination for inspection and thereafter from that inspection depôt to their ultimate destination. It is understood that 25 days frequently elapse from the time the merchant consigns the goods until they are received by the requisitioning depôt. This would mean that 50 days in all, or 7 weeks, would elapse from the time the recoument order was issued until it was satisfied.

208. As an illustration of the losses sustained by a railway owing to these delays, reference is made to copies of two letters quoted in Appendix V complaining of the delay in receipt of stores requisitioned for ordinary shop work, and the hindrance thus caused to the workshops. This whole question deserves thorough investigation, but as it hardly falls within the scope of my enquiry, I merely mention it here as an indication that some remedy is required.

209. While I have seen many stores that are maintained in excellent order, I have seen others in which there is much confusion.

210. At some stores depôts visited it was noticed that heaps of scrap were stacked in close proximity to good materials and in some cases there were alternate heaps of good and scrap materials. It is thought that it would be almost impossible to prevent the good stores and the scrap becoming mixed, when the two are stacked in such close proximity to each other. It is most important that the scrap yard should not only be entirely separated from other parts of the stores, but that there should be ample space to permit of separate stacking of different kinds of material, and each class of material should have a separate account in the Stores Records. Another impression left upon my mind is that a good deal more might be done in recovering scrap and working it up into useful material. This is the more important as it appears to be increasingly difficult to dispose of scrap.

211. Under the present system of accounting, while freight on stores is divided up over the various abstracts and capital accounts in proportion to the issues of stores under those headings, the whole administration and clerical work in connection therewith is charged in Abstract E as a general expense. In Chapter VII I have recommended various changes in these abstracts, and among others that all expenses in connection with stores be gathered together in a new Abstract G and spread over the cost of stores by a percentage addition to the invoice price. The amount so added should be credited to stores overhead account, to which the whole of the expenses incurred in handling the stores including superintendence, wages, salaries, freight, loss on sale of obsolete materials, etc., should be charged. For the first year of the new system a tentative figure should be adopted; thereafter experience will show what variations are necessary to keep the balance of this stores overhead account within safe limits.

212. As to pricing of stores issues, it is suggested that the official price list of each railway be sectionalised under classes, and that each item be given a distinguishing serial number which would remain unchanged. It would be necessary to leave one or more numbers blank after each item, to permit of fresh

entries being made when further items were added to the official list. Typical entries on any form referring to stores would be :—

<i>Class.</i>	<i>Price List No.</i>	<i>Description.</i>
7	277	Bricks glazed double faced, 9 in. by 4½ in. by 2¾ in.
26	59	Leather Belting, Leather Double, Sewn width, 6 in.

The pricing of stocks issued to jobs, etc., is an important matter, and in order to have uniformity of prices it is suggested that each item be rated at the unit value at which it appears in the price list. Prices of issue should be based on the average price (including percentage addition for stores expense) of the latest receipts up to an amount approximately equal to the quantities on hand. In order that the price list prices may be maintained at accurate figures it will be necessary for them to be revised at least once each month. It will, therefore, also be necessary for each priced stores ledger keeper to calculate the unit price of each article in stock at the end of each month. Should the price thus ascertained be more than 2½ per cent. either above or below the price list price, the ledger clerk would report the change to the head of his section, and immediate steps would then be taken to amend the official price list. Fluctuations of 2½ per cent. or less would be ignored.

213. All I need further add here is that, as I have already recommended, the codes relating to stores and stores accounting, should be superseded in favour of a manual laying down the general system and supplemented by detailed instructions for each section of the work. In particular the distinction that is attempted between capital and revenue stores should be abolished. Under the system of accounting recommended in Chapter XI, the allocation of expenses and store issues to capital and revenue will be made direct from the bills, store issue notes, workshops costs, etc., and will follow through automatically to the proper head of account in the general books. The distinction as now made is in any case quite meaningless; as an instance, in the case of relaying a 90 lb. rail in place of a 70 lb., it is impossible to earmark the new rail as either capital or revenue, and in the accounts it will be partly one and partly the other.

214. I have drawn up a complete system of stores accounting which should be adopted in all railways. Full details thereof, with the relative forms, will be found in Appendix V, and the following is a summary of the main features of this system :—

- (a) Classified price lists to be maintained.
- (b) All purchases to be made by a purchasing officer.
- (c) The certification and passing for payment of suppliers' bills to be done by the Chief Accountant.
- (d) Unpriced quantity records to be maintained at all workshops, depôts, sites, etc., where stores are held and to be written up with the aid of Burroughs machines at places of sufficient size to warrant the use of these mechanical aids.
- (e) Issues from depôts to be made on authorised requisitions only, and not more than one item to be entered on each requisition.
- (f) Stores trains to be used for the replenishing of stocks carried by station masters, train examiners, etc.
- (g) All material returned to stores to be classified on receipt and scrap to be further inspected by a Stores Committee before being sold.
- (h) The accounting department to maintain in the stores accounting division in the Central Office detailed quantity and money records for each commodity at each depôt, excepting only permanent way inspectors depôts, etc., as particularised in the Appendix.
- (i) The accounting department to maintain in a subsidiary ledger, control accounts in money only for each depôt and the Chief Accountant to govern these by one main stores control account for all depôts in the General Ledger.
- (k) Every item of stock at every depôt to be verified by the Chief Accountants permanent stock checkers by actual count, weighment, etc., at least twice a year, and discrepancies investigated and adjusted.

CHAPTER X.

NEW SYSTEM OF WORKSHOP ACCOUNTING.

215. An investigation has been made of the system of organisation and accounts in force in the various workshops, and for this purpose the following workshops were visited :—

- (1) *East Indian Railway*.—Carriage and Wagon at Lillooah. Locomotive at Jamalpur.
- (2) *Great Indian Peninsula Railway*.—Locomotive at Parel. Carriage and Wagon at Matunga.
- (3) *Eastern Bengal Railway*.—Locomotive Carriage and Wagon at Kancharapara.
- (4) *North Western Railway*.—Locomotive and Carriage and Wagon at Moghalpura.
- (5) *Bombay, Baroda and Central India Railway*.—Locomotive and Carriage and Wagon at Parel and Ajmer.
- (6) *Madras and Southern Mahratta Railway*.—Locomotive and Carriage and Wagon at Madras.

It was not considered necessary to visit Locomotive and Carriage and Wagon Shops at Lucknow and Jhansi as the operations carried out there are understood to be similar to those in the shops visited. Cost systems are not considered necessary for the light repairs to rolling stock which are carried out in Running Sheds and on the line. The whole expense is at present carried direct into Abstract B and will continue to be so treated. Modified cost systems are also suggested for miscellaneous workshops, comprising Bridge and Signal Workshops, Printing Works and Uniform Factories.

216. I have had an opportunity of discussing the question of workshop organisation and accounts with Mr. J. M. D. Wrench, who is engaged in reporting on the operating organisations, and the suggestions I have to make for a complete costing and accounting system for the shops on the State operated Railways have been designed to fit in with the methods of operation which I understand he will recommend. I have also had an opportunity of reading the excellent report made by Messrs. C. E. Spurgeon and H. F. P. Judge under date 15th December, 1925, on Modern Production and Costing methods as applied to Locomotive and Carriage and Wagon Repairs.

217. It must be premised that no system of cost accounting can be efficiently carried out in practice unless the shops have been so organised that the work can be put through with order and method and unless accurate particulars of time spent and materials consumed on various operations can be regularly and quickly obtained. For this reason it is necessary in explaining the proposed costing system to deal briefly with the system of organisation upon which it is based, although in so doing I may be trenching upon Mr. Wrench's work and to some extent duplicating his report.

218. The work carried out in the workshops may be summarised under the following heads :—

1. Construction and Assembly of :—
 - (a) Locomotives (carried out at Ajmer only).
 - (b) Coaching Vehicles.
 - (c) Goods Vehicles.
2. Repairs to :—
 - (a) Locomotives.
 - (b) Coaching Vehicles.
 - (c) Goods Vehicles.
3. Manufacture of parts for use in the above operations.
4. Manufacture of articles required by the home railway stores for general use.
5. Manufacture of articles of various kinds for :—
 - (a) Other Government Departments.
 - (b) Foreign Railways.
 - (c) Railway Staff.

Each Locomotive Workshop and each Carriage and Wagon Workshop form complete and separate units and throughout this Report these units are designated as "Workshops." Each Workshop again has separate Divisions such as Foundry, Forge, Smithy, Machine, Bolt and Nut, etc., in this Report designated as "Shop."

219. The organisation required is as follows :—

1. The whole of the workshops, excluding Bridge, Signal, Printing and Uniform should be under the charge of the Chief Mechanical Engineer.
2. At each separate workshop there should be a Chief Manager under the title of either Deputy Chief Mechanical Engineer, Superintendent, or Works Manager, who would be directly responsible to the Chief Mechanical Engineer for the efficient conduct of his workshop.
3. Under the Works Manager there should be :—
 - (a) A Production Engineer responsible for the work of the following sections :—
 - (i) Planning and Rate Fixing.
 - (ii) Jigs and Tool Drawing Office.
 - (iii) Tool Room.
 - (iv) Feed and Speed Chargemen.
 - (v) Inspection.
 - (b) An Assistant Works Manager in charge of all Manufacturing operations in the Workshop. He would have under him :—
 - (a) A Main Progress Office.
 - (b) Shop Progress Offices.
 - (c) Shop Foremen.
 - (c) An Assistant Works Manager in charge of New Construction of and Repairs to Rolling Stock with a main Scheduling Office and a Scheduling staff and foremen in each shop.

In only one workshop visited is any such complete organisation at present even partially in existence, a beginning having been made in the locomotive workshops of the Great Indian Peninsula Railway at Parel, where a planning and progressing system for the manufacture of standard parts is well under way under capable and efficient management. This system is based upon the latest most up to date methods, and the system recommended in this report follows the same general lines.

4. There should be a Workshop Accountant who would be appointed by and be responsible to the Chief Accountant of the Railway and he would be located at the principal Workshop and would be in general charge of the costing and workshop accounting at all workshops of that Railway. Under him there should be at each separate workshop an Assistant workshop Accountant in charge of the accounting of that workshop.
5. At each workshop there should be a Stores Officer responsible for the custody, replenishment and distribution of workshop stores. He should be directly responsible to the Controller of Stores, and his duties, so far as they relate to accounts, are set out fully in Appendix V dealing with the system of Stores Accounting.

220. In such an organisation as that outlined above, helpful co-operation by all officials is essential to efficiency, and in order the better to achieve this, it is suggested that meetings be held at least once a month, and perhaps oftener, under the chairmanship of the Works Manager at which there should be present, the Production Engineer, the Assistant Works Managers, the Works Store Officer and the Assistant Workshop Accountant and at which matters of importance would be discussed and settled. Such meetings would do much to ensure smooth working in all workshops and shops and to avoid delays in distribution of stores and materials and in preparation of cost sheets, accounts and other financial statements necessary for the information of the Works Manager and his assistants.

221. The general scope of the duties of these officials, so far as they have reference to the progress of work through the shops and to time occupied and

materials consumed, which are the primary elements in cost accounts, will appear in the following paragraphs.

222. The functions of the Production Engineer are of great importance. His duties are :—

- (a) To plan the best method of production and the most economical use of machines,
- (b) To determine standard time for each operation,
- (c) To design machines and tools to suit the needs of work passing through the shops, and
- (d) To ensure the most economical methods of production.

His division should also :—

- (i) Prepare and design drawings and specifications for new standard parts and for the necessary jigs and tools,
- (ii) Prescribe the nature and sequence of operations to be performed,
- (iii) Inspect all manufactured parts, and
- (iv) On the conclusion of any series of operations, compare the times actually taken with those originally estimated by his division, investigate all important differences and report as to the causes thereof and as to the remedies therefor.

223. The duty of the Progressing Division should be to route the work through the different shops on the plans laid down by the Production Engineer, co-ordinate the activities of the manufacturing shops as a whole and on requisition from the Stores Officer issue orders for manufacture of parts. The order form should comprise time sheets for each operation and material delivery sheets for the material required. On completion of the order or at the end of each ten day period (*i.e.*, 10th, 20th, and last day of each month) the order with the relative time sheets and material delivery sheets should be returned to the Progress Division duly filled up and signed by the foreman and would form the basis of the cost accounts. All parts manufactured should, on completion and after inspection be sent into stores and nothing should be allowed to pass directly on to another order.

224. Separate costs should be obtained for all orders :—

- (a) For parts manufactured for stores.
- (b) For work executed in excess of Rs. 500 for other Departments of the Home Railway.
- (c) For work executed in excess of Rs. 200 either for Repairs to Machinery or for work done for and chargeable to third parties.

In the Foundries, Rolling Mill and Saw Mills, costs would be obtained on an average basis by charging all labour, material and overheads to Progress Order Accounts and dividing by the total product in each case to obtain the cost per unit. In the Foundries separate costs would be obtained for each principal mixture and/or by a system of grading for castings of different weight.

225. The scheduling division would issue orders and schedules for all construction and repair work on locomotives and vehicles passing through the shops, and would fix dates for the completion of each separate portion of the construction or repair of each locomotive, but passenger and goods vehicles should be manufactured on group orders and repaired on standing orders. Separate costs would then be obtained for each new or repaired locomotive and for each batch of new coaches or wagons, while all repairs of coaches and wagons should be charged out on four orders only, *viz.* :—

- Upper Class Passenger Carrying Vehicles ;
- Lower Class Passenger Carrying Vehicles ;
- Other Passenger Carrying Vehicles ;
- Wagons ;

for each of which orders a total cost would be obtained which, by comparison with the number of vehicles, would give the average cost per vehicle. Separate costs for any particular operation on a locomotive, could be obtained as desired by the Works Manager. As costs would be obtained in each shop, and summarised on sorting and tabulating machines all that would be necessary would be to punch additional cards for the time and material on each operation for which the cost is desired.

226. The Workshop Accountant would have under him the following sections :—

1. Time.
2. Labour.
3. Material.
4. Costing.
5. Accounts.

The Assistant Workshop Accountant, through the labour section, should be responsible for the verification of the pay sheets and for the allocations made throughout the month to different order numbers. All time tickets would be punched on Hollerith or Powers cards, and sorted, tabulated and agreed with the pay sheet.

227. In carriage and wagon and other workshops situated at points where there are no locomotive works, the work necessary to prepare time costs will not be sufficient to justify the use of Sorting and Tabulating machines. In these cases I recommend that the Paramount system of sorting described in Chapter XVII be adopted and the results tabulated on Burroughs machines.

228. One important point arises in connection with the charges for labour cost, in that labour is paid in workshops not on the basis of the grade of work done but at varying rates for the same work based on the length of service of each employee. For this reason, in order to obtain accurate labour costs for different order numbers it will be necessary to take not the actual pay of the individual workman engaged on the job but the average rate of all (a) skilled workers, and (b) semi-skilled workers in each shop. This will result in there being some slight difference each month between the total shop pay sheet and the amount charged to jobs, and it will be the duty of the Assistant Workshop Accountant to see that this difference is negligible and that the fixed rates are altered from time to time as may be required for this purpose.

229. Material delivery notes would be sent in every day to the material section for pricing, and thence to the costing section. They would also be sorted and tabulated by order numbers and again by store catalogue numbers either by Hollerith or Powers machines or the Paramount card system, so as to give both the charge to order numbers and the credit to store catalogue accounts.

230. Overheads are those expenses which have been incurred in manufacture but cannot be allocated direct to any specific job or jobs and in respect of the Railway workshops would consist of :—

- (1) Work done in the shops, such as repairs to machines, tools and other plant.
- (2) Wages of foreman, time-keepers, etc.
- (3) Salaries of the supervisory and administrative staff (including a proportion of provident fund bonus and gratuities for good service).
- (4) Other charges to workshops originating in the central accounting office or in other departments of the Railway.
- (5) Depreciation.

It is necessary to note that on no account should interest in any shape or form be included in overhead expenses.

231. There are many different bases on which it is customary to distribute overhead expenses. In view of the fact that Railway workshops are organised for the purpose of manufacture and repair work for the Railway only and are not operating for profit, the basis of a percentage on direct labour cost, is sufficiently accurate for all purposes. All overhead expenses, would, as far as possible, be allocated to each separate shop and divided in proportion to the labour costs of that shop. Such expenses as could not be so allocated would be divided in proportion to the total labour in all shops.

232. On the completion of each work order, and at the end of each ten days in the case of standing orders, the time sheets relating thereto would be sent by the progress division to the labour section of the workshop accounting division for pricing and thence to the cost section.

233. Carriage and wagon repair orders, being standing orders, should be automatically charged out each month. Engine repair orders, which are individual, would in the ordinary course be available only on the completion of the

work, but for the purpose of the general accounts of the Railway the totals of these orders for each month should be aggregated so as to ascertain the total expenditure on all engines for repairs for that month for submission to the accounting department at the central office and inclusion in the maintenance of rolling stock.

234. The costing section would keep a loose leaf cost ledger, containing an account for each order number, to which would be debited labour, material and overhead expenses, including that charged by the Central Accounting Office. Overheads would be added monthly to each account, except store orders and those for third parties to which it would only be charged on completion of the job. This detailed Ledger should be divided into four sections, each controlled by an account in the Workshop Ledger, *viz.* :—

Engine Repair and Construction Orders.

Standing Orders.

Sundry Orders.

Manufacturing Orders.

235. The accounts section would keep a workshop ledger for each workshop which should be completely written up and balanced by the tenth of the month, and all that would then remain would be to send the closing entries to the Central Accounting Office. These closing entries would be standard for each month, and should be made in the form of journal entries ready for incorporation in the Central Accounting Office books and supported by the necessary detailed schedules.

236. It will be noted that, except in the case of work done for other departments of the Railway or for third parties, no costs as such would find their way into the general books. These costs would, however, all be contained in the cost ledger which through the workshop ledger would balance with and be controlled by the central books. From the cost ledger, costs of every order as completed should be made out and sent in full detail to the works manager and such other officials as may be interested. These completed costs should be in the hands of the works manager within five days after the 10th, 20th and the last day of each month, being the dates as of which tabulations would be prepared.

237. Particular attention should be paid by the workshop accountant to those accounts in the workshop ledger which contain unabsorbed balances. Such are the following :—

- (a) Job shop accounts containing on one side the actual wages paid and on the other the amounts charged out to orders at fixed or average rates.
- (b) Standing order accounts to which all costs on these orders are charged, while the credits consist of estimated costs of individual orders.
- (c) Process shop accounts, to which the same considerations as to standing orders apply.
- (d) Overhead accounts, to which all overhead charges are made, while the credits are the percentages on labour charged to orders.

In all these cases the balances must be watched carefully from month to month to see that they are kept down to negligible amounts, and such changes must be made in the rates at which credits are made as will rectify any appreciable differences that may be found.

238. In Chapter VII reference has been made to Abstract H containing all expenses of the electrical department which deals with the generation and/or distribution of electric power, the maintenance and repair of all electric fittings and equipment in workshops on rolling stock and for construction. All the cost of this department is carried into the Electrical Abstract and distributed to the other abstracts and other departments of the Railway. The electric shops are usually situated in the other workshops and the system of orders costing and distribution of work would be similar, but there are differences in detail.

239. In Appendix VI (Workshops) and Appendix VII (Electrical Department) will be found full details of the suggested cost system and the relative forms will be found in Part III of the Report.

CHAPTER XL

NEW SYSTEM OF GENERAL ACCOUNTING.

240. In Chapter IV the proposed organisation of the accounting department is set out and discussed, and on page 22 of that chapter a chart is given of this organisation. In Chapters VIII, IX and X and XV, and the Appendices relating thereto, the duties of the traffic, stores and workshop accountants and of the accountant in charge of statistics are set out in full. It remains to deal with the duties of the establishment, expenditure, and general bookkeeping sections to be carried out partly at the offices of divisional superintendents, but principally in the Central Accounting Office. Full details of the system proposed are set out in Appendices VIII and IX, and may be summarised here.

241. In the Central Office and directly responsible to the Chief Accountant there would be :—

- (a) An establishment officer.
- (b) An accountant in charge of expenditures under whom would be :—
 - (1) Assistant accountants in each operating division and engineering district.
 - (2) An assistant accountant in charge of pay sheets and bills, and
 - (3) An assistant accountant in charge of accounts.
- (c) An accountant in charge of general bookkeeping.

242. The assistant accountant at each operating division and engineering district would be responsible for :—

- (a) Checking and verifying all pay sheets and contractors' bills before payment,
- (b) The correct allocation of stores issued to his division,
- (c) The critical analysis of periodical accounts submitted by the Central Accounting Office to the divisional superintendent,
- (d) Assisting the divisional superintendent in all financial matters, e.g., preparation of estimates, etc. All pay sheets of operating divisions and engineering districts would be sent after payment to the establishment section where they would be checked to ensure that they have been prepared in accordance with the regulations and that the special allowances are proper.

243. All Central Office pay sheets would be sent by the head of the department preparing them to the establishment section for a complete verification before payment. After this verification they would be sent to the assistant accountant in charge of pay sheets and bills, whose duty it would be to see that all the routine checking had been done. He would then enter them in his pay sheets and bills register and send them to the Chief Accountant or his representative for signature and transmission to the Treasurer for payment. The officers salary roll and the pay sheets of the Establishment section clerical staff, prepared in the latter section, would be verified by the Chief Accountant or his representative appointed for that purpose.

244. The assistant accountant in charge of accounts would be responsible for—

- (a) The entries in the journal allocation register ;
- (b) The postings to the detailed* abstracts, new construction and depreciation fund accounts ;
- (c) The balancing of these accounts with the control columns in the registers ;
- (d) The preparation of monthly abstracts ;
- (e) The preparation of the detailed monthly statements of expenditure required by the operating officials.

The assistant accountants would prepare from their registers the monthly journal entries recording in a summarised form all the transactions for the month, which would then be sent to the accountant in charge of bookkeeping.

245. The accountant in charge of bookkeeping would have under him an assistant accountant in charge of general and subsidiary ledgers, and an assistant accountant in charge of provident and other funds ledgers. The general ledger would be written up from the journal entries sent in by the Assistant accountants, and the subsidiary ledgers from the original documents from which these journal entries were prepared. He would also be responsible for the preparation of the monthly and annual income accounts and balance sheets and would obtain from the accountants and assistant accountants in charge of the subsidiary records all statements required as exhibits to these accounts. All these periodical accounts and statements should be in the hands of the Chief Accountant for approval and transmission to the Departments interested, by the 20th of each month.

246. Provision has been made in the proposed system for the use of loose leaf ledgers and Burroughs accounting machines, which will not only reduce the expense but ensure greater accuracy. A fuller reference to these will be found in Chapter XVII.

247. The treatment of English indents and payments made in England for salaries, allowances of officers on leave, and for other purposes should be somewhat modified to fit in with the new accounting system suggested. As advices of consignments shipped from England are received at the Central Office of the Railway an account should be opened for that consignment in a subsidiary consignment ledger. As the consignment is cleared on arrival, passed and despatched to ultimate destination the consignment account would be cleared. The original credit for each consignment would be to an account entitled "English Indents" which would be cleared on receipt of a definite statement from the Government of India of amounts taken up by them in their current account with the India Office. These accounts would then be settled by cheque as provided for in Chapter V. A similar procedure would be followed in respect of all other English accounts, the liability being taken up as soon as ascertained in every case.

248. The Chief Accountant should have immediately responsible to himself a staff of Inspectors, whose duties would be to make frequent surprise checks of the different sections, divisions and departments of the railways in which financial transactions originate. The movement of the Inspectors should be arranged by the Chief Accountant personally and their work should consist of a complete verification of transactions from start to finish in the office investigated; these investigations should follow the same lines as those laid down in Chapter VI and Appendix II relating to audit. The systematic arrangement of Inspectors covering the whole accounting field of the Railway is a most important function and one of the best preventives of irregularities and fraud.

249. The principles involved in this system of accounting differ fundamentally from the methods which are at present in force in that they are based on a system of control accounts with which all the detail accounts must automatically balance; the detail accounts being written up from the original documents while the control accounts would be written up from summaries of those documents. The system of controls would extend throughout the Accounting system over Stores, Workshops, Traffic and Expenditure. It would ensure that at least two, and frequently more independent persons are involved in the figures which ultimately reach the first books of account, and that those in the subsidiary books and records must balance automatically with those reaching the general books from the same original sources but by different channels. This system coupled with the payment of wages and bills by the Treasurer, or by cashiers responsible to him, ensures as far as practicable the accuracy of the accounts and the prevention of errors and frauds. Such a system will also ensure that the loss of or alteration in any of the original documents after they have once been prepared and certified must be found out through disagreement with the control account. The new system with the assistance of mechanical methods will avoid a great deal of the detail work and duplication that now exists; will ensure greater accuracy and conduce to greater speed in the preparation of final accounts.

250. In the existing system the same aim has been attempted mainly by duplication of records, under which all individual entries are carried through from one voluminous abstract to another by a continuous series of compilations by which errors if once made are perpetuated and can only be eliminated by preparing duplicate abstracts and comparing one with the other in all its details.

251. Full details of the Central Office accounting system of which the outlines only are here given will be found in Appendices VIII and IX.

252. The accounts of the Railway Board are at present kept by the Accountant General Railways. In accordance with my recommendation in paragraph 62, these accounts would be maintained in future by the Chief Accountant to the Railway Board. They are quite simple, and call for no special comment, and the system suggested will be found in Appendix IX, Section II.

CHAPTER XII.

NEW SYSTEM OF ACCOUNTING FOR COLLIERIES.

253. Included in the present operations of the railways is the mining of Coal on quite an extensive scale. Originating in the control by one or more railways of certain coal areas it has developed into a big industry the normal output of which even at the present time amounts to approximately 2½ million tons per annum. At the present time the operating and financial control of the mines is as follows :—

Controlled by the East Indian Railway : The Serampore and Kurhurbaree collieries at Giridih, the coke ovens, workshops and power plant at Giridih, and the Bokharo, Sawang and Kedla collieries near Bermo which is about 50 miles from Giridih.

Controlled by a separate Colliery Department of the Railway Board : The Kargali, Jarangdih and Religara collieries near Bermo and the Bhurkunda colliery near Barkakhana Station.

254. While the mines may seem to be a small organisation compared to the railways, they are at the same time one of considerable importance and the technicalities involved in their operation are different to those of the railways. I recommend, therefore, that the operating administration and the financial accounts of the mines be vested in a Director of Collieries who would be directly responsible to the Railway Board. When thus divorced from the railways, the Colliery Department should have its own Budget which would form a separate item in the Railway Budget under each of the five Demands for :—

- (1) Administration.
- (2) Maintenance and Repairs and Operation.
- (3) Depreciation Fund.
- (4) Capital Expenditure including Working Capital.
- (5) Expenditure out of Depreciation Fund.

Any surplus of the Colliery Department after providing for all expenses, depreciation and interest upon capital at charge on the same basis as adopted for the railways should be paid over to the Railway Board and become part of the Reserve of the Railway Department. The capital invested in the collieries by the railway interested therein should be taken out of the railway books and brought into the Colliery Department books. In so far as the ownership of collieries is vested in company managed railways, their interest may be preserved in accordance with their contracts by paying over to them their share of interest or profits either in proportion to capital invested or to deliveries of coal.

255. To facilitate their convenient operation, the mines should be divided into two groups, viz. :—

- (1) Giridih—to control the Serampore and Kurhurbaree collieries and the coke ovens, workshops and power plant at Giridih.
- (2) Bermo—to control the Bokharo, Kargali, Jarangdih, Religara, Sawang and Kedla and Bhurkunda collieries, and the power plant at Kargali.

256. The Director of Collieries would be located in Calcutta, and would be responsible for the general management of all the collieries and for the purchase of all supplies. He would have under him, in addition to such technical officers as may be necessary, the following staff :—

- (a) A General Superintendent at each group centre, who in turn would have under him :—
 - (1) A manager for each mine.
 - (2) A workshop superintendent for each workshop.
 - (3) One superintendent for each power plant.
 - (4) A cashier at each group centre.
 - (5) A storekeeper at each place where stores are kept, who would be responsible to the Director of Collieries for the custody of stores and for keeping the necessary quantity records relating thereto.

but would be under the general superintendent for the purpose of discipline.

- (b) A Chief Accountant of Collieries who would be located in Calcutta and would be appointable and removable only by the Railway Board. He would be directly responsible to the Director of Collieries, retaining, however, the right of access to the Railway Board in the event of disagreement. He would be in charge of all accounting functions including the internal check of all the colliery accounts. At each group centre he would have a mine accountant to whom would be delegated the responsibility of keeping all accounts for the collieries, workshops, etc., controlled from that centre. For the purpose of discipline, the mine accountant would be under the General Superintendent.

257. The functions of audit would remain with and be exercised by the Auditor General in accordance with the principles enunciated in Chapter VI. The Auditor General would not have power to interfere with the management or control of the collieries, but would retain the right of reporting thereon.

258. Such accounting records as are necessary at each group centre would be kept by each mine accountant, but the principal financial books would be kept by the Chief Accountant of Collieries in Calcutta. The main outlines of the accounting system are as follows :—

Each mine accountant would keep a mine ledger in which would be kept the operating accounts of the mine, and, in the case of Giridih, a control account for the Giridih workshop. It would be convenient to have this ledger in loose leaf form, and, when more than one colliery is controlled from the group centre, to sectionalise the ledger so that the accounts of each colliery may be kept separately.

259. The mine accountant would be responsible for checking the pay rolls prepared by the pay officer in respect of both the weekly wage bills and monthly salary sheets in order to ensure their accuracy, and would also be responsible for seeing that the system and preparation of pay and method of making payment was properly carried out, and that all reasonable precautions were taken. From the wage bills and pay rolls he would prepare summaries allocating all wages against the account heads debitabe and then post from the summaries to the debit of the accounts concerned in the mine ledger. He would also keep detailed quantity and money records for each commodity in each of the colliery stores.

260. It has been explained in Chapter IX that every item of stock at every railway depôt must be verified by the Chief Accountant's permanent stock checkers at least twice every year, and this procedure should obtain also in respect of colliery stores. Differences revealed by the stock checkers' reports must be investigated, necessary adjustments made, and the quantities shown on the mine accountant's records agreed twice yearly with those on the records maintained by the storekeeper of the depôt concerned. On his copy of the stores issued notes the mine accountant would insert issue prices, calculate values, summarise the value of stores issued against the account heads debitabe and then post from the summary to the debit of these accounts in the mine ledger.

261. The cashier at each group centre would be furnished with an imprest for such an amount as may be necessary and from which he would pay wages, small contractors' bills, salaries and petty disbursements under Rs. 100 each. The carbon copy of his imprest petty cash book, certified by the mine accountant and supported by all vouchers, together with a summary of these vouchers allocating the expenditure under the appropriate account heads, would be sent weekly to the Chief Accountant, Calcutta, who would reimburse the cashier with the amount expended.

262. The daily invoices of consignments of coal (quantities only) would continue to be sent from the collieries to all consignees. At the end of the month these invoices must be summarised in duplicate to show the total consignments for the month to each consignee. A certified copy of this summary would be sent to the Chief Accountant in Calcutta who would then enter the prices, bill the consignees, and make the necessary entries in the financial books.

263. The mine accountant would prepare for the mine manager a weekly approximate account of wages and materials and send a carbon copy of this to the Chief Accountant. In respect of each Colliery he would also send to the

Chief Accountant a statement showing the output for the month, number of shifts worked, average production per shift, and wages cost per ton. The mine accountant would also prepare and send to the Chief Accountant not later than the tenth of the following month a monthly statement of mine expenditure and consumption for each colliery, supported by a trial balance of the mine ledger accounts of that colliery.

264. In the head office in Calcutta would be kept the following books :—Head office ledger, cash book, journal, bill register (with a cash column) and subsidiary ledgers for capital expenditure, debtors for coal and other items. The head office ledger would contain only control accounts, as follows :—

- (a) Capital expenditure at each mine, which, so far as it was represented by wages and stores, would be taken up in total at the end of each month from the respective mine ledgers by transfer to the corresponding capital expenditure ledger. So far as outside purchases are concerned, these would be posted direct from the bill register.
- (b) Control accounts for each colliery into which the totals from the documents forming the basis of entry in each mine ledger would be posted through the journal.
- (c) Imprest account for the mines containing only the amount of the imprest supplied to each mine, and this amount would only vary when it was found necessary either to increase or decrease the imprest.
- (d) Stores account for each mining centre, which would be debited through the bills register with all purchases for each mine, and would form a control account for the quantity and money records kept at each mining centre.
- (e) Sundry debtors account controlling the debtors ledger.
- (f) Bill register control account controlling the outstanding balances on the bill register.

265. A monthly cost account, profit and loss account and balance sheet for each Colliery would be prepared by the Chief Accountant, and copies thereof sent to the Railway Board not later than the fifteenth of the next month.

266. The cash system would be in accord with that already outlined in Chapter V for the Railways, a separate account for the Colliery Department being maintained with the Controller of Currency to whom would be sent monthly by the Colliery Chief Accountant a statement showing all lodgments and withdrawals and the numbers of the cheques on which the withdrawals were made and also the balance of the account. With this statement would be sent an Advice slip in duplicate and the Controller of Currency should certify and return one copy. All suppliers' bills would be passed for payment by the Chief Accountant after being checked against the copy of the purchase order and the certified part of the delivery note received from the officer who inspected and passed the goods.

267. At the present time all stores required by the colliery stores at Giridih and Bokharo are drawn from the East Indian Railway stores, while those for the other colliery stores are purchased by the Superintendent of Collieries. It is desirable, as soon as the segregation of all collieries into one department can be effected, that all stores therefor should be purchased through the Colliery Central Office. The stores requirements of the collieries are not sufficient in volume to justify the appointment of a purchasing agent : but it is suggested that all purchases should be made by the Director of Collieries as the stores needed are necessarily different from those of a railway and should therefore be handled by an officer having an intimate knowledge of colliery wants.

268. It is important to consider the price to be charged for coal sold to the State Railways and other Government Departments. In the past, the charge has been approximately cost price after providing for sinking fund, with no addition to represent interest or profit. In future, the price should be based on cost, including all administration and overhead expenses, depreciation and exhaustion of minerals, plus a percentage to cover a fair remuneration on the capital at charge. A fair rate would be 6 per cent. per annum, and I recommend that this rate be adopted in future. This will enable a fair comparison to be made with the market price of similar coal.

269. I have drawn up a complete system of Colliery Accounting, and full details thereof with relative forms will be found in Appendix X.

CHAPTER XIII.

DEPRECIATION.

270. The present practice of the Indian State Railways is to provide each year for depreciation at varying rates upon the whole of the permanent works and equipment of each railway by a charge to Revenue and a credit to a Depreciation Fund. The rates of depreciation are based upon the estimated life of each class of structure or equipment and upon the original cost thereof, less estimated scrap value on abandonment or retirement.

271. For the State managed railways the charge is made in the accounts of each railway while in the company managed lines one sum is charged through the accounts of the Railway Board and credited to a Fund for those railways, but is not taken up by the individual railways, in whose accounts replacements are charged to a Renewal Account. In one other respect the method adopted for State managed and Company managed lines also differs. In the former, on the abandonment or retirement of any property the original cost is charged to the Depreciation Account, while any excess or deficiency between replacement and original cost is charged or credited to capital account. In the latter, the entire cost of replacement is charged to renewals, while only the cost of excess capacity is charged to capital.

272. At the present time cost of replacement is almost universally in excess of original cost, and the first method whereby excess cost is charged to capital means in effect that capital must be provided each year in order to maintain the property in a condition to carry on its normal operations as well as to provide it with facilities for carrying increased traffic. If cost of replacement is in the future reduced to a figure below original cost, there will be a credit to capital account each year. Moreover, demands from the public or the Legislature for improved accommodation, greater speed, etc., may frequently result in the replacing unit costing more than would a reproduction of the displaced one. This part of the extra cost does not necessarily produce greater revenue or reduce working expenses. It follows that the first method of dealing with renewals means the continuous adjustment of the capital invested in the property by reference to current costs of reproduction, plus the cost of greater and better facilities required to maintain the existing traffic, in addition to requirements to meet increased traffic.

273. The second method, *viz.*, that adopted by the Company managed lines of charging excess cost to Revenue, has the effect of maintaining the original undertaking in all respects at original cost and it provides out of Revenue for such improvements as are necessary to maintain the existing traffic, leaving as a charge to capital only the cost of increased capacity. Moreover, it throws the burden of renewals in periods of high prices as a charge against revenues also produced by high prices, whereas by the other methods low revenue rates may have to meet high replacement cost.

274. In the Convention (Appendx XI) adopted when the Railway Budget was separated from the General Budget of the Indian Government no specific provision is made either for the capital required when cost of renewal is higher than original cost or for the capital returnable under the contrary condition. The Convention, contains a provision [Serial No. 2011 (Section 5)], for loans to the Railway Board out of the Reserve Fund, such loans to be repaid in subsequent years out of revenue, but it is at least open to doubt whether it was contemplated that such loans could be used to meet the excess cost of renewals.

275. To put concisely another view of the effect of the methods adopted by the State managed and Company managed railways respectively, the first contemplates a continuously varying capital account in respect of existing properties whereby their book values are constantly tending towards actual cost to replace at any time, while in the second case the capital account is definitely closed at the time of completion of the original work, and the cost of renewing or replacing it is thrown upon revenue.

276. Another slight inconsistency in the method adopted by the State managed railways may be noted. Any particular unit, *e.g.*, a locomotive, may be partially renewed many times during its life and at the time of each renewal the cost of replaced parts is charged to revenue (except in the case of a complete boiler or a complete tender) whether such parts cost more or less than when the locomotive was originally constructed. It is difficult to see why if the first method is sound it should not be applied also to partial renewals.

277. There is one further question of principle which requires consideration. If additional cost not accompanied by additional capacity or additional net earning power is charged to capital, the amount of capital at charge under the first method will be continually increasing without any corresponding additional earnings, the interest charge made by the Government of India under the Convention will be continually increasing, and surplus revenues and railway reserves will diminish, while under the practice adopted in the Company managed lines these items will remain stationary so far as open lines are concerned.

278. Inasmuch as the whole of the railway revenues either directly or indirectly accrue to the benefit either of the Government of India or of the traveling public (by way of improved services or lower rates) and as all additional capital must be found by the Government of India, it may perhaps be considered immaterial which method of providing for depreciation and renewals is adopted. On the other hand, the importance of sound accounting principles cannot be overlooked. Expediency should not be allowed to override the principle; there is much to be said for the view that the railway property should be handed on from year to year intact, *i.e.*, properly maintained in its original state, and the cost of this met out of earnings before net earnings are employed for any other purpose.

279. The scale of Depreciation Rates set by the Railway Board for each different class of structure and equipment in India has, it is understood, been carefully considered and fixed by competent engineers, and it is hardly within my province to question these rates. I may, however, suggest that in fixing estimated life sufficient account has perhaps not been taken of obsolescence. The railways of India have mostly been in existence less than 60 years and in other countries less than 80 and during that period the changes in methods and consequent obsolescence have been great.

280. The age of electricity lies closely ahead and changes in electrical methods appear to come rapidly. In fact, it is not many years since leading electrical experts in the United States would not give any electrical apparatus a life of more than 10 to 15 years. There would seem to be reason to think that in less than 50 years entirely different methods of transportation may be evolved which may render existing railways and their equipment to a large extent obsolete. Under these circumstances, I would venture to suggest that no class of railroad property should be estimated to have a life of more than 50 years, and that in the case of electrical equipment this should be reduced to a maximum of 25 years.

281. The real commercial reason for providing depreciation is of greater importance than the particular method adopted, *viz.*: that it provides a fund to meet any changes and reconstruction required to meet obsolescence, and enables a property to be maintained continuously in the highest state of efficiency without too great a strain upon the revenue resources of short periods. For this reason alone, the most conservative methods of providing for depreciation should be adopted.

282. In the United States a plan of providing for depreciation was laid down by the Interstate Commerce Commission and is set out in the classification of operating revenues and operating expenses prescribed by that body and made effective in July, 1914. Under this plan depreciation was made compulsory in the case of equipment only and optional in the case of structure. The railways fix their own rates upon the basis of the original cost and estimated life and depreciation ceases when the amount accumulated on any unit is equal to the difference between original cost and estimated scrap value. If a unit is retired from service before the full amount of depreciation has been provided, the difference between the book value (less salvage) and the accrued depreciation is charged to revenue account under the head of "Retirement."

283. The Interstate Commerce Commission Rates make no provision for any charge to revenue either for excess cost of renewals over original cost or for any portion of the cost of renewals which does not add to the carrying or earning capacity of the railway. All such additions must be added to capital accounts, but provision is made for crediting to a permanent account entitled "Additions to Property through Income and Surplus" any such amounts of income as may be definitely set aside and expended in additions to property of any kind. This permissive attitude in fact recognises what has always been the best railway practice in that country, *viz.*: to charge to revenue large sums for betterments, *i.e.* (1) for the replacement of retired units by units more suited to the current needs of the railway, but not necessarily producing a greater revenue (2) for reconstruction of permanent way structures to suit present day requirements and (3) for

generally modernising the railway undertaking. By this means the capital accounts of American Railways have been maintained at a much lower figure than would otherwise have been the case, and they have been enabled to reduce rates materially and at the same time to earn a moderate but not excessive return on the capital employed. The only change in this practice made by the Interstate Commerce Commission Rules has been that all amounts so expended out of revenue must be shown on the face of the accounts and cannot, as frequently occurred previously, be merged in general repair and renewal charges.

284. In England provision is made for renewals for all working assets, *i.e.*, rolling stock, steamers, etc., either (1) by charging to Revenue each year the proportion of the estimated cost of replacement having regard to probable life and residual value, thus charging to Revenue (and not to Capital as in India) the excess cost of Renewals over original cost for the same capacity, or (2) by charging to Revenue the proportion of original cost and in addition the excess cost of renewal when it takes place. The former method (1) involves a forecast of the probable future cost of renewals and is an attempt to equalise the provision over the whole life. With considerable variations in cost, such as have occurred since 1913, it is a difficult matter to forecast cost of replacement; and as these variations are usually accompanied by similar variations in Revenue, it may be better to adopt the latter (2) and to take original cost as the unit and to charge or credit excess or deficit of replacement cost over or under original cost to a Renewal Account in the year when it takes place.

285. Conditions in India as to railway construction are more like those in the United States than in England. In such a large country with a dense population, great distances, with a relatively small mileage of railways, and low rates, both for passenger and goods traffic, there is need for considerable railway extension which can perhaps be best carried out at first by a lower standard of construction to be improved gradually as the traffic increases. Under such conditions a most conservative accounting policy should be adopted and considerable sums should be set aside each year to meet improvements and betterments in addition to providing for the replacement of units by units of similar capacity as occasion requires. One important step towards such a policy is to charge all additional costs of renewal and replacement due to higher costs to revenue instead of to capital; and a second equally important one is to charge also to revenue any such additional cost as may be due to the necessity of maintaining the property in the highest state of efficiency required for modern conditions, but which may not correspondingly increase either traffic or earnings. To some extent this is met by the terms of the Convention which reserves to the Railway Administration a proportion of each year's surplus; but the use of this surplus is restricted. It would seem desirable to make higher charges to revenue (which would reduce surplus) and to permit of the use of surplus for betterments as well as new construction.

286. There is one special matter included in Clause 11 of my Terms of Reference, which can best be dealt with here, *viz.* :—

“ To report whether the realised surplus of any considerable amount resulting from the disposal of a fixed asset should be treated as a receipt on Capital Account or credited to Revenue Account.”

Under the practice recommended in this Chapter, Depreciation Fund would have been credited annually with the proposition of the difference between original cost and the estimate scrap value of the asset replaced, and the amount realised from the sale of the scrap would be credited to Depreciation Fund. When the replacement occurs the original cost would be charged to Depreciation Fund and the excess cost to Renewals, the effect being that Capital Account remains debited with the original cost of the replaced unit, but with the addition of the cost of any excess capacity calculated to increase revenue.

287. The question specially raised assumes that the asset, whether replaced or not, is disposed of at a price exceeding original cost. Such a condition could only arise in the case of land or buildings, and then only in exceptional circumstances. The proper procedure in such a case would be (1) to credit to Capital Account the original cost, less accrued depreciation, and (2) to credit the realised surplus over that figure to a “Capital Reserve Account” to which should be charged any losses due to sales of similar assets for sums less than the difference between the original cost and the amount standing to the credit of the Depreciation Fund in respect of those assets. The Balance on this account at any time whether credit or debit will represent the aggregate amount by which realisations of Capital Assets have exceeded or fallen short of the Book Value.

There is no necessity to deal further with this balance which can remain a part of the Capital Account as it is only on final realisation of the whole of the Capital Assets that any real Profit or Loss can be said to have arisen. This, in effect, is equivalent to crediting the entire price realised on sale to Capital Account; but the record is clearer if the account is divided so as to show separately the surplus or deficiency on realisations over the original cost.

288. After full consideration of the arguments set out above, I make the following recommendations as to renewals and depreciation.

1. That the principle of setting up each year a charge to revenue and a credit to depreciation fund to represent the estimated accruing renewals on each class of railway property is sound.

2. That the sums to set aside should be based upon the estimate life of the property and the original cost less estimated value of scrap to be recovered, but that in no case should a greater life than 50 years be allowed for any railway property, while in the case of electrical apparatus the maximum should be 25 years.

3. That when renewal or replacement takes place, the original cost should be charged to depreciation fund and the balance above or below original cost should be debited or credited to a renewals account in the appropriate Abstract to be included under the main head of Depreciation.

4. That the cost of excess capacity due to improvements in service but not producing any greater revenue should be charged to an account entitled "Betterments," which account would be a charge against net income for each year.

5. That the cost of excess capacity enabling increased revenue to be earned should be charged to capital account.

6. That in order to determine whether a new unit of equipment is a replacement or an addition, a register of all equipment be maintained showing:

- (a) For each class of locomotive unexpired tractive power, *i.e.*, tractive power multiplied by number of years of unexpired life.
- (b) For each class of passenger coach unexpired capacity, *i.e.*, number of passengers for whom accommodation is provided multiplied by unexpired life of coach.
- (c) For each class of goods wagon unexpired tonnage capacity, *i.e.*, capacity multiplied by unexpired life.

As long as there is no increase in the aggregate unexpired tractive power of locomotives or the aggregate unexpired carrying capacity of coaches or wagons, all expenditure on new equipment of each class should be charged to depreciation account for that class, in respect of original cost, and charged or credited to Renewals in respect of the excess or deficit of present cost over or under original cost. If the unexpired tractive power and or capacity show an increase, then the cost of the increase should be charged either to betterments or capital according as the increase has been necessary in order to maintain existing traffic or represents greater revenue earning power.

7. That the realised surplus over original cost, less accrued depreciation, resulting from the disposal of a fixed asset should be credited to a capital reserve account, to which should be charged any losses due to sales of similar assets for sums less than the difference between the original cost and the amount standing to the credit of depreciation fund in respect of those assets.

CHAPTER XIV.

289. The Railway Budget as submitted to the Legislative Assembly takes the form of Demands for Grants under 15 separate headings. Each Demand is an aggregate under its respective heading of the total expenditure of the Railway Administration, and no reference is made to separate railways.

The demands are as follows:—

No. 1.—Railway Board Demand, including Pay of Officers and Establishment, together with other allowances.

No. 2.—Demand for Inspection, including Pay of Officers and Establishment, together with other allowances.

No. 3.—Demand for Audit, including Offices of the Accountant General Railways, Government Examiners of Accounts, Chief Auditor East Indian Railway, and the Audit Office attached to the Clearing Accounts Office.

These three votes represent amounts required to defray expenses directly incurred by or on account of the Railway Board, and have no relation to individual railways.

No. 4.—Working Expenses: Administration.

This Demand is a summary of the amounts shown under each heading of Administration in each of the Expenditure Abstracts.

No. 5.—Working Expenses: Repairs and Maintenance and Operation. This, in the same way, is a summary of the amounts shown in the Abstracts under the second and third main headings, *viz.*: Repairs and Maintenance and operation.

No. 6.—Is the Share of Surplus Profits and Net Earnings paid over to the Railway Companies and Indian States in respect of State Lines.

No. 7.—Is for New Construction of Commercial Lines.

No. 8.—Is for Additional Construction Works on Open Lines.

No. 9.—Is the Appropriation to Depreciation Fund out of Revenue and is a summary of the items charged under this heading in the Expenditure Abstracts.

No. 10.—Is the Expenditure paid out of the Depreciation Fund.

No. 11.—Covers a number of Miscellaneous items which are a charge against the earnings of the separate railways taken over by the Railway Board, and form part of the accounts of the Railway Board. It includes among other things, Surveys Written Off, Rates Advisory Committee, Technical Office under the Railway Board, Clearing Accounts Office, Office of the Chief Mining Engineer, and Audit Officer of the Railway Collieries.

No. 12.—Is for the Appropriation made to the Reserve Fund, *i.e.*, the amount which under the Convention of 20th September, 1924 (Appendix XI), is allowed to be retained by the Railways out of their net earnings.

No. 13.—Only occurs occasionally and is to provide for a payment to the Government out of Reserve in cases when the Net Revenue falls short of the minimum to be paid over to the Government under the Convention above mentioned.

No. 14.—Represents the amount of Repairs, maintenance and operation expended on strategic lines, the deficit on which is payable by the Central Government.

No. 15.—Is for the capital expenditure on strategic lines either open or new.

290. It will be noticed that the whole plan of this Budget is based upon the Government having received the gross revenues of the railways as part of the Government Revenue and having therefore to authorise the expenditure by the railways of the whole of the operating and other expenses necessary for railway purposes; and, in addition, to authorise the payments made by the railways out of either the Depreciation Fund or Reserve Fund.

291. If the system of cash accounting recommended in Chapter V be adopted, it may be necessary to vary this plan in the following respects: The gross revenues being under this plan earmarked for the railways and remaining the

property of the railways although held by the Controller of Currency, the votes for Capital and Revenue will take the form of authorising the railways to incur certain expenses, as at present, but the vote for Strategic Lines Revenue will take the form of an allowance by the Central Government for the deficiency on the strategic lines, this vote coming out of the General Government Revenues and not out of the Railway Revenues.

292. Each railway submits to the Railway Board a statement entitled "Revised Estimate and Budget Estimate." No dates as a rule appear on these documents, but I understand they are usually submitted about November or December in each year. Thus at this date in the year 1926 is submitted the Revised Estimate for the year 1926-27, ending on the following March 31st together with Budget Estimate for the year 1927-28, the figures being submitted in four columns:—

- (1) Final Accounts for the year 1925-26.
- (2) Budget Estimate for the year 1926-27.
- (3) Revised Estimate for the year 1926-27.
- (4) Budget Estimate for the year 1927-28.

293. The Abstract of Working Expenses which in the Annual Report is given both under departmental headings (Abstracts) and by account headings, *viz.*:—

- (1) Administration;
- (2) Repairs and Maintenance;
- (3) Operation;
- (4) Depreciation;

is in the Budget only given in the latter form, repairs and maintenance and operating expenses being merged into one, and each of the three headings is supported by a statement of details. Each heading is further adjusted by the variation in suspense account, *i.e.*, working capital, during the year and by deducting the expenses chargeable to worked lines.

294. The only alteration suggested in the method of submission is (1) that the statement of revenue expenditures and receipts and the supporting statements should be so altered as to agree with the amended accounts suggested for the Annual Report; (2) that the net revenue allocated under their contracts to worked lines should be treated as a deduction from net income and included in Vote No. 11 in the Government Railway Budget. The reasons for this change are given in Chapter VII; (3) that the variation in working capital (at present called suspense account) should be taken out of the revenue statement and included as a special item in the Capital Vote under the true heading, *viz.*: Increase or Decrease in Working Capital. This figure, with the normal extension of railways from year to year, will usually be an increase.

295. The remaining statements in the individual Railway Budget are the following:—

- Statement D, showing superior appointments and scale of pay thereof.
- Programme of New Construction. Demand No. 7.
- Abstract of capital programme on open line supported by full details. Demand No. 8.
- Expenditure from Depreciation Fund. Demand No. 10.
- Stores transactions for coming year.
- Manufacturing operations for coming year.

There is no need for much change in these forms, but each railway should make up its Budget in identically the same form as that recommended in Chapter VII for its annual accounts.

296. Particular attention is called to the variation in the form of the new Abstract IV (formerly Abstract IX) which contains a summary of expenditure with a deduction for administration expenses, store expenses and electric department expenses, which, as explained in Chapter VII are distributed as overhead and other charges through the remainder of the Abstracts.

297. The General Railway Budget itself as presented to the Legislature should be supported by a consolidated income account as described in Chapter

VII which, for Budget purposes should be made up in four columns to conform to the rest of the Budget statements, *viz.* :—

- (1) Final Expenditure for the year 1925-26 ;
- (2) Budget Estimate for the year 1926-27 ;
- (3) Revised Estimate for the year 1926-27 ;
- (4) Budget Estimate for the year 1927-28 ;

and there should be furnished also the consolidated balance sheet with a complete set of Exhibits drawn up in three columns, *viz.* :—

- (1) Actual as at March 31st, 1926 ;
- (2) Estimated as at March 31st, 1927 ;
- (3) Estimated as at March 31st, 1928 ;

and statements showing the increase or decrease in working capital in the year, and a summary of stores and workshop accounts all in the forms given in Appendix III.

298. One other matter of some importance remains to be dealt with. In making comparisons between Budget Estimates and actual results, it is necessary to have regard to the gross revenue upon which the estimated expenditures in the Budget were based. If this gross revenue varies materially, there should follow automatically some variation in expenses. A comparison between estimated and actual expenditure without taking this factor into account might be misleading. For instance, a reduction in gross revenue should be accompanied by some reduction in expenses. A comparison of these expenses with the Budget Estimate would, therefore, show a reduction, and yet the administration might have been more extravagant than was necessary, which extravagance would fail to be disclosed by reason of the reduction in the total.

299. For a proper comparison, it is necessary that a separation be made between those expenses which are unaffected by annual or other variations in traffic earnings and those which are so affected. The experience of previous years will enable some sort of ratio to be established between invariable and variable expenses respectively. If gross revenue has increased or decreased, the Budget estimate of expenses should be revised by increasing or decreasing the variable expenses in the proportion which past experience has shown to be the equivalent to a percentage increase or decrease in gross earnings. This is a matter which should be investigated by the statistical officers of the Railway Board and a method perfected by which a more accurate comparison would be obtained not so much between the actual expenses and the Budget Estimate, but between the actual expenses and what the Budget Estimate would have been if the actual variation in traffic receipts had been known at the time it was prepared.

300. I put forward one other suggestion for consideration, but make no recommendation thereon at the present time. The Budget Estimates of Expenditure are, as already stated, not made up under the headings of the respective abstracts, but as a summary of the main headings under each abstract. It is worth consideration whether a clearer view of the railway accounts would not be obtained if the functional divisions on which the abstracts have been drawn up were preserved throughout, not only in the railway accounts but in the Budget Estimates also. There would seem little doubt that the functional division is the best, but there may well be doubt whether this division is sufficiently superior to the existing division by account heads to justify a change in the Budget which would for some little time to come disturb comparisons with previous years.

CHAPTER XV.

STATISTICS.

301. In the Report of the East India (Railway Committee 1920-21) a severe comment is made upon the statistics at that time being prepared on the Indian Railways. Extracts from this report are given in Chapter I, and it is sufficient here to say that since that time the whole of these statistics have been revised, and that nothing but approval can be given for the work which has been accomplished in this direction during the last few years. Men of considerable statistical and accounting ability have been engaged in a careful revision not only of the statistics themselves, but of the methods of their compilation, and, speaking generally, both are on the right lines.

302. In order that the important branch of Statistics may be put on a proper basis, I recommend the following organisation :—

- (a) The Railway Board already have a Chief Statistical Officer who is responsible for gathering together, interpreting and criticising the statistics received from the different railways and preparing the summaries for the monthly and annual publications. No change is suggested in this organisation, which seems to work well. The title of the Chief Statistical Officer might perhaps be changed to that of "Assistant Director in Charge of Statistics," which would give him a somewhat higher standing when dealing with the officials of different railways.
- (b) In the case of the individual railways there should be attached to the Agent's Office a Chief Statistician with a title of "Deputy Agent (Statistics)" who would act for the Agent in the same capacity as the Assistant Director in Charge of Statistics to the Railway Board. He would, however, have nothing to do with the compilation but only with the interpretation and criticism of the statistics; from the results of his study, weak points would be taken up promptly with the Agent and his Deputies.
- (c) The Railway Board should appoint a Standing Statistical Committee consisting of the Assistant Director in charge of Statistics with representatives of the different operating departments on the state Railways and of the Chief Accountants of the separate Railways.
- (d) The Statistical Committee should lay down the method of preparation to be adopted so as to ensure that the best methods are adopted by all railways.
- (e) The Committee should from time to time revise the Statistics published monthly and annually by the Board, and should approve or otherwise any additional Statistics, which individual railways may desire to prepare for regular publication.
- (f) No statistical officer should be allowed to add to the regular authorised statistical compilation any further table until it has been approved by the Statistical Committee, but this would not preclude the preparation of any figures specially required from time to time.
- (g) Any suggestions for a change in methods of compilation should be laid before the Committee immediately.

303. All statistics in the railways, except such as consist solely of figures supplied by the operating departments of the railways and require no tabulation or compilation, would be in charge of a compilation officer under the Chief Accountant with the title of "Accountant in charge of Statistics." It would be his duty to compile and issue all the regular monthly and annual tables authorised by the Railway Board, and also to prepare for the Deputy Agent (Statistics) any special information required from time to time. He should collaborate closely with the Deputy Agent (Statistics) and consult freely with him as to any changes that may seem likely to improve either the statistics themselves or the efficiency of the methods used to produce them.

304. He would have under him a machine section, and it would be part of his duty to carry out in that section any work for the accounting department that may be suitable for this section to do. His staff should be carefully trained in the use of machine methods, and he should have a sufficient number of chief clerks to ensure that efficient supervision over the work which is required by its importance. This section would not necessarily compile all statistics, for instance, the new plan of audit of traffic receipts set out in Chapter VIII contemplates the production of all Passenger Mile, Ton Mile and Commodity Statistics

in the Central Traffic Audit Section, which would be sent to the Deputy Agent (Statistics) and to the Chief Accountant of each railway the required summaries.

305. One further word of caution seems desirable. The value of statistics is undoubted, and most useful information is obtainable therefrom, particularly by the Railway Board, and Agents and their subordinates on the individual railways. It should, however, be remembered that continuous personal inspection and supervision by officials in charge of small sections of the line is of greater value than statistics in obtaining economy of operation, and any tendency to substitute the study of statistics for such personal inspection should be ruthlessly checked.

306. The first essential in considering what statistics are to be prepared is whether or no and to what extent they will be of use to those responsible for the operation of the railways, and the second is that they must be prepared promptly and within the shortest possible period after the occurrence of the transactions to which they relate. There is a tendency amongst statistical compilers to lose sight in the midst of the mass of figures with which they have to deal of the purpose which these figures are to serve, and to prepare a number of statistical statements which can be of no real practical use. On the other hand, it is equally true that operating officials, who have not the same knowledge of statistical methods or of what can be produced in that direction as the officials in charge of their preparation, are not always prepared to accept as necessary the statements submitted to them, and cases have been brought to my knowledge where it was only after it had been proved that the figures given disclosed directions in which waste was taking place and improvements could be made that they were accepted. Perfection lies in the mean between these two views. This can be obtained only by a combination of the minds of the Operating Official, the Statistical Officer, and the Statistical Compiler.

307. As an instance of the needless publication of statistics, I would refer to two volumes of passenger and goods traffic statistics prepared by some railways annually which contain from 400 to 500 pages of figures. These are comprised under a number of useful headings, to which nothing but praise can be given, but are worked out for each station on the railway. They are not in themselves of much use, but form the groundwork for the preparation of the really useful figures. If the same figures were published for each section or division only of the railway, the annual statement in each volume would be reduced to about five pages of figures. This would be a document which if prepared even monthly might be of considerable use to the operating officials, but even then it would have to be completed at a much earlier date after the close of the transactions.

308. Delays in the preparation of statistics at the present time are mainly due to the fact that no commencement is made thereon until after the close of the month to which they relate, whereas in most cases the documents from which they are originally compiled could be available daily, and the sorting, the tabulating and the final compilations could be carried on from day to day and completed shortly after the close of the month. With a fuller use of machine methods of audit and compilation will come greater speed both in the preparation of the statistics, in the audit of the accounts, in the preparation of costs and in the many other matters connected with the activities of a railway.

309. Another point to be mentioned is that to many, and particularly to those who are not familiar with accounts, it is much easier to read and obtain a knowledge of the salient points from a graph or chart than from a table of figures. After a slight study of the principles on which such charts are made up, they can be read with the greatest ease and show almost at a glance whether any peak has occurred which appears to call for corrective action. Directly some salient point of a bad nature appears on the chart, the matter would be at once referred to the particular official responsible and a full explanation furnished by him of the cause thereof and remedies therefor. It is worth the consideration of the Railway Board and of the agents of the different railways whether some such system of graphs could not to an even greater extent than at present take the place of the volumes of figures which are now submitted.

310. There is a tendency to prepare regularly and continuously any statistics which have been once asked for. This tendency should be severely checked, and no discretion should be left with the statistical officer to prepare regularly as a matter of routine any statements additional to those in the official list. At the same time, it should be his duty if some special statistics are required for any purpose, to prepare these promptly and send them to the department asking for them. Any request to continue the preparation of these for a few weeks or for a few months, according to whether they are weekly or monthly statistics, should

be immediately referred to the Chief Accountant to take up in the usual course with the Statistical Committee of the Railway Board. It is only in this way that a check can be kept on the statistical compilation section and its expense kept within reasonable bounds.

311. The statistics prepared by the railways on the instructions of the Railway Board may be conveniently divided into three classes as under :—

I. Those provided by the operating departments for which no great accumulation of figures are required, *viz.* :—

- (1) Miles of route and single track, etc.
- (2) Locomotives in use, in repair shops, etc.
- (3) Coaches and wagons, in repair shops, etc.

These statistics call for no comment.

II. Those which are supplied by the accounting department from their books and records, *viz.* :—

The monthly accounts of revenue and expenditure with the relative abstracts. These should follow the forms given in Chapter VII of this Report, and no further comment need be made thereon here, except to emphasise that no other arrangement of these figures appears to be necessary, and that certain duplications which at present exist should be avoided.

III. Those which require a considerable amount of compilation before useful figures can be obtained.

312. This last division includes the great bulk of the statistics and the method of their preparation now in force varies in every railway. In one or another, machine methods have been adopted for the different compilations, but these methods are not yet universal. This tentative arrangement was wisely adopted in the first instance with a view to testing the use and economy of tabulating machines, and thereby much useful information has been acquired and methods of using the machines have been perfected. These machine methods should now be extended to all railways and the necessary machines supplied for the purpose.

313. It will be useful now to state shortly what are the factors upon which the machine calculations are based and the method of arriving at the fundamental statistics, and then to consider the derived statistics with special reference to a limitation of their quantity to those which are really useful to the operating and controlling officials and are likely to lead to greater economy and efficiency of operation.

314. The first and perhaps the most important group of fundamental statistics are those which are derived from the Freight Invoices. At present, summaries of these invoices are received from stations only after the end of the month to which they relate : there has consequently been considerable delay in the preparation of these figures. Under the system for Traffic Audit recommended in Chapter VIII of this Report, this work would be considerably expedited. By the use of punched cards and sorting and tabulating machines, the figures by commodities of goods earnings, tonnage and ton miles from station to station on each railway system should be available by the 20th of the succeeding month. Ton miles are now quickly obtainable by the density method invented by Mr. W. H. Scott, as set out in the Appendix "E" to the "Report on the Systems of Station Accounts and Audit Procedure, 1920-21," and since elaborated and improved by him in the offices of the North Western Railway. Similar methods also produce statistics of passengers, passenger miles and passenger density. These statistics being all prepared from carefully checked original documents, *e.g.*, goods invoices and passenger ticket classifications and completed on machines with a minimum of clerical work may be taken as accurate and reliable.

315. The next set of statistics is that relating to engine performance and consumption. The bases for these are (a) the engine drivers' reports, (b) the guards' journals or guidances, and (c) the issues by sheds to engines of coal and oil fuel and lubricants. The forms in use for Engine Drivers and Guards Reports vary on different railways ; but a good deal of attention has been given to the matter in connection with fuel economy campaigns on both the Great Indian Peninsula and North Western Railways and the forms are still in process of revision. As these returns have to meet other requirements of transportation officials as well as statistics, it is best left to them in consultation with the statistical officers to settle the forms thereof.

316. These reports are not so accurate as are the audited invoices which form the basis of ton mile and commodity statistics, but they are obtainable more speedily and are of greater use to the operating officials. The engine driver's report, should be fairly accurate as it is concerned only with movements and times. The guard's journal would be sufficiently accurate as to number of vehicles attached and detached, but the particulars of vehicle tare and weight of contents (goods) are not altogether reliable. It is stated that wagon tares as painted on wagons are not always accurate and that the wagon labels from which weight of contents are taken are not as legible as they might be, and these defects, added perhaps to some want of care on the guard's part in transcribing the figures, even as he reads them, tend to general inaccuracy. There is, however, no particular reason why errors should be all one way so that in the collection of a mass of figures from these sources the aggregate of all errors should not be sufficiently serious to invalidate the results for the purposes for which they are required.

317. From these two forms are obtained vehicles by class and number and their tare and contents weight, attached and detached at each station on the train run, and from these the freight and vehicle density for each train and for each engine by which it is hauled.

318. The third original document required to complete this set of statistics is the issue note of fuel, oil and other supplies by engine sheds to engines. The information on this form is subject to limitations particularly as to issues of fuel. Coal is usually accepted at colliery weights, which are not often weights as received, on account both of variation due to percentage of moisture and to losses and perhaps thefts *en route*. Coal is delivered to engines usually by baskets unweighed, and there are other well known reasons why the weight of coal charged to and accepted by an engine driver may be inaccurate. These defects can be largely overcome by the erection of weigh scales both for trucks and baskets at each shed and by closer and more reliable supervision.

319. Up to the present the different railways have been investigating the possibility of statistics which will with reasonable accuracy give them an equation between engine consumption and work performed. This work has been proceeding more or less independently and has reached different stages on different railways. The proper use of these three reports and their rapid conversion into statistics will be of great value to transportation officers and will supply a long felt want: this in itself should lead to a greater accuracy in their preparation. In Appendix XII, Section I, will be found a short description of a method for using these reports which appears to produce simply and by machine methods the results required. The suggestion has been discussed with railway officials who, without committing themselves to details, have approved it in principle and subject to any amendments resulting from practical tests. I should particularly mention the Great Indian Peninsula, North Western and Bombay, Baroda and Central India Railways whose suggestions and practical experience have been valuable.

320. The primary unit of this compilation is a division engine, and all the statistics derived from it will be related to the work of a division engine whether on its home division or on another. The results, therefore, do not apply to a division area, although, if necessary, by sub-dividing the reports whenever an engine passes from one division to another, strict division figures could be obtained. It would appear, however, that with a possible extension of the practice already in force on some railways of running engines belonging to one division on a continuous run over two or more, this information may be unnecessary.

321. Before dealing with the various statistics derived from these fundamental units, there are some general questions to which reference should be made.

322. It has been the practice on Indian Railways to divide all expenses between passenger and goods traffic on the basis of ton miles of each class of traffic carried. This has also involved assuming a rule for conversion of passenger miles into passenger ton miles under which an arbitrary weight is put upon a passenger and his luggage, varying with each class of traffic. Moreover no attempt is made to allocate each expense head to Passenger and Goods Traffic according to the service it represents although a great part of the cost of maintenance of rolling stock, commercial and transportation expenses is capable of direct allocation. For these reasons it would appear that the principle of dividing expenses on the basis of ton miles of goods and passenger traffic is inaccurate.

323. The method now in force in the United States, made effective by the Interstate Commerce Commission under date 1st January, 1920, is probably the most accurate yet devised. It is contained in a document entitled "Rules governing the separation of operating expenses between Freight Service and Passenger Service of large Steam Railways" issued by the Government Printing Office at Washington in 1920. In Appendix XII Section III, a summary of this method applied to the Abstracts of Expenditure as amended in this Report (see Appendix III) will be found.

324. Except for the division of Maintenance of Way and Structures the principles of this allocation have been continuously in force since 1915. At that time it was suggested that Maintenance of Way and Structures not directly divisible should be divided in proportion either to gross ton miles or engine ton miles, but in 1920 this suggestion was abandoned and the division on the basis of fuel consumption was definitely accepted. As to the relative accuracy of this or any other basis of division of Maintenance of Way expenditures to give effect to the different factors of speed load, nature of equipment, etc., which must affect the question I am not competent to speak. I can only report that the basis of fuel consumption appears to have been definitely accepted by the largest railroad system in the world and to have passed without public comment for seven years. Whatever basis is adopted, it would seem quite sufficient that this division of expenses should not be made more than once a year.

325. I also recommend that passenger statistics be based only on passengers carried and passenger miles, and that the calculation of net passenger ton miles be discontinued.

326. If these recommendations be adopted, it would follow that any tables now prepared which apportion expenses on railroads and divisions between goods and passenger traffic would also be discontinued as monthly compilations. There are other good reasons for the abandonment of the distribution both monthly and yearly of earnings over divisions which occupy a considerable space in the monthly publications of some railways. The duty of a Division Superintendent is to obtain as much traffic as possible and to move this traffic efficiently over his lines at the lowest possible cost. The expenses over which he has any control are limited to wages, payments to contractors for maintenance work, staff salaries and stores consumed. There can be no possible object in apportioning over divisions all other expenses of the commercial and transportation activities of the railway over which the divisional superintendent has no control. I, therefore, recommend that in future only a statement of actual expenses incurred in the division for the use of the Divisional Officer be prepared and that all additional statements of divisional earnings and expenses at present prepared be discontinued.

327. It should be the duty of the Chief Accountant to furnish the Division Superintendent as frequently as required, and within a few days of the end of the period to which they relate, a statement of the expenses which he controls. A comparison of these expenses with the goods and passenger traffic moved and with that originating on the division would give him all that is necessary to show the economy and efficiency of his management.

It has been the practice on some railways not only to divide expenses over Divisions but also to distribute their earnings on a ton mile basis. Traffic receipts depend on rates, and while the advice of a Divisional Superintendent on the rates for traffic originating on his division would naturally have weight with the railway executives, this is not a matter which he can determine or for which he can be held responsible. This practice should also be discontinued.

328. The published statistics are of two kinds :

- (a) Those published by the Railway Board both monthly and annually for all Railways both State Owned and others.
- (b) Those prepared by Individual Railways for their own use and for submission to the Railway Board.

The annual statistics are published in Volume II of the Annual Report of the Railway Board. The information is well and clearly set out, and, generally speaking and subject to the remarks which follow this volume, contains all that is necessary and little that is unnecessary. In Appendix XII, Section II, will be found a detailed criticism of some of these tables and suggestions for their improvement. In this chapter I deal with certain general questions arising from these criticisms.

329. The annual volume of statistics published by the Railway Board is divided into two sections. Section A contains summary totals only for all lines under various classifications, while Section B contains similar figures for each individual railway system, the totals in a general way agreeing with the summaries in Section A : but the summaries in Table A are not (as they should be) referenced to Section B. Thus Tables I to VI in Section A deal with Revenue Receipts, Working Expenses, Interest Charges and Capital at Charge of State Owned and other railways, and are supported by Tables I to VII in Section B. In both sets of tables there is some unnecessary repetition, and suggestions are made in Appendix XII for the consolidation of these statements, thus avoiding duplication and tending to simplification.

330. Three different methods of classifying railways are adopted in these tables, *viz.* :—

- (a) State Lines worked by the State and by Companies.
- (b) Class I, II and III Railways.
- (c) Railways according to methods of working classification (a) is also included in (b), but the figures do not agree as they should do.

These tables require to be entirely rearranged, and with a view of saving space and avoiding duplication, the suggested new forms which are fully explained in Appendix XII consist of the following :—

- (1) A statement of capital at charge.
- (2) A statement of income giving gross earnings, working expenses and net revenue.
- (3) A statement of gross earnings showing the different sources.
- (4) A statement of working expenses by Abstracts and Budget Demands.

There are other discrepancies between the tables to which reference is made in Appendix XII and which go to show that insufficient care is taken in their preparation.

331. The remaining Tables deal with statistics as distinct from finance, and few comments are called for. The more important criticisms have reference to terminology which might with advantage be improved in the following respects to avoid a certain amount of confusion in the Tables.

332. Engine mile and hours should throughout be classified as :—

- (a) Train engine miles or hours, *i.e.*, of engines hauling trains of any kind.
- (b) Other engine miles or hours, *i.e.*, light, assisting, standing, etc.
- (c) Total engine miles or hours.

Train hours will differ from train engine hours only by the time of a train standing without an engine attached.

333. Ton miles should be classified as :—

- (a) Traffic ton miles, *i.e.*, the product of weights and distances carried of goods only.
- (b) Traction ton miles, *i.e.*, the product of weights and distances hauled by engines, including vehicle tare.
- (c) Gross ton miles, *i.e.*, products of weights and distances hauled by engines including both vehicle tare and engine weight.

Under the present practice, net ton miles is used to denote traffic ton miles, and gross ton miles is used for both traction and gross ton miles as defined above, resulting in some confusion in the Tables.

334. The terms Coaches and Wagons should be used universally to denote passenger and goods vehicles respectively, and the term Vehicle to denote both coaching and goods vehicles.

335. In some cases statistics are worked up for units which do not appear the best that could be adopted, *e.g.* :—

- (a) Fuel and oil consumption of locomotives is worked out per gross ton mile and also per engine mile. The important unit is undoubtedly the gross ton mile being the work done by the engine. Under the statistics of engine performance, the amount of fuel

and oil used by engines on "Other Engine" miles or hours can be ascertained approximately, and this together with wages of the crew while on "Other" service forms the overhead expense, the proportion of which to "Train engine" cost is an important factor.

- (b) Commodity statistics are given for a number of selected commodities in the form of total tons carried and total earnings, while the more important figures of ton miles carried and earnings per ton mile of each are omitted. The number of tons carried seems a useless figure for transportation statistics unless distance is also taken into account.

336. In addition to the Annual Statistics, the Railway Board also publishes a volume of fifty pages of monthly statistics for all railways, which is issued two months after the date to which the bulk of the figures relate, and also contains figures of passenger and freight traffic (numbers, miles and tonnage) and earnings and expenses for the previous month, *i.e.*, three months after the month to which they refer. Under the system suggested in this report for Traffic Audit and Income and Expenditure Accounts, each railway should be able to supply its figures to the Railway Board at least by the end of the succeeding month, and should endeavour to send them by the 20th of that month. If this be done, the Railway Board monthly publication should be published as regards all its contents by the middle of the second month, and it should be possible when the new system is thoroughly organised to reduce this period to five weeks or less.

337. The individual railways, in addition to the statistics prepared for the Railway Board, prepare somewhat voluminous tables for their own use. As already indicated, less latitude should be allowed in this direction and the publications should be strictly controlled by the suggested Statistical Committee. In Appendix XII, Section IV, a detailed comment is made on those published by the North Western Railway, with suggestions for improvement and condensation. The publication of large volumes of figures is the cause of considerable expense, and much economy could be obtained if operating, statistical and accounting officers would remember this and endeavour to limit statistics to those which are really of service in promoting economy and efficiency.

338. The remainder of the Tables call for no comment. They are excellently arranged and appear to give in a convenient form all information necessary. If the suggestions already made are carried out, the statistics will be a model of what railway statistics should be and will reflect additional credit on those who have in a comparatively short period remodelled the statistics which received such severe criticism in Sir William Acworth's report.

CHAPTER XVI.

METHOD OF DEALING WITH FREIGHT ON STORES AND SUPPLIES FOR USE ON THE RAILWAY.

339. The present practice under which Freight on Coal for the use of the Railways, and on all other Railway Material, is charged in the accounts appears to be inconsistent. In some cases no charge is made ; in others a charge is made at a reduced rate ; and in others again full rates are charged. It is clear that there should be a consistent system throughout the whole of the Railways in India under which these charges are to be made. At the same time, a railway carrying its own materials for its own line should not make a profit thereout ; nor, on the other hand, should the railway be subjected to a loss by reason of carrying this freight free of charge.

340. In the case of freight carried by one railway for another, there would seem to be no reason why the first railway should not earn a profit thereout by charging the second railway the full freight charge which would be paid by the public. In the case of freight for construction purposes, the cost of construction will be reduced if no freight is charged ; on the other hand, the cost of moving the materials exists and should be considered as part of the cost of construction ; while again the railway for whom the construction is being carried out should not make a profit thereout by unduly swelling the capital cost. In this respect, there is a difference of principle between freight on capital material and freight on revenue material. In the former case, any charge to capital is a credit, and, in so far as these credits exceed the cost of transportation, a profit to revenue. In the latter case, whatever is credited to earnings for freight is also a debit to expenses as the cost of the transportation of the revenue materials.

341. Definite and clear principles emerge from these considerations :—

(1) That each railway should charge full classification rates on all material conveyed for another railway which is not part of its operating system.

(2) That all material conveyed for a railway for its own use, whether for revenue or for construction purposes, should be charged and credited at a reduced rate calculated to represent approximately the cost of transportation. This cost might safely be considered to be 60 per cent. of the full classification rate.

These provisions would only apply in cases where materials and supplies were delivered to the railway company at stations on the line, and freight was not payable by the suppliers.

342. A question of some importance arises in connection with the allocation of coal and other supplies to various points on the line, the freight rates to which will vary considerably. The cost of transportation is clearly part of the cost of such supplies ; but, just as the Post Office carries letters to all parts of the country at a flat rate, it is for accounting and statistical purposes perhaps simpler, and at the same time unobjectionable, to average the freight and other charges on materials for railway use, over the whole of such materials, irrespective of the point to which they are delivered.

343. In connection with stores, provision has been made in Chapter VII for collecting all expenses in connection with stores to Abstract G and for adding to the cost of all stores a percentage estimated to meet this expense. In this way all expense attributable to stores will be included in the issue price and in the charge to the division or section using them.

The main use of coal is for transportation purposes and all expense thereon is a charge to that abstract. Coal is, however, used for other purposes and this use may increase with the extension of electricity generated in Central Power Plants. All coal used for other purposes than transportation should be charged at cost with the addition of a percentage to cover freight and charges which should be credited to the charges thereon in Abstract D Transportation.

CHAPTER XVII.

MECHANISED ACCOUNTING.

344. For many years past the use of machines and other labour saving devices has been rapidly increasing, particularly in England and the United States, and there is little doubt that mechanised accounting methods will be extended even more rapidly in future. The greater progress in the United States has been largely due to the high salary cost of clerical staff, and it has been usually assumed that on account of the much lower salary cost in India there would not be the same inducement in that country to displace clerks in favour of machines. Experiments successfully made by Mr. Scott at Lahore and by the Statistical Compilation Officers on the Eastern Bengal, Great Indian Peninsular and other Railways have proved that considerable savings can be made by these machine methods, even with the limited use at present made of them.

345. My own enquiries and observations have satisfied me that considerable economy together with the even more important advantages of greater accuracy and speed in obtaining results can be realised by using machines and other labour saving devices to as great an extent as possible in place of labour of such low efficiency as is found in the junior ranks of the clerical staff. At the same time, it must be noted that more efficient supervision, and a greater amount of it, is absolutely necessary if the fullest measure of advantage is to be obtained from machine methods.

346. An important part of the reorganisation to be effected if the system of accounting recommended in this Report is adopted will be in the selection and training of well educated and skilled accountants with a sound training in modern bookkeeping and accounting as well as machine methods to fill the posts of supervisors and assistants to officers, in whose sections mechanical devices are installed. The nucleus exists in the offices already mentioned, and it must be expanded by careful selection of the most suitable men and without any regard to seniority or personal preferences.

347. Another equally important point is the proper housing and care of the machines adopted for use. Complaints have been made to me that the sorting and tabulating machines in use at Lahore are not reliable, are frequently out of order, and that the results obtained from these machines have to be checked as carefully as the "head and hand" work of the clerical staff. In view of the large number of such machines in use in other countries, the general reliability and accuracy of these machines and the testimony to their value given by their extended and increasing use for work in which reliability is absolutely essential, I find it very difficult to accept these complaints. In Lahore where they originate, the machines are housed most unsuitably; they are old machines which have not been properly looked after, and owing to the small number in use in India the service given by the manufacturers' agents has not been as good as it should have been, particularly having regard to the admitted difficulties of the Indian climate. At the same time, I find that similar machines have been in use at the Custom House in Bombay for some years and my inspection of these machines showed that they were properly housed in a special room as far as possible free from dirt and dust, had been properly looked after and had given throughout the whole period excellent and accurate service. These two matters of proper housing and constant and efficient service are of essential importance to their successful use, and I am satisfied that both can be obtained without difficulty, the former by the railway officials and the latter by the manufacturers and their agents, who have assured me that if machines are employed on the scale recommended in this report they will see that continuous efficient mechanical service at all points is given.

348. Another factor requiring attention is the reluctance to see present employees displaced by machines. This reluctance has not always been passive, and has in some cases no doubt contributed to breakdowns and other malpractices, such as omission to carry out properly the necessary checking of original documents. This is admittedly a difficult problem, but it has always existed and always will when any reforms involving less employment are introduced. While every effort should be made to avoid hardship, yet it is essential that efficiency be the main object and in so far as it involves reduction in staff it must be carried through on the principle of the greatest good for the greatest number, *viz.*: that more efficient railway service is in the interests of the whole community.

349. Reference has been made in this report to (a) the Hollerith and the Powers sorting and tabulating machines ; (b) the Remington and the Burroughs accounting machines ; (c) the Dalton calculating machine and (d) the Comptometer. All of these except the Burroughs machines which have only recently been introduced into India have been used in one or more divisions of the Railway Accounting and Auditing Department, and the companies have representatives in the principal cities who are always ready to assist in the solution of any particular problem. The Burroughs Company has perhaps the greatest number of different types of machines, each particularly adaptable to certain operations, and their representatives are now prepared to give efficient service in India.

350. Both the Hollerith and Powers installations serve the same purpose, and both have been thoroughly tried out in India. Each has its special advantages and disadvantages which are well known to Mr. Scott and some of the statistical Compilation officers. One important matter should perhaps be mentioned, *viz.*: that the Hollerith system provides a mechanical check upon the punching of the cards, while in the Powers system the check must be a visual one. Similarly, other purposes of tabulation can be served by both the Remington and Burroughs machines. The Remington Company has in the Dalton machine one of particular use to India for checking calculations. The whole operation is printed on a slip and it is impossible for a clerk, without detection, to say that he has checked a number of calculations when, as a matter of fact, he has not done so. In all these cases, experience has already or will quickly show which are the most serviceable machines for different purposes, and the accounting service of the Railways should be guided accordingly. In recommending in this report certain machines for certain purposes I have been guided largely by experience in England and America.

351. In addition to those already mentioned, reference should be made to the Paramount Sorting System, which is quite unknown in India but is in considerable use in England in cases where the amount of sorting and tabulating to be done would not justify the use of a Hollerith or Powers installation. The cards in this case have holes punched round the edge only (Part III, Form 218) and each hole is coded according to the sorting required. The information to be tabulated is typed on the body of the card. In operation the information is also recorded by clipping open the corresponding holes ; then by passing a needle through any particular hole in a pack of cards a slight shake of the pack causes the cards on which that hole has been clipped to fall out, thus sorting out all those which are of the same kind as regards this one hole. By repeating this operation the sorting is continued down to the final result when all of the same number will be found in one pack. Each pack is then listed and totalled on a Burroughs machine, the results being identical with those obtained on a Hollerith or Powers machine. This method has been used to great advantage to sort out stores issue notes (1) by store catalogue numbers, and (2) by account numbers to be charged, the holes being coded for these two numbers and the double distribution and totals easily and quickly obtained. The use of this system is suggested in some parts of this report for workshops, store and labour distributions when the quantity involved is too small to warrant a machine sorting and tabulating installation.

352. One other matter should be mentioned. Loose leaf ledgers have been in common use for all purposes in England and America for the past 20 years ; but while they have been tried in the Railway Accounting Departments in India there appears to be a somewhat unreasonable prejudice against their use. For mechanised accounting they are essential, and throughout this report it is recommended that they be adopted. I am satisfied that if the usual and proper precautions be adopted they can be used with even less risk than bound ledgers. In order to satisfy the objections raised, I have asked Messrs. Morland & Impey Ltd., agents for loose leaf ledger forms to supply me with a complete statement of the safeguards usually adopted, and this statement which will be found in Appendix XIII should set at rest the mind of the greatest doubter.

CHAPTER XVIII.

INSTALLATION OF NEW SYSTEM.

353. In previous chapters and the relative appendices there has been set out a complete new system of accounting for traffic earnings, stores, workshops and general accounts.

354. So far as traffic earnings are concerned, the new system is already in use being under the superintendence of Mr. W. H. Scott, and its extension throughout the railway department will proceed in a normal manner up to the point where traffic earnings reach the Chief Accountant of each railway for incorporation into the general books.

355. So far as stores are concerned, there are officials in the stores department who are familiar with the methods recommended and can be trusted to instal them if furnished with additional and competent help during the transition period. This will apply up to the point where the stores summaries reach the Chief Accountant for incorporation in the general books and after they leave that office for incorporation in the stores records.

356. It is in the general accounting and the principal financial books of the railway that the new system will effect a complete revolution in the old fashioned and antiquated methods at present in force. As already mentioned in Chapter XI, these records have never been put upon a proper double entry bookkeeping basis, nor has the modern accounting method of working through control accounts received recognition. To put this new system into force will require great energy, a thorough, practical knowledge of modern methods of accounting, and the education in these methods not only of a sufficient junior staff but of many of the administrative officers; and while when completely installed it will mean a reduction in clerical staff it will require in those that remain higher qualifications and greater energy.

357. The change cannot be all brought about at once, nor can the old system be dispensed with until the new is ready to take its place. This will require a good deal of preliminary work, which may be summarised thus :—

- (1) The preparation of a regular accounting classification on the lines of that in force in the United States under the aegis of the Interstate Commerce Commission. The outlines of this are laid down in the appendices of this report.
- (2) The preparation of a series of manuals dealing with the detail work of each accounting section to take the place of the codes and manuals at present in existence. As already mentioned, these manuals should not have the binding authority of the present codes, but they must be subject to revision by the sub-section head in consultation with the section head and the Chief Accountant as the system develops and opportunities for improvement in methods arise.
- (3) The unification and revision of all existing forms to suit the needs of the new system and to make these forms uniform for all railways. The ground work will be found in the forms given in Part III, of this report.
- (4) The designing of the journals, ledgers and subsidiary books recommended in this report.
- (5) The training of the necessary staff, its organisation into sections and sub-sections, and the selection of the most suitable persons for the section and sub-section heads.
- (6) The organisation of a system of classes for the instruction of the selected staff, and the institution of periodical examinations, success in which must be a preliminary to promotion (a) out of the lowest grade to a higher and (b) out of any grade to the position of sub-section, section or departmental head. For this purpose the examinations recent organised by the Institute of Transport in England will be found useful.

358. It will probably take five years to complete this work and put the new system into operation on all State Railways, and for that period at least it will be necessary to constitute a special corps of chartered accountants, thoroughly

familiar with modern accounting methods, to organise and carry out the work outlined above.

I recommend that four such chartered accountants should be selected as soon as possible and appointed for a definite term of five years. They should be constituted a Committee under the chairmanship of the Director of Accounts of the Railway Board, and the Chief Accountants of the four State Managed Railways should be added to this Committee. The four chartered accountants with the chairman should be the Executive Officers of the Committee, the other members being called upon from time to time in a consultative capacity. The chairman who could not give more than a small part of his time to this work should select one of his chief subordinates to work (as a whole time officer) on the Executive Committee. This Committee should decide upon the best methods of introducing the new system and the railways whose accounting departments should be dealt with first.

359. The four chartered accountants to be appointed should have at least five years experience in actual accounting work after passing their final examinations ; should be experienced in the installation of new systems ; should be familiar with mechanised accounting methods ; should be of an age between 28 and 35, with the capacity to accommodate themselves to new conditions, and should above all have energy, ability, tact and patience. For such qualifications a commencing salary of Rs. 2,000 per month rising over the five years to Rs. 2,400 per month would not be excessive. At the end of the term of five years they should be entitled to six months leave and should then be considered for selection to vacant posts of Chief or Deputy Chief Accountants. After five years it may be hoped that the organisation of a competent railway accounting service may be well on the way to accomplishment, and that the system of promotion examinations backed up by the growth of the new body of Indian Public Accountants, which is now under consideration, may thereafter provide a continuous supply of qualified men to fill the ranks in the Railway Accounting Departments.

360. In the workshops a different problem will arise, as, in addition to the general accounts which will come more immediately under the supervision of the committee already suggested, there has to be installed a Planning and Progressing Section as well as a detailed system of Cost Accounts. The former requires engineers rather than accountants, and the qualifications for cost accountants would be somewhat different from those required in the Central Accounting Offices, particularly in that they must have a general knowledge of workshop organisation and operation. It would be difficult, if not impossible to find such men in India, and they must be sought in England or perhaps in the United States where this special kind of knowledge is more common.

361. For the rapid organisation of the workshops on these lines and the installation of the Cost Accounting System, there should be engaged four Production Engineers and the same number of Cost Accountants. There will be no difficulty in absorbing these men permanently in the railway workshops organisation where there is an urgent demand for such services. They should be of an age between 25 and 30 with previous workshop experience, but the cost accountants need not necessarily be Chartered Accountants provided that they have had at least three years practical experience of cost accounting, and have a thorough knowledge of machine methods. Both the production engineer and the cost accountant should be adaptable to new conditions and should above all have energy, ability and patience. For such qualifications the commencing salary should be about Rs. 1,200 per month with prospects of increases up to say Rs. 1,600 per month.

This force would be able to start work on four of the principal workshops, and as the work progressed and they were able to train up efficient subordinates the work could be extended to the others.

362. The preliminary work would follow the lines laid down in paragraph 249 for the general accounting, and the installation would follow the detailed systems laid down in Appendices VI and VII.

363. The annual cost of salaries under the plan suggested would be from Rs. 2 Lakhs to Rs. 3 Lakhs per annum. This may seem a large amount, but I am satisfied that the expense will justify itself both in the greater efficiency and economy in the accounting departments and the workshops and by the gradual reduction in staff and ultimate saving in salary cost as the new systems are put into force and extended to all the railways. I am further satisfied that the

whole system, both in workshops and accounts, is, with few exceptions, so out of date and inefficient that it requires an entirely new organisation, such as that suggested, to establish it on modern, economical and efficient lines. To patch it up would be worse than useless ; it is beyond patching and must be replaced entirely.

364. My examination has shown me that it will be difficult to obtain from the present records all the material required for Railway Balance Sheets in a sufficiently accurate and concise form without an audit and verification of the assets and liabilities in each case. I therefore recommend that chartered accountants be instructed to make such an audit and prepare balance sheets as of the date at which the new accounting system is to be installed and the new books opened on each railway. These audited balance sheets with schedules giving all necessary details of each asset and liability would form the basis of the opening entries.

CHAPTER XIX.

SUMMARY OF RECOMMENDATIONS.

365. The following is a summary of the recommendations contained in the foregoing chapters :—

366. *Separation of Audit and Accounts.*

1. That the Principal Accounting Officer of each State Railway be styled " Chief Accountant " and be directly responsible to the Agent of each railway, but appointable and removable only by the Railway Board. *Chapter II. Paragraph 33.*
2. That the accounts of the Railway Board at present kept by the Accountant General Railways be handed over to a Chief Accountant appointed by and responsible to the Railway Board. *Chapter IV. Paragraph 62.*
3. That the title " Accountant General Railways " be altered to " Chief Auditor Railways." *Chapter IV. Paragraph 62.*
4. That the independent post-audit of all Railway Accounts be carried out by the Auditor General, who would have no power or authority to hold up payments or accounts but only to report thereon. *Chapter VI. Paragraphs 116—122.*
5. That efficiency be judged by the relation between the earnings and the operating expenses, by the value to the community of the services rendered, and by the efficiency and economy with which they are rendered. *Chapter II. Paragraph 37.*

367. *General Accounts.*

6. That the Accounting Department of each railway be reorganised, as shown on the chart on page 22. *Chapter IV. Paragraphs 62—85.*
7. That an entirely new and modern system of general accounting be introduced with a proper system of Control Accounts. *Chapter XI. Paragraph 249.*
8. That the Railway Accounts be kept upon the basis of work done and services rendered by the Railways and of work done for the Railways, both expressed in money values and entered in the books as at the time when the services are performed and the work done, and whether paid for at that time or not. *Chapter II. Paragraph 37.*
9. That a system of rewards for any suggestions made and adopted for improvements in accounting methods be introduced. *Chapter IV. Paragraph 86.*

368. *Expenditure Abstracts.*

10. That the Expenditure Abstracts be remodelled as indicated in Appendix III. *Chapter VII. Paragraphs 141—144.*
11. That a separate abstract be prepared to include all expenses connected with " Stores." *Chapter VII. Paragraph 145.*
12. That a separate abstract be prepared for all expenses of the Electrical Department. *Chapter VII. Paragraph 146.*

369. *Capital and Income Accounts and Balance Sheet.*

13. That the Capital and Income Accounts rendered by each Railway be revised in accordance with the new forms attached to Appendix III. *Chapter VII. Paragraphs 135—136.*
14. That the " Suspense Account " be treated as Working Capital and included in the Capital Expenditure instead of in Income. *Chapter VII. Paragraphs 138—139.*
15. That payments to worked lines in respect of net earnings of those lines under the terms of the contracts be treated as a charge to Income and not as at present deducted as to Receipts from Gross Earnings, and as to Expenses from Operating Expenses. *Chapter VII. Paragraph 151.*
16. That each Railway prepare monthly and annually a Balance Sheet in the form set out, supported by exhibits showing how the various assets and liabilities are arrived at. *Chapter VII. Paragraph 155.*
17. That the Railway Board prepare an Income Account and Balance Sheet recording their activities apart from those of individual railways ; and that from these accounts and from the Income Accounts and Balance Sheets of individual railways a Consolidated Income Account and Balance Sheet of the Railway Department be prepared monthly and annually. *Chapter VII. Paragraph 136.*

370.

Cash System.

18. That the Controller of Currency act as Banker and keep separate accounts for each railway system, crediting to this account all the receipts and charging to it all the payments. That the Treasurer of each railway send daily to the Controller of Currency a statement of the Railway Receipts showing the Bank or sub-treasury to which they have been paid over, and a statement of all cheques drawn against authorised credits. *Chapter V. Paragraphs 90—101.*
19. That all accounts between the Railways and other Government Departments or Provincial Governments and other Railways be settled by cheque instead of by transfers as at present. *Chapter V. Paragraphs 102—109.*

371.

Traffic Accounting.

20. That the Railway Clearing House at Lahore be converted into a Central Station Accounting Office and moved to Delhi ; that, in addition to dealing with the foreign traffic between the four State Railways, it should also handle the local traffic of those Railways, commencing first with that of the North Western Railway ; that Branch Offices be established at Howrah, Wadi Bunder and Karachi for the traffic audit at those stations ; these Branches to be under the control of the Central Station Accounting Office at Delhi ; and that the methods of audit worked out by Mr. W. H. Scott be gradually extended to comprise the whole system of State Railways. *Chapter VIII. Paragraphs 176—181.*

372.

Stores Accounting.

21. That all Railway Stores, except imprest stores of small amount at running shed and engineers' depots, be placed under the control of the Controller of Stores, and that he keep detail quantity records thereof ; that quantity and money records be kept of all stores by the stores accountants ; and that an entirely new system of accounting for Stores Receipts, Issues and Balances be adopted. *Chapter IX. Paragraphs 198—199.*
22. That the whole cost of purchasing and handling stores, including all administration and clerical expense, be added to the cost of stores by a percentage addition to all purchases, so that departments using stores may be charged with the full cost thereof. *Chapter IX. Paragraph 211.*
23. That an official price list of stores be established for all issues, and be varied from time to time so that divergencies between money value of stores on hand in accordance with this price list and the book value may be kept within small limits. All such differences should be written off whenever there is a change in price. *Chapter IX. Paragraph 212.*
24. That the purchasing of stores be entirely separated from their custody and be entrusted to a supply officer who would purchase on requisition from the Controller of Stores or other authorised officers. *Chapter IX. Paragraph 197.*

373.

Workshop Accounting.

25. That a system of planning, progressing and scheduling be adopted in all railway workshops, and that a new system of cost and general accounting be put into force under a Workshop Accountant. *Chapter X. Paragraphs 215—239.*
26. That all expenses incurred in connection with the workshops which cannot be allocated direct to any specific job or jobs, viz. : Repairs to plant and machinery superintendence and depreciation be included as overhead expenses and distributed over the output as a percentage addition to the direct labour costs. *Chapter X. Paragraph 230.*

374.

Statistics.

27. That a "Deputy Agent Statistics" be appointed on each Railway as an assistant to the Agent to study the Statistics submitted by the Chief Accountant and other Railway Departments. *Chapter XV. Paragraph 302.*
28. That a Statistical Committee be set up, consisting of the Director of Finance to the Railway Board, the Assistant Director of Statistics to the Railway Board, and representatives of the Operating Departments and of the Statistical Offices of the various railways to decide from time to time upon any variation in the matter to be tabulated and the methods of tabulation. *Chapter XV. Paragraph 302.*

29. That machine methods be adopted to a much greater extent in the preparation of Statistics. *Chapter XV. Paragraph 304.*
30. That some revision be made in the Statistics with a view to their improvement by eliminating duplication and some Tables of small value. *Chapter XV. Paragraphs 305—310.*

375. *Depreciation.*

31. That the present plan of providing for Depreciation be continued, except that :
- (1) Additional cost of replacing any unit be a charge to revenue and not to capital.
 - (2) That the life of any unit be not estimated to exceed 50 years, and in case of electrical units 25 years.
 - (3) That Capital Expenditures to the extent to which they do not increase operating revenues or decrease operating expenses be written off to surplus income under the term "Betterments." *Chapter XIII. Paragraphs 270—288.*

32. That the realised surplus resulting from the disposal of a fixed asset should be credited to a Capital Reserve Account, to which should be charged any losses due to sales of a similar asset for sums less than the difference between the original cost and the amount standing to the credit of Depreciation Fund in respect of this asset. *Chapter XIII. Paragraph 287.*

376. *Coal Mines Organisation and Accounting.*

33. That the Railway Collieries be removed from the control of the separate Railways and concentrated under the control of a Director of Collieries responsible to the Railway Board ; and that a new system of cost, stores, workshop and general accounts be introduced. *Chapter XII. Paragraphs 254—268.*
34. That all coal shipped to State Railways be charged at cost, including Depreciation, Sinking Fund and Administration Expenses, and in addition a sum calculated to yield approximately 6 per cent. interest per annum on the capital at charge to the collieries. *Chapter XII. Paragraph 268.*

377. *Railway Budget.*

35. That the Budget submitted to the Legislative Assembly continue in its present form but be supported by a revised set of Income and Capital Accounts and a Consolidated Balance Sheet of the Railway Department. *Chapter XIV. Paragraphs 294—297.*
36. That in comparing Budget figures with actual results, regard be had to any variations in expenditures that might be expected on account of variations in gross earnings. *Chapter XIV. Paragraphs 298—299.*

378. *Charges on Transport of Railway Supplies.*

37. That all goods carried by a Railway for its own use be charged for transportation at 60 per cent. of the full rates. *Chapter XVI. Paragraph 341.*

379. *Mechanised Accounting.*

38. That machine methods and loose leaf ledgers be employed in the new accounting systems and that the machines be installed under suitable conditions of housing and with an undertaking on the part of the suppliers to give effective service in the way of supervision and repairs. *Chapter XVII. Paragraphs 344—352.*

380. *Installation of New Systems.*

39. That in order to instal the new systems of accounting the following staff should be engaged for a term of 5 years :—

- 4 Chartered Accountants at Rs. 2,000 per month, rising to Rs. 2,400.
- 4 Cost Accountants at Rs. 1,200 per month, rising to Rs. 1,600.
- 4 Production Engineers at Rs. 1,200 per month, rising to Rs. 1,600.

Chapter XVIII. Paragraphs 358—361.

40. That Chartered Accountants be instructed to audit the present records and prepare Balance Sheets of each railway, as of the date at which the new accounting system is to be installed and the new books opened on each railway. *Chapter XVIII. Paragraph 364.*

CHAPTER XX.
CONCLUSION.

381. In concluding this report I desire to record my appreciation of the courtesy and assistance I have received during my investigation from the members of the Railway Board and their officials and from the agents and officials of all the State Railways which I visited. In particular, I should mention Rai Bahadur B. D. Puri, who has been with me throughout and has been most helpful in obtaining information required and in arranging for my necessary movements from place to place.

To my assistants, Messrs. W. H. Cockburn and T. A. Maul, I am indebted for their helpful co-operation throughout, and in particular for the very useful work they have done on the detail designs for the new accounting systems recommended, work which has contributed materially to the production of this report.

And lastly, I must express my sincere appreciation of the hard work and loyal assistance of my secretary, Mr. G. A. Wright, whose services have been invaluable to me.

I am, Dear Sir,

Yours faithfully,

A. LOWES DICKINSON.
