

# REPORT

TO THE

## BOARD OF TRADE

OF THE

### EMPIRE COTTON GROWING COMMITTEE.

---

---

Presented to Parliament by Command of His Majesty.

---

---



LONDON:

PRINTED AND PUBLISHED BY  
HIS MAJESTY'S STATIONERY OFFICE.

To be purchased through any Bookseller or directly from  
H.M. STATIONERY OFFICE at the following addresses:  
IMPERIAL HOUSE, KINGSWAY, LONDON, W.C.2, and 28, ABINGDON STREET, LONDON, S.W.1;  
37, PETER STREET, MANCHESTER; 1, ST. ANDREW'S CRESCENT, CARDIFF;  
23, FORTH STREET, EDINBURGH;  
or from E. PONSONBY, LTD., 116, GRAFTON STREET, DUBLIN.

1920.

[Cmd. 523.] *Price 1s. 6d. Net.*

## TABLE OF CONTENTS.

	PAGE.
MINUTES OF APPOINTMENT ... ..	3
PREFATORY REMARKS ... ..	4
PART I.—THE PROBLEM AND ITS SOLUTION ... ..	7
Question I.—The Acquisition of Necessary Knowledge and the Supply of men to apply it ...	7
Question II.—Efficient arrangements for (A) The Control of Cotton Growing and (B) The Marketing of Cotton Crops ... ..	9
Question III.—The Provision of the Necessary Funds ... ..	11
General Conclusions and Recommendations ... ..	14
PART II.—SURVEY OF THE COTTON GROWING AREAS OF THE EMPIRE ... ..	16
West Indies ... ..	17
Egypt ... ..	20
The Sudan ... ..	26
Mesopotamia ... ..	28
Uganda ... ..	29
East Africa ... ..	33
Nyasaland ... ..	34
Rhodesia ... ..	35
The Union of South Africa ... ..	36
Nigeria ... ..	38
India ... ..	42
Queensland and Oceania ... ..	43
Special Conclusions and Recommendations ... ..	48
APPENDIX I.—Extract from Recommendations of the Textiles Committee ... ..	51
APPENDIX II.—Memorandum to the Prime Minister... ..	51
APPENDIX III.—Terms of Reference and Constitution of the Indian Cotton Committee ... ..	56
APPENDIX IV.—Circular to Colonial Governors ... ..	57
APPENDIX V.—Memorandum as to the Work of the Imperial Institute in connection with British Cotton Cultivation... ..	57
APPENDIX VI.—Reports and Letters to the President of the Board of Trade ... ..	60
APPENDIX VII.—Sub-Committees of the Empire Cotton Growing Committee ... ..	68
APPENDIX VIII.—Witnesses ... ..	69
APPENDIX IX.—Statistical Tables ... ..	70
TABLE OF PARAGRAPH HEADINGS ... ..	73
MAPS—	
1. The World.	
2. West Indies.	
3. Egypt.	
4. Mesopotamia.	
5. South Africa.	
6. Nigeria.	
7. India.	

X9 (J781). 3. N181-

FI

## APPENDIX I.

EXTRACT FROM RECOMMENDATIONS OF BOARD OF TRADE DEPARTMENTAL COMMITTEE  
ON THE TEXTILE TRADES (Cd. 9070, PAGE 13).

B. As there is now available very much more knowledge with regard to the scientific principles underlying the development of cotton than was the case some years ago, the time appears opportune for a new departure, and we therefore recommend that H.M. Government, without delaying the action urged in the previous paragraphs, should immediately appoint a Special Committee to investigate in all its bearings the question of increasing the supply of cotton in the British Empire.

The primary duty of such a Committee would be to assist in the development of the cotton resources of the Empire, and, keeping as it would, in constant touch with work in progress in India and the Colonies and Dependencies connected with the growing, handling and marketing of cotton, it would become a clearing house of information which could not fail to be of great practical assistance to the various Governments.

The exact terms of reference will need careful drafting, but we consider they might, with advantage, include an investigation into:—

- (a) The scientific development of cotton, both as to quantity and yield.
- (b) The possibilities of the extension of cotton-growing within the Empire.
- (c) The areas suitable for cotton-growing owing to soil, climate, labour and transport facilities.
- (d) The kinds of cotton suited to special districts
- (e) The improvement of transport.

- (f) The best method of marketing the crops, particularly in those parts of the Empire where cotton-growing is in its infancy.
- (g) The means by which suitable experimental work can best be conducted by the Governments of the different Colonies and Dependencies.
- (h) The methods of co-ordinating the results obtained in different places, so as to make the knowledge available for the whole cotton-growing industry.

It is suggested that the Committee should include representatives of the interests affected, that is to say, the Governments of India, Egypt, and the Colonies and Dependencies concerned; the trades involved both in the United Kingdom and in India, viz., cotton merchants, cotton spinners, manufacturers and dyers; the British Cotton-Growing Association; the Imperial Institute; and at least one botanist who has devoted special attention to the growth of cotton.

We desire to make it clear that it is not our intention that this Committee should be vested with any powers of control. While its assistance and advice would be at the disposal of the various Governments, the discretion of those Governments in deciding the extent to which, and the manner in which, development should proceed, must necessarily remain unfettered.

A separate memorandum by Mr. J. W. McConnel is appended, which explains more fully the views which he has personally explained to us.

## APPENDIX II.

## MEMORANDUM TO THE PRIME MINISTER. (Presented in July, 1917.)

MEMORANDUM ON THE DEVELOPMENT OF COTTON  
GROWING IN THE BRITISH EMPIRE.

1. At a meeting held in Manchester on 13th December, 1916, the following bodies were represented:—

- British Cotton Growing Association.
- Federation of Master Cotton Spinners' Associations.
- Cotton Spinners and Manufacturers' Association
- Wigan and District Cotton Employers' Association.
- Amalgamated Association of Operative Cotton Spinners.
- Amalgamated Association of Card and Blowing Room Operatives.
- Operative Cotton Spinners' Provincial Association, Bolton.
- Northern Counties Amalgamated Association of Weavers.
- Liverpool Cotton Association.
- Manchester Cotton Association.
- Bleachers' Association, Ltd.
- Bradford Dyers' Association, Ltd.
- Calico Printers' Association, Ltd.
- Fine Cotton Spinners and Doublers' Association, Ltd.
- Lancashire and Cheshire Coal Owners' Association.

The following resolutions were passed unanimously:—

- A. "That the present situation as to the supply of cotton is most serious, and requires the immediate attention of His Majesty's Government."
- B. "That it is essential for the future prosperity of this country, and also for the welfare of the Colonies, that cotton growing should be developed as rapidly as possible in all suitable parts of the Empire."

C. "That the authorised irrigation works for the development of the Gezira Plain should be pushed on with the least possible delay."

D. "That immediate steps should be taken both to improve the quality and to increase the quantity of Indian cotton."

E. "That a departmental or other committee should be appointed to consider the best method of continuing and developing the work inaugurated by the British Cotton Growing Association, and that, pending a decision on this question, the Government should render such financial and other assistance to the Association as will enable them to carry on their work to the fullest possible extent."

It was further resolved:—

"That copies of this resolution be sent to the Prime Minister, the Secretary of State for the Colonies, the Secretary of State for India, the Chancellor of the Exchequer, and to the President of the Board of Trade, and that the Prime Minister be requested to receive a deputation on the subject."

The bodies present at the meeting represent practically the whole of the Cotton Spinning and Manufacturing Industries of Lancashire.

The British Cotton Growing Association was formed in 1902, and its existence is evidence of the anxiety which even years ago was felt about the future supply of cotton. Its supporters have subscribed £500,000, without receiving any monetary return for their outlay. The object of the Association has been to ascertain how far it is possible for the British Empire to produce the cotton required for its mills.

The other Associations present at the meeting represent the various amalgamations of both Capital and Labour interested in and dependent on the Cotton Trade, and there were also present represen-

tatives of many of the largest firms engaged in the manufacture and shipping of cotton goods.

It may be further stated that the views expressed in the foregoing resolutions are almost universally agreed to by all persons interested directly or indirectly in the Cotton Trade of Great Britain.

2. The Manchester Chamber of Commerce at a recent meeting passed the following resolution:—

"That the Board of Directors view with grave apprehension the rapidly increasing world's consumption of cotton, and are of opinion that it is absolutely vital in the interests of Great Britain that new and reliable sources of supply within the Empire should be obtained as soon as possible and encouraged to the utmost extent —to neutralise the effect of this increasing scarcity. The Board therefore call upon the Government to appoint forthwith a committee to envisage the whole question and to report to the Government."

Similar resolutions have been passed by other Chambers of Commerce.

3. It is understood that the Textiles Committee of the Board of Trade in its interim report on raw cotton made recommendations which are for practical purposes identical with the resolutions passed at the joint meeting of the bodies concurring in this statement.

4. While it is thus evident that the resolutions now presented to the Government have behind them an immense weight of public opinion, yet it is no doubt desirable that an attempt should be made to state as plainly as possible the elements of the problem which the Government are asked to solve.

It will perhaps conduce to clearness if something is said about each of the resolutions in turn.

A. *That the present situation as to the supply of cotton is most serious, and requires the immediate attention of His Majesty's Government.*

5. The growing insufficiency of the supply of cotton is a world problem, as well as a special danger to the British Empire.

Considered as a world problem, all people who have studied the matter are agreed that the use of cotton and the need for cotton is increasing largely every year, and they are also agreed that a corresponding increase of supply is not developing spontaneously.

6. The cotton crops of the world are estimated by the Census Bureau of the United States to have averaged about 22,600,000 bales of 500 lbs. each in the three years ending July 31, 1915. This figure omits the short scrapings from the seed, known as "linters" in the United States, and also such parts of the Chinese and Indian crops as are used in home manufacture. It therefore represents the cotton destined to enter commercial channels. The origin of the cotton is shown in the following table, stated in bales of 500 lbs. each:—

United States	...	...	...	14,000,000
India	...	...	...	8,600,000
Egypt	...	...	...	1,500,000
China	...	...	...	1,300,000
Russia	...	...	...	1,000,000
Brazil	...	...	...	400,000
Rest of world	...	...	...	800,000
				22,600,000

Many of these figures are only approximate estimates, and comparisons of a reasonably accurate character are only available for a few years back. There is however very little doubt that for the past half century there has been a fairly regular increase in the world's production. There are no records for past years of the world's consumption as separate from supply, but the world's consumption is necessarily limited by the supply, and the balance between supply and demand is reflected in the price. Measured in this way it is evident that even before the war supply had become noticeably insufficient for the world's needs. The price of Middling American affords the best index of the relations of supply and demand. The average price of Middling American during the last twenty years was as follows:—

5 years—1895-1899	...	...	...	3-76d.
" 1900-1904	...	...	...	5-44d.
" 1905-1909	...	...	...	5-78d.
" 1910-1914	...	...	...	7-16d.

In no single year since 1875 until 1909-10 had an average price been recorded so high as 7-0d.

7. In the opinion of those qualified to judge, there is (apart from the war), an increase in the world's actual requirements of cotton each year, at an average rate of at least three, or more probably, three and a half per cent. That is to say that the world calls at the present time for its supply of cotton to be added to and increased in each year by at least 600,000 bales and probably by 800,000 bales of 500 lbs. each.

8. Cotton is the cheapest clothing material. It supplies the garments for all the more backward and impoverished peoples, and moderate prices are a necessary foundation of the Cotton Trade.

9. Such is the matter considered as a world problem. The special interest of Great Britain is due to several reasons. In the first place the enormous importance of the Cotton Trade to Great Britain must be mentioned. In 1913 the total exports "wholly or mainly manufactured" from the United Kingdom were returned at £411,400,000, and of this cotton yarns, piece goods, and other cottons amounted to £125,600,000. It is estimated that the capital engaged in the Cotton Trade and the subsidiary and allied industries amounts to over £500,000,000, and that 10,000,000 of the population of this country are directly and indirectly dependent on the Cotton Trade for their livelihood.

10. Then there is another factor of great moment. The British Cotton Trade is very largely an export trade. It is estimated that four-fifths of the British production of cotton yarns and goods are for export. The Cotton Trade practically originated in Great Britain, and the history of its development in other countries may be described as a continuous effort to replace British-made cotton goods by domestic manufacture. Consequently it is very generally the case that Great Britain supplies the surplus for countries which partly manufacture for themselves. Wherever this is the case the difficulties which arise from any shortage in the supply of raw material are found to fall most seriously upon the country supplying this surplus. It has certainly been the case that in those seasons, when mills had to run short-time or to stop altogether in consequence of shortage of cotton, Lancashire has suffered more severely than either America or the Continent of Europe.

11. There is another feature of the Lancashire Cotton Trade to which attention must be drawn, and which may require rather careful explanation. In accordance with the natural laws of commerce, each country, as it develops its own manufacture of cotton, begins with the coarsest numbers, and what Lancashire is able to retain is generally the finer end of the trade. There are many reasons for this: in coarse goods of low value freights are proportionately a more heavy charge; fine goods require better and more experienced workmanship; the Lancashire climate also is more suitable for fine cottons than that of many other countries. It is customary in Lancashire to divide the trade according to the varying "fineness" of the yarn under the headings of "coarse," "medium," "fine," or "extra-fine," but all of these headings represent finer yarns than are usual in most other countries, and the "coarse" numbers manufactured in Lancashire are finer than the finest numbers spun in many other cotton manufacturing countries.

12. It follows from this that it is of vital importance to Lancashire, not merely to obtain increased supplies of cotton, but to get cotton suitable for the counts she spins. In normal times Great Britain requires for her own use (deducting raw cotton re-exported) about 4,000,000 bales of 500 lbs., and of this some 3,200,000 bales or 80 per cent. come from America, 600,000 bales of 15 per cent. from Egypt, and 200,000 or 5 per cent. from elsewhere. In this connection special attention must be drawn to the present position as regards the American supply. There is at present no other country in the world which can give to Lancashire in any considerable quantity cotton of the right kind to replace the 3,200,000 bales she draws from America. Referring to the table of the world's supply given in paragraph 6, Indian cotton is for the most part unsuitable for Lancashire mills, and Chinese cotton entirely so; Russia grows only for herself; and Egyptian cotton, on the other hand, is limited in quantity. Some small

quantities of suitable cotton are already drawn from Brazil and from those countries grouped in the last line, but on the whole it is strictly true to say that the regular Lancashire trade depends to-day upon American cotton just as much as it did at the time of the Civil War.

13. The danger to be faced is the insecurity of this supply. The American cotton crop, as is the case with cotton crops elsewhere, varies greatly from season to season owing to climatic and other reasons. On the whole there has been a steady increase since the days of the reconstruction after the war, but many people doubt whether this rate of increase will be maintained in the future. There are reasons for the doubt. New extensions of cotton growing will necessarily be outside the negro belt; there are other crops equally or more remunerative; the Boll Weevil certainly reduces production and adds to the cost, and no complete remedy for it has yet been discovered; and it also inflicts a special injury on fine spinners, because where this pest is prevalent only early maturing cotton can be satisfactorily grown, and most early maturing cotton is short and unsuitable for finer counts.

14. In addition the consumption of cotton in the mills of the United States has lately been increasing with great rapidity. Before the war affected matters, the following particulars of deliveries to spinners gives at any rate an indication of what was happening:—

(In 1,000 bales.)	Great Britain.	Europe.	U.S.A.	Etc.	Total.
Average, 1903/4—1905/6	2,870	3,930	4,380	330	11,510
1911/2—1913/4	3,400	5,270	5,430	590	14,690
Increase in 8 years	530	1,340	1,050	260	3,180
Percentage ...	18½	34	24	79	27*

(Shepperson, 1916, p. 36.)

\* 27 per cent. increase in eight years is equal to an annual increase at the compound rate of 3 per cent.

Since the war began the increase in American consumption has been much larger.

—	Great Britain.	Europe.	U.S.A.	Etc.	Total.
Deliveries to spinners in 1914/5 ...	3,112	4,129	6,088	712	11,041
in 1915/6 ...	3,250	2,831	6,810	742	13,633

The recent rapid increase in the consumption of cotton in the United States is even more clearly shown by the following figures:

—	Total American Crop.	U.S.A. Consumption.	Percentage of Crop.
	Bales.	Bales.	
1913/4 ...	14,552,000	5,503,000	37·8
1914/5 ...	15,136,000	6,088,000	40·2
1915/6 ...	12,862,000	6,810,000	53·0

The above figures deal with American cotton only and do not include linters, which are largely used in the manufacture of explosives, and which have therefore since the war been more extensively produced than was usual before.

15. It is of course impossible to predict whether America will retain, when peace comes, any considerable portion of the extra trade she has lately secured. But it is certainly alarming for the Lancashire Cotton Trade, practically dependent as shown previously on American cotton, to find that a year has now arrived when America has reached the point of herself using more than half her own crop.

B. "It is essential for the future prosperity of this country, and also for the welfare of the Colonies, that Cotton Growing should be developed as rapidly as possible in all suitable parts of the Empire."

16. The importance to this country of fresh supplies of cotton has been already dealt with in some degree, but there is one special disadvantage of our present dependence on America that has yet to be named. This lies in the fact that cotton is an annual crop, and its growth in any year is dependent on weather and local circumstances. The production in America has varied in recent years from 158 lbs. to the acre, to 224 lbs. or more (the actual production in 1914-15 was probably nearly 250 lbs., but large quantities were not brought to market). Such a variation would mean, on the present acreage, crops varying from 11,400,000 to 16,200,000 bales. It is obvious that where such difference is possible with only a few months' notice of the probabilities, prices must be very erratic. This is all the more disastrous because the American crop dominates the cotton markets of the world, and variations in the prices of American are largely reflected in the quotations of other crops.

17. It is clear that the most satisfactory remedy for the present and prospective shortage in cotton supplies would be found in a large and rapid development of Cotton Growing in other parts of the world, where the climatic conditions are likely to differ in any particular season from those prevailing in America, and where the harvests mature at a different time of the year. The broader the basis of supply the steadier the price of cotton.

18. But it is maintained that altogether apart from the advantages to the Cotton trade in Great Britain, it is also essential for the welfare of the Colonies that Cotton Growing should be developed as rapidly as possible in all suitable parts of the Empire.

19. The British Cotton Growing Association, in the fourteen years of its existence, has been doing work of a pioneer character. Incidentally it has met with some disappointments, but these have had their use in indicating some of the conditions which limit the area where the growing of cotton is commercially possible. The main result of the work done by the Association is that they have conclusively proved that cotton can be satisfactorily grown in increasing quantities in several parts of Africa, notably in the Sudan, in Uganda, Nigeria and Nyasaland, and also in the West Indies. And moreover, they have also proved that in all these countries the cotton that will grow to the best advantage is cotton very well suited for use in Lancashire mills in place of the American cotton now used.

20. There can be no doubt that the growing of cotton is beneficial to those countries for which it is suitable.

In Egypt, cotton and cotton seed form 90 per cent. of the exports of the country. In the Sudan cotton is already more than 10 per cent. of the exports, and in Uganda nearly 70 per cent.

In the West Indian Islands cotton forms over 30 per cent. of the total exports of St. Vincent, Montserrat, and the Virgin Islands, and is an important factor in St. Kitts-Nevis, and Barbadoes.

In India, even as things are, cotton is among the first three of the articles exported and forms more than one-tenth of the whole.

In a Memorandum sent to the Colonial Office by the British Cotton Growing Association on Dec. 15th. 1915, it was stated that the Government Revenues of the Colonies and Protectorates where the Association was operating were benefiting to the extent of over £130,000 per annum in direct consequence of the cultivation of cotton.

C. "That the authorised Irrigation Works for the Development of the Gezira Plain should be pushed on with the least possible delay.

21. While there are very large openings for the future development of Cotton Growing in many parts of the Empire, there are two propositions that are urged upon the Government to be taken in hand with the least possible delay. One is the development of the Gezira Plain in the Sudan; the other is the extension and improvement of cotton in India. The most immediate of these is the development of the

Gezira Plain. This is the tract of country lying between the Blue and the White Nile immediately south of Khartoum. It is thought to be ultimately capable of growing as much cotton as is now grown in the Egyptian Delta.

22. The preliminary scheme, estimated to cost £3,000,000, has already received the authorisation of His Majesty's Government. The details of this proposition were fully enquired into by the late Lord Kitchener, and were drawn up under his personal supervision. Briefly stated, the scheme is as follows:—

a. The construction of a dam or barrage on the Blue Nile capable of supplying water to irrigate 3,000,000 acres.

b. The construction of a preliminary main canal and of subsidiary canals to irrigate 300,000 acres, of which 100,000 acres would be under cotton.

It is estimated that if the work is pushed on rapidly the water supply will be available in two years from now, and that the whole of the preliminary area of 300,000 acres will be brought under cultivation five years hence, viz., in 1922. This area should produce about 80,000 bales of 500 lbs. per annum. It is hoped that the cultivated area will extend rapidly afterwards, but this will depend on two factors, namely, a sufficient population and the supply of water from the Blue Nile, part of which is required by Egypt.

Many years must elapse before the whole of the Gezira Plain can be brought under cultivation, and further investigations of the conditions will be necessary, and more especially as to the relative allocation of water to Egypt and to the Sudan. This does not however apply to the preliminary scheme, for full investigations have already been made as to suitability of soil, sufficiency of population, and the necessary supply of water. In addition, two large experimental stations on a commercial scale have been working for several years, and it has been definitely proved that Egyptian Cotton of good quality and most suitable for Lancashire requirements can be grown in the Gezira on a sound economic basis.

The Gezira scheme is the only proposition which offers any prospect of producing any appreciable quantity of cotton of high quality in the immediate future, and therefore it is of paramount importance that not one moment should be lost in pushing on its development with the least possible delay.

D. "That immediate steps should be taken both to improve the quality and to increase the quantity of Indian Cotton."

23. In discussing the future supplies of cotton, it has been so often stated that India probably offers the best and quickest opportunity for obtaining relief, that the broad fact must be well known to members of the Government. It is therefore only necessary here to deal with the matter very shortly.

24. Cotton has been grown in India from the earliest times, and in early days cottons of the finest possible character were grown there, at any rate to some extent. Before the war, the acreage devoted to cotton was estimated to be about 25,000,000 acres. This may be compared with about 36,000,000 in the United States. The crop was estimated to have averaged in 1912-13 and 1913-14 the equivalent of 3,850,000 bales of 500 lbs. Thus, while America was producing on an average about 195 lbs. of cotton to the acre, the average production in India was about 75 lbs. only.

25. The average annual distribution of the cotton in 1912-14 was as follows, in bales of 500 lbs. each:—

Great Britain	...	...	91,000
Europe	...	...	1,124,000
China and Japan	...	...	1,065,000
			<hr/>
Total Export	...	...	2,280,000
Indian Mills	...	...	1,700,000
Home use	...	...	360,000
			<hr/>
			4,340,000

Some discrepancy will be noticed if these figures are compared with the production given above, or with the figure of the Census Bureau recorded earlier on, but the general conclusion is plain. Only a negligible fraction of the crop is used in Great

Britain; half the crop is used in India itself; the rest is shared about equally by China, Japan, and by Europe.

The fact is that the quality of Indian cotton makes it suitable only for the lowest counts, and it consequently only commands very poor prices. It is probably true to say that Indian cotton is less valuable than American by at least 20 per cent.

26. Taking these comparisons of quantity and price together, it appears that if the production of cotton in India could really be improved so that the value per acre there was equal to the value per acre in America, the total value of the Indian cotton crop would be trebled, and there would be added to the annual purchasing power of India the considerable figure of about £70,000,000. And it must be remembered that this would be achieved without lessening the food or other crops, and without putting a single extra acre into cotton. It must also be noted that this might and probably would be done quite as much by making the short cotton suitable for India more prolific as by growing new and longer cottons for Lancashire.

27. It is not suggested that a change of this kind can be brought about by merely waving a magician's wand; indeed, it cannot be said for certain that it can be done at all, but it is urged that both the British Government and the Indian Government should recognise in the first place the necessity for making a very full investigation, and in the second that, in a matter so important, very much more ought to be done in the near future than has been done in the past.

28. The British Cotton Growing Association so far back as 1904 made some useful recommendations to Lord Curzon of Kedleston, which may be briefly summarised as follows:—

- a. The establishment of Government Seed Farms in all cotton growing districts.
- b. The experimenting with fresh types of seed.
- c. That the Government should carefully investigate the reasons why Egypt and the United States were more successful than India in growing cotton.
- d. The formation of a special agricultural department devoted solely to cotton, so as to supervise and improve the selection of seed, the methods of cultivation, the ginning and grading of cotton.
- e. The survey of varieties currently grown in India, and selection of those most suitable for particular districts.

29. The deputation desire to express their recognition that since 1904 a considerable improvement has taken place. The types of cotton grown have been improved; a beginning has been made in scientific work; and possibly the general level of cultivation has been slightly raised. But it is submitted that what has been done meanwhile ought only to be treated as the very beginning of what ought to be done and of what can be done by the co-operation of the Government, the growers, and the consumers.

This deputation is anxious not to commit itself to any specific recommendation, but it urges that the Indian Government ought to consider the whole matter *de novo*.

The following suggestions might be considered:—

- (a) The strengthening of the official staff, and particularly the staff of Europeans engaged in experimental work, so that varieties of cotton of better quality and more prolific types may be made available for the different cotton growing areas as soon as possible.
- (b) The establishment of local cotton markets for the protection of the small farmer, and the establishment of such arrangements as will ensure that the grower of improved varieties will receive a fair market price.
- (c) The elaboration of some scheme by which the supply of good seed may be made available for all growers.

(d) The control and licensing of ginneries to prevent mixing of seed.

(e) The development by the various Provincial Governments of model plantations, or at any rate of what is known as demonstration work.

(f) The more rapid extension of irrigation.

30. The deputation ventures to suggest that possibly some improvements which have been found difficult in the past might be facilitated by the co-operation of the British Cotton Growing Association supported by practical spinners in this country as well as in India.

31. There is perhaps one other remark that it is necessary to make with regard to Indian cotton. As named before, about half the cotton grown in India is used in India. For the most part this is used in spinning coarse counts of yarn. It must be clearly stated that there is no desire in this country that cottons suitable for English spinners should be grown in India with the result of displacing cottons suitable for Indian use. Though the laws which govern the suitability of different cottons to different countries are not yet fully understood, yet it is probable that the great bulk of the cotton grown in India will always be short and coarse, and therefore only suitable for coarse counts of yarn. It is fully recognised that the Indian growers must not be asked to grow cottons which are unsatisfactory or unprofitable to the grower. There is, however, probably just the same room for improvement in such cottons as there is in finer kinds. The aim should be to so largely increase the production per acre in those districts where worse cottons must be grown so as to set at liberty large areas elsewhere which might be suitable for finer and more valuable kinds. It is confidently hoped that in a comparatively short time the production of short cotton could be largely increased, and that at the same time several hundred thousands of bales of cotton suitable for Lancashire could also be produced. At any rate it is strongly urged that the possibility of doing this should be exhaustively investigated.

E. *"That a Departmental or other Committee be appointed to consider the best method of continuing and developing the work inaugurated by the British Cotton Growing Association, and that pending a decision on this question the Government should render such financial and other assistance to the Association as will enable them to carry on their work to the fullest possible extent."*

32. The two previous resolutions deal with matters of great immediate importance, and yet they must be considered to be comparatively matters of detail. The great object the bodies represented by this deputation have in view is to get the whole question of Empire Cotton Growing treated as a national question, as affecting not only the welfare of this country but also the future prosperity of the Empire.

33. There is on the one hand the Cotton Trade of Great Britain, India, and Canada. So far as Great Britain is concerned it is one of her greatest industries. It more than holds its own against the competition of the World, but it is not an indigenous industry, nor one which is essentially impervious to attack. As has been shown, eighty per cent. or more of its raw material is drawn from foreign sources, and seventy or eighty per cent. of its products are exported to the Colonies or elsewhere. On the other hand there is within the Empire the opportunity for growing both in quantity and in quality all the cotton that it requires. In the British West Indies the finest cotton in the World is now grown; Egypt and the Sudan together are practically the only places in the World where cottons of the Egyptian character can at present be grown on a really large scale. These cottons are essential for spinning the great bulk of what are known in England as fine yarns. In India, at any rate, some large quantities of cotton equal to the American type could be grown. In Africa again the British Cotton Growing Association has proved that it will be possible to develop large crops of cotton suitable for Lancashire.

34. Even under existing conditions the following cottons are produced in the Empire:—

	Area in Square Miles.	Population.	Estimated Production Bales 500 lbs.
Extra Fine—			
West Indies ...	12,140	1,718,216	5,000
Long Staple—			
Egypt ...	363,181	11,287,359	1,500,000
Sudan ...	984,520	3,000,000	20,000
Medium Staple—			
Uganda ...	121,437	2,893,494	32,000
Nyasaland & N.E. Rhodesia.	329,801	1,847,904	6,000
Nigeria ...	336,000	17,611,944	32,000
			1,595,000
Short Staple—			
India ...	1,802,657	315,156,393	4,000,000
Total ...	3,949,736	353,515,310	5,595,000

35. In these days, when so much is wisely and nobly said about organising the resources of the Empire, this is surely a matter that should be taken in hand at once.

36. The British Cotton Growing Association has done the pioneer work. It has now reached the limit of its resources. Some new departure is urgently required.

What is asked for is that the Government should appoint a committee to consider the best method of continuing and developing the work inaugurated by the Association.

37. It would obviously be out of place to ask for such a committee to forestall its recommendations. But the nature of the work which will be required in the future may be briefly alluded to.

38. The organisation of the resources of the Empire means, in regard to this industry, the protection of the interests of all concerned in it and the development of close relations between them. At one end of the chain there is the grower of cotton; in between we have the shipper and the carrying agent, at the other end the spinner and manufacturer. The latter are in business to make profits, and, as is natural, will look after themselves. On the other hand though the cotton grower may also ultimately be in a position to look after his own interests, in the early stages it is essential that he should receive the assistance of some philanthropic body, and if the business is too large to render this possible, it will be necessary for the Government to assist.

39. In any case there is also a wide sphere of work which must be done by someone, and will certainly not be quickly done except with Government assistance.

40. It seems to be essentially the business of each Colony or country to decide for itself whether its climate, its soils, its population, and its means of access to markets are suitable for cotton. And if the conditions are suitable, then it has to decide what kinds of cotton will pay the grower best.

41. Again it is the business of the Colonial Government to try experiments, to establish model farms, to secure purity of seed, to regulate the industry so as to minimise pests, and also so as to create a confidence in the regularity of the quality produced.

42. Again it is the business of the Local Government to provide capital for any big schemes of irrigation or drainage that may be necessary, and to arrange for such railways, roads, or water facilities as may be necessary for the marketing of the cotton produced, and of the other crops which will probably be necessary as rotations.

43. It seems again that there is scope in almost all of these matters for a central bureau in the Imperial Government to advise and assist the separate Colonies. Apart from the help that is always required from the Mother Country for infant Industries in Colonies which are not financially strong, there is also a special need in regard to cotton. The time



has come when cotton can be and ought to be systematically and scientifically studied. The cotton industry is less than 150 years old, and in its early days it developed itself both as to its raw material and as to its machinery almost by chance. Modern science tells us now that cotton can be modified so as to fit in with many limitations of climate, and to resist disease, and escape the attacks of insects. It can also be modified so as to be longer or shorter in staple, finer or coarser. There are, of course, some limits and there is much yet to learn. Such knowledge as has been gained is largely scattered in the local reports of agricultural stations. Codification and analysis into local and universal truth are much required. The study of cotton as a science ought therefore to be made a special business in the British Empire.

44. Then there are other matters that lie between the régime of private profit and public duty. There is the assistance necessary in the early days of an industry. Inexperienced planters require financial help as well as advice. Marketing has to be done almost on philanthropic lines until the growers know their markets. Probably at all stages of such an industry as Cotton Growing, a statistical bureau under Government direction would assist in keeping a fair balance between supply and requirement.

45. Much of this work has been done in the past to the best of its ability by the British Cotton Growing Association. But the business is now too large for its resources.

46. It is, of course, to be hoped that in any plan of work which the Government may eventually decide on as best for the future, it will be found possible to utilise the experience gained by the British Cotton Growing Association. In work of this kind any breach of continuity would be a misfortune. At the same time what is now urged is that the whole subject of the best way of organising the Cotton Growing of the British Empire should be carefully considered by a competent committee, and the organisations represented are prepared to loyally accept the decisions of the Government after such careful consideration.

47. It seems absolutely necessary that the Committee suggested should be appointed as soon as possible, but as it would be ruinous to the young industries which are now developing so rapidly in Nigeria, Uganda and the Sudan, if they were left meanwhile without support, it is urged that temporary financial support of a substantial nature be given under Government supervision to the British Cotton Growing Association, and that no time should be lost in giving effect to the resolutions for special work to be done in the Sudan and in India.

### APPENDIX III.

#### TERMS OF REFERENCE AND CONSTITUTION OF THE INDIAN COTTON COMMITTEE.

1. The Committee was appointed by the Governor General in Council under the Resolution of the Revenue and Agriculture Department No. 933-263, dated September 27th, 1917, the first two paragraphs of which are reproduced below:—

"The question of extending the cultivation of long stapled cotton in India is one which has frequently engaged the attention of the Government of India. It has again been brought into special prominence as the result of recent investigations by the Board of Trade which have shown the importance in Imperial interests of increasing the production of this class of cotton within the Empire. The Government of India consider it desirable that India should co-operate in the solution of this problem and they believe that the interests of this country in the matter will be found to coincide with those of Lancashire. It has repeatedly been urged by manufacturers in India that it is of even greater importance to them than to manufacturers elsewhere that sufficient cotton of long staple should be forthcoming in this country and that the extension of the growth of improved cotton would react most favourably on the manufacturing industry. There are certain areas in which there is reason to believe that long staple cotton will give a sufficiently large yield to enable it to be grown at a profit. Here the problem is one mainly of organization. In other areas, which include the majority of the cotton-growing tracts in India, a type of cotton combining yield and quality in sufficient degree to enable it to compete successfully with the prevailing short staple types does not appear to have been as yet evolved and the question of research will enter largely into the solution of the problem. An extension of the growth of long staple cotton in the above two cases would, in all probability prove of great benefit to the cultivators owing to the higher prices which long staple cotton commands, provided that the full benefit of these prices can be secured to them by improvements in the system of marketing and by the prevention of the harmful practices of adulteration and damping which have done so much in the past to lower the reputation of Indian cotton. In

these circumstances, the Government of India have decided that the possibilities of extending the growth of long stapled cotton in India should be investigated by a Committee constituted as follows:—

J. MacKenna, Esq., C.I.E., I.C.S., Agricultural Adviser to the Government of India	} President
F. Hodgkinson, Esq., Member of the Council of the British Cotton Growing Association...	
N. N. Wadia, Esq., Member, of the Committee and Ex-Chair- man, Bombay Millowners' Association ... ..	} Members.
G. S. Henderson, Esq., Officiat- ing Imperial Agriculturist ...	
W. Roberts, Esq., Principal and Professor of Agriculture, Lyall- pur Agricultural College ...	
H. F. Ashton, Esq., Executive Engineer, Punjab ... ..	
F. Noyce, Esq., I.C.S. ... ..	
	} Secretary.

2. The Committee will examine the work which has been done in the various provinces of India in the establishment of long stapled cottons. It will report regarding the possibility of the extension of any methods which have led to success. It will investigate the causes of failure where this has occurred, and, if it finds that the failure has been due to agricultural, irrigational or economic causes or to administrative difficulties, will propose appropriate remedies. It will carry out a detailed study of local conditions in each cotton growing tract and will enquire into the possibility of improving existing methods of ginning and marketing and also of preventing adulteration and damping. It will further report on the possibility of improving the accuracy of the cotton forecasts and generally of making the statistical information published by Government of greater utility to the cotton trade. Finally, it will submit recommendations in regard to the staff required and the organisation necessary for the development of the cultivation of long stapled cottons in tracts which it considers suitable for that purpose.



## APPENDIX IV.

## CIRCULAR TO COLONIAL GOVERNORS.

Copy of Circular addressed by the Colonial Office to the Governors of the West and East African and West Indian Protectorates.

To the Officer Administering the Government of .

Downing Street,

SIR, 31st August, 1917.

I HAVE the honour to inform you that His Majesty's Government have recently appointed a Committee to investigate the best means of developing the growing of cotton within the Empire, and to advise the Government as to the necessary measures to be taken for this purpose.

2. The Committee have prepared the accompanying statement of the points on which they desire information from various parts of the Empire, and I shall be glad if you will furnish me with your observations on these points so far as concerns your Administration.

3. You will understand that the Committee will welcome your views on any subjects, not covered by their statement, on which you consider that you are able to assist them in their enquiry.

4. It is desirable that as much information as possible should be in the hands of the Committee at an early date, and you may find it convenient to deal in the first instance with those points on which you can give an immediate reply, reserving others for further report after any enquiry which may be necessary.

5. The purpose for which the Committee have been appointed is one to which His Majesty's Government attach great importance from the point of view of the future security of the cotton trade of the United Kingdom, and in order to make the enquiry as extensive as possible I am addressing this despatch not only to Colonies and Protectorates in which the cotton-growing industry is firmly established, but also to others in which it does not exist or has for any reason been discontinued.

(Enclosure in Circular Despatch, dated 31st August, 1917).

## EMPIRE COTTON GROWING COMMITTEE

Points on which information is desired as to the possible production of cotton in Colonies and Protectorates.

A. What area or additional area of land suitable for cotton cultivation could be made available in the Colony or Protectorates—

- (1) without expenditure from public funds?
- (2) with a moderate expenditure on roads and means of local transport, clearing water channels, etc.?

- (3) with an extensive programme of expenditure on railways, steamers for local transport, irrigation works, etc.?

It is advisable to distinguish between work which could be undertaken within the immediate future, say within the next ten years, and further extensions which could only be developed subsequently.

B. (1) Estimates of cost as far as possible in the case of A. (2) and (3).

(2) Rough statement as to portion of cost which could be borne by the local Government.

C. (1) Rough estimates of output of cotton or additional output in bales of 400 lbs. under A. (1), (2) and (3).

(2) Statement of what ginneries or additional ginneries would be required.

(3) Statement of population in each area recommended for cotton-growing and the probable proportion of population which would be available for cotton cultivation.

D. Reports should be furnished in the case of each area suggested for new production as to any difficulty which might arise owing to scarcity of the population or the existence of another industry which yields a greater prospect of remuneration to the peasant or the native.

An expression of opinion is also requested as to whether the best method of development is by plantations owned and managed by Europeans or by the establishment of a purely native industry or by cultivation by peasant proprietors; also as to the general effect on the welfare and the prosperity of the Colony or Protectorate which may be expected from the successful establishment or extension of cotton-growing.

Reports are invited as to the existing facilities for marketing the crop and as to whether the assistance of an unofficial body acting under Government auspices, such as the British Cotton Growing Association, would be required or would help in the more rapid extension of the industry.

E. What steps, if any, could be taken to establish residential experiment stations (acting later, perhaps, as seed-farms and ginneries also), one to each typical area of the districts proposed for cotton-growing?

F. Cotton produced in these experimental stations, if established, should be sent home for examination by the Imperial Institute and by the British Cotton Growing Association or other body.

## APPENDIX V.

## MEMORANDUM AS TO THE WORK OF THE IMPERIAL INSTITUTE IN CONNECTION WITH BRITISH COTTON CULTIVATION.

The Imperial Institute, since its establishment as a Government Institution in 1903, has continuously promoted the interests of British cotton cultivation by conducting investigations respecting the quality of cotton grown, in association with the Agricultural Departments of the countries concerned and with the British Cotton Growing Association; by collecting and publishing information respecting the progress of cotton growing in all countries, and by arranging and maintaining reference collections of cottons from every country of the Empire.

The first report from the Imperial Institute was issued as a Blue Book in 1904 (Dunstan: Cotton Cultivation in the British Empire and in Egypt; Cd.

2020, 1904). This report drew attention to the importance of cotton cultivation to the Empire and the desirability of its extension, and described the position and prospects of cotton cultivation in each country. In 1905, the year following the issue of this Report, a Cotton Exhibition was held at the Imperial Institute, with the co-operation of the British Cotton Growing Association. It was opened by H.R.H. the Prince of Wales (now H.M. The King), and was intended to arouse further interest in the subject of Empire cotton growing. It included samples of cotton grown in each British producing country so arranged as to display the length of staple and other characteristics, whilst for comparison a

collection of the chief cottons of the United States, Brazil, Peru, China, and other foreign countries were similarly shown. The various uses of cotton for textile purposes were fully illustrated and the chief types of machinery employed were shown. The Handbook issued in connection with this Exhibition supplied information respecting the position of cotton growing in each country of the Empire. The collections of cotton thus brought together at this Exhibition have been maintained and added to, so as to make a comprehensive illustration of the types of cotton produced in British territories, which has proved of the utmost service as a reference collection to enquirers from all parts of the world.

The Imperial Institute has acted continuously as a centre for information and investigation respecting many aspects of cotton cultivation. Numerous reports have been made to the local Governments, to planters and others respecting the quality and commercial value of cotton grown, as to the quality of the soil and its improvement by manuring, as to the types of cotton most likely to be suitable for trial in particular countries, as to the supply of seed and methods of seed disinfection, and as to the treatment required for insect and fungoid pests. Much information has also been supplied concerning the methods of improvement of varieties of cotton by seed selection, by breeding, etc. In order to cope with the increasing demand made on the Imperial Institute for information and investigation respecting cotton, the work has been organised in three chief branches of exhibition, information, and investigation. The work of exhibition has involved the display in the Public Exhibition Galleries, in the individual Courts assigned to the exhibits of the various countries of the Empire, of a series of samples, photographs, statistical and other diagrams illustrating the position of cotton cultivation in each country, and also the maintenance of the Reference Collection of samples of Empire-grown Cotton and of the chief cottons of foreign countries.

Information has been systematically collected and arranged from publications respecting cotton cultivation in every part of the world, and also that obtained by special application to Governments and planting companies. This information, which includes particulars as to land available, cost of labour, etc., is utilised in dealing with the numerous enquiries addressed to the Institute and in connection with the preparation of periodical publications.

In connection with investigation, the work has chiefly consisted in examining samples of experimentally grown cotton, mainly as to length and strength of fibres and its suitability for special purposes in comparison with other cottons or with the same type of cotton grown in other countries. This work has been carried out in collaboration with the local Agricultural Departments, whose efforts have been directed to secure the type of cotton best adapted to the particular country and its improvement by various means. Numerous analyses of cotton soils have been conducted before and after experimental manurial treatment. The commercial value of various experimentally grown cottons has also been determined by reference to manufacturers as well as to brokers, and this section of the work has been carried on in close touch with the British Cotton Growing Association. The whole of these operations have been conducted with the aid of a small grant of £500 a year made by the Treasury in the first instance for a term of five years from 1905, and then renewed for a further term of five years. This grant has not been again renewed during the period of war.

The Director of the Imperial Institute, as well as members of the staff, have visited cotton growing countries and made a special study of the economic and other conditions under which cultivation is carried on. Reports by Professor Dunstan on Cotton Cultivation in Cyprus and in Asia Minor have been published as Parliamentary Papers, and are referred to later.

The Director and Staff of the Institute have also contributed various papers and reports to Societies and Congresses connected with cotton cultivation. At the International Congress of Tropical Agriculture held in Brussels in 1910 the Director of the Imperial

Institute presented a General Report on the Position of Cotton Cultivation, with special reference to the British Empire, and also a collection of special reports on Cotton Cultivation in each country, some of which were contributed by the local Directors of Agriculture and others by members of the Staff of the Imperial Institute.

At the next International Congress of Tropical Agriculture which was held in London in 1914 and of which the Director of the Imperial Institute was President and two principal members of the staff were Organising Secretaries, prominence was also given to the subject of cotton cultivation, and a large number of papers and reports were contributed, and have since been published in the Transactions of the Congress. Concurrently with the London Congress an International Exhibition of Cotton and other Fibres was held at the Agricultural Hall. The Director of the Imperial Institute, as President of this Exhibition, offered a Silver Trophy for the best large sample of British grown cotton established within the preceding ten years and which had furnished at least three successive crops. From a number of excellent samples submitted and examined in detail at the Imperial Institute the trophy was awarded to the "Buri" and "Rosea" cottons from the Government Experimental Farm at Akola in the Central Provinces of India.

Finally, reference may be made to the reports on the various aspects of cotton cultivation which have appeared in successive years since 1905 in the quarterly "Bulletin of the Imperial Institute," the more important of which are included in the following list, which illustrates the wide range of the work of the Institute on this subject. The titles are also given in this list of the special reports alluded to previously and of that of a Handbook by Dr. Ernest Goulding on Cotton and Other Fibres in the Imperial Institute Series on the Commercial Resources of the Tropics, which has been recently published, and of which a second edition is in preparation.

In addition to these published reports numerous special reports on cotton cultivation have been made to the Governments and Agricultural Departments of the principal cotton growing countries of the Empire. Analysis of some hundreds of the reports shows that reports based on the results of investigations conducted at the Imperial Institute have been made among others to the following countries:—India, Egypt, the Sudan, British East Africa, Uganda, Nyasaland, Union of South Africa and Rhodesia, British West Africa, Australia, British North Borneo, Fiji, West Indies, British Guiana, Mauritius, British Honduras and Cyprus.

It will be seen that the Imperial Institute, which took a prominent part in the inception of the movement for cotton-growing within the Empire, has become a recognised centre and clearing house for investigation, information and exhibition, respecting the various aspects of cotton production. The need for the work undertaken by the Imperial Institute will not diminish with the extension of activity throughout the Empire to produce more and better cotton, nor should its work as a central clearing house be impeded by any agencies which may be inaugurated to assist cotton cultivation by scientific research. Such research can only be properly conducted and controlled in the countries in which cotton is grown and under the auspices of their Agricultural Departments and Planting Companies, and it is by the strengthening and extension of the scientific work of the Government Agricultural Departments in all cotton growing countries that advances will best be made. It is as a centre for collecting, collating and recording the results of this, and all other cotton work in British countries, in conducting investigations of the quality and value of the cotton produced, in affording general information and in publishing statistics and reports of progress, that the Imperial Institute will continue under the extended constitution provided by the Imperial Institute Act of 1916 to be of service in this subject to the Empire as a whole.

Imperial Institute,  
April, 1918.

IMPERIAL INSTITUTE.  
SPECIAL REPORTS, ETC., ON COTTON.  
By PROFESSOR WYNDHAM DUNSTAN, C.M.G., LL.D.,  
F.R.S.

Cotton Cultivation in the British Empire and in Egypt. Cd. 2020. 1904.  
Handbook of the Cotton Exhibition, Imperial Institute. 1905.  
Cotton Cultivation in Cyprus. Cd. 2717. 1905.  
Cotton Cultivation in Asia Minor. Cd. 4324. 1908.  
British Cotton Cultivation. Cd. 3997. 1908.  
The Present Position of Cotton Cultivation. Report to the International Congress of Tropical Agriculture, Brussels, 1910.  
Papers and Reports on Cotton Cultivation. International Congress of Tropical Agriculture, Brussels, 1910.  
La Culture du Coton dans le Monde. Revue Economique Internationale, 1911.

By ERNEST GOULDING, D.Sc. (Lond.).

Cotton and Other Vegetable Fibres: their Production and Utilisation. Murray, 1917.

REPORTS, SPECIAL ARTICLES, ETC. BULLETIN OF THE IMPERIAL INSTITUTE. 1905-1917.

Examination of Cotton grown in South African Colonies. Vol. III (1905) No. 1, pp. 26-32.  
Cotton Growing in Northern Nigeria. Vol. III (1905), No. 1, pp. 49-55.  
Fungoid Disease of the Cotton Plant. Vol. III (1905), No. 1, pp. 60-62.  
Cotton Exhibition at the Imperial Institute. Vol. III (1905), No. 2, pp. 113-116.  
Cotton from British East Africa. Vol. III (1905), No. 2, pp. 139-142.  
Cotton from British New Guinea. Vol. III (1905), No. 3, pp. 225-226.  
Cotton Cultivation in Rhodesia. Vol. III (1905), No. 3, pp. 247-249.  
Cotton Growing in the Portuguese Colonies. Vol. III (1905), No. 3, pp. 250-251.  
Cotton from the Federated Malay States. Vol. III (1905), No. 4, pp. 314-316.  
Cotton Growing in Cyprus. Vol. III (1905), No. 4, pp. 327-334.  
Cotton Cultivation in the United States of America. Vol. III (1905), No. 4, pp. 334-345.  
Cotton from British North Borneo. Vol. IV (1906), No. 1, pp. 22-23.  
Insects which attach Cotton in Egypt. Vol. IV (1906), No. 1, pp. 48-52.  
Cotton Cultivation in Corea. Vol. IV (1906), No. 1, pp. 66-67.  
Cotton Cultivation in Ceylon. Vol. IV (1906), No. 2, pp. 178-179.  
Cotton Cultivation in British East Africa. Vol. IV (1906), No. 4, pp. 291-296.  
Improvement of West African Cotton. Vol. IV (1906), No. 4, pp. 349-350.  
Cotton from Bermuda. Vol. IV (1906), No. 4, pp. 363-364.  
Cotton from Nyasaland. Vol. IV (1906), No. 4, pp. 386-388.  
Cotton Growing in Spain. Vol. V (1907), No. 1, pp. 31-35.  
Cotton Growing in Portuguese East Africa. Vol. V (1907), No. 1, p. 61.  
Insect and Other Cotton Pests, and the Methods suggested for their Destruction. Vol. V (1907), No. 2, pp. 140-166.  
Cotton Growing in Algeria. Vol. V (1907), No. 3, pp. 269-276.  
Cotton Cultivation in German East Africa. Vol. V (1907), No. 4, pp. 425-426.  
Cotton from Cape Colony. Vol. V (1907), No. 4, p. 440.  
Cottons from India. Vol. VI (1908), No. 1, pp. 11-19.  
Cotton Growing in Central Asia. Vol. VI (1908), No. 1, pp. 60-74.  
Weight as a Factor in Seed Selection, with special reference to Cotton Seed. Vol. VI (1908), No. 1, pp. 74-75.  
Cotton Experiments in Eastern Bengal and Assam. Vol. VI (1908), No. 2, pp. 202-203.  
Cotton Experiments in Punjab. Vol. VI (1908), No. 2, p. 203.  
Cotton Experiments in Bombay. Vol. VI (1908), No. 2, pp. 204-205.

Cotton Growing in the French Colonies. Vol. VI (1908), No. 3, pp. 288-292.  
Cotton from British Guiana. Vol. VI (1908), No. 4, pp. 383-387.  
Notes on the Present Position of Cotton Cultivation in the United States. Vol. VI (1908), No. 4, pp. 404-417.  
Cultivation of Egyptian Cotton in Sind. Vol. VI (1908), No. 4, pp. 418-419.  
Cotton Growing in Togo. Vol. VI (1908), No. 4, pp. 420-421.  
Cotton from the Gold Coast. Vol. VII (1909), No. 1, pp. 14-20.  
Cotton Ordinances of the Uganda and East Africa Protectorates. Vol. VII (1909), No. 1, pp. 92-93.  
Cotton from Southern and Northern Nigeria. Vol. VII (1909), No. 2, pp. 154-159.  
Agricultural Work in Nyasaland. Vol. VII (1909), No. 3, pp. 314-317.  
Cotton in Nyasaland. Vol. VIII (1910), No. 1, pp. 29-40; No. 4, pp. 372-381.  
Economic Development of German Protectorates in Africa. Vol. VIII (1910), No. 1, pp. 50-52.  
Cotton Growing in French Colonies. Vol. VIII (1910), No. 1, p. 61.  
International Congress of Tropical Agriculture. Vol. VIII (1910), No. 2, pp. 129-135.  
Present Position of Cotton Cultivation. Vol. VIII (1910), No. 4, p. 402.  
Cotton from the Cape Province, South Africa. Vol. IX (1911), No. 1, pp. 14-15.  
Cotton from the New Hebrides. Vol. IX (1911), No. 1, pp. 53-54.  
Agriculture and Industry in Grenada. Vol. IX (1911), No. 2, pp. 145-146.  
Cotton Growing in Sind. Vol. IX (1911), No. 3, pp. 217-227.  
Sakellaridis Cotton. Vol. IX (1911), No. 3, p. 288.  
Agricultural Development of Nyasaland. Vol. IX (1911), No. 4, pp. 380-382.  
Recent Progress in Cotton Cultivation. Vol. IX (1911), No. 1, pp. 66-70; No. 2, pp. 164-169; No. 3, pp. 304-306; No. 4, pp. 409-412.  
Some Cotton Soils of the Nyasaland and Uganda Protectorates. Vol. X (1912), No. 1, pp. 54-74.  
Cotton from Papua. Vol. X (1912), No. 2, p. 215.  
Economic Developments in the Belgian Congo. Vol. X (1912), No. 2, p. 296.  
Improvement of Cotton in India. Vol. X (1912), No. 3, pp. 351-372.  
Recent Agricultural Developments in Uganda. Vol. X (1912), No. 3, pp. 422-431.  
Work of the British Cotton Growing Association. Vol. X (1912), No. 3, pp. 479-481.  
Cotton from Uganda. Vol. X (1912), No. 3, pp. 481-482.  
Cotton Industry of Nyasaland. Vol. X (1912), No. 4, pp. 527-536.  
Cotton Worm in Egypt. Vol. X (1912), No. 4, pp. 584-620.  
Cotton from Ceylon. Vol. X (1912), No. 4, p. 657.  
Cotton Growing in French Colonies. Vol. X (1912), No. 4, pp. 657-658.  
Recent Progress in Cotton Cultivation. Vol. X (1912), No. 1, pp. 158-162; No. 2, pp. 321-324; No. 3, pp. 500-502; No. 4, pp. 677-679.  
Cotton Industry of Northern Nigeria. Vol. XI (1913), No. 1, pp. 70-79.  
Progress of Egyptian Agriculture with Special Reference to Cotton. Vol. XI (1913), No. 1, pp. 90-101.  
Agriculture of Mozambique Province. Vol. XI (1913), No. 1, p. 108.  
Recent Developments in Cotton Growing in the United States. Vol. XI (1913), No. 1, pp. 142-144.  
Recent Progress in Cotton Cultivation in the Sudan. Vol. XI (1913), No. 2, pp. 189-203.  
Cotton Industry of Uganda. Vol. XI (1913), No. 3, pp. 381-401.  
Organisation of Experimental Work in Agriculture in the German Colonies. Vol. XI (1913), No. 3, pp. 462-478.  
Cotton Protection Ordinance in Nyasaland. Vol. XI (1913), No. 3, p. 514.  
Cotton Growing in French Colonies. Vol. XI (1913), No. 3, pp. 514-516.  
Cotton Growing in Gold Coast. Vol. XI (1913), No. 4, pp. 600-615.

- Cotton Cultivation in Northern Nigeria. Vol. XI (1913), No. 4, pp. 658-660.
- Cotton Growing in the Ivory Coast. Vol. XI (1913), No. 4, pp. 672-673.
- Cotton Protection Rules in Uganda. Vol. XI (1913), No. 4, p. 673.
- Recent Progress in Cotton Cultivation. Vol. XI (1913), No. 1, pp. 164-166; No. 2, pp. 353-355; No. 3, pp. 532-534; No. 4, pp. 688-689.
- Agriculture in the Gold Coast. Vol. XII (1914), No. 1, pp. 115-116.
- Cotton Seed Distribution in Egypt. Vol. XII (1914), No. 1, pp. 117-119.
- Insect Pests of the Southern Provinces, Nigeria. Vol. XII (1914), No. 2, pp. 294-296.
- Insect Pests of the Nyasaland Protectorate. Vol. XII (1914), No. 2, pp. 296-297.
- Cotton Cultivation in the French Colonies. Vol. XII (1914), No. 3, pp. 466-467.
- Cotton Pests in German East Africa. Vol. XII (1914), No. 4, pp. 611-613.
- Recent Progress in Cotton Cultivation. Vol. XII (1914), No. 1, pp. 136-139; No. 2, pp. 312-316; No. 3, pp. 488-492; No. 4, pp. 628-630.
- Cotton Growing in German East Africa. Vol. XIII (1915), No. 1, pp. 124-125.
- Cotton from British Guiana. Vol. XIII (1915), No. 3, pp. 380-384.
- The War and the World's Cotton Crops. Vol. XIII (1915), No. 3, pp. 385-392.
- Cotton Breeding in the United Provinces, India. Vol. XIII (1915), No. 3, pp. 476-478.
- Cotton Problems in Italian East Africa. Vol. XIII (1915), No. 3, p. 478-479.
- Recent Progress in Cotton Cultivation. Vol. XIII (1915), No. 1, pp. 161-163; No. 2, pp. 311-316; No. 3, pp. 488-492; No. 4, p. 656.
- Cauto Cotton from British Honduras. Vol. XIV (1916), No. 4, pp. 591-592.
- Recent Progress in Cotton Cultivation. Vol. XIV (1916), No. 1, pp. 131-134; No. 2, pp. 302-303; No. 3, pp. 479-480; No. 4, p. 637.
- Cotton Cultivation in Australia. Vol. XV (1917), No. 1, pp. 23-32.
- The Improvement of Cotton in India. II. Vol. XV (1917), No. 2, pp. 149-177.
- Recent Progress in Cotton Cultivation. Vol. XV (1917), No. 1, pp. 129-131; No. 2, pp. 284-285; No. 3, pp. 452-455.

## APPENDIX VI.

### REPORTS AND LETTERS TO THE PRESIDENT OF THE BOARD OF TRADE.

#### (a) GENERAL POSITION OF RAW COTTON SUPPLIES, 1918.

16th May, 1918.

Sir,

We have the honour to present a brief Interim Report on the work of the Empire Cotton Growing Committee since its appointment on 25th July, 1917.

You will remember that the Committee was appointed in accordance with a recommendation of the Textiles Committee of the Board of Trade, supported by representations made by the British Cotton Growing Association and other bodies representing important trade interests.

The Committee includes representatives of India, Australia, South Africa, and Egypt, as well as of the Foreign Office, the Colonial Office, the India Office, the Board of Trade, the Imperial Institute, and various cotton trade associations, including those which represent labour.

We hope that such a report may be of interest to the representatives of the self-governing Dominions and of India, who will be present at the approaching Imperial Conference, as showing what progress is being made in the study of the Empire's resources for the production of raw material for the cotton industry. The question of increasing the supply of raw cotton from Imperial sources is of vital interest to all parts of the Empire as consumers of cotton goods or cotton seed products, if not as growers of cotton.

#### *India.*

Our attention was first drawn to India, which appeared to offer the best opportunity for a considerable increase of supply in the near future. Any investigation on our part was, however, rendered unnecessary by the appointment by the Indian Government on 27th September, 1917, of a committee to inquire into the whole situation with regard to the possibilities of extending the cultivation of long staple cotton in India. Our efforts were, therefore, for the time being confined to assisting in the selection of a suitable representative of the Lancashire industry to join the Indian committee, and this was done. The committee has, it is understood, almost completed its enquiries, and we trust that we shall be given an opportunity to advise on its report before action is taken by the Government of India.

#### *The Sudan.*

The Committee next turned its attention to the position in Egypt and the Sudan, and advantage was taken of the presence in this country of Sir Murdoch Macdonald, Adviser to the Ministry of Public Works in Egypt, and an official deputation from the Sudan, to obtain from them valuable evidence as to the whole position, both in Egypt and the Sudan. As the result of this evidence, the Committee joined the Sudan deputation in making representations through the Board of Trade to the Treasury with regard to the urgent necessity for an immediate grant in advance of the proposed loan of £3,000,000 which had been authorized just before the outbreak of war for railway and irrigation works in the Sudan. These representations were successful in securing a grant of £500,000, which will enable the Sudan authorities to undertake at once certain essential preliminary works in preparation for the actual work of construction of the main irrigation works upon which the Gezira scheme depends.

#### *Egypt.*

With regard to Egypt, it appeared that the drainage works in the northern delta, which had already been begun under Lord Kitchener, were suspended by the War, owing partly to scarcity of labour and partly to the impossibility of procuring the necessary engineering plant for the large pumping stations upon which the whole scheme turns. For this there is, unfortunately, no immediate remedy. It was pointed out, however, to the Committee that a large part of the work of constructing and realigning the main drains had already been done, and that if this work could only be carried a little farther it would at once begin to yield results which, although far short of the maximum benefit to be derived from the full scheme, would yield some return upon the capital already expended, and would add considerably to the area under cotton in Egypt, as well as to the yield of those areas affected by the scheme. The Committee therefore suggested that the Egyptian Government should be urged to take immediate steps for providing the funds necessary to complete these parts of the scheme in so far as this is possible under present conditions.

From further information, however, it appears that the difficulties in the way of proceeding even with the partial completion of these works are serious, apart

from the question of finance. The demands of military operations in Egypt and Palestine have made heavy calls upon the labour supply available in Egypt, with the result that the military authorities are opposed to the execution under present conditions of any schemes which would involve a large amount of labour, as the works in question admittedly would. It appears, therefore, to be very doubtful whether works of such an important character even as those in question can be carried out under present conditions in Egypt; nor is there any reason to believe that these conditions are likely to be substantially modified in the immediate future.

In connection with the Egyptian crop the Committee caused to be prepared a special report on the world's supply of fine cotton, the position of which is becoming increasingly acute. The Committee felt that this was an important factor in the question of the restriction of acreage in Egypt, which had been decided upon by the Egyptian Government in August, 1917, owing to the shortage of foodstuffs and the urgent necessity of increasing the area to be put under cereals in Egypt during the winter of 1917-18. This report was accordingly forwarded to the President of the Board of Trade for communication to the Egyptian authorities and to the various departments of the home Government specially interested from the point of view of the supply of fine cotton for aeroplane cloth. It was pointed out that, in view of the scarcity of flax for the manufacture of linen for aeroplane cloth, it was important that steps should be taken to maintain and increase the supplies of fine cotton within the Empire.

#### *Other Colonies and Dependencies.*

With regard to the Colonies and Dependencies generally, it was agreed that the first step should be the issue of a circular letter or questionnaire by the Colonial Office to all Colonies which possessed possibilities for cotton-growing. The terms of such a circular were settled with the Colonial Office, and it was despatched on 31st August, 1917. Replies have now been received from all the Colonies and Protectorates, as follows:—

*Africa.*—Nigeria; Gold Coast; Sierra Leone; Gambia; Nyasaland; Uganda; Rhodesia; Zanzibar; British East Africa.\*

*West Indies.*—Leeward Islands (Virgin Islands, Antigua, Montserrat, St. Kitts Nevis); Windward Islands (St. Lucia, Grenada, St. Vincent); Dominica; Jamaica; Barbados; Trinidad; Bahamas; Bermuda; British Guiana; British Honduras.

Many of these replies may be described as mainly negative in their character, but valuable reports have been received with regard to Uganda, Nigeria, and Nyasaland, and from Sir Francis Watts with regard to the general position in the West Indies.

Reports have also been received as to the possibilities of Queensland, where considerable quantities of excellent cotton have been grown in the past, and renewed efforts have recently been made to encourage its cultivation. In various parts of South Africa, too, especially Natal and certain districts of the Transvaal, recent developments have given encouraging results, and there are signs of cotton-growing becoming a success on a commercial scale. We have also initiated inquiries into the prospects of cotton-growing in Mesopotamia, where experimental cultivation has been commenced under an officer of the Madras Department of Agriculture. All these will be more fully gone into.

Having now received these reports and also heard evidence from various witnesses as to the progress already made in cotton-growing in all parts of the Empire, our next step must be to proceed to consider, in view of the information thus obtained, what organizations will be required to develop on a really large scale the growing of cotton within the Empire.

Speaking broadly, the Committee is of opinion:—

- (1) That the present position of the world's cotton supply cannot be regarded by the Empire without misgiving, not only because the supply is altogether deficient, but also because the cotton trade of the Empire

is, to a most undesirable extent, dependent upon an outside source for its supply of raw material, and

- (2) That if the proper measures be taken it is reasonably certain that in course of time a large proportion of the cotton required by the British Empire could be grown in its own territories.

These two propositions are very briefly treated in the following pages:—

#### *I.—General Position of the World's Supply.*

Even before the war there was already a deficiency in the world's annual cotton crops as compared with the actual consumption, which was only limited by the supply actually available.

The effect of the war was to reduce very materially the world's supplies of cotton, through a serious reduction of the acreage in all the countries which contribute most largely to the supply, while the demand after the first few months of the war exhibited a quite unexpected power of recovery. The resulting scarcity shows no signs of being materially mitigated while the war lasts; indeed, it is highly probable that the deficiency will be still more marked when peace brings a return to something like normal consumption among the Central Powers, who have been practically cut off from the world's supplies.

The war has brought home to the whole cotton trade the dependence of the industry upon the United States for its supply of raw material. While the general tendency of the American supply has been to increase, the annual returns show marked variation from season to season. These variations are mainly responsible for the violent fluctuations in price which have been experienced during recent years, and are most injurious to every branch of the cotton trade. Another point which must be taken into account in connection with the American crop is the increasing quantity which the American mills are taking for their own use.

An important advantage of the development of the resources of the Empire in medium cottons would be the provision of large areas for cotton-growing in different continents not subject to the same climatic vagaries as those of the American cotton belt, so that the world's supply would not be so largely dependent on the fortunes of the weather in one comparatively limited area.

#### *II.—Possibilities of the Empire for Cotton-Growing.*

The actual and potential sources of supply within the British Empire are India, Egypt, and the Sudan, the West Indies, and some of the African Colonies and Protectorates, more particularly Nigeria, Uganda, and Nyasaland. South Africa, Rhodesia, and Queensland have also proved their capacity to grow excellent cotton.

Of these, India offers the most promising prospects of a considerable increase of output within a reasonably short time; though the bulk of the Indian crop is of shorter staple than is required by the Lancashire industry and that of the British Empire outside India.

The cottons grown in the West Indies and in Egypt are each of a special character, which cannot at present be produced on a large scale in any other part of the world, and the exclusive possession of these sources of supply enables the British Empire to control to a great extent the spinning of fine counts of yarn which are mainly used in the production of the finer cotton materials. This is the more important inasmuch as there has been for many years a marked tendency, especially in Lancashire, towards the manufacture of finer fabrics, which require the use of longer stapled cotton.

In Uganda and in Nyasaland the cotton mostly grown has been of a grade intermediate between that of Egyptian and American. This grade is becoming increasingly important to the cotton industry, because in America of late years there has been a falling-off in the production of similar cotton.

The Empire's supply of cotton is chiefly deficient in the medium grades which form the raw material

\* A report has also been received from the Administrator of German East Africa

of the great bulk of the Empire's trade. Of such qualities the Empire's total production has hitherto been trifling compared to the world's production; but there have been distinct evidences of development on a large scale of new areas for the production of such medium cottons. Both India and West Africa have proved their capacity to produce such cotton in much larger quantities than hitherto.

The share of the British Empire in the world's cotton supplies is brought out in the following table, which shows the various grades of cotton, from the finest to the lowest, and the share of the British Empire in each grade.

[Here followed Table A, as printed in Appendix JX Statistics.]

From this it will be seen that, while the British Empire produces thirty-three per cent. of the very highest grade, eighty-nine per cent. of the second, and seventy per cent. of the third, its share of the great medium grade, the fourth, is only about two-and-a-half per cent., while in the lowest grade again it accounts for sixty-four per cent. of the total supply.

These facts have been generally known for some time past, and it was in view of them that the British Cotton Growing Association was formed in 1902. The Association, after much excellent and useful work, has reached the limit of its resources, and it has become necessary to consider how its work is to be carried on in the future. In the meantime there has become available much more knowledge of the scientific principles underlying the cultivation and improvement of cotton.

The Committee consider that the extension of cotton-growing within the Empire should form an integral part of any general plan for developing the resources of the British Empire and making it economically independent and self-supporting. It is undeniable that the measures which would lead to the extension of cotton-growing in various parts of the Empire, e.g., the extension and improvement of means of communication and transport, and the provision of irrigation facilities where necessary, are exactly the conditions which would lead to development in respect of every other crop which they are capable of producing, and at the same time would have the effect of raising the general standard of well-being of the inhabitants and increasing their purchasing power.

In view of these considerations, we are convinced that the appointment of the Empire Cotton Growing Committee, representative as it is of the various parts of the Empire, is amply justified. We are satisfied that the work of the Committee will expand and that its functions as a standing Imperial committee on cotton-growing should include the following:—

- (1) To secure the systematic collection, examination, and dissemination of information with regard to cotton-growing in various parts of the Empire, as well as in other parts of the world.
- (2) To consider and advise upon all questions affecting the development of cotton-growing within the Empire, including applications to or through the Imperial Government for funds for the execution of necessary public works, such as railways, roads, harbours, or other means of communication or transport, or of irrigation or drainage works.
- (3) To consider and advise upon the relative urgency and importance of schemes of development in connection with cotton-growing, and to secure the co-ordination of effort in different parts of the Empire.
- (4) To stimulate and secure the co-ordination of scientific research on cotton-growing, whether conducted by local Governments in the cotton-growing areas, or by suitable agencies in this country upon large questions of general interest to the Empire.

Much of this work has during recent years been performed in varying degrees by the British Cotton Growing Association and the Imperial Institute.

The Committee desire to put on record their appreciation of the admirable pioneer work done in many parts of the Empire by the British Cotton Growing Association, and in particular of the work of Mr. J. Arthur Hutton, Chairman of the Council of the Association, who gave to the Committee very full and most valuable evidence with regard to all the areas in which the Association has carried on its operations. The work of the Association in trying and proving the capabilities of various areas throughout the Empire for cotton-growing has been of value, even where the results have been negative, as well as in other areas where success has been clearly established, and cotton-growing upon a more or less commercial scale has followed from the efforts of the Association. Whatever be the future of the British Cotton Growing Association, certain branches of its work must be continued in one form or another in areas where cotton-growing is not fully established upon an independent commercial basis. The question of the most desirable form of this future organization is still under consideration by the Committee.

The Committee also desire to acknowledge the valuable work done by the Imperial Institute in connection with cotton-growing, especially in examining and reporting on samples of cotton grown in various parts of the Empire and in maintaining reference collections.

In conclusion, we desire to express the hope that the President of the Board of Trade will commend the work of the Committee to all the members of the Imperial Conference, and will endeavour to secure their co-operation and support in furthering its main object, namely, the development of the British cotton-growing areas, so as to free the Empire as far as possible from its dependence upon foreign sources of supply.

I have, &c.,

(Signed) HENRY BIRCHENOUGH,  
Chairman.

(b) EXPANSION OF THE COMMITTEE.

SIR,

22nd October, 1918

In your original reference to the Empire Cotton Growing Committee you asked us to investigate the best means of developing the growing of cotton within the Empire and to advise the Government as to the necessary measures to be taken for this purpose.

2. The Committee has from the first understood that it was not your desire that it should merely present a Report and should then cease to exist, but that it was your intention that it should be a Standing Committee in connection with cotton-growing within the Empire and that it should be competent for it to make recommendations from time to time with regard to its own constitution and activities.

3. In our Interim Report to you dated May 16th, 1918, we stated that we were satisfied the work of the Committee would expand and that its functions should include the following:—

- (1) To secure the systematic collection, examination and dissemination of information with regard to cotton-growing in various parts of the Empire, as well as in other parts of the world.
- (2) To consider and advise upon all questions affecting the development of cotton-growing within the Empire, including applications to or through the Imperial Government for funds for the execution of necessary public works, such as railways, roads, harbours or other means of communication or transport, or of irrigation or drainage works.
- (3) To consider and advise upon the relative urgency and importance of schemes of development in connection with cotton-growing and to secure the co-ordination of effort in different parts of the Empire.
- (4) To stimulate and secure the co-ordination of scientific research on cotton-growing, whether conducted by local Governments in the cotton-growing areas or by suitable agencies in this country, upon large questions of general interest to the Empire.



It was not intended that this should be an exhaustive statement of the Committee's functions. There was not in our minds any finality about it. It is to be noted that all the functions set out in the above statements are either advisory or supervisory in their character. They do not indicate that the Committee should itself take the initiative and undertake constructive work in connection with cotton-growing within the Empire.

4. The Committee has now been in existence for rather more than a year. During that time it has been engaged upon various useful enquiries, as is shown in the Interim Report above referred to, and certainly its time has not been wasted. It is, however, felt that a stage has now been reached when, if it is to fulfil the expectations raised throughout the Empire at the time of its appointment, it cannot remain purely advisory or supervisory but must initiate and accomplish genuinely practical work. Unless it does, it may not only stagnate itself, but may paralyse existing agencies connected with Empire Cotton Growing, which might otherwise continue to do good work. In these circumstances the Committee has been led to examine its own constitution and organization with a view to determining whether they are appropriate to the work it considers should fall within its future sphere of operations.

5. The Committee consists of 20 members, including representatives of the Foreign Office, Colonial Office, India Office, Board of Trade, the Government of India, Australia and South Africa, the British Cotton Growing Association and the Imperial Institute, the merchants and manufacturers of Cotton in the United Kingdom and in India, and the workpeople of the English Cotton Industry. The Committee is fully representative of all the interests concerned and we have no further recommendations to make in that connection. It is, however, a large Committee for the transaction of detailed business. The problems with which it has to deal are extremely varied and we are unanimously of opinion that the work would be most efficiently done if these problems were considered by smaller bodies, specially interested in each class of questions and specially qualified to deal with them.

We therefore suggest the formation of a series of sub-Committees to consist partly of members of the Main Committee and partly of additional members appointed *ad hoc* by the President of the Board of Trade upon the nomination of the Main Committee. These additional members would in each case be chosen for their special knowledge and experience. They would not be members of the Main Committee but only of the sub-Committee or Committees to which they were appointed.

6. In making this recommendation we have also in mind the importance of interesting a larger number of the leaders of the cotton industry—both employers and employed—in the problems and work of Empire Cotton Growing than it was possible to include in the Main Committee. It is quite clear that the Committee can only succeed in its work if it commands the full confidence and co-operation of the whole Cotton Industry, and it can only obtain that confidence, if it satisfies the Industry that it means practical business and has a proper organization for the efficient transaction of business.

Another argument in favour of the appointment of additional members to the Sub-Committee lies in the fact that it would make it possible, if it were thought desirable, to associate with the Main Committee's work some of the existing agencies—such for instance as the British Cotton Growing Association, the Imperial Institute and the Cotton Research Association—by the appointment of some members of their Managing Bodies upon the appropriate Sub-Committees with which we are dealing.

It is intended that these Sub-Committees should deal with all questions remitted to them by the Main Committee, whether by Standing Order or by special reference, and should in all cases report to the Main Committee.

We further recommend that it should be competent for Sub-Committees, with the consent of the Main Committee, to hold meetings in Manchester. It is considered that this will not only meet the convenience of Lancashire members, but will have the advantage of associating the work of the Empire Cotton Growing Committee more closely with the industry.

7. The following is the preliminary list of Sub-Committees, which we recommend should at once be formed:—

Finance.  
Commerce.  
Research and Education.  
Information, including both its collection and dissemination.  
India.  
Egypt and the Sudan.  
The Dominions, Colonies, and Protectorates.

8. *Finance*.—To this Sub-Committee all questions of finance would be referred.

(a) It would be its first duty to draw up an estimate of the probable financial requirements of the Main Committee (1) for its establishment, staff, accommodation, and initial general expenses, (2) for any immediate practical work of development; so that the Main Committee may submit an estimate to the President of the Board of Trade.

(b) This Sub-Committee would consider and report upon the financial aspects of all schemes laid before it for the development of cotton-growing areas within the Empire.

In many cases financial assistance of a substantial character may be required in order to establish or maintain the industry in new districts by providing gineries and buying agencies, by assuring to cultivators a satisfactory price for their crops, or by assisting to market their crops.

In other cases applications may be made to or through the Imperial Government for assistance in the raising of funds for public works, such as railways, roads, harbours and irrigation works, which are beyond the immediate means of the local Government.

All such questions—of which these are only intended as instances—would naturally be referred to the Sub-Committee of Finance before the Main Committee offered any advice to His Majesty's Government.

9. *Commerce*.—To this Sub-Committee would fall the consideration of the commercial aspects of all schemes for the development of cotton growing. It is suggested that it might in some form or other work with or through the organisation of the British Cotton Growing Association. That, however, is a matter for further investigation and consideration, which will engage the attention of the Main Committee almost at once.

10. *Research and Education*.—These subjects are bracketed together so as to avoid the formation of too large a number of sub-committees at the outset. The education we have in view is that of a body of skilled cotton agriculturists and investigators, the permanent supply of which is absolutely essential if progress is to be made in cotton growing.

(a) *Research*.—The importance of research is universally acknowledged. It will be the duty of this Sub-Committee in the first instance to consider and advise upon the part the Empire Cotton Growing Committee can best play with regard to (a) the investigation of the large questions of common interest to all cotton growers throughout the Empire and (b) those local problems which are mainly the business of the various Local Governments.

If a Cotton Research Association is ultimately formed for the Cotton Industry its sphere will cover all the problems involved in growing, spinning and manufacturing. It is suggested that this Sub-Committee might in liaison with the Research Association undertake the Empire Cotton-growing branch of the work. Failing the formation of a Cotton Research Association or in the event of such Research Association not including cotton growing in its scope, the Empire Cotton Growing Committee might through this Sub-Committee become the Research Body in connection with Empire Cotton growing.

(b) *Education*.—We consider that the provision of adequate training centres in the Empire, for the study of the agriculture of cotton growing is a matter of the greatest urgency. There is at present no centre to which a young man can go for the special training which is necessary. There is a great need throughout the Empire for education in the principles com-



mon to all tropical agriculture and it would be for this Sub-Committee to consider in the first place whether the attempt should be made to direct such education to cotton growing in particular or whether it should join its efforts with those of others who may have in view the provision of such education for tropical agriculture generally.

11. *Information.*—The Committee has always regarded the collection, examination and dissemination of information with regard to Cotton Growing as one of its essential duties. Such work, if properly carried out, obviously involves considerable expenditure and an adequate staff. It would be the first duty of this Sub-Committee to consider the question in all its bearings, and to make proposals. It is suggested that an arrangement might be come to with the authorities of the Imperial Institute for some form of close co-operation. The Institute possesses many of the necessary elements, including a staff, library, collections of samples, &c., and it ought to be possible to conclude an arrangement with the Imperial Institute which would avoid overlapping and multiplication of efforts. We have every reason to believe that proposals for collaboration would be welcomed by the Imperial Institute.

12. In view of the fact that the areas available in the Empire fall into three groups, namely,

1. India,
  2. Egypt and the Sudan,
  3. The Dominions, Colonies and Protectorates,
- and each of these groups presents problems in many respects different, it seems desirable to establish a Sub-Committee for each group. It is, of course, clear that in the case of India, Egypt, and the Dominions the functions of these Sub-Committees will be mainly advisory.

13. If our recommendations for what is in effect a large extension of the Committee's personnel and activities are accepted, it is clear that provision will have to be made for a suitable staff, and at no distant date for the service of an all-time Secretary. As already stated, it will be the first duty of the Sub-Committee on Finance to prepare an estimate of the probable immediate requirements of the Committee. Meanwhile we venture to ask for some general assurance that His Majesty's Government will afford such financial support to the Committee as is absolutely necessary, if real progress is to be made with the development of the cotton-growing areas.

We have the honour to be, Sir,

Your obedient servants, on behalf of the Committee,

(Signed) HENRY BIRCHENOUGH,  
Chairman.

(c) FINANCIAL REQUIREMENTS OF THE COMMITTEE.

25th November, 1918.

SIR,

1. The Finance Sub-Committee of the Empire Cotton Growing Committee has now been able to form a preliminary estimate of the Committee's financial requirements. They fall under two heads:—

- (1) Its immediate requirements for running expenses upon its establishment, for grants to allied bodies, for enquiries, missions, etc.
- (2) Its ultimate requirements for definite schemes in connection with development, research, and education, information, etc.

2. With regard to (1) it is necessary to ask for immediate provision to be made, and the following estimate is submitted.

It must, however, be remembered that the cost of the Establishment will depend upon the scope of the work to be undertaken, and that at his stage any estimate can only be provisional. Some little time may indeed elapse before all that is asked for in the estimate is really needed, but it is not considered that it would be safe to ask for less.

*Staff*—

Secretary	... ..	£800-£1,000
Two Assistant Secretaries—		
One with business or administrative experience—the other with some scientific knowledge	... ..	£300-£500
Three 2nd Division Clerks	... ..	£250-£350
Shorthand Writers and Typists, say 4	... ..	85s.-57s.

*Premises*—

- 1 Secretary's Room.
- 2 Two Assistant Secretaries.
- 1 Senior Clerk.
- 1 Office.
- 1 Typists' Room.
- 1 Library.
- 1 Sample Room.
- 1 Committee Room for at least 20 with witness-rooms, &c.
- 1 Ante Room for witnesses, &c.

*Library, &c.*—

Subscriptions to trade papers and publications	... .. say	£200
Binding Reports, &c.	... .. say	£200
Standard works of reference	... ..	—
<b>Total</b>	... .. say	<b>£2,500</b>
Publications and Provisions for grants, special enquiries, missions, &c., and propaganda and education	... .. say	£2,500
<b>Total</b>	... .. say	<b>£5,000</b>

3. With regard to (2), namely, the ultimate financial requirements of the Committee for definite schemes in connection with the development of cotton growing throughout the Empire, it is clear that there are alternative sources from which the funds required for such schemes as are contemplated might be obtained. For instance, necessary expenditure might be provided—

- (a) entirely out of the funds of the local Government in whose territory the area to be developed is situated;
- (b) partly out of such funds and partly by a grant or guarantee from the Imperial Government, where local funds were insufficient, or where the general interests of the Colony or Protectorate were not so entirely coincident with the interests of cotton-growing as to justify the Local Government in meeting the whole expenditure out of local funds;
- (c) partly from the funds of private corporations, and partly by a grant or guarantee upon terms from the Imperial Government.

In connection with such schemes as are contemplated in (b) and (c) the Empire Cotton Growing Committee might either make a specific recommendation for submission to the Treasury in each individual case, or they might be entrusted with the administration of a block grant out of which they would themselves make allocations subject to the approval of the President of the Board of Trade.

The Committee would be glad to know which of these two methods of procedure is likely to be adopted. In case the former method of procedure is likely to be adopted, the Committee would like to receive some assurance that it is the intention of the Government to give most favourable consideration to schemes approved of and recommended by the Committee, so that real and speedy progress may be made in the development of Cotton growing areas within the Empire.

4. At the present time the Empire Cotton Growing Committee have the following schemes before them, which will shortly involve large expenditure:—

- (1) The completion of the drainage and irrigation works in the Northern Delta of Egypt which have been postponed owing to the war, through lack of machinery and labour. The financial responsibility for these works had already been undertaken by the Egyptian Government, and it is assumed that as soon as the war is over they will at once be pressed on to completion.
- (2) The large irrigation schemes on the Blue and White Niles which are partly the necessary concomitant of the works already commenced in the Northern Delta, and are partly intended for the direct improvement of the Sudan itself, particularly in connection with the Gezira cotton Scheme. Provision had already been made to a con-

siderable extent for these works before the War by the undertaking of the British Government to guarantee the proposed loan of £3,000,000 which the Sudan Government were to raise for these and other development purposes, *e.g.*, railways. Owing to the war the issue of this loan was suspended, but the Treasury in 1917 granted a temporary loan of £500,000 to the Sudan Government to enable them to carry out at once certain preparatory works which would save delay in proceeding with the major works as soon as the war was over. It is presumed that the principal works of these schemes will now be proceeded with at the earliest possible moment. The question of whether the British Imperial Government will take direct responsibility for the further finance required, or whether the original scheme of a guaranteed loan will be reverted to should be taken up at once.

- (3) In other parts of Africa there are at least three principal schemes which were under consideration before the war, and which will now come up for early decision. All three have reference to railway development, one in Northern Nigeria, one in Uganda, and the third in Nyasaland. The Empire Cotton Growing Committee is at present considering the relative merits of these schemes both as regards feasibility and probable cost, and in relation to the increased quantity of cotton which might be expected to result in each area at an early date as the result of railway extension. They hope to be in a position to put before you with the least possible delay a concrete scheme recommending the immediate initiation of one or more of these schemes.

It may be well to conclude by reviewing briefly the possible developments of the work of the other sub-committees which have now been set up, in reference to their probable financial requirements.

5. *Commercial Committee.*—The amount of funds likely to be required by this Committee will depend largely on the arrangement to be come to with the British Cotton Growing Association for the future carrying on of its work. It seems undesirable that this Committee should itself undertake commercial work through its own officials. Its duties, therefore, would be confined mainly to arranging with the Association or other bodies the terms upon which the work is to be carried on by them, with Government assistance if necessary, and to supervising the manner in which the money thus provided is spent.

6. *Research and Education.*—The amount to be spent in this connection will depend on whether the Committee is itself to undertake or directly subsidise scientific work either in this country or elsewhere. It is probable that its work for some time at least will consist mainly in promoting and co-ordinating research by other bodies. If, however, the other course should be adopted it would obviously involve a considerable budget for scientific staff, and for premises and equipment.

With regard to education, it is probable that the Committee's energies may from an early date be given a somewhat wider scope. It may be necessary to stimulate by grants teaching of the kind required for the training of young men for cotton work abroad, or to provide allowances for selected men who are preparing for such service to enable them to carry out specialised training, *e.g.*, young men who have gone through a general scientific course might be given scholarships to carry on their training in particular branches at the Universities or elsewhere with a view to equipping them specially for cotton work abroad. If such a scheme were decided upon it would involve considerable expenditure which is not provided for in the above Budget.

7. *Information.*—The expenditure to be undertaken under this head depends to a certain extent on the arrangement to be made with the Imperial Institute with a view to making use of the information and collections already in their possession. If their library, for example, is taken as the basis of a collec-

tion for this Committee, the initial outlay would obviously be much less than if the Committee is to lay down such a library *ab initio*.

In the same way the probable expenditure on publications depends very largely on whether satisfactory use can be made of existing publications, such as the Board of Trade Journal or the Bulletin of the Imperial Institute, or whether it may be found desirable to issue a special publication. On this point much will depend on the character and extent of the scientific research work for which the Committee decides to make itself responsible.

In the meantime only very moderate allowances have been made in the above Budget for expenditure under these heads, but it is essential, even at this stage, to provide a certain amount for probable expenditure on special enquiries, missions, &c., and propaganda.

I have the honour to be,  
Sir,  
Your obedient Servant,  
(Signed) HENRY BIRCHENOUGH,  
Chairman.

(d) IRRIGATION AND RECLAMATION SCHEMES IN EGYPT.  
(Extract from a letter dated 29th December, 1917.)

"In particular my Committee hope that the Government will find it possible to agree with the Egyptian Government (1) to confine the restriction of acreage in 1918 within the narrowest limits consistent with the necessities of the case as regards food supply; (2) to take every possible measure to combat the ravages of the pink boll worm which has already reduced the average yield of the Egyptian crop so seriously; and (3) to take immediate steps to accelerate the completion of such portions of the reclamation works in Northern Egypt as are not absolutely held up by lack of essential machinery.

My Committee are informed that a great part of the work which has already been done in the direction of drainage is at present incomplete and therefore unfruitful, and that, while the work cannot be completed on the original lines until after the war, much could be done by comparatively small expenditure to bring into effect those parts of the work which are nearly complete. This would go far to improve the condition of the land already under cultivation, and to extend the possible area. It would be of the greatest benefit to the cotton position if even a hundred thousand feddans could thus be dealt with for the coming season's crop.

I am, &c.,  
(Signed) HENRY BIRCHENOUGH,  
Chairman."

(e) IRRIGATION AND RECLAMATION SCHEMES IN EGYPT  
AND THE SUDAN.

17th February, 1919.

SIR,

As you are no doubt aware, the irrigation and reclamation schemes which had been contemplated in Egypt and the Sudan before the war, are now being again considered with a view to immediate work. It is understood that the money required for the works in the Gezira district of the Sudan is to be provided at an early date, but this Committee is most anxious that the drainage and irrigation schemes in the Delta, and the barrage on the White Nile should also be pushed forward as early and as energetically as possible.

In my letter to you of the 29th December, 1917, I pointed out that a considerable part of the drainage work in the Delta had even then been completed, and that although it was impossible at that time to complete the two sections of the full scheme which had already been commenced owing to the impossibility of getting the heavy pumping machinery made in England, a considerable amount of work remained which involved but little manual labour, and which if completed would go far to secure immediate benefit from the work already done. This would not only have brought a considerable area of new cotton land into cultivation, but it would also add materially to the fertility of the land already under culti-

vation, and so increase the average yield of cotton per acre.

In reply to the representations which you then addressed through the Foreign Office to the Egyptian Government, the latter stated that it was then impossible to proceed further with these works, owing to the insistent demands of the army in Egypt for labour in connection with the military operations then proceeding in Egypt and Palestine, but they also stated that as soon as these operations were completed the work would be proceeded with at once.

Now that this condition has been fulfilled my Committee is most anxious that this essential work should be gone on with at the earliest possible moment. The Egyptian crop has suffered very severe curtailment during the war owing in part to the exigencies of the food supply. The restrictions on the acreage under cotton which the Egyptian Government found it necessary to impose in 1918, have now however been withdrawn, and it is extremely desirable that everything possible should be done to develop the Egyptian crop beyond its former dimensions. The completion of the drainage works is part of the necessary work to be done towards that end, and my Committee believes that no difficulty is now apprehended in obtaining the necessary labour. We should therefore be greatly obliged if you would now take the opportunity of pressing upon the Egyptian Government our great anxiety that this part of the work should now be pressed forward with the minimum of delay. It is in our view the most desirable that material progress should be made with the work during the coming spring and summer, so that the benefit of the improved drainage may be felt during the next flood season.

With regard to the completion of the two sections already undertaken by the installation of the large pumping plants at the sea-coast, my Committee believes nothing stands in the way of the immediate placing of the necessary contracts, and that such contracts would now be welcomed by the engineering firms concerned in this country. It is in our view very desirable that this should be done at once, so that these two sections may be completed at the earliest possible moment, and the full benefit of the work already done be realised as soon as possible.

Before that can be done, however, it is necessary that large reclamation works in the newly drained areas should be undertaken and the execution of these works must await the provision of further water supplies for the Delta. For this purpose the proposed dam on the White Nile, South of Khartoum was planned, and it is now essential that this scheme also should be taken up and pushed through to completion as soon as possible. Upon this will also depend the commencement of the remaining sections of the full scheme for the drainage and reclamation of the Delta, which, when finished, will add well over a million acres to the area available for cotton in the Delta. Such an addition is an essential matter to Britain, and my Committee trusts that no delay will take place in pushing the whole scheme through to completion. The supply of fine cotton is extremely critical, especially in view of the steady advance of boll weevil into the Sea Island districts of Florida and Georgia, and it is absolutely essential as a very minimum that the increase of the Egyptian crop should at least keep pace with the reduction of the Sea Island supply.

The Committee has recently had the advantage of hearing further evidence on this whole subject from Sir Murdoch Macdonald, K.C.M.G., Under-Secretary of State for the Public Works Department of the Government of Egypt. Sir Murdoch Macdonald made it clear that the Gezira scheme and the Blue Nile barrage, the Delta drainage scheme and the White Nile Dam, form one comprehensive whole, and the Committee is convinced that they would make possible a great increase in the production of cotton, the desirability of which we need not press on you. The Committee understands that the Gezira scheme is being pursued and does not therefore feel it necessary again to emphasise its importance at the moment; it does however wish to insist on the equal importance of the expansion of area in lower Egypt.

The Committee, therefore, wishes me to beg you to impress upon the Government of Egypt the necessity

for proceeding at once with the drainage of the Delta, and the barrage on the White Nile, both of which it feels are vital to the increased production of cotton in Egypt.

I am, Sir,  
Your obedient servant,  
(Signed) HENRY BIRCHENOUGH,  
Chairman.

(f) MESOPOTAMIA.

5th August, 1919.

SIR,

As you may be aware, this Committee was approached some time ago by Colonel Wilson, Acting Civil Commissioner for Mesopotamia, with a view to securing from this country the assistance of capital for the preliminary stages of the development of cotton-growing in Mesopotamia. They have since discussed the question with Mr. H. St. J. B. Philby, I.C.S., who was authorised by Colonel Wilson to carry the matter further after the latter's return to Mesopotamia, and more recently with Captain R. Thomas, of the Indian Agricultural Department, who has since 1918 been carrying on the experimental work in Mesopotamia. I may mention that these experiments have so far yielded most promising results.

Mr. Philby placed before this Committee a Memorandum embodying a statement of the position and the result of his interviews with the British Cotton Growing Association. This Memorandum has been discussed by this Committee, and they have also taken the evidence of Captain R. Thomas on the whole subject.

From this evidence it appears that the work, which was begun experimentally in 1918, is being carried further this year—still on experimental lines—but that in 1920 it ought to be ready for development on something more nearly approaching to a commercial scale. In that year a considerable area should be laid out as seed-farms, to provide a sufficient supply of commercial seed for the commencement of work on a large scale in 1921.

The British Cotton Growing Association have arranged to send out a deputation to Mesopotamia this autumn. This deputation, after going over the ground, will meet the Civil Commissioner, and discuss with him the terms of an agreement under which the British Cotton Growing Association will set up a number of model plantations, which will at once serve the purpose of seed farms and demonstration farms. It is extremely unlikely, however, that the necessary arrangements for putting this scheme into effect can be completed in time for the 1920 season, and it is therefore of the first importance that the Department of Agriculture in Mesopotamia should be put in a position to carry their present work beyond the experimental stage in that season to the extent of setting up a number of small seed-farms to propagate seed on a substantial scale.

It appears, however, that no provision has been made in the Mesopotamia Budget of the present financial year (1st April to 31st March, 1920) to cover the necessary preparations which must be made during the coming winter for the establishment of these farms next summer. The Budget, which, it seems, has been rigorously cut down, provides only for the carrying on of the present experimental work on the minimum scale.

My Committee is strongly impressed with the fact that, unless these seed-farms can be established in 1920, there will be a delay of at least a year in starting the production of cotton on a commercial scale; and in the present position of the world's cotton supplies such delay is to be avoided at almost any cost.

My Committee have, therefore, asked me to bring the matter before you immediately, and to represent to you in the strongest possible manner how desirable it is that the Authorities in this country (presumably the Treasury) should make sure that the Authorities in Mesopotamia are authorised and are in a financial position to carry on this work during 1920. The amount required is comparatively small, and would involve an addition to the Budget of only 75,000 rupees, which at the present rate of exchange is £6,250.

X9 (181) . 3 . N185

I enclose copies of two Reports by Captain Thomas on the recent experimental work, and also of memoranda submitted by him and Mr. Philby to this Committee.

I have the honour to be, Sir,  
Your obedient Servant,  
(Signed) HENRY BIRCHENOUGH,  
*Chairman.*

(g) AGRICULTURAL DEPARTMENTS OF THE COLONIES AND PROTECTORATES.\*

5th August, 1919.

Sir,

Among the many points which have been brought out by the evidence laid before this Committee with regard to the development of cotton-growing in various parts of the Empire, none has impressed us as being more urgent than the necessity for the immediate strengthening of the staffs of the Agricultural Departments in every Colony and Protectorate, where the possibilities of cotton production have been proved. Even before the war these staffs have never been really adequate, either in point of numbers or of the scale of salaries offered, and this fact had been recognised by many of the Governments concerned, who were taking steps to improve the conditions of service in their departments, and to add considerably to their strength. The outbreak of war, however, brought matters to a head. Many members of the staffs were called up for military service, while those who remained were in many cases transferred to other duties, with the result that the position of the Agricultural Departments more than ever calls for immediate consideration and action.

My Committee were greatly struck by the absolutely unanimous evidence of every witness that no effective measures can be taken to develop cotton-growing until this state of affairs has been remedied. In every case the work of improving or extending the cotton crop falls first and mainly upon the Department of Agriculture. We could quote many instances in which any scheme that this Committee would wish to propose is rendered impossible by the lack of staff to carry it out.

My Committee are so strongly impressed with the necessity of immediate action on this point, that they have decided, instead of waiting for the presentation of their Report, to bring the matter before you at once. They have, therefore, prepared a set of resolutions, of which I enclose a copy, and have asked me to forward these to you and respectfully to request that you will be good enough to place the matter

before the Colonial Office at the earliest possible moment, with your support.

I understand that the Colonial Office are, as a matter of fact, already considering the question, and that the views of the Committee may be of assistance to them in dealing with the matter.

My Committee desires to draw particular attention to the case of the Imperial Department of Agriculture in the West Indies, which apparently suffers from one peculiar disability. The funds of the Department being provided directly from the British Treasury, the salaries paid to the staff are subject to the deduction of British Income Tax, and the increased burden of the tax upon salaries already inadequate is proving so serious that the Director is afraid that he will lose the services of several of his staff unless arrangements can be made immediately to meet the difficulty. It is for this reason that the case of the Imperial Department has been specially referred to in the last of the resolutions.

I have the honour to be,  
Sir,  
Your obedient Servant,  
(Signed) HENRY BIRCHENOUGH,  
*Chairman.*

RESOLUTIONS REGARDING STAFFS OF AGRICULTURAL DEPARTMENTS, 30TH JULY, 1919.

That in the opinion of this Committee one of the necessary conditions for increasing the cotton crops of the Empire is the enlarging and strengthening of the Agricultural Departments in these Colonies and Protectorates in which cotton can be grown.

That this enlargement and strengthening is not possible without a considerable raising of the scale of remuneration for the members of the staff employed in those Departments.

That such raising of the scale of remuneration is advisable on general grounds apart from the extra cost of living consequent upon the war.

That this Committee respectfully recommends that the Colonial Office be asked to appoint a Committee to advise on the scale of numbers, salaries, and general expenditure which should be aimed at for adoption as and when circumstances permit.

That in certain cases which have come to the notice of this Committee, notably in the case of the Imperial Department of Agriculture for the West Indies, the matter is so urgent that it is desirable that, pending the Report of the suggested Committee, immediate increases of pay should be granted to the men employed.

\* See footnote to § 15, page 8.

## APPENDIX VII.

## SUB-COMMITTEES OF THE EMPIRE COTTON GROWING COMMITTEE.

1. *Finance.*

Sir Henry Birchenough, K.C.M.G., Chairman  
 Mr. J. S. Addison.  
 Mr. W. C. Bottomley.  
 Mr. D. T. Chadwick.  
 Mr. J. Cross.  
 Mr. J. Murray.  
 Mr. W. H. Himbury.  
 Mr. J. A. Hutton.  
 Mr. R. H. Jackson.  
 Mr. J. W. McConnel.  
 Mr. N. N. Wadia, O.I.E.

2. *Commerce.*

Mr. J. S. Addison, Chairman.  
 Sir Henry Birchenough, K.C.M.G.  
 Mr. Peter Bullough.  
 \*Mr. H. Boothman.  
 Prof. W. R. Dunstan, C.M.G., F.R.S.  
 Mr. N. S. Glazebrook.  
 \*Mr. William Greenwood.  
 Mr. W. H. Himbury.  
 Mr. F. Hodgkinson.  
 Mr. J. A. Hutton.  
 Mr. R. H. Jackson.  
 Mr. J. W. McConnel.  
 Mr. N. N. Wadia, C.I.E.  
 Mr. C. M. Wolstenholme.

3. *Research and Education.*

Mr. J. S. Addison, Chairman.  
 Sir Henry Birchenough, K.C.M.G.  
 Dr. W. Lawrence Balls.  
 Mr. W. C. Bottomley.  
 Mr. D. T. Chadwick.  
 Mr. J. Cross.  
 Prof. W. R. Dunstan, C.M.G., F.R.S.  
 \*Prof. J. B. Farmer, F.R.S.  
 Mr. J. W. McConnel.  
 \*Dr. E. J. Russell, F.R.S.  
 \*Sir Frank Warner, K.B.E.

4. *Information.*

Mr. J. W. McConnel, Chairman.  
 Sir Henry Birchenough, K.C.M.G.  
 Dr. W. Lawrence Balls.  
 Mr. W. C. Bottomley.  
 Mr. D. T. Chadwick.  
 \*Mr. J. I. Craig.  
 Prof. W. R. Dunstan, C.M.G., F.R.S.  
 Mr. J. A. Murray.  
 Mr. W. H. Himbury.  
 Mr. J. A. Hutton.  
 Mr. William Mullin.  
 \*The Chairman, Publications Committee of the  
 Textile Institute (Mr. F. W. Barwick).

5. *India.*

Mr. D. T. Chadwick, Chairman.  
 Sir Henry Birchenough, K.C.M.G.  
 \*Sir Charles H. Armstrong.  
 Mr. N. S. Glazebrook.  
 Mr. F. Hodgkinson.  
 Mr. R. H. Jackson.  
 Mr. L. J. Kershaw, C.I.E.  
 Mr. W. Mullin.  
 Mr. N. N. Wadia, C.I.E.  
 \*Sir Marshall Reid, C.I.E.

6. *Egypt and the Sudan.*

Mr. J. S. Addison  
 Sir Henry Birchenough, K.C.M.G.  
 Dr. W. Lawrence Balls.  
 Mr. Peter Bullough.  
 Mr. W. H. Himbury.  
 Mr. J. A. Hutton.  
 Mr. R. H. Jackson.  
 \*Mr. A. T. Loyd.  
 Mr. J. W. McConnel.  
 Mr. J. Murray.  
 Mr. William Mullin.  
 \*Hon. G. Peel.  
 Mr. C. M. Wolstenholme.

7. *Dominions, Colonies and Protectorates.*

Sir Henry Birchenough, K.C.M.G., Chairman  
 Mr. J. S. Addison.  
 Mr. Peter Bullough.  
 Mr. W. C. Bottomley.  
 Mr. A. Canham.  
 Prof. W. R. Dunstan, C.M.G., F.R.S.  
 Rt. Hon. A. Fisher.  
 Mr. W. H. Himbury.  
 Mr. J. A. Hutton.  
 Mr. R. H. Jackson  
 \*Mr. E. Judson.  
 Mr. J. W. McConnel.  
 Mr. William Mullin.  
 Mr. C. M. Wolstenholme.

8. *Joint Standing Committee with the British Cotton Industry Research Association.**Empire Cotton Growing Committee.*

Dr. W. Lawrence Balls, Chairman.  
 Mr. J. S. Addison.  
 Mr. J. Cross.  
 Mr. R. H. Jackson.  
 Mr. J. W. McConnel.

*British Cotton Industry Research Association*

Mr. F. W. Barwick.  
 Mr. H. Cliff.  
 Mr. J. C. M. Garnett.  
 Mr. William Greenwood.  
 Mr. K. Lee.

## APPENDIX VIII.

## WITNESSES.

The following gentlemen have given evidence before the Committee or one of the Sub-Committees. The names are given in the order in which they appeared before the Committee:—

- Sir Murdoch MacDonald, K.C.M.G., C.B., Adviser and Under-Secretary of State for Public Works in Egypt.
- Mr. E. Bonham Carter, C.M.G., Legal Secretary to the Sudan Government.
- Col. E. E. Bernard, O.M.G., Financial Secretary to the Sudan Government.
- Mr. D. P. McGillivray, Manager, Sudan Plantations Syndicate.
- Mr. J. Arthur Hutton, Vice-President, British Cotton Growing Association.
- Mr. E. R. Sawyer, Sudan Educational Department.
- Sir Daniel Morris, K.O.M.G., late Imperial Commissioner, West Indian Agricultural Department.
- Mr. Norris Dent, Managing Director of the Northern Rhodesian Cotton Company.
- Mr. A. McClure, Assistant Director of Public Works in Uganda.
- Mr. D. F. Basden, Chairman of the Uganda Company, Ltd.
- Major E. H. M. Leggett, D.S.O., British East Africa Corporation.
- Mr. F. H. Leakey, Uganda Cotton Ginning and Buying Company.
- Mr. W. H. Johnson, Director of Agriculture, Southern Provinces, Nigeria.
- Mr. J. P. Jones, Chairman of West African Section of the Liverpool Chamber of Commerce, and General Manager of the Lagos Stores, Ltd.
- Mr. W. H. Himbury, Manager of the British Cotton Growing Association.
- Mr. G. C. Dudgeon, C.B.E., late Consulting Agriculturist, Egyptian Government.
- Mr. A. T. McKillop, Ministry of Agriculture Egypt.
- Dr. E. J. Russell, F.R.S., Director of the Rothamsted Experimental Station, Harpenden.
- Lt.-Col. B. F. E. Keeling, O.B.E., M.C., Surveyor General of Egypt, Chairman, Cotton Research Board.
- Prof. W. Bateson, F.R.S., Director of the John Innes Horticultural Institution, Merton.
- Major H. V. Gorle, D.S.O., South Africa.
- Prof. J. B. Farmer, F.R.S., Professor of Botany, Imperial College of Science and Technology.
- Prof. W. Roberts, Professor of Agriculture, Lyallpur, India.
- Sir F. Lugard, G.C.M.G., C.B., D.S.O., late Governor-General, Nigeria.
- Mr. H. S. Goldsmith, C.M.G., Lieutenant-Governor, Northern Provinces, Nigeria.
- Sir H. F. Wilson, K.C.M.G., Chairman, North Charterland Exploration Co. (1910), Ltd., Secretary of the Colonial Institute.
- Mr. J. S. J. McCall, Director of Agriculture, Nyasaland.
- Mr. P. H. Lamb, Director of Agriculture, Northern Provinces, Nigeria.
- Mr. H. St. J. B. Philby, C.I.E., Indian Civil Service.
- Sir H. Hesketh Bell, K.C.M.G., Governor of Mauritius, late Governor and Commander-in-Chief of Northern Nigeria.
- Mr. S. Simpson, Director of Agriculture, Uganda.
- Mr. H. R. Palmer, First Class Resident, Northern Provinces, Nigeria.
- Mr. H. Martin Leake, Principal of the Agricultural College, Cawnpore, India.
- Sir Francis Watts, K.C.M.G., Imperial Commissioner of Agriculture for the West Indies.
- Captain R. Thomas, Indian Agricultural Service, Deputy Director of Agriculture (Research) Mesopotamia.

**APENDIX IX.**  
**STATISTICAL TABLES.**  
**TABLE A.**  
**THE WORLD'S COTTON SUPPLY AND THE BRITISH EMPIRE'S SHARE IN IT.**  
(Based on Pre-War Figures.\*)

Grade and Quality.	Where Grown.	World's Crop. Bales of 500 lbs.	Empire's Share. Bales.	Per cent.			
I. Best Sea Island ...	Islands, South Carolina ... ..	8,000	4,000	33			
	West Indies ... ..	4,000					
		12,000					
II. Sea Islands ... ..	Florida and Georgia ... ..	70,000	552,000	89			
	West Indies ... ..	2,000					
Best Egyptian (Sakel, etc.)	Egypt ... ..	550,000					
		622,000					
III. Egyptian ... ..	Egypt ... ..	700,000	760,000	70			
	Sudan ... ..	20,000					
Staple American	Mississippi Delta, etc. ... ..	200,000					
Peruvian	Nyasaland, Uganda, and East and South Africa ...	40,000					
	Peru ... ..	125,000					
		1,085,000					
IV. American ... ..	United States of America ... ..	15,000,000	415,000	2·5			
	Mexico ... ..	150,000					
	Brazil ... ..	300,000					
	Russia ... ..	500,000					
	West Africa ... ..	15,000					
	Levant ... ..	100,000					
	India ... ..	400,000					
	China and Corea ... ..	250,000					
					16,715,000		
	V Indian, etc. ... ..	India ... ..			4,500,000	4,500,000	64
	Russia ... ..	750,000					
	China ... ..	1,800,000					
		7,050,000					
		25,484,000	6,231,000	24·5			

\* In the case of Egypt the allocation between Grades II. and III. is based on the figures of the 1917 crop.

**TABLE B.**  
**ACREAGE, YIELD AND PRICES OF THE WORLD'S CHIEF CROPS. 1913-19.**

Season.	Acreage.	Percentage on 1913.	Crop.	Yield per Acre.	Liverpool Prices (pence per lb.).		
					Lowest.	Highest.	Average.
<i>American.</i>	<i>Acres.</i>		<i>Bales-500 lbs. approximately.</i>	<i>Lbs.</i>		<i>Middling.</i>	
1913-14 ...	37,458,000	—	14,609,968	195	6·20	7·96	7·26
1914-15 ...	37,406,000	100	15,067,247	200	4·25	6·50	5·22
1915-16 ...	32,107,000	86	12,953,450	200	5·34	8·74	7·51
1916-17 ...	36,052,000	96	12,975,569	180	8·12	19·45	12·33
1917-18 ...	34,925,000	93	11,911,896	170	16·90	24·97	21·68
1918-19 ...	37,207,000	99	11,602,634	156	15·24	24·77	19·73
1919-20 ...	33,960,000	91	11,000,000†	165‡	—	—	—
<i>Indian.</i>	<i>Acres.</i>		<i>Bales-400 lbs.</i>	<i>Lbs.</i>		<i>No. 1. Fine Oomra.</i>	
1913-14 ...	25,020,000	—	5,065,000	81	4·70	6·56	5·87
1914-15 ...	24,595,000	98	5,209,000	85	3·94	5·00	4·46
1915-16 ...	17,746,000	71	3,738,001	84	4·75	6·90	6·09
1916-17 ...	21,745,000	87	4,502,000	83	7·10	18·30	11·00
1917-18 ...	25,188,000	100	4,000,000	64	15·50	20·36	18·78
1918-19 ...	20,497,000	82	3,671,000	72	13·97	23·00	18·12
<i>Egyptian.</i>	<i>Feddans.*</i>		<i>Kantars.†</i>	<i>Lbs.</i>		<i>F. G. F. Brown.</i>	
1913-14 ...	1,723,094	—	7,684,172	444	8·15	10·45	9·44
1914-15 ...	1,755,270	102	6,490,221	369	6·30	8·30	7·34
1915-16 ...	1,186,004	69	4,806,331	406	7·50	11·90	10·42
1916-17 ...	1,655,512	96	5,111,080	310	11·60	31·50	21·56
1917-18 ...	1,677,310	97	6,307,618	375	28·56§	35·50§	30·97§
1918-19 ...	1,361,000	79	4,820,660	355	26·59§	30·19§	27·85§
1919-20 ...	1,573,662	91	6,000,000‡	380‡	—	—	—

\* 1 Feddan = approximately 1 acre. † 1 Kantar = approximately 100 lbs. ‡ Estimates. § Sakel.  
|| Government crop estimates which are generally about 20 per cent. below the trade estimates of the actual crop.



TABLE C.  
EGYPTIAN COTTON CROP.  
AREA AND YIELD, 1895-1919.

From the Annuaire Statistique de l'Egypte, Alexandria General Produce Association Bulletins,  
and the "Cotton Diagram."

Season.	Area.	Percentage of total area cropped.	Percentage.		Crop.	Average Yield lbs per Feddan.
			Upper Egypt.	Lower Egypt.		
1886	Feddans. 874,645	—	5·5	94·5	Kantars. 2,872,000	330
1887	865,396	—	7·9	92·1	2,996,000	345
Delta Barrage completed.						
1894-95	965,946	15·21	5·5	94·5	4,619,000	478
1895-96	997,735	15·51	7·0	93·0	5,275,383	529
1896-97	1,050,749	16·04	7·9	92·1	5,879,750	560
1897-98	1,128,151	16·68	8·8	91·2	6,543,628	580
1898-99	1,121,262	16·37	8·2	91·8	5,589,314	498
1899-1900	1,153,307	16·40	7·6	92·4	6,510,050	564
1900-01	1,230,319	17·18	7·1	92·9	5,435,480	442
1901-02	1,249,884	17·14	8·4	91·6	6,369,911	510
1902-03	1,275,677	17·17	8·4	91·6	5,838,790	458
Assuan Dam completed.						
1903-04	1,332,510	18·16	12·0	88·0	6,508,947	488
1904-05	1,436,709	18·94	17·0	83·0	6,313,370	439
1905-06	1,566,602	20·71	19·8	80·2	5,959,883	380
1906-07	1,506,291	20·14	16·3	83·7	6,949,383	461
1907-08	1,603,224	20·92	19·5	80·5	7,234,669	451
1908-09	1,640,415	21·59	20·8	79·2	6,751,133	412
1909-10	1,597,055	20·83	16·9	83·1	5,000,772	313
1910-11	1,642,610	21·30	19·2	80·8	7,573,537	457
1911-12	1,711,241	22·68	21·2	78·8	7,424,208	433
1912-13	1,721,815	22·42	21·8	78·2	7,532,920	437
Assuan Dam raised.						
1913-14	1,723,094	22·35	22·1	77·9	7,684,172	446
1914-15	1,755,270	23·19	21·8	78·2	6,500,000	370
1915-16	1,186,004	15·16	20·9	79·1	4,806,331	406
1916-17	1,655,512	21·73	22·1	77·9	5,111,080	310
1917-18	1,677,310	21·82	22·9	77·1	6,307,618	375
1918-19	1,361,000	—	22·1	77·9	4,820,660	355
1919-20	1,573,662	—	22·5	77·5	6,000,000*	380*

\* Estimates.

TABLE D.  
AFRICAN COTTON CROPS (EXCEPT EGYPT).  
From the Annual Reports of the British Cotton Growing Association.  
In bales of 400 lbs.

	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.	1918.
<b>West Africa:—</b>																	
Gambia ...	—	50	100	300	—	—	—	—	—	—	—	—	—	—	—	—	—
Sierra Leone ...	—	50	100	200	150	100	—	—	—	—	—	—	—	—	—	—	—
Gold Coast ...	—	50	150	200	200	250	200	200	100	100	120	100	100	100	100	100	100
Lagos and Southern Nigeria ...	25	550	2,100	3,850	6,150	9,750	5,700	12,400	6,200	6,100	9,170	14,200	13,750	6,300	9,400	7,900	3,100
Northern Nigeria ...	—	50	100	500	1,000	1,500	500	400	400	600	2,600	2,000	1,000	1,200	10,800	3,900	3,000
<b>Total West Africa ...</b>	<b>25</b>	<b>750</b>	<b>2,550</b>	<b>4,550</b>	<b>7,500</b>	<b>11,600</b>	<b>6,400</b>	<b>13,000</b>	<b>6,700</b>	<b>6,800</b>	<b>11,890</b>	<b>16,300</b>	<b>14,850</b>	<b>7,600</b>	<b>10,300</b>	<b>11,900</b>	<b>6,200</b>
<b>East and South—</b>																	
Uganda ...	—	—	—	—	500	2,000	4,000	5,000	12,000	20,000	29,000	26,000	42,000	25,200	26,100	24,000	33,000
British East Africa ...	—	160	850	2,000	200	200	300	300	400	500	900	1,000	500	300	200	200	200
Nyasaland and Rhodesia ...	—	—	—	—	2,300	2,700	2,400	3,200	3,400	5,300	7,200	7,500	8,000	9,000	8,500	6,500	5,000
South Africa ...	—	—	4	24	55	60	114	190	109	88	60	100	345	390	330	580	640
<b>Total East and South Africa ...</b>	<b>—</b>	<b>160</b>	<b>854</b>	<b>2,024</b>	<b>3,055</b>	<b>4,960</b>	<b>6,814</b>	<b>8,690</b>	<b>15,909</b>	<b>25,888</b>	<b>37,180</b>	<b>34,600</b>	<b>50,845</b>	<b>34,890</b>	<b>34,130</b>	<b>31,280</b>	<b>28,840</b>
<b>Total West Africa ...</b>	<b>25</b>	<b>750</b>	<b>2,550</b>	<b>4,550</b>	<b>7,500</b>	<b>11,600</b>	<b>6,400</b>	<b>13,000</b>	<b>6,700</b>	<b>6,800</b>	<b>11,890</b>	<b>16,300</b>	<b>14,850</b>	<b>7,600</b>	<b>20,300</b>	<b>11,900</b>	<b>6,200</b>
Sudan ...	300	2,000	3,500	4,000	4,063	7,773	9,540	6,890	15,370	21,907	15,000	14,000	10,000	24,000	16,200	23,000	12,000
<b>Total ...</b>	<b>325</b>	<b>2,900</b>	<b>6,904</b>	<b>10,574</b>	<b>14,618</b>	<b>24,333</b>	<b>22,754</b>	<b>28,580</b>	<b>37,979</b>	<b>54,595</b>	<b>64,070</b>	<b>64,900</b>	<b>75,695</b>	<b>66,490</b>	<b>70,680</b>	<b>66,180</b>	<b>47,040</b>

TABLE E.

DISTRIBUTION OF THE AMERICAN COTTON CROPS. (IN THOUSANDS OF BALES OF 500 LBS.)

Compiled from the Shepperson Company's "Cotton Facts," 1918, and from the Annual Statement of the American Cotton Crop published by the Liverpool Cotton Association, Ltd.

Season.	Total Commercial Crop.	Exports.			Taken by United States Mills.		Percentage of Crop taken by U.S. Mills.	
		To Great Britain.	To Continent, Japan, Mexico, etc.	Total Exports.	Takings of Northern Mills.	Takings of Southern Mills.		
1836-41 ...	1,670	984	418	1,402	268		16	
1841-46 ...	2,161	1,230	541	1,771	390		18	
1846-51 ...	2,330	1,244	538	1,781	549		24	
1851-56 ...	3,219	1,696	802	2,498	721		22	
1856-61 ...	3,780	2,020	933	2,953	827		22	
1861-65 ...	Civil War—No record of Cotton Movement.							
1865-70 ...	2,532	1,234	445	1,679	703	140	33	
1870-75 ...	3,831	1,889	768	2,657	1,075	121	31	
1875-80 ...	4,943	2,131	1,259	3,389	1,363	164	33	
1880-85 ...	6,086	2,585	1,551	4,135	1,625	296	32	
1885-90 ...	6,871	2,749	1,861	4,610	1,769	453	32	
1890-91 ...	8,674	3,345	2,446	5,791	2,027	613	30	
1891-92 ...	9,018	3,317	2,541	5,858	2,172	684	32	
1892-93 ...	6,664	2,301	2,089	4,390	1,652	723	36	
1893-94 ...	7,532	2,861	2,371	5,232	1,580	711	30	
1894-95 ...	9,837	3,449	3,277	6,726	2,019	852	29	
1895-96 ...	7,147	2,299	2,328	4,627	1,605	900	35	
1896-97 ...	8,706	3,022	2,957	5,979	1,793	999	32	
1897-98 ...	11,216	3,544	3,996	7,540	2,211	1,254	31	
1898-99 ...	11,256	3,525	3,788	7,313	2,217	1,415	32	
1899-00 ...	9,422	2,343	3,603	5,946	2,047	1,597	39	
1900-01 ...	10,339	3,050	3,488	6,538	1,964	1,583	34	
1901-02 ...	10,768	3,041	3,601	6,642	2,066	2,017	38	
1902-03 ...	10,674	2,849	3,826	6,675	1,966	1,958	37	
1903-04 ...	10,002	2,577	3,455	6,032	2,046	1,889	39	
1904-05 ...	13,654	4,124	4,609	8,733	2,292	2,270	33	
1905-06 ...	11,234	2,891	3,696	6,587	2,335	2,292	41	
1906-07 ...	13,540	3,750	4,614	8,364	2,510	2,495	37	
1907-08 ...	11,441	2,944	4,517	7,461	1,885	2,079	35	
1908-09 ...	13,817	3,539	4,908	8,447	2,688	2,555	38	
1909-10 ...	10,513	2,430	3,778	6,208	2,012	2,244	40	
1910-11 ...	12,075	3,347	4,269	7,616	1,994	2,307	36	
1911-12 ...	16,101	4,248	6,404	10,652	2,619	2,772	33	
1912-13 ...	14,104	3,604	5,176	8,780	2,450	2,939	38	
1913-14 ...	14,552	3,419	5,447	8,866	2,466	3,037	38	
1914-15 ...	15,136	3,798	4,571	8,369	2,817	3,271	40	
1915-16 ...	12,862	2,866	3,185	6,051	2,877	3,933	53	
1916-17 ...	12,737	2,688	3,076	5,764	2,727	4,187	55	
1917-18 ...	11,837	2,155	2,111	4,266	2,694	4,129	58	