154

EAST AFR: PROT

14367

C.O. 14367 REC.D 18 MAR 20

O.A.G. BOWRING.	152
1920	
12th Feby.	
Last previous Paper.	
52805/19	

Circular

ECONOMIC AND SCIENTIFIC RESEARCH IN PROT.

Describes brief description of resources of Prot.

Circ. desp 11 June 1919

Mr. Darnley per Bottomley

This has apparently been circulated with [illegible] 62496/18, which returned [illegible] on Saturday – from where is not known.

Paper [illegible] detail will no [illegible] be of [illegible] if there is any chance of getting grants from the Col. Research [illegible] for the E.A.P.

For [illegible] it has [illegible] as a "rich" Protectorate, but as things are [illegible]

Next subsequent Paper.

59392

(20080—4.1) Wt. 20449—35 50,000 11/19 H. St. G. 12/11.

badly in need as any Colony of any assistance which can be given in matters of this kind

[illegible] 28.20

[illegible] Dominica will be [illegible] all [illegible] the project.

[illegible]
1/7 20

[illegible] Dominica [illegible]
[illegible] 2 8 20

Sir R. Hamley [illegible]

The [illegible] Research Committee is [illegible] for [illegible] over [illegible] with appointment except from [illegible]

I think it is very likely that the [illegible] but when any appt is made the Dept should give some [illegible] to the means of the Colony

CRD 13/8

1) ~~[illegible]~~

2) Mr [illegible] Read

I do not think that ~~[illegible]~~ [illegible] has yet seen this despatch [illegible] to him. We may safely assume, I think, that Dominica is a "poor" Colony – [illegible] get down to practical [illegible] what we really would like to know is [illegible] what [illegible] could expect to receive from the [illegible] Research Committee [illegible] if so [illegible] estimate could be [illegible] then [illegible] other [illegible] would not [illegible]

the limits thus imposed.

3. If this procedure, quite out of the question, then the only way is to ask Gov to put up in an order of priority a limited number of concrete proposals for expenditure on what may properly be termed research work – whether medical, veterinary, agricultural, entomological, mycological, geological or mineralogical –

If I understand the position correctly, we must make it clear that the Col research Ctte might be able to make grants for limited numbers

but that it could not contemplate the financing of any kind in the nature of a permanent institution or organisation in Kenya.

A I agree. We ... also explain ... medical matters ... outside ...

4. You also see ... pp 24. 29 ... [illegible] ... (Colony ...) ... In particular do you agree with the suggestion in Chap X to set up a local ... of Economic Development, which would advise on schemes of research locally?

5. But in any case I feel that "something ought to be done" - otherwise there is the danger that the Colony will think that once more there has been a lot of writing & pious expression of hopes etc. - all leading (in Utopian phraseology) to Govt. Office pigeon-holes!

In this case alone, - apart from the great convenience, - it wd. be desirable if we could tell Kenya that the Col. Res. Ctee is probably able to give them £-,000 for - years.

ACCP
13.8.20

I am inclined to suggest £1,000 a year for three years, in the belief that the Ctee might ultimately find it possible to give a little more than £3000. But as the Ctee has not been consulted we should merely tell the Gov that if he will put up a scheme or schemes which will cost about this sum they will be laid before the Ctee. And note as at A of Mr Parkinson's minute.

I feel hardly qualified to express opinion as to the advisability of setting up an Economic Development Board which turns a great deal on local conditions. But I may remark that for the consideration of a special subject a special Ct. usually enables a more suitable personnel to be obtained, & that the function of such a Board would seem to be principally to settle priority between various schemes & to consider their financial aspects.

CRW 16/8

In a desp. which has just gone to the E.A.P. Admin: about the establ. of Amani as a central agricl. & research Institute for all of them, the S. of S. has said that if they will contribute certain specified sums, which were specified, he will ask the Research Ctee favourably to consider the question of making a substantial grant from their funds. We had much better concentrate for the moment on this scheme. The work of a really well-equipped institute of this kind will probably be of much greater value than the work carried out by a number of minor bodies, without much co-ordination & on a comparatively small basis.

Wait for replies to desp. & question at once

H. J. R.
16/8/20

See
C.A.S. 20.8.20
[illegible]
C.O. 31/12/20

would be able to provide laboratory accommodation for one or two plant physiologists. I suppose it is most unlikely that the Protectorate would be able to lend the service of any such officer.

CRD 31/1

Sir H. Read

We have nothing further as to a separate Botanical Dept and the Colony has no doubt been waiting to [illegible] about funds. An appt of Plant Breeder has however been created in the Agricultural Dept (candidate selected but not yet named) and this arrangement, so far as applied research is concerned, is I think on the right lines. Personally I should like to have the full views of the Director of [illegible] before going further.

As regards pure research, until the Amani project (see your minute on 14567/20) is settled one way or the other it is useless either to multiply effort or to make an application to the Research Committee for a separate object.

My

My inclination is to write unofficially to Sir E. Northey with reference to these despatches – explain that as regards botanical research properly so called we adhere to the proposal to make Amani the centre for E. Africa and that the assistance of the Research Committee (not the Research Dept.) will be best employed in that connexion – say that as regards work directed to special local problems, such as should properly be under the control of the Director of Agriculture we think it best that he should obtain a definite expression of Mr Holm's views on the lines on which he should proceed and that it will then be possible to ascertain whether any separate help can be obtained from the Cee for the separate object.

We might also ask for info about the Wickham's Department & its relation with the Agricultural & Veterinary work (It has been described to me as a "camp" by Mr Wickham, who ...

others when there was neither a D.A.A. nor a C.V.O. on the spot].

Of course the Gov. should put his obsrvns in the form of an Official despatch.

W.A.S. 8.2.21.

As proposed by Mr Bottomley.
at once.
H. J. R.
9/2/21

Mr Jeffries

AFRICA PROTECTORATE
No 152

GOVERNMENT HOUSE,
NAIROBI,
BRITISH EAST AFRICA

C O
14367/24
PEC
REC 18 MAR 20

-6-

4. As regards (a) there [illegible] that the question of the native [illegible] the most important [illegible] ed. In connec[illegible] native administra[illegible] [illegible] has been introduced [illegible]

[illegible]

[illegible] However this [illegible]

(b) Minerals. In [illegible] direction a considerable amount of investigation has already taken place and it seems improbable that there [illegible] of the more valuable ores [illegible] and Granites have been worked [illegible], but [illegible] oil [illegible] the [illegible] session the [illegible] the po[illegible] [illegible] ability. The [illegible] of a [illegible] sufficient. [illegible] and [illegible]. The possibilities of Salt [illegible] treated [illegible] [illegible]

EAST AFRICA PROTECTORATE

No. 152

GOVERNMENT HOUSE,
NAIROBI,
BRITISH EAST AFRICA.

C O
14367/20
REC. 18 MAR 20

February, 1920.

...ve Registration ...t Ordinance.

...dum by ...C. Ukamba.

...g & Topo ...Department ...24.9.19.

...overnment ...t. ...27. 9. 19. ...nclosures.

...dum by ...rvator of ...s.

...Veterinary ...ogist with ...ures ...10.12.19.

... Director ...lic Works ...10. 1.1920.

My Lord,

I have the honour to refer to Your Lordship's Circular (A) Despatch of June 11th respecting possible lines of economic and scientific research which might be pursued in this Protectorate and to express on behalf of this Government and the East African public generally the great appreciation and satisfaction with which they have learnt that Your Lordship views such investigations with so much interest and may in certain cases extend financial assistance in furtherance of them.

2. The subject is of course a very extensive one, but it has to some extent been covered by the Report of the Economic Commission forwarded to Your Lordship in my despatch No.553 of 5th June 1919. I have now consulted the Heads of the various Departments principally concerned and the following remarks are a brief indication of the existing position, though they are in no way exhaustive.

3. The resources of the country may be roughly divided into three heads.

(a) Man-power
(b) Minerals and means of generating mechanical energy.
(c) Agricultural and pastoral possibilities.

4.

RIGHT HONOURABLE
VISCOUNT MILNER, P.C., G.C.B., G.C.M.G., &c., &c.
SECRETARY OF STATE FOR THE COLONIES,
DOWNING STREET,
LONDON, S.W.

-2-

As regards (a) there can be no doubt that the question of the native labour supply is one of the most important problems with which we are at present confronted. In connection with native administration generally considerable progress has been made. A Chief Native Commissioner has been appointed and an organization sketched out for separating the native reserves for administrative purposes from the areas where white settlement is predominant. Legislation has been introduced for Registration and also for the control of squatters on European Farms. Expenditure has been provided on the Estimates for the extension of Medical and Educational facilities in the Reserves. Much however remains to be done and it is essential that a separate Labour Department should be formed to investigate and examine the sources of supply and demand, to ascertain the necessary statistics and to correlate the various factors which govern the market. At present, although there is a very important call for an increase in the number of workers, it is [illegible] to ascertain the actual requirements [illegible] given the necessary data the [illegible] would be greatly facilitated. It is hoped [illegible] the object may be achieved by the enactment of a [illegible] of which I attach a scheme amending the Native Registration Ordinance by making provision for the rendering of monthly returns by employers of labour. As however this will throw a considerable amount of work on the latter I have thought it desirable to postpone its introduction until the new Council comes into [illegible].

C.

(b) Minerals. In this direction a considerable amount of investigation has already taken place and it seems improbable that there are any deposits of the more valuable ores on a commercial scale in the Protectorate. Mica and Graphite have been worked experimentally, but have not proved payable. Soda at Lake Magadi is being extracted by a Company and exported, but, it is open to question whether this valuable product should not be retained in the country as a basis for the manufacture of Soap and Glycerine, which would stimulate the local market for oil seeds and incidentally provide a supply of oil-cake for stock. By the terms of the present concession the community derives little if any profit from the possession of an extensive reservoir of this useful commodity. The amount available is very large and the retention of a comparatively small proportion of it would be sufficient.

Minerals which it would probably be worth while to investigate are Baryte, Manganese, Diatomaceous Earths and Bituminous Shales. The possibilities of Salt manufacture have been treated in a memorandum by Mr. Beaton and Mr. [illegible]. The production of Cement [illegible] there are undoubtedly deposits of suitable limestone and a plentiful supply of fuel, this material would assist the development of the Protectorate enormously.

Generally speaking the [illegible] of further Topographical Surveys is recommended and the extension of the Mineral Survey Department. As Your Lordship is aware our activities in this direction have necessarily been curtailed through lack of funds.

6.

V. The sources of development of mechanical power resolve themselves as far as East Africa is concerned, for all practical purposes into wood and water, neither coal nor oil having been discovered in payable quantities. Wood has been somewhat wastefully employed in the past for the generation of energy and an extended application of water-power is very desirable. Many estates are now making use of it and this tendency is on the increase both in the way of turbines and plant for the production of electricity. The Acting Director of Public Works is of opinion that no unit or group of units exists large enough to justify its consideration by Government from the point of view of public utility. Your Lordship may however think it desirable to obtain Mr. McGregor Ross's opinion in regard to this. As you are aware he is now on leave in England. A Government Hydraulic Engineer has been recently appointed to consider the question of water supply, its conservation and utilization both for power-production and irrigation. It is very probable that much might be done by sinking bores in suitable places. Investigation is also required into the possibility of an treating by filtration or other means the effluents from sisal, coffee and flax factories, as to render them innocuous.

VI. The Analytical Department occupies a position midway between the sub-divisions (b) and (c) of this enquiry. Considerable progress has been made in the examination of rocks, minerals and soils, and researches have been instituted with the effect of environment upon the anatomy and physiology of Plants. A grant in aid has been made both in the Analytical Laboratory itself and for investigations

the field is however required for the prosecution of this important branch of enquiry. It is also suggested that bonuses should be offered to Administrative Officers for observational, photographic and collecting work.

A section devoting itself to Meteorology and Climatology should also be formed and attached to the Department. At present the only Meteorological officer belongs to the Agricultural Staff.

6. (e) As Your Lordship is aware this Government has not neglected the Agricultural possibilities of the Protectorate. On the practical side we have experts in Coffee, Pig and Dairy Products, Horticulture, Cereals, Flax and Tobacco. There is an Economic Plants Division and experimental farms at Mazeras, Kibos, Kabete and Muguga, while a fifth is shortly to be established on the Uasin Gishu Plateau. On the scientific side there is a Division of Entomology and a Mycologist. All these services, particularly the latter, could, however, be greatly extended, were funds available, as the field of investigation is a very wide one. The creation of a separate division of scientific Botany is advocated.

The same remarks apply to the sphere of Veterinary activities. It has long been recognised that the stock industry is one of our most important and valuable assets and considerable sums of money have been spent upon it. A well equipped Laboratory has been established at Kabete and much useful work has been done in connection with the diseases of cattle and other animals and the preparation of preventive Sera. This Protectorate has also supplied large quantities of the latter to neighbouring Governments. The possibilities

possibilities in this direction are however infinite and further expenditure and increased staff would enhance the value of the institution and produce even greater results. On the practical side there is a similar need. The stock industry requires more supervision and control than the Department, short-handed as it is, can exercise at present to prevent the spread of disease and to encourage the development of an export and coll[illegible] trade.

(d) In the domain of Forestry the work so far accomplished has been mainly of a conservative nature. Considerable areas have been demarcated and measures taken to prevent destruction by native encroachment or external agencies such as fire. The energies of the Department have however necessarily been mainly directed to the supervision of cutting operations and the control of wasteful exploitation. Local demands have absorbed all available supplies and there is still such a shortage of bamboo timber that large quantities have to be imported. There are prospects however of an export trade in pencil cedar and Bamboo pulp for paper-making.

The Conservator is anxious to extend his experiments in methods of forest regeneration and presses for the establishment of a Bureau of Forest Research at an estimated expenditure of £1000 initial and £1500 recurrent. There is no doubt that such an institution would be extremely useful.

I have addressed Your Lordship in a separate despatch on the subject of an amalgamation of the Forest Departments of this and adjacent territories.

[illegible]

11. I attach for Your Lordship's further information copies of the memoranda furnished by the various Departments which form the basis of the foregoing observations.

I have the honour to be,

Your Lordship's

humble, obedient servant,

ACTING GOVERNOR.

INCLOSURE I

In Despatch No. 1208 of 12 - 2 - 1920

C O
14367
REGD
REC'D 18 MAR 20

A Bill

Entitled

An Ordinance to Amend the Law Relating to the Registration of Natives.

Printed by the Government Printer, Nairobi.

A Bill

Intituled

An Ordinance to Amend the Law Relating to the Registration of Natives.

Short title.

1. This Ordinance may be cited as "The Native Registration Ordinance, 1915," and shall be construed and read together with the Native Registration Ordinance, 1915, hereafter referred to as "The Principal Ordinance" and the Native Registration Amendment Ordinance, 1915.

Amendment of section 2 of the Principal Ordinance.

2. (1) Section 2 of the Principal Ordinance shall be and is hereby amended as follows:—

After the definition "District" there shall be added the following definition "Chief Registrar of Natives" means the officer appointed from time to time by the Governor to perform the duties of Chief Registrar of Natives who shall have his office at Nairobi.

(2) After the definition "Registration Officer" there shall be added the following definition "Central Registration Office" means the office of the Chief Native Commissioner at Nairobi.

Repeal of section 12 of the Principal Ordinance and re-enactment thereof.

3. (1) Section 12 of the Principal Ordinance is hereby repealed and the following section substituted in lieu thereof:—

"12. (1) Every person employing a native shall notify the Chief Registrar of Natives, Nairobi,

(a) of such employment, the name or names of the native, the consecutive number given or assigned to the native in the Register, the date of employment, the contract period, the nature of employment and rate of pay;

(b) the discharge, desertion or death of any native in the employ and the date thereof, and shall also in case of death forward to the nearest District Commissioner the certificate and metal case of the deceased.

(2) Such notification shall be forwarded to the Chief Registrar of Natives before the tenth day of the month next following such engagement, discharge, desertion or death.

Amendment of section 14 of the Principal Ordinance.

4. Section 14 of the Principal Ordinance shall be and is hereby amended by adding the sub-section following:—

"(2) Shall fail to notify, or shall knowingly notify any false particulars required to be notified under Section 12."

Amendment of section 21 of the Principal Ordinance.

5. (1) Section 21 of the Principal Ordinance shall be and is hereby amended as follows:—

By adding the following sub-sections:—

(4) Prescribing the duties of the Chief Registrar of Natives.

(5) Prescribing the fees and charges for any entries made, or any act, matter or thing done under this Ordinance.

(2) The figure (4) in brackets in Section 21 of the Principal Ordinance shall be deleted and the figure (6) in brackets substituted therefor.

Numbered case.

6. (1) Every native on being registered under the Principal Ordinance shall be given a metal case wherein he shall keep and carry at all times his certificate.

(2) There shall be stamped on such metal case the number given or assigned to the native in the Register and set out in his certificate.

(3) Any person who shall contravene the provisions of this section shall on conviction be liable to a fine not exceeding Rs. 150/- or to imprisonment for a term not exceeding 3 months or to both.

Offences.

7. Any native who shall dispose of, destroy, damage or put to any use not prescribed by Section 6 of this Ordinance the metal case issued to him thereunder or who shall fail to carry such metal case upon his person with his certificate therein shall on conviction be liable to a fine not exceeding Rs. 150/- or to imprisonment of either description for a period not exceeding 3 months or to both.

Replacement of metal case.

8. (1) Any native who has lost the metal case issued to him under Section 6 of this Ordinance or whose metal case has been damaged or destroyed may obtain a new metal case from the nearest Registration Officer who may demand the payment of Re. 1/- therefor.

Provided that should such native prove to the satisfaction of the Registration Officer that his metal case was lost, damaged or destroyed through no fault or neglect of his own the new metal case shall be issued free of charge.

(2) If a native has undergone punishment after conviction from failing to carry such metal case or for having disposed of destroyed from or damaged such metal case the Registration Officer shall issue a new metal case free of charge.

(3) If the loss, damage or destruction of a metal case was caused by an employer of the native or other person such employer or other person shall pay a fee of Rs. 2/- for a new metal case; such fee shall be recoverable in a Court of competent jurisdiction.

Penalty: use of metal case.

9. Any native who shall keep and carry a metal case issued under this Ordinance other than the metal case given to him under Section 6 or Section 8 of this Ordinance shall be guilty of an offence and shall on conviction be liable to a fine not exceeding Rs. 150/- or to imprisonment of either description for a period not exceeding 3 months or to both.

Return of metal cases.

10. Any native who shall come into possession of a certificate issued under the Principal Ordinance other than the certificate issued to him or of a metal case issued under this Ordinance other than the metal case issued to him shall at the earliest opportunity forward such certificate or metal case as the case may be to the nearest Magistrate or to the nearest Registration Officer. Any native who contravenes the provisions of this section shall on conviction be liable to a fine not exceeding Rs. 150/- or to imprisonment of either description for a period not exceeding 3 months or to both.

Person employing native to keep labour register or record.

11. Every person employing a native shall keep a labour register or record of all natives employed by him showing in each case the number given or assigned to the native in the register, the name of the native, nature of employment, pay and the date of engagement, discharge or death. Such register or record shall be open to inspection and examination by any Registering Officer, or Police Officer, or any other officer duly appointed by the Governor in that behalf, and any such officer may require the production of the labour register or record of any employer for the preceding 12 months, and any such officer may require at all reasonable times the production of any servant in the service of any employer in order to examine his certificate and to make any inquiries concerning matters affecting the provisions of this Ordinance which he considers necessary. Failure or refusal to produce records or servants when required shall be an offence.

Officers empowered to call for labour register or record and production of servant.

152 12 2 320

Production of Raw Materials conditioned by Labour.

Circular A lays stress on the necessity for and the advantages of Scientific Investigation of each Colony's resources, particularly in the field of Raw Material. This Protectorate has given proof of the ability of its soils and climates to produce Raw Material in vast quantities but there is one uncertain factor of equal or greater importance viz: Labour. That the production & treatment of raw materials is conditioned by the supply of African labour admits of no dispute and it is as essential to investigate the resources, possibilities and limits of Labour as it is to analyse soils, conduct geological surveys, and combat plant & animal disease.

Labour Commission's recommendations insufficient.

The completely hap-hazard treatment of this subject has been considerably amended by the fulfilment of many of the recommendations of the Native Labour Commission 1912-13: a Chief Native Commissioner has been appointed: a scheme for Native Administration suggested: Labour Inspectorships created & filled: the demarcation of the Native Reserves nearly completed: the Resident Natives Law passed though not yet applied: increased Taxation applied: the Registration Ordinance passed and prepared for application: a few steps taken to restrict the consumption of Native Liquor: money provisionally earmarked for Native Education: mechanical transport increasingly substituted for porterage.

But with all this no great improvement has taken

P.T.O.

taken place because the Native Labour Commission's recommendations did not go far enough although the Commission recognised that Labour was a vital if not the governing factor of the Protectorate's prosperity, even as Agriculture, Transport & Veterinary Science are, as proposed and put forward that Labour should be studied and [illegible] administered by a special Department or Sub-Department of experts even though every other factor was already so constituted. The Commission was content to leave the matter as one of the many activities of the Chief Native Commissioner and the future Native Affairs Department.

3. Lesson from War.

If the need for specialisation in Labour matters was not recognised before, the War has now made it clear: it is scarcely necessary to state that the East African campaign depended upon the organisation of the Military Labour Corps and it was as much due to the attention paid to every ramification of this branch of the Service as to any other cause that the campaign ended successfully: had the Military left the supply and administration of the Native Labour Transport to chance as has the Civil Government, the production and distribution of Civil Labour, the Germans might be in German East Africa to-day.

The parallel of the need in peace is exact although methods must vary to [illegible] the organisation and production of [illegible] Labour is as important in Peace time as it was essential in War.

4. Mutability of Labour conditions necessitate permanent sp[ecial] staff.

The mutable conditions of Labour, new tribes coming into or to the edge of the Labour market, others dropping out - 10 years ago there were Masai

syces, [illegible] a [illegible] demand [illegible] in variety & quantity, and above all the material, [illegible] being the most complex & variable possible, these variable conditions render the creation of a permanent scientific department of experts essential to the development of this all important factor in the production of wealth.

At the present moment an effort is being made to discover the Labour Demand of this Protectorate and the curve of seasonal demand: however successful the attempt may be in two years the figures will be obsolete. 170

The potential Labour supply of this country can be roughly discovered by taking a percentage of the [illegible] population but no statistics exist showing in what proportion the tribes come out to work or abstain from work, nor is there a Department or organisation capable of arriving at such conclusion.

Government working in the dark compared with commercial methods.

So far as Labour is concerned Government may be said to be working entirely in the dark. Compare this lack of system with the methods of a large Industrial firm, say Lever Bros.: There will be found chemists, experts in the purchase of Nuts, Oils & Alkalis conversant with the world stocks of such necessary materials, Agents travelling the world encouraging the planting of [illegible] crops or the production of chemicals, [illegible] Engineers, Accountants, Advertising [illegible] experts, every department

P.T.O.

department keyed up & tuned to the latest methods of production and the needs of the industry: similarly if this Protectorate is to be regarded as a Commercial proposition we must organise not merely in the discovery of raw material but in the perfection of every part of the machinery least of all can we continue to neglect the most important item of all, the Study of the African Labour Supply.

The activities of this Labour Department would be manifold.

In relation to Demand it would be in continual touch with all employers, preferably through an East African Chamber of Commerce which as yet does not exist, as fully as possible cognisant of all aspects Demand in the Present, the Immediate, & the Visible Future: these aspects would include not merely the quantity of Labour required but also the nature, seasons & localities of Demand.

(b) In re Supply

On the side of Supply it would discover:-

(1) the proportion of each tribe coming into or abstaining from the Labour Market,

(2) other possible but untapped sources of Labour and the means of tapping them,

(3) the causes of & impediments to the free flow of Labour in each case,

(4) methods of removing such impediments,

(5) the normal seasons of Labour flow,

(6) the causation of seasonal variation of flow,

(7) means, where necessary & possible, to alter such causation so as to bring Labour out to meet the seasons of Demand,

(8) the directions of Labour flow,

(9) methods to divert, where necessary & possible, the flow of Labour so as to have choice,

(10) every method of encouraging Labour already flowing by ameliorating conditions at or on the way to Labour Areas,

In short so to provide that Supply shall meet Demand.

171

(c) In re possible over-development.

Another valuable function of this Department would be to watch for and give warning against over-development, a quite possible contingency in this country of vast extent & limited populations: that our resources are finite must be admitted and it is important to remember that it needs far more labour to reap than to develop plantations.

(d) In re the State.

Another activity of the Labour Department would be the provision of State Labour. Without going into details it may be as well to state certain premisses in this respect. In the first place the upkeep of all State Services is a condition of the prosperity of White & Black and therefore every Native owes a duty to the State in this regard.

Secondly the State owes a duty to every Native and if it is true, as I firmly believe, that European domination of Africa is a necessary stage of African evolution, that the European is merely playing the game of Nature as revealed throughout history - the dominant race compelling the labour of the inferior, primarily & as its motive force to the advantage of the former though according to the former's ever higher moral code, but ultimately & therefore all the

while

P.T.O.

while to the benefit of the inferior race - if this is true then it is obligatory upon us that we should demand the labour of the African and inevitable that we shall do so, because we are proceeding on the course laid down by Nature in the Evolution of Races. It is not suggested that this latter argument justifies compulsion upon the African to work for any individual European for that European's profit, but it does justify the State in compelling the labour of the African so far as the duty of the African admits i.e. to and for the State.

Given then that we are bound by Duty & Fate to compel African Labour, Government must organise that production upon the most humane, equitable & moral lines known. This can only be done by scientific systematic study of the Labour Problem by experts in that Branch.

It seems necessary to add only one further remark. To a great extent the activities of this Labour Department are bound up with those of the Native Administration. In important aspects however, especially on the side of Demand they exceed those bounds: it is for this reason that a recommendation is made here that the Department should not be subordinate to but parallel with that of the Native Administration: it should have its own Head sitting on Legislative Council independent & responsible under the Governor directly for his policy.

7. Department should be independent.

PROVINCIAL COMMISSIONER

C/O. TRIG. & TOPO. SURVEY DEPARTMENT,
Military Siding,
Nairobi, 24th. September 1919.

No.M/142.

172

The Hon: The Chief Secretary,
E.A.P. - NAIROBI.

RE: ECONOMIC RECOURSES OF THE BRITISH EMPIRE.

Sir,

With reference to your memo No.S/20329/5 dated 19.9.19.

1. What is being done at the present time.

(1) The only serious development of the Protectorate Mineral Recourses is that of the Soda Works at Magadi Lake. These are not dealt with by my Department.

(2) Other developments are shortly as follows:-

MICA PRODUCTION.

This was developed by the administration, under instructions from England, in connection with supplies for the Minister of Munitions. The industry will no longer be carried on by the administration, and tenders have been invited for taking over the workings by private individuals. A considerable amount of satisfactory mica was exported, but we have no report as to what prices this realized. I am not in a position to quote accounts showing profit and loss on the venture, as worked by the Government, but it is safe to say that had working been continued, and further developed, the position would have become a paying concern should the demand for mica in home markets not decline. Future success now depends upon future demands, reserve stocks accumulated during war which may be turned on the market, and the development in India, Canada or G.E.A., which may maintain recently developed areas due to war demands, or possibly close down to pre-war conditions (I quote here from a report by Professor Gregory).

(3) Production of Graphite.

Graphite is being worked near Machakos, but the works have not yet begun to pay. As development continues, the assays improve, the last report available being 87% graphite, and it is hoped by the firm engaged, to find suitable machinery for extracting the foreign matter from the ore by some cheap process. If the percentage of pure graphite improves, the mining of graphite may compete with other markets, but it must improve in quality before it does so. It is interesting to note that in connection with this mineral, we possess in the Protectorate, an almost inexhaustable supply of pencil cedar, and have all the raw materials for pencil manufacture.

Contd.

(4) The above exhausts the list of minerals which are receiving any attention at the present time.

2. WHAT COULD BE DONE AND AT WHAT COST.

(1) It is quite impossible to give a satisfactory answer to this question until we have more information with regard to our mineral recourses than we have at present, and I will merely confine this memo to a mention of possible sources of development.

(2)
BARYTA.

A recent discovery has been made at VITENGENI. The sample analysed contained 83.8 % lead and.008 % silver, and would yield approximately 9 ounces of silver to one ton of lead. The discovery may lead to further deposits of the same nature.

(3)
MAGANESE.

There are in the coast belt deposits of maganese ore; the ore is a low grade and would only be a paying proposition if worked by a large company who could provide suitable transport to the coast and make arrangements for ships to carry the ore as ballast.

(4)
SALT.

The manifacture of salt from sea water has recently formed the subject of a monagraph by Mr. Hobley which he submitted to you (Ref. your file S/19362/16). It seems worthy to note that we import approximately 4500 tons annually, and by developing our own industry could save this amount of space in sea freight for other commodities.

(5)
DIATOMITE.

There are [illegible] in the country and the Government Analyst in a report on the deposit at mile 61 Magadi Railway estimated over 3[illegible]0,[illegible] tons available from this deposit alone. It [illegible] that the price of diatomite in Engla[illegible] of its being exported as it [illegible]. It is used for brick making. [illegible] of soda manifacture and the manifacture [illegible] explosives, and its exploitation for local manifacture [illegible] be considered in connection with other econom[illegible] development

(6)
BITUMINOUS MINERALS.

Deposits of xxx Bituminous shales and lignite have been reported from time to time.The most promising seems to be a carboniferious bed 45 feet under ground and 30 to 35 feet thick, which was discovered in sinking a well in the vicinity of Takaungu in 1915, the shaft has since fallen in and no further action has been taken to develop the discovery.

Contd.

(7)
CEMENT MANUFACTURE.

It seems undoubted that suitable lime-stones for cement making can be found in the Protectorate, and in connection with the Bituminous deposit referred to above the coal was found under an overburden of 10 feet of compact earthy lime-stone which was reported on by the Imperial Institute as worth examination for cement making purposes. The importance of the early development of cement manufacture in the Protectorate cannot be over-estimated.

3.

(1) The development of the Mineral resources of the Protectorate is in its infancy, and until the Administration is in a position to carry out a mineral survey and to disclose at least some of the mineral wealth of the country and its approximate locality, I do not think we shall attract prospectors to the extent necessary for much development by private interprise, and the only course open therefore is the early development of the Mineral Research Department.

(2) In connection with the work of the experts of this Mineral Research Department, I would emphasise the economy and general facility to them, which would result by the early topographical survey, on a suitable scale, of such areas as shown the most probable chances of success in prospecting.

(3) An accurate topographical survey of the mineral areas is an essential, and if the survey cannot be carried out by an expert, it will have to be done by the prospector himself. If the prospector is not a skilled topographer his map has no real value, if he is skilled, he is wasting time which is better devoted to the work of prospecting for which he is engaged. In case my view should be considered as prejudiced, in that I am responsible for the topographical Survey of the Protectorate, I quote from a memo by the Commissioner of Mines as follows:-

" Both a geological and mineral survey
" depends greatly on the accuracy and detail
"of the topographical survey available, so
" that geological work to be worth anything
" can usually only follow the publication
" of the topographical sheets in a particular
" area. It is not economical for the Geologist
" to have to construct his own map."

(4) My general recommendations therefore are as follows.-

(a) Carry out early topographical surve[illegible] promising mine areas on a scale suitable [illegible] and geological prospecting.

(b) Develop the Mineral Research [illegible] as soon as possible.

(c) As far as possible and as soon as possible publish the result of the research carried out by the Mineral Survey to make such results available to the general public here and in the Empire.

Contd.

(d) If I may be informed as to any particular Mining Industry on which His Excellency may require further details and costs, I will endeavour to investigate and report on the particular mineral.

I have the honour to be,

Sir,

Your obedient servant.

Ag. Commissioner of Mines.

E. A. Protectorate.

C.L.No.11/11/19

Analytical Laboratory

Nairobi

27th September 1919

To the Hon'ble
the Chief Secretary,
Nairobi.

Sir,

re Economic Research of the British Empire.

In reply to your No.S.20329/6 of the 19th instant and the enclosed copy of Colonial Office Circular A of the 11th June, I have the honour to submit the following report upon the present position of scientific research and my recommendations as regards the future, in so far as matters within my province are concerned.

2. It will avoid unnecessary repetition of views already expressed if reference be made to the following letters and enclosures

1. No.94/A and memo of 9/5/19 A concise statement of the functions of this department.
2. C.L.No.11/3/19 and memo of 26/6/19. Suggestions upon grant in aid for research.
3. Pamphlet upon soil Survey (1913) (enclosed)
4. Pamphlet upon Equatorial Experimental Stations (1918) (enclosed)
5. Synopsis of Routine and Research Work for next years estimate (enclosed)

3. The answers to your queries are contained in these references and briefly it may be stated that actually in hand are the following:-

A. Analysis of rocks and minerals, but no organisation for collecting specimens.

B. Research upon the effect of environment upon the Anatomy and Physiology of Plants.

C. Research upon the Origin, Composition, Properties and Distribution of the Soils of the Protectorate.

4. While much can be done in the Laboratory it is obvious that laboratory work is merely an adjunct to field work, and that the exploration of the resources of the country badly requires more field work. The researches Nos. 1 - 4 of

enclosures No.3 from a system which, with proper organisation, will bring to our knowledge the resources of this country in the most rapid and accurate manner possible.

To carry out this system means considerably increasing the [illegible] of officers recently established in this department and designated " Field Assistant". My desire is to have a " Field Assistant" appointed to every district, who shall act as my Intelligence Officer, as a collector of soil samples, rocks, minerals, plants &c. and shall make a photographic survey of the district. These officers would also be instructed to collect for the Entomologist and the Mycologist.

It is highly probable that officers in the Administration might be encouraged to assist in the work of collecting material and photographic surveying, and possibly a circular of instructions upon these matters would be productive. I put forward this suggestion tentatively, as I am fully aware that an administration Officer's time is already very fully occupied, and I am also aware that hitherto preference has not been given in the selection of candidates for appointment to the administrative department to those with scientific training ; nevertheless the officers of the administration possess a very intimate knowledge of their districts, [illegible] are in a remarkably good position to make observations, they are keenly interested in the country and are always indefatigable in their efforts to assist in any progressive movement, therefore I am of opinion that an endeavour should be made to encourage these officers to further scientific research into the resources of the Protectorate.

5. As concrete proposal I would suggest that ten bonuses of £50 per annum be offered to A.D.Cs. or other suitably situated officers who would undertake to act as Intelligence Officers to this department, the continuation of the bonus to be dependent

upon the work performed during the previous year.

Each officer would be equipped with standard camera and material, compass, sample bags, field notebook, vasculum, press for preserving botanical specimens, killing bottle, and explicit instructions in regard to observational, photographic and collecting work.

If a trial be given to this proposal it would be well to await its results before making appointments of special Field Assistants excepting such as are required to supervise the Equatorial Experimental Stations, and I strongly recommend this suggestion to your consideration.

6. I would like to suggest that the present position of meteorological investigation in this country is very unsatisfactory A very essential part of our most important scientific research now in hand. The Equatorial Experimental Stations - consists in correlating plant growth with meteorological stations as well as afield for observing plant growth. The records from different parts of the country only have a practical value when we have discovered how different plants behave under observed conditions. Meteorological observations depend, therefore, for their practical value upon the Equatorial Experimental Stations, and, conversely, the lessons learned in the latter depend upon our knowledge of meteorological conditions in other parts of the country for their practical application.

I submit that the whole of the meteorological work of the protectorate should be placed under the control of this Department to ensure uniformity of methods and to place it upon a sound and scientific basis. Some time ago I arranged for a course of instruction to be given to natives at the Reformatory Kabete, in reading instruments and recording observations, and I suggest that an extension of this class would enable a trained subordinate of this department to be attached to every

meteorological station of importance in the country.

This re-organisation would effect certain economies, as Equatorial Experimental Stations will be either second or third order Climatological Stations and would to some extent reduce the expenditure which would be incurred in establishing such stations on an independent scheme. The great advantage, however, would lie in uniformity in methods, establishment of stations in accordance with a general principle, placing the meteorological Officer in a scientific department in which he would assist, and be assisted by, scientific colleagues.

The officer at present dealing with meteorological affairs has many other duties to perform meteorology is certainly not the principle one, and the proper appreciation of the value of this science is evidently lacking when it is left to be sandwitch in with numerous other calls upon his time and attention. An estimate of something like £1675 has been put in for meteorological work in connection with the Department of Agriculture and I have had to ask for £400 for instruments alone to equip the Equatorial Experimental Stations.

I think it will appear quite evident that it would be desirable to place the meteorological stations under the control of the department responsible for scientific research in the Equatorial Experimental Stations, and I suggest, therefore that Mr.Carpenter be transfered to the Department as meteorological officer and that the whole question of meteorology be gone into by Mr.Carpenter and myself.

7. In reference to paragraph 4 of the C.O.Circular I would like to refer you to my letter No.[illegible] of 8th November 1917 re manufacture of Glycerine and Soap.

I hold the view that Lake Magadi is the pivot around which East African industries must revolve, and that, as the developmen

of large chemical industries would materially alter the whole course of the general development of this country, this is essentially a case " for action on the part of the Colonial Government".

If the soda from Lake Magadi were used in the manufacture of soap and glycerine there would be a revolution in the agriculture of the country. There would be local market for oil seeds - cottonseed, simsim, ground nut, copra, castor, sunflower, linseed and ceores of other kinds which could be cultivated in thie country. Not improbably the cultivation of oil seeds would be the salvation of the small holder. Further than this, there would be the effect of the "cake" from the oil mills on the stock industry., particularly in the dairying section. A heavier head of stock could be carried on the smaller farms with a steadier production of milk, butter and cheese, all the year round.

Cake feeding of stock means richer manure - hence an improvement in the yield of maize, coffee, flax &c.

From these remarks it will appear that by exporting the Soda from Lake Magadi for the manufacture of soap elsewhere this country is being deprived of the means of developing its agriculture upon the lines so clearly indicated by nature.

The two great industries of soap [illegible] paper pulp manufa- [illegible] are [illegible] upon soda, and [illegible] initiating an attempt [illegible] the former I have discussed [illegible] have discussed it with company promoters who would like to put capital into such an [illegible] if a supply of soda at a suitable price could be guaranteed. Private enterprise would start upon the project at one but for the knowledge that the Magadi Co. hold the key to the enterprise and could oust any local

industry dependent upon soda should that company decide to enter into competition.

The outstanding industries which nature has placed East Africa in an unique position to carry on are at present stifled for reasons into which it would seem proper for Government to enquire, inasmuch as the prosperity of the country at large would seem to be prejudiced through this lack of development of our one great mineral resources.

The difficulties, whether commercial or thenical, should be known.

8. It is necessary that additional accomodation be provided at the Laboratories. The clerical work of the department is being carried out in a room 8' by 9'6". The compound does not lend itself to any satisfactory extension of building and I therefore urge that bacteriologist be equipped with a new laboratory on another site and that the present bacteriological laboratory be handed over to this department.

Without such additional accommodation it will be impossible to organise and satisfactorily carry out the work which this department is designed to perform, and at the same time I understand that the bacteriologist is hopelessly cramped himself. Both Dr. Kauntze and his predecessors have condemned the use of the buildings as being most unsuitable and actually dangerous for the preparation of vaccines, sera &c. owing to the proximity of [illegible] highfare and the adjoining Veterinary Hospital.

The acquisition of the bacteriological laboratories by this department would provide adequate accommodation for our work and I do not see in what other way this could be effected.

9. From the financial point of view I give the following estimates.

Personal Emoluments.	Draft Estimate. 1919-20	Proposed Estimates 1920-1	Estimate to include Research Programme submitted
	£	£	£
Director	500	1000	1000
Fees	50	50	50
Senior Chemical Officer / Chemical Officer	915	700 550	700 550
Chemical Officers (3 prob.)	1200	1500	1500
Additional Scientific Officer	-	-	2000
Field Assistants (2)	400	500	(4) 1000
Chief Clerk	-	-	350
Clerk Storekeeper	150	200	200
4th Grade Clerk	72	72	72
Laboratory Assistant	64	64	64
Bonuses to Collectors 10 @	-	-	500
Laboratory Attendants	52	52	104
	3403	4686	8090

Other Charges.			
Upkeep of Laboratories	96	150	200
Transport Passages	580	900	1400
" Local Travelling	300	300	500
" Travelling Allow	225	225	400
Carriage of Goods	38	38	50
Uniforms	10	20	25
Lab. Stores books apparatus furniture	320	1150	2500
Upkeep of Expt. Plots	500	1000	1500
Contingency	-	-	200
	1869	3783	6775
Total	5272	8469	14,865

10. In conclusion I would like to say that although £15,000 may appear a very large sum yet it is less than one percent of the Revenue of the Protectorate, and the spending of this money in the manner suggested ensures

1. A systematic investigation of our resources dependent upon soil and climate.
2. The recording of the physical features of the country and the correlation of these with economic values.
3. The collection and analysis of the minerals and rocks.
4. Systematic investigation of the flora of the country with a view to discovery of economic products.

6. Industrial researches to further the interests of the stock, flax and other industries.

The list of researches is not intended to be exhaustive, it is only suggestive of the lines of enquiry upon which this department is anxious to work. There are numerous other problems for discussing such, for example, as the question of fuel - the practicability of the Government working wood distillation plant to produce charcoal tar &c. in the Forest Reserves - a matter which might be discussed with the Conservator of Forests and Chief Mechanical Engineer U.R. - but the scheme I have put forward is comprehensive in that it would ensure a staff competent to deal with every problem connected with scientific research into natural resources and industrial Enterprise.

I have the honour to be

Sir,

Your obedient servant

Sd/ V.H.Kirkham

Government Analyst.

Copy.

11/3/19

Analytical Laboratory,
Nairobi,
26th June 1919.

To His Excellency the Governor,
East Africa Protectorate,

Through
The Honourable the Chief Secretary,
Nairobi.

Your Excellency,

Scientific and Industrial Research.

I have the honour to submit to Your Excellency the enclosed memorandum upon the above subject containing a suggestion that certain research work which is being started in East Africa is of more than local interest and would appear to be of a nature likely to receive support from the Imperial Trust administered by the Department of Scientific and Industrial Research.

Without such support it will be extremely difficult to conduct any comprehensive schemes for research, and I would therefore respectfully ask Your Excellency's consideration of the suggestion put forward.

I have the honour to be
Your Excellency's most obedient servant

sd. W.H.Kirkham
Government Analyst.

Scientific and Industrial Research in the
East Africa Protectorate.

XXXX o XXXX

The newly created department, which it is proposed to name the Chemical Research Department, is concerned with the scientific exploration of the resources of the Protectorate. The department is not concerned with the development of the resources, such being the function of the departments of Mines and Agriculture, and its scope is therefore limited in accordance with the recommendations of the Committee of the Privy Council for Scientific and Industrial Research as set forth in the Report for the year 1916-17.

> " We sincerely hope that any plans that may be ultimately
> " adopted will include means for collecting information as to
> " all the resources of the Empire and that whatever Department
> " may be entrusted with the investigation of our national
> " resources will be limited to the establishment of scientific
> " facts and to rendering them available for use for the other
> " agencies interested in, or affected by, the development
> " the resources disclosed. Our experience has convinced us of
> " the necessity of keeping scientific research clear from the
> " entanglements that arise over the commercial exploitaion of
> " discoveries or the routine administration of matters
> " directly affecting capital, labour, public health or other
> " national services."

2. The title "Chemical " Research Department may possibly require a word of explanation as the [illegible] that branch of knowledge called chemistry is not commonly understood. Chemistry is the Science of the composition of matter and the changes which matter is capable of undergoing, and, therefore, fundamental to every branch of knowledge excepting mathematics, which is the only science not concerned with matter. The Chemical Research Department, therefore, is concerned with determining the composition of the minerals, rocks, soils, waters, vegetable and animal products, occurring in the country. But chemistry is equally concerned with the changes which matter is capable of undergoing, and it is in this field that the greater part of the research work has to be performed

The effect of the rocks upon the soil, of the soil upon the plant, of the plant upon the animal, of climate upon soil, plant and animal, are all subjects for chemical research.

Knowledge on these matters is capital, and prosperity depends upon the skill with which this capital is invested in our pursuits and industries. The aquisition of this capital is the province of scientific research, the investment of it is the province of business.

3. The research work which is in hand is partly of local interest and partly of universal scientific interest. No scientifically established fact can be entirely limited to local interest, but a soil survey, for example is predominantly so. On the other hand the important research work which is being undertaken upon the effect of environment upon the anatomy and physiology of plants is of universal interest. This country is exceptionally adapted to be the theatre of experimentation on account of the close proximity of varying environments and the unique opportunity which the Uganda Railway affords of the supervision of experiments under such a variety of conditions; but the established facts that certain conditions of temperature, humidity &c affect the production of sugar, oil, &c in certain crops in a certain manner will be equally useful to India or the West Indies as to East Africa.

4. In view of this universal interest in the research which will have to be carried out for our own information, it would seem quite proper to invite aid from the Imperial Trust for the Encouragement of Scientific and Industrial Research. In the particular case of the research last mentioned I believe that East Africa is the most suitably situated portion of the Empire in which to carry out such work- moreover it is already in hand, experimental stations have been and are being laid out and a research laboratory for the chemical, physical and microscopical examination of material is already built.

5. Further equipment in the matter of scientific instruments is required and above all more workers are needed.

A grant of, say, £1000, for microscopes, microtomes, meteorological instruments &c would place the Laboratories at Nairobi in the front rank of institutions of this description, and would place them in the position of affording Research Fellows every necessary requisite for laboratory work in connection with the Equatorial Experimental Stations, which are situated within 24 hours of the laboratory at elevations from sea-level up to 9000 ft.

6. The excellence of the opportunities thus provided for scientific research, the importance to the Empire of precise knowledge of the limiting factors in the requirements of all kinds of crops, lead me to hope that the Department of Scientific and Industrial Research might be prepared to consider not only a grant for scientific instruments but might also award scholarships or fellowships to further this work.

Such scholarships should be tenable for three years, of which at least 2½ years should be spent in East Africa. Owing to the cost of living in this country being very high it would be necessary to make a scholarship of the value of not less than £300 per annum.

Four such scholarships, one of which should be for meteorological research, one for soil bacteriology and two for bio-chemistry, would enable full use to be made of the opportunities afforded by the stations and the laboratories.

Such research scholars would work in collaboration with the Director or independently upon some phase of the work allotted to them by him; they would, of course, have nothing whatever to do with the routine work which the Department carries out for other departments of Government.

sd W. H. Kirkham.

No. 94/A

Chemical Laboratories

Nairobi

9th May 1919.

To,

His Excellency the Governor,
East Africa Protectorate,
NAIROBI.

Through the Hon. the Chief Secretary.

Your Excellency,

I have the honour to address Your Excellency on the occasion of the retirement of Dr.Rose and the absorption of the bacteriological side of the Laboratories Department into the Medical Department, and to submit herewith a Memorandum containing a reasoned statement of the organisation necessary to carry on the many and varied activities of the Chemical Laboratories in the interests of every department of Government requiring such a scientific assistance.

I am convinced that the subordination of the Chemical Laboratories to any one department would not be in the interests of the service as a whole, and the scheme which I submit to Your Excellency is based on the recommendations of His Excellency the late Governor, Sir H.C.Belfield, and ensures the fullest and most impartial treatment of the requirements of every department of Government requiring the services of these Laboratories.

I have the honour to be,

Your Excellency's most obedient servant,

[illegible]

Government Analyst

MEMORANDUM

on

THE POSITION OF CHEMICAL SCIENCE IN RELATION TO THE STATE IN THE EAST AFRICA PROTECTORATE.

(sgd) V. H. Kirkham

GOVERNMENT ANALYST.

MEMORANDUM
on a
Chemical Research Department.

DEFINITIONS.

1. Chemistry is the science concerned with the composition of things.
2. Applied Chemistry is the study of the principles governing the production of things.
3. Agriculture is the art of producing raw materials.
4. Manufacture is the art of making other things out of raw materials.
5. Industrial Efficiency depends upon the arts (Agriculture and Manufacture) being in conformity with scientific principles (Chemistry).

FUNCTION OF A CHEMICAL RESEARCH DEPARTMENT.

1. To investigate the possibilities of producing raw material in the different regions of the country.
2. To effect improvements in production by investigating what are the effects of climate and other conditions upon the composition and rate of production of raw materials, and hence the selection of varieties most suitable for given conditions.
3. To advise on Industries aiming at making the country self-supporting, at establishing local markets for raw materials, or for turning out commodities of greater value and less bulk for export. (Already the Chemical Department has assisted by pointing out the way to such industries as tanning, paper-making, soap manufacture, brewing, sugar refining, pottery and glass making, and has demonstrated by actual experiments the possibilities in each case.)
4. To investigate the commercial value of the natural vegetation - feeding value of the grasses, value of essential oils, drugs &c occurring in the herbs, shrubs and trees) and of the rocks and minerals.
5. To conduct general analytical work for all departments of Government - Police (toxicological work being the reason for the first appointment of a Government Analyst). Medical (Water Supplies), Railway, Central Tender Board &c.

6. To organise a system of Food Control to prevent fraud as well as danger to health, and also to serve on a Rivers' Board to advise upon pollution of rivers.

CO-ORDINATION

The Department works in association with every other Department of Government requiring investigations.

The Association with the departments concerned consists of :-

1. Annual estimates from departments of the nature and amount of work likely to be submitted.

2. Conference with Heads of Departments respecting researches or investigations to be undertaken.

3. Representations by Heads of Departments supporting the Financial Estimates of the Chemical Research Department in respect of the division concerned.

4. Quarterly returns to the Departments of the work done and in hand.

Division	Associated Departments.
(1) Agricultural Division	Agricultural and forest Departments.
(2) Water, Food & Drugs Division	Medical and Police Depts.
(3) Stores & Engineering Division	Central Tender Board, Customs.
(4) Mineralogical Division	Uganda Ry. & Public Works Department.
(5) Toxicological Division	Commissioner of Mines Police.

PRESENT POSITION AND ITS HISTORY

The above organisation represents the present position excepting that the Government Laboratories do not [illegible] as a part of the Agricultural Department which comprises the bacteriological as well as the [illegible]

Formerly the bacteriologist and Govt. Analyst were [illegible] Medical Department, the two Laboratories [illegible] and constituted a Separate Department under the style of "Government Bacteriologist" with the Bacteriologists as Director.

The reason for this action is as follows :-

In despatch No. 3.6 of 4th April 1914, to the Rt. Hon the Secretary of State, His Excellency the late Governor Sir H. Conway Bedfield, wrote as follows:-

" At present the Government Analyst is shown under the Medical
" Department in the Protectorate Estimates although his duties are of
" such a nature that it is not practicable for him to be directly sub-
" ordinate to the Principal Medical Officer or any member of the Medi-
" cal Staff. He performs chemical analytical work for the Medical
" Agricultural, Veterinary, Police, Mining and Forestry Departments
" besides examining and reporting on samples and specimens sent to him
" for analysis by the General Public. He is thus necessarily in prac-
" tice independent of direct control by the Principal Medical Officer
" although that Officer has hither-to been regarded as his Administra-
" tive Chief. I consider that in future years it would be advisable
" to show the Government Analyst's Department as a separate schedule
" in the estimates."

In reply to this the Secretary of State in his despatch No.480 of 20. May, stated :-

" I see no objection to the separation of the Analyst's Department from
" the Medical Department, but I suggest that the most satisfactory
" arrangement might be to separate the whole of the Laboratories Divi-
" sions from the Medical Departments and to provide for these Divisions
" as a Single Department under the Director of Laboratories."

This suggestion was adopted and the Bacteriologist, being the senior officer, was made Director.

FUTURE POSTION

As the Laboratories Department was created as a result of Sir H.Conway Belfield's recommendation that the Government Analyst should be separated from the Medical Department and appear in a separate schedule of the Estimates, and as the Government Analyst is now the Senior Officer in the Department, it would not be unreasonable for him to expect promotion to the position of the Director. He is still of the opinion expressed in 1914, however, and considers that Medical work should be under Medical Control and that Chemical work should be under the direction of a chemist.

The moment is now opportune for any change which may be considered desirable and the opinion is expressed that a return of the medical side of the Laboratories Department to the Medical Department is desirable, leaving the Government Analyst as a separate Department as suggested by H.E. the late Governor.

CONCLUSION

It will sufficiently appear from the foregoing remarks that the position of the proposed Chemical Research Department should be an independent one and that its function are to afford all departments of Government the assistance they require and to initiate and carry out scientific research into the natural resources of the Protectorate.

1a. ROUTINE

Division of Chemical Research Department.	Other Depts assisted.	Nature of Work
1. Agricultural Chemistry Div.	Agricultural and Forest.	Analysis of soils, manures, feeding stuffs dairy products, crops, insecticides, fungicides, cattle dips, sheep dips, cattle licks etc.
2. Water, Foods and Drugs, Div.	Medical, Police and Customs. Central Tender Board, Native Affairs.	analysis to determine purity of water supplies and to detect adulteration in food and drink. Control of water sterilisation schemes.
3. Engineering Chemistry Div.	Uganda Railway Public Works.	Testing stores such as lubricating and fuel oils, paints XX lime, cement, sand, building stores, metals and alloys.
4. Mineralogical Div.	Mines and general public.	Identification of minerals and assay of their constituents.
5. Toxicological Div.	Police, Medical and Veterinary.	Investigation in respect of suspected cases of poisoning in man and animals.

C.O. 533 230

2. Research

A. Systematic Research and Exploration

Subject.	Outline of Scheme.
1. Effect of Environment upon the Anatomy and Physiology of Plants.	Experimental and Meteorological Stations at different altitudes- Sea level up to 9000 Ft. All classes of economic plants to be grown and the most exact observations made upon their Rate of growth, structure and composition.
2. Soil Survey of the Protectorate.	Samples of soil collected from all farms Classification into types. Mapping areas of types. Minute investigations into origin, structure and composition of each type. Experiments with plants and Minerals upon each type.
3. Photographic Survey	A systematic record by means of photography of the physical features of every part of the Protectorate. It is necessary for the proper understanding of meteorological returns, of the soil survey and for the application of Experimental Station results to the country at large. Collections of rocks, plants, soils, etc made in connection with this survey.
4. Economic products of the Indigenous Flora.	Gums, resins, balsams, fibre, drugs, etc. occuring in the trees, shrubs and herbs growing wild in the country.

B. Purely Scientific Research

5. Meteorological History of E.	An attempt to decipher the past history of our climate by the effects it has produced in the Anatomy of forest trees working by means of microscopic examination of polished sections of diggerent woods from different localities.

C.O. 533 230

Subject.	Outline of Scheme.
6. Retting of Flax.	Research upon the effects of the different types of waters in the Country upon the fibre, and generally to investigate the conditions of retting in E.E.A. Collaborate with Flax Expert and Growers.
7. Salt Licks.	Numerous 'salt licks' in the country devoid of 'salt' but sought after by game and stock and mined by natives for the purposes. Analysis does not clearly indicate their function. Definite proof of their value and function to be obtained by feeding experiments. Collaborate with Veterinary Dept.
8. Destruction of Ticks.	Research upon poisoning ticks with a view to extending our present knowledge on the subject and to improving dipping practice. Collaborate with Veterinary Dept.
9. Poisonous Plants.	Experiments to determine plants injurious to stock and indentification of the active principles therein

D. Health.

10. Pollution of Rivers.	Experiments to determine best method of dealing with effluents from coffee, sisal and flax industries to prevent pollution of rivers. Collaborate with Public Works Dept.
11. Feeding of Natives.	Composition of native foods. Balancing of ration. Grinding and preparation of food.

C.O. 533 230

Mycological Laboratory
Ainsworth Hill
Nairobi, 24.10.19

197

The Acting Director of Agriculture.
Nairobi.

Ref. Economic Resources of the British Empire.
Secretariat No. 20329 of the 17.9.19 and your
minute No. 16.184 of the [illegible]

What is being done at the present time

1) At the present time and for the past six years and a half the work of plant pathology has been crippled from the absence of a staff and [illegible] to such an extent that it has not been possible to investigate thoroughly those serious diseases of economic plants which cause annually the loss of large [illegible]

The present staff [illegible] clerk and [illegible]

The [illegible] is expected to investigate all plant diseases to identify plants [illegible] inspect imported plants and seeds, to [illegible] all wheat breeding experiments and to do the work [illegible] of an economic botanist. He [illegible] to deal with a large [illegible] correspondence [illegible] includes the [illegible] of reports pamphlets and drafting [illegible] with the grading [illegible] for export [illegible] must be prepared [illegible] laboratory [illegible] requests from settlers [illegible] to inspect diseases [illegible] his absence there [illegible] to carry [illegible] laboratory.

[illegible] work [illegible] laboratory with a totally inadequate working vote of £200 per annum has been provided.

The laboratory was only [illegible] after six years of [illegible] representation when the sum of £540 was sanctioned for its construction, but the request of a trained assistant was refused. At the same time as the [illegible] of this money was sanctioned the sum of £3000 was granted to the [illegible] 1917, the assistant mycologist was again refused but the analyst again received additional [illegible] to increase his staff and [illegible] provide work for [illegible] agricultural experiments. This position should be contrasted [illegible] of money

[illegible] that of the mycologist [illegible] but is [illegible] Administrative section [illegible] the Department of Agriculture.

Representations for increased facilities [illegible] deal adequately with Plant Diseases and to carry out the necessary and urgent research work in connection [illegible] were made in 1917 (see Mycologist's Report No. [illegible] of the [illegible] July 1918 to the Chief Secretary). The requirements were again emphasised [illegible] in the draft estimates for 1920-21 [illegible] 1919 but were again refused.

Up to the present on account of the conditions [illegible] above it has only been possible to examine roughly [illegible] diseases with the result that the causes whether [illegible] or bacterial have been indicated and a line of treatment based on this work has been suggested. The

[illegible] successful

successful experiments on spraying for coffee leafe diseases (see Annual Report for 1915) warrant further work on other diseases, but require more time, money and assistance to undertake.

(3) For the Wheat Breeding experiments, the land for which is provided [illegible] the Nairobi Experimental Farm at Kabete (7 miles from the Mycological Laboratory). Expenses are shared with the Flax Instructor from "A Grant in aid of Wheat and Flax Industries" vote, amounting to [illegible] per annum. Sometimes the flax experiments absorb all of this sum, [illegible] ers the wheats benefit.

[illegible] on this important subject is sandwiched in between pathological [illegible] and the inspection of plantations, and it has only been possible [illegible] select new strains from those already present and to try such in field experiments. With so little time at one's [illegible] it has been quite impossible [illegible] a large number of new hybrids which is [illegible] necessary for the production of rust resistant varieties.

[illegible] the work [illegible] been so [illegible] assistant who should spend [illegible] the growing [illegible]

[illegible] for wheat at the Govt. [illegible], but unfortunately [illegible] several [illegible] either [illegible] red.

[illegible] farm the [illegible] plots [illegible] rse [illegible] confus [illegible] sent out [illegible]

Very good results have [illegible] of hybrid wheat (see pamphlet on wheat [illegible]) such as [illegible] of this [illegible] work (see [illegible] B

[illegible] Laboratory [illegible] exotic [illegible] development [illegible] season.

[illegible] also [illegible] plants [illegible] Roy[illegible] as to the nature of various active [illegible] considerably [illegible]

[illegible] been started on the larger fungi [illegible] preserved [illegible] destroyers [illegible] poisonous plants and native [illegible] plants [illegible] important subjects.

[illegible] season.

successful experiments on spraying for coffee leafe diseases (see annual Report for 1915) warrant further work on other diseases, but [illegible] more time, money and assistance to undertake.

3) For the wheat breeding experiments, the land for which is provided [illegible] the Nairobi Experimental Farm at Kabete ([illegible] miles from the [illegible] Biological Laboratory) [illegible] Expenses are shared with the Flax Instructor from "A Grant in aid of Wheat and Flax Industries" vote, amounting to £250 per annum. Sometimes the flax experiments absorbs all of this sum, at [illegible] are the [illegible] [illegible].

[illegible] in between pathological [illegible] inspection of [illegible] and it has only been possible [illegible] select new strains from those already present and to try such in field experiments. With so little time at one's disposal it has been quite [illegible] to create a large [illegible] of new hybrids which is absolutely necessary for the production of rust resistant varieties.

A little [illegible] been done in this respect, but [illegible] been sorely [illegible] of a trained Assistant [illegible] [illegible] during the growing [illegible] [illegible]

[illegible] for wheat at [illegible] but unfor- [illegible] several [illegible] to keep [illegible] grain either [illegible]

[illegible] the farm the field plots [illegible] in the course [illegible] become confused, with [illegible] pure grain to be sent out [illegible] the [illegible]

Very good results [illegible] selections [illegible] wheat (see pamphlet [illegible]) in many parts of the country [illegible] warrant [illegible] this important work [illegible]

4) [illegible] Biological Laboratory [illegible] nucleus for [illegible] future Agricultural Department [illegible] Botanic Garden [illegible] a few [illegible] exotic [illegible] has prevented any development [illegible] to keep the place fairly [illegible] season.

[illegible] of native [illegible] been named by the Royal [illegible] useful in answering enquiries as [illegible] considerably [illegible] plants [illegible]

[illegible] the larger [illegible] preserved [illegible] by [illegible] poisonous plants and Native [illegible] plants are [illegible] but as yet no much [illegible] important subjects.

S. [illegible]

ECONOMIC RESOURCES OF THE BRITISH EMPIRE.

FORESTRY IN BRITISH EAST AFRICA.

****

Scientific forestry has been practised in the Protectorate in a small way since 1902.

In the 17 years which have elapsed since the formation of a Department the energies of the officials have been largely expended in an endeavour to conserve and exploit the natural forest resources of the country.

Of necessity a great deal of the work has been of a preliminary nature such as defining the areas which should be reserved, inspecting and reporting on forest lands applied for as farm lands etc. exploring forests and collecting information as to the trees composing them and their distribution etc.

During the last six years the timber industry has made rapid strides, many saw mills have been set up and the time of the staff of the Department has been taxed to the utmost in marking trees for felling, defining areas for exploitation and in endeavouring to keep pace with the fellings to take steps to procure regeneration of the forests exploited.

A certain amount of data relating to the technical properties and characteristics of the various indigenous timbers has been collected; the majority of the trees have been botanically determined and a representative herbarium formed, a few forest surveys have been done and the sylvicultural requirements of some of the trees have been studied but, as yet, not sufficiently to come to any definite conclusions.

It has been the consistent aim of the Department to preserve to the State the control and management of the forests and to prevent the alienation of any part of them to any one person or firm, one large block of forest has been alienated under terms which preclude its proper management during the currency of the concession, the rest of the forests of the Protectorate are at present free of any vested interests or prescriptive rights.

The situation at present is that there is a very large local demand for timber for building, joinery, railway construction, public works and minor industries and for firewood, the staff of the Department is absolutely inadequate to manage the forests [illegible] being exploited, all time is [illegible] felling and other [illegible] the regeneration of the forests can be [illegible] only on a very small scale [illegible] of knowledge of the sylvicultural requirements of the [illegible] trees such work is entirely in [illegible] stage.

Very little is known of the technical properties of the timbers and the uses to which the various kinds can be put, there are only four or five timbers dealt in by local merchants yet there are very many kinds in the forests which for want of being known are either wasted or mixed with known timbers and sold to an unsuspecting public.

Owing to the large demand for timber the greater part of that which is sold is unseasoned and either by reason of lack of capital or incentive there is little effort made by Saw Millers to attempt to season their timbers.

As stated above a certain amount of information as to the technical properties of the woods of the country has been obtained but a vast amount of research work requires to be done before it can be said that the East African timbers are known and they can be utilized to the best advantage.

Requirements.

To ensure the proper management of the forests so as to secure the greatest benefit from the wealth which they contain and are capable of producing exploration and research are required.

Exploration.

Research is dependent on exploration in which term is included not only exploration in the general sense of the word but also demarcation, timber-cruising and the internal survey of the forests and the measurement of the timber stands.

It is necessary to acquire accurate information as to the quantities of timber and other products which are available for exploitation and also the maximum yield which can be secured without danger of over-exploitation with with consequent loss of forest capital (the annual yield of any forest product may be compared to income derived from invested capital).

Measurements of forests must be made and the rates of growth of trees composing the forests must be ascertained before the annual increment or yield can be guaged, in order that proper working-plans be prepared for the correct management of any part of a forest.

Research.

Among the most urgent research works necessary at the present time are those in connection with the sylvicultural requirements of the indigenous timber trees without which no scientific management of the forests is possible in order to ensure a sustained and increasing annual yield of timber and to maintain forests which are required to be conserved for protective purposes.

A certain amount of research into the sylviculture of Cedar & Podocarpus has been carried out by the Assistant Conservators in the small time spared from routine work, as a result of which a good deal of valuable information has been acquired both by failures and successes; but many more experiments will have to be conducted before it can be said with any degree of certainty that such and such a procedure in a given locality is the correct one to follow.

From the point of view of the Colonial Secretary's Circular the most urgent problem would appear to be that of ensuring the full economic use of all forest products, more especially timber, and the avoidance of waste. Research in this direction would be productive of immediate results. Such research should be directed to ascertaining the physical and technical properties of the timbers and the uses to which they could be put; the best means of securing the rapid seasoning of the timbers and of treating them with preservatives against decay and insect attacks and the most economical conversion of logs with a view to the timber being put on the market in the form most in demand for any particular purpose e.g. slats for pencil making.

At present there are but three or four kinds of timber which are in demand and many other varieties do not find a ready sale because they are unknown.

The majority of the saw milling concerns in the country have too small a capital to experiment with unknown timbers or to attempt to season the better known kinds, moreover there is such a good market for timber seasoned or unseasoned that there is little inducement to lock up capital by holding stocks of timber to season or to lay down artificial seasoning plants; the result of this strong demand for timber is that unknown kinds are mixed with, and sold as, better known woods and merchants who require well seasoned timbers for special purposes are forced to buy imported wood. The Railway and Public Works Departments are now importing Pitch Pine.

Research would certainly result in fixing the values of the indigenous timbers, it would afford most valuable information for architects and the building trade in drawing up specifications; it would be the means of finding markets for many timbers for which there is at present no demand and it is quite possible that there may be timbers growing in the country possessing peculiar technical properties which would render them eminently suitable for special purposes e.g. Aeroplane construction, flax scutching blades etc.

One of the greatest difficulties of forest management at the present time in this country is the disposal of the "slash" on the felling areas, in the existing conditions of the saw milling trade only the best logs are cut from the boles of the felled trees and the lop and top is left to litter the ground, afford breeding places of insects injurious to timber, constituting a continual menace of fire and an effectual bar to the regeneration of the forests. Most valuable research could be carried out to ascertain the most profitable use to which this wood could be put and to enquire into the by-products derived from its destructive distillation, the result of such research would be the means of effecting economy in management and increased revenue from the sale of the forest products.

There are very many other problems in connection with the economic management and exploitation of the forests which require elucidation by means of research in order to reduce [illegible] management to a minimum and to derive the full benefit [illegible] forest wealth of the country.

[illegible]

[illegible] of the exploitation and research work indicated above as being very necessary could be carried out by the officials of the Department provided that fully qualified men were appointed and the staff were increased so as to allow of the members of the administrative staff being able to devote their time and energies to work for which they are qualified and trained to carry out instead of, as at present, having to devote all their time to routine and clerical work which could be equally as well performed by the executive staff. No doubt it would be most valuable if a Sylviculturist were appointed who could [illegible] coordinate the experiments carried out in various parts of the country but at the present juncture it is more important to increase the staff of the Department.

Exploration

As a first step towards a rapid survey of the forest resources of the country a combined timber-cruising and survey party should be formed, this would examine each group of forest

in detail, ascertain the areas which should be permanently reserved as forest, measure up sample areas in order to ascertain the volume of the stands and the possible yield; divide the forest into working circles, each working circle to be a unit of management and exploitation; make records of the species and measurements of the trees composing the forests also of the soils and geological formations of the localities; the limits of growth of the various species as indicated by altitude, soil and rainfall etc. etc.

The immediate results of such exploration would be that the Government would be in a position to invite applications for saw milling rights and at the same time be able to give accurate information of the annual output from the forest to the mills and the varieties of timber which could be exploited. Instead of the haphazard system in vogue at present under which saw mills are established in different parts of the forests without any idea as to the quantity of timber available, good capital could be attracted to the saw milling industry and the trade be established on a far better basis than it is at present. No timber merchant can be expected to invest money in putting down saw milling plant unless he is certain of returns over a period of years; to the uncertainty as regards supplies which exists and has existed in the past is due in no small measure the absence of any experts in the trade, experienced sawyers and a certain degree the high cost of sawn timber.

Research.

As regards what may be termed economic research I advocate the establishment of a Forest Research Laboratory in charge of a physicist or technologist whose special duties it would be to conduct experiments and carry out tests to ensure the full economical and commercial utilization of all forest products to the avoidance of waste. It would be the duty of such an officer to concern himself with the finding of uses for timbers for which at present there is no market, the publication of reliable and accurate [illegible] the weights, strength, durability and special characteristics of the timbers; to conduct experiments in connection with the seasoning of timbers and their treatment with preservatives to render them durable and to give advice as to [illegible] economic conversion of logs into timber.

[illegible] the [illegible] measure the [illegible] [illegible] compared [illegible] verges [illegible] the [illegible]

[illegible] for [illegible] testing [illegible] distillation [illegible] and possibly [illegible] have no [illegible] would receive [illegible] samples of woods sawn to his specifications.

An Assistant and [illegible] staff would be required.

It is somewhat difficult to estimate [illegible] of the establishment of a laboratory as I have no first hand information of the cost of the necessary plant, but I am of opinion that a sum of £3000 would suffice for the capital outlay and the annual recurrent expenditure to include salaries etc might be estimated at £1500.

If such a laboratory could be established it would be highly desirable to include in it's sphere of research the neighbouring Protectorate of Uganda and the Mandatory State of later German West Africa. The three countries are in direct communication by rail and water and the centralisation of research work would make for economy in each country; moreover the forest floras of these countries are intimately related and the comparison of the physical properties of botanically identical timbers of different localities as a result of tests carried out under similar conditions and methods would be of undoubted value to the trade and in the event of an export trade being established the result of putting timbers of known localities on the market would be of very material assistance both to exporter and the buyer. As an instance of the result of the absence of research in this respect I may mention the great uncertainty which exists in Great Britain with regard to the numerous Mahogany timbers imported from the West Coast of Africa; it is more than probable that there are differences between the Cedars of such localities as Kenya and the Western Mau and the Usambara Hills, accurate information on any variation in the timber would be of great importance to pencil cedar buyers.

In the event of an export trade in any species of timber being established it might be very desirable for such timber to be graded and marked by the Timber Research Laboratory.

The marking and grading of timbers for export would be specially valuable in cases of little known species which it might be desirable to place on the home markets and also in the case of some specially valuable timber being discovered which might be superficially resembled by another and inferior species.

In making the above recommendation for the establishment [illegible] Forest Research Laboratory I do not advocate at once embarking on a scheme of elaborate and detailed research but [illegible] the work to be undertaken in the immediate future should [illegible] a preliminary nature which should form the basis [illegible] for more detailed research in the future, as time goes on it will be necessary to enlarge the sphere of the laboratory by the creation of departments of specialised research such as forest botany, forest entomology, [illegible] technology of timbers, chemistry etc.

At present though research in all branches is very [illegible] to the [illegible] most insistent need is for enquiry [illegible] the individual [illegible] there is [illegible] going [illegible] the [illegible] present [illegible]

[illegible]

[illegible] forests there [illegible] agriculture and [illegible] as well as to agriculture and [illegible] [illegible] of the [illegible]

[illegible]

I would particularly mention botany, [illegible] the Government mycologist there is no botanist [illegible] the identification of the majority of the plants, trees [illegible] of the country recourse has to be had to sending all herbarium material to Kew and of necessity dried specimens cannot be identified or examined as easily as fresh material.

Practically every industry in the country is dependent on plant life yet there is no one to refer to when the name, natural order or other information is desired of or about any plant. The Conservator of Forests has been pleased to give what information he can when plants or grasses have been brought to him either for naming or enquiry when they are suspected of being poisonous or with reference to their economic value, but he is not a professed botanist. The flora of the Protectorate should be worked out and a representative herbarium embracing all plant life should be established. The Government botanist would of course be in continual communication with the Authorities at Kew but delays in getting plants named would be obviated, and private research for economic products including drugs would be fostered by advice as to which natural orders of plants may be expected to possess certain properties. At present timber is practically the only indigenous product of the vegetable kingdom which enters into the trade of the country, of passing interest have been Bambeira fibre, Landolphia rubber & Castor oil. All the energies of the Government and the settlers have been confined to discovering what exotics will grow and thrive in the country, certainly with great success, but there is no reason to doubt that there are many valuable indigenous natural products which only await discovery to add to the resources and wealth of the country.

Meteorology.

Little is known at present of the meteorology of the Protectorate; rainfall and temperature records are made at many districts and stations but as to the causes of the variations in the rainfall of different localities and at different seasons nothing is known. There are many problems in connection with the meteorology of the country which would be of great value to the farming community both of this and neighbouring countries could they be solved. Forecasts of probable weather conditions would be the means of saving the farmer from loss and indication of prolonged drought or abundant rain would be of inestimable value. There is reason to believe that the weather conditions in this country are related to those in South Africa e.g. the very best season 1917 here was followed in S. Africa by abnormal rains in 1918 the drought of 1918 here is now being followed in S. Africa by a failure of the rains could it be scientifically proved that the weather conditions of this country were an index of what may be expected further South the value of such a discovery would be incalculable to that country.

Mechanical Power.

So far no geological indications of coal or oil have been discovered in the country, the main sources of mechanical power are, therefore water, wood-fuel and alcohol derived from the distillation of vegetable matter.

The forests are intimately associated with these sources of power, directly for the production of fuel and charcoal and indirectly with the maintenance of the flow of water in the streams; any lessening of the cover provided by the forests on the mountains and in the highlands would be a menace to the streams having their catchment areas in the localities concerned. All powers at the disposal of the Government should be used to prevent the forests becoming the prey of party politics and to ensure their conservation for all time for the benefits of the whole community and the prosperity of the country.

207

Summary of Recommendations.

(1) The fitting out and despatch of a joint survey and forest party to explore, demarcate, survey and measure all the forests of the Protectorate with a view to securing accurate information as to the extent and value of the forests.

(2) The increases in the staff of the Department to provide for the above mentioned exploring party and for carrying out research work in connection with the sylvicultural management of the forests.

(3) The establishment of a nucleus of a Forest Research Laboratory in charge of a well qualified physicist and timber technologist with a view to the full and economic exploitation of all timbers and other forest products. The laboratory to be managed for the benefit of the East Africa & Uganda Protectorates and the Mandatory State of late German East Africa.

(4) The consideration by the Government of the advisability of appointing a Systematic & Economic Botanist.

(5) The consideration by the Government of the advisability of securing scientific and expert advice in connection with the investigation into the meteorology of the country.

(6) That having regard to the intimate relation that the forests bear to the soil and to regulation power the Government take adequate precautions to ensure their conservation for all time and their proper management and exploitation for the benefit of the whole community and the continued prosperity of the land.

CONSERVATOR OF FORESTS.

ECONOMIC RESOURCES OF THE BRITISH EMPIRE.

FORESTRY IN BRITISH EAST AFRICA.

++++++++++++

Export of Timbers.

In a memorandum on the timber resources of the Protectorate submitted to the Economic Commission in 1917 the average annual yield of timber from all the forests was estimated at 3,484,000 c.ft.

This figure is a conservative one and it is very probable that on survey it will be found to be too low.

The annual demand for timber in the country was estimated at a million and a half c.ft. in the immediate future increasing to two millions in a very few years.

According to these estimates there would be a surplus of about 1½ millions c.ft. a year available for export if all the forests were being exploited, which however is not the case, though it should be borne in mind that the output of timber from the forests the subject of the Crown licence is and will continue to be, far in excess of the figures estimated as the average annual yield on account of the forests not being subjected to any conservative management. The output from these forests should be more than balance the yield of those forests which cannot be exploited by reason of [illegible] not yet [illegible] accessible.

In discussing the chances of establishing an export trade in timber it is necessary to study the demand in the importing countries. As a general rule it is the soft coniferous and the lighter hard woods, timbers for special purposes and hard woods of particular beauty or possessing very valuable technical properties which are required.

As far as is at present known there are two East African timbers of outstanding importance, Pencil Cedar & Mzaiti (formerly erroneously called Camphor).

With regard to Pencil Cedar British East Africa is the only country in the Empire which produces this class of wood [illegible] America [illegible]

[illegible] large quantities [illegible] cost of [illegible] I believe an [illegible] from the Usambara [illegible]

[illegible] It is estimated doubtful if Podocarpus timber would command a price in competition [illegible] soft woods to leave a sufficient margin of profit to the exporter, the local [illegible] for this timber should absorb the [illegible]

Of hard woods Mkenaragi (Olea hochstetteri) possesses a very handsome grain and when well seasoned might be in demand for the cabinet making trade but it is somewhat doubtful if there is any real demand for this class of timber at present. The quantity available would justify efforts being made to find a market.

There are other hard woods which as a result of research may be found to possess qualities which would obtain for them ready markets abroad.

At the present time I am of opinion that it is Pencil Cedar, manufactured locally into slats which should receive first attention and research should be carried out to ascertain the most suitable manner to saw the slats, the most suitable age for timber to be felled to obtain the best quality of timber for conversion into pencils, the most economical machinery to handle the wood and to advise the trade as to its proved qualities and defects.

Some system of grading under the aegis of Government should be introduced in order to assist buyers and to prevent bad material from being exported.

Slats are already being exported by one firm of saw millers to India and to America, but if a regular trade is to be established it will be necessary to encourage other saw millers to put down milling plant to handle cedar logs for conversion into slats and to give them expert advice.

To maintain a regular trade in slats I estimate that the minimum annual output should be half a million cubic feet. I am sanguine that this could be done but only if the trade were organised and received active support and advice from research officers who experts in the trade.

I have no figures as to the possible yield of cedar from the Usambara forests, timber from them was being regularly exported before the war.

Paper Pulp.

An important raw material for the manufacture of paper pulp exists in the very large quantities of bamboo (Arundinaria alpina).

This bamboo covers very large area and while it is of undoubted and extreme value in connection wit the conservation of water yet there is no reason why it should not be exploited under scientific management. No report has been received as to the suitability of the material for the manufacture of pulp from the Imperial Institute, some years ago an experiment was made by private enterprise and the result was said to be [illegible] further investigation is required.

[illegible] bamboo may be estimated at [illegible] and the individual bamboo forests are of [illegible] extent that the laying down of plant for the manufacture of pulp on a large scale would be fully justified provided that research should show that the material were suitable.

General Remarks.

At the present time it is desirable to encourage an export trade in pencil cedar slats and paper-pulp made from bamboos. The quantities of these two materials would justify endeavours being made to find markets for them.

Research is required to enquire into other timbers and forest products to ascertain their technical properties, values, uses etc. and the quantities in which they can be produced with a view to their exploitation.

Conservator of Forests.

210

1522.

30th. December, 192[illegible]

TO: The Hon'ble, The Director of Agriculture,

Nairobi.

ECONOMIC RESOURCES OF THE BRITISH EMPIRE.
Colonial Office Circular (A) of [illegible]

With reference to [illegible] of the [illegible] instant [illegible] of the 15th September [illegible] I [illegible] the [illegible] as follows:-

WHAT IS BEING DONE AT THE PRESENT TIME.

At the present time the work of the [illegible] Division consists of:-

(a) The preparation of [illegible] and Vaccines for immunization [illegible] against [illegible] spread of [illegible] diseases.

The following table shows the [illegible] during the [illegible]

[illegible]

Anthrax [illegible] Vaccine.

Manufactured during the year 3,[illegible]60 Issued [illegible]

Ulcerative Lymphangitis Vaccine.

Manufactured during the year [illegible] 132[illegible] Issued during the year [illegible] 2

Blackquarter Vaccine (Single)

Manufactured during the year 5,400. Issued during the year [illegible],450

Blackquarter Vaccine (Double.)	Doses.		Doses.
Manufactured during the year..........	[illegible]	Issued during the year..........	10,850

Kikuyu Fowl Disease Vaccine........			
Manufactured during the year..........	3,649.	Issued during the year..........	3,649.

Anthrax Vaccine. Double.			
Manufactured during the year..........	18,890.	Issued during the year..........	18,890.

Pluero-Pnemonia Vaccine.			
Manufactured during the year..........	564.	Issued during the year..........	564.

Our books shew that the total revenue derived from the sale of Sera, Vaccines, and other Laboratory products was approximately £[illegible] [illegible]. This does not include revenue derived from the issue of Anti Rinderpest Serum for [illegible] [illegible] as such revenue appearing in the Veterinary Division books under "Testing [illegible] Fees, etc.".

The revenue realised [illegible] the sale of Anti Rinderpest Serum is made up as follows:-

Uganda Government	£2,[illegible]
Belgian [illegible]	[illegible]33.
Nyasaland.	[illegible]
Locally (The [illegible])	[illegible]
	£ [illegible]

The sanctioned expenditure of this Division [illegible] work [illegible] purposes amounted to [illegible] the revenue [illegible] Sera [illegible] Vaccines more than covered this.

[illegible] specimens [illegible]

[illegible]

[illegible] reported during the year.

[illegible] disease [illegible] treatment, and the investigation [illegible] pathological, Bacteriological [illegible] parasitological [illegible].

During the year [illegible] for the purposes of confirmation otherwise [illegible] suspected Pleuro Pneumonia [illegible] bovum (Lumpy Sickness) were [illegible] confirmed and the vaccine prepared.

 212

(b). Investigations as to the cause of abnormal mortality which occurred after Rinderpest double inoculations were made.

(c). Experiments to note the curative effects of various agents employed in the curative treatment of Ulcerative and Epizootic Lymphangitis.

(d). Investigations as to the mortality in sheep [illegible] water, and the preparation of vaccine for the former.

(e). Collection and mounting of various pathological specimens for museums.

[illegible]. Collection of specimens, parasites, for identification and classification.

[illegible]. A course of laboratory instruction to Veterinary [illegible] and Veterinary [illegible] Stock Inspectors.

[illegible] the [illegible] in connection with the [illegible] which is still proceeding [illegible] the [illegible] stage of the process [illegible] been impossible [illegible] extend [illegible] in research work, as for some [illegible] there has [illegible] present, and a considerable portion of his time has been [illegible] work.

[illegible]

[illegible]

[illegible]. The preparation of sera and vaccines for the eradication of, and controlling the more important stock diseases, viz, Rinderpest, Pluero - pneumonia, etc, which occur [illegible] Native Rserves.

[illegible] Veterinary [illegible]

[illegible]

[illegible] [illegible]

[illegible]

The approximate [illegible] estimated at 2,000,000, vide, [illegible] Report [illegible] Division for the year ending [illegible] 31st of March, [illegible]

Of this [illegible] 80,000 are European owned and [illegible] the Masai Natives [illegible] the Reserve, leaving a balance of 1,920,000 [illegible]

C.O. 533 230

213

Other Native Reserves.

There is no Veterinary staff in the Reserves and consequently it [illegible] difficult to furnish statistics as to the number of deaths that occur [illegible] this must be enormous, in fact, the Acting Chief Veterinary Officer [illegible] [illegible] out,

"It is estimated, that given a reasonable immunity from disease, "The Masai Reserve would at once be capable of providing for its "normal increase of stock, on a conservative estimate of 30,000 "three year old bullocks, equivalent to 3,000 tons of beef, worth "£90,000 merely surplus stock. This estimate which is based on a "very liberal estimate of loss, viz, 20%, only concerns the "present figures, without taking into account the obvious increase "of birthrate and the decrease of subsequent mortality, which "would result from veterinary measures".

" At the present moment, the position is literally this, "that year after year, the total head of stock in the Reserve, "shews little or no increase."

Attention has been drawn many times to the spread of infection [illegible] the Native Reserves, more particularly from that of the Masai.

It is centrally situated and borders the more important European [illegible] [illegible] areas of the Protectorate and it also impinges on several Native [illegible] Reserves, e.g., LUMBWA, KISII, KIKUYU, WAKAMBA, [illegible] [illegible] [illegible] conquered [illegible] territory, Native areas, [illegible] [illegible] source of danger of infection [illegible] these [illegible] areas.

Outbreaks in European [illegible] have already been [illegible] to [illegible] [illegible] movements from the Reserves.

In a report by the Officer Commanding Masai Reserve in [illegible] [illegible] following interesting particulars were given:-

The Masai Reserve [illegible] area of [illegible],5[illegible]0 sq[illegible] miles

[illegible]

[illegible] appears [illegible] resulted [illegible]

[illegible]

It should be pointed out that in the estimate [illegible] the Pathological [illegible] for 1919-20, the [illegible] of £1000 [illegible] expenditure [illegible] was taken [illegible] provide the necessary staff for the Laboratory which has already been [illegible] erected at Narok, in the Masai Reserve. The cost of the erection of this Laboratory amounted to approximately £1000. [illegible]

The Acting Chief Veterinary Officer has estimated [illegible] that [illegible] outlay of £60,000, with a yearly expenditure [illegible],000, would be required [illegible]

214

for Veterinary Administration, in order to deal with the Stock Diseases of the Masai Reserve.

The cost of Administration could be met by a tax per head of cattle.

The expenditure for the preparation of Sera and Vaccines would be met by the revenue derived from the sale of these.

A MEMORANDUM IN CONNECTION WITH STOCK INDUSTRY IN EAST AFRICA WAS PREPARED FOR THE ECONOMIC COMMISSION BY R.EUSTACE MONTGOMERY, ESQ, LATE VETERINARY PATHOLOGIST, IN WHICH THE FOLLOWING VIEWS AS TO ITS COMMERCIAL APPLICATION, WERE GIVEN... ....

(A). STOCK RAISING IN THIS PROTECTORATE:

Prior to the advent of Europeans, Stock raising in Cattle, Sheep, Goats, and Donkeys, was carried out by several native pastoral tribes. Inter-tribal warfare and disease restricted the disposition of these herds from which the early settlers obtained the nucleus for stocking their farms, and which today provide the most satisfactory means of population the [illegible] areas.

The herds of the native reserves are not only an Imperial, but also a most valuable local asset and should receive adequate attention. At a conservative estimate there are in the Reserves, excluding the Northern Frontier District, [illegible] million cattle and [illegible] million sheep, the capitalised value of which exceeds [illegible] million pounds sterling. European owned stock probably amounts to [illegible] million cattle and [illegible] million sheep, the value of which is about [illegible] million pounds.

Local conditions [illegible] water in some limited districts limit the [illegible] capacity [illegible] beast per [illegible] acres, [illegible] practically the whole of the [illegible] the country [illegible] nearly 5,000,000 acres, [illegible]

There exists, therefore, a considerable area not fully [illegible] and the protection of native herds will permit [illegible] greater surplus being available for sale. These animals are not of a class at present suited for the best markets, but they are, by their resistance to disease, and their susceptibility to [illegible] by breeding, eminently suited for sale to Europeans who will develope them and their progeny to the advantage of the markets.

It is no exaggeration to [illegible] that the Meat - Stock population of this Protectorate could be [illegible] ten million cattle and an equal [illegible]

C.O. 533 230

PUBLIC RECORD OFFICE LONDON

number of sheep, with a capitalised value exceeding fifty pounds sterling.

Two main factors only enter into the problem of stock raising (a) beneficient conditions and (b) predaceous influences. With a provision of the former and absence of the latter, the country would rapidly become overstocked. There is probably no country in the world which possesses the natural beneficient conditions of East Africa. Grazing, Water and Climate all combine to encourage growth and maturity and largely to eliminate the possibilities of drought and famine. In addition to these natural advantages, there exists that of easily and cheaply growing artificial foods for such special purposes as milking and finishing for the butcher.

The occurrance of predaceous influences acts as a check to immediate progress. Of these, vermin and stock theft are small compared with disease, the control of which is vital and fundamental to the establishment of the industry on a sound [illegible] basis. [illegible] export of 25,000 cwt of Hides and 2,000 cwt of Sheep and Goat skins from this protectorate alone [illegible] of animal life, [illegible] which is preventible [illegible]

Apart from [illegible] [illegible] to encourage the [illegible] conditions [illegible] largely [illegible] settlers in the [illegible] [illegible] possess [illegible] [illegible] ... ement, [illegible] acquirement and dissemination of knowledge, areas set [illegible] particular sections of the [illegible] [illegible] the self gratification of the individual [illegible] profitable that may be at present.

The establishment of [illegible] should serve as object lessons to the neighbourhood, [illegible] they must be [illegible] on commercial lines and their produce disposed of [illegible] the country's trade without entering into competition with private producers. Facts and figures concerning all operations [illegible] these [illegible]

should be available, and shew the maturity of different breeds and crosses. The feeding values of locally grown foods. The milking capabilities under varying conditions of different animals. Such would be initial expense to the State [illegible] their maintenance would be covered by their revenue which should also provide a reasonable interest on the Capital Outlay. Model Stock farms are not yet required, but those capable of emulation by any private individual whose negative quality - the brains or experience of the subject - is made good by the Government representative.

Cattle, Sheep, Goats, Pigs and Poultry should all receive adequate attention and encouragement.

At the present time a prospective stock breeder must follow his own inclinations with only instinct to guide him. Were I a commercial man I should certainly desire some statistics on which to base my enterprise and to enable it to be regarded as an investment rather than a speculation.

(b). THE MARKETING OF STOCK PRODUCE.

Today an internal market exists for practically all stock and their produce, but that is not sufficient to meet the anticipated productions of a few years hence, and an export trade must be [illegible] [illegible] the possibilities [illegible] with [illegible].

It is unnecessary to enter into details regarding the demands of the London market which in 1910 [illegible] imported over [illegible] million pounds worth of animal products, meats, wool, hides and skins, and dairy produce [illegible]

[illegible] Australasia and South America [illegible] geographical [illegible] [illegible] the matter [illegible] ocean freights [illegible] placing of a cheaper article on the home market [illegible] place [illegible] alternatively [illegible]

Much [illegible] freight charges [illegible] [illegible] [illegible] since the carrying capacity [illegible] is so [illegible] meat [illegible] cost than at Buenos Ayres, and [illegible] at a [illegible] internal facilities [illegible] will be [illegible]

and more knowledge applied to the industry.

This country is capable of producing beef, mutton, pig and [illegible] products of unexcelled quality which would command high prices [illegible] London. It must be admitted, though, that at the present time [illegible] is not self sufficient surplus of this quality to justify an export trade and the marketing of inferior produce should be deprecated.

The augmentation of assets and the improvement in quality must be encouraged.

From a cattle population of two millions, there should be available 200,000 head representing a 10% cast per annum. If the correct proportion of 150,000 are available in the Native Reserves, they are taken up in an internal trade with other [illegible] in Reserves [illegible] with Landowners [illegible] but it seems [illegible] that only a proportion of [illegible] is [illegible] balance [illegible] skins, the result of deaths from disease [illegible] purposes. The [illegible] European [illegible] be similarly dissipated and [illegible] present.

In what year a true surplus [illegible] large areas to be [illegible] will [illegible] largely [illegible] which can be effected by [illegible] disease, but [illegible] of waiting I am strongly of opinion that [illegible] offered to natives and European [illegible] the objective. The introduction of pure [illegible] be [illegible] for improvement [illegible]

[illegible]

[illegible] surplus, [illegible] the [illegible] development [illegible] effected [illegible] co-operation on the part of individual owners.

When discussing the [illegible] between [illegible] Diseases, the opinion will be expressed that in [illegible] settled areas [illegible]

where full returns are to be obtained from the monetary outlay, game must be driven back. To bring this about game destruction will be necessary, and the establishment of freezing or chilling plants and cold storage in the best neighbourhoods should be encouraged, to deal with game meat now, and be available for mutton and pork products as they reach the market, and for beef products in the future.

It is not too early to add dairy, poultry and pig products experts to the staff of the Government, nor to obtain the services of a man familiar with the export meat trade, all of whom will provide the much needed benefit to the producer, and can direct his energies towards the future possibilities.

Education is also necessary in the matter of Hide and Skin curing, and towards the limitation of excessive branding, factors which at present are responsible for a loss approaching 25 per cent of Hide values.

(2) PRELIMINARY FIELD EXPERIMENTS IN CONNECTION WITH THE UNDETERMINED STOCK DISEASES, AS FOR INSTANCE :-

(a) Wasting disease of cattle of certain areas.

(b) Suspected vegetable poisoning of Stock, etc.

I have the honour to be,

Sir,

Your obedient servant,

John J. Walker.

VETERINARY PATHOLOGIST.

Re Colonial Office Circular (A) dated IIth June, 1919.

"Economic Resources of the British Empire."

(a) What is being done at the present time?

The Division of Entomology was established eleven years ago [illegible] Entomologist was appointed. For periods amounting to [illegible] years out of the past six the Entomologist has had one assistant. A [illegible] Export Inspector at Mombasa has worked under the direction of [illegible] Entomologist. Since 1913 a West Indian has been in charge of [illegible] Beetle [illegible] work at [illegible] Coast [illegible] present [illegible] clerk [illegible]

The entomological work [illegible]

[illegible] is given in [illegible] large. [illegible] Not a few [illegible] 2 of the Division of Entomology [illegible] field and [illegible] these insects were new to science. [illegible] reports from settlers a large [illegible] has been [illegible] less extent, [illegible] about the host [illegible] of these insects. The chief [illegible] help [illegible]

[illegible] largely [illegible]

[illegible]

[illegible] British East Africa, and not [illegible] species similar [illegible] not identical [illegible] the local [illegible] [illegible] successful [illegible] have [illegible] satisfactory. Of successful methods learnt from workers in countries [illegible] Britain at the Coast [illegible] South African poison bait spray against [illegible] [illegible] elsewhere, [illegible] ever, it frequently [illegible] that it is only [illegible] [illegible] he reports [illegible] it is not known whether [illegible] [illegible]

Further, [illegible] impossible to carry out the [illegible] [illegible] lack [illegible] [illegible]

[illegible] decided [illegible]

With adequate staff [illegible] worked out and the knowledge [illegible] could be applied. [illegible] likely that such research [illegible] [illegible]. All [illegible] [illegible]

This [illegible] [illegible]

...insects directly or indirectly injurious ... to animals are ... jects upon which research is ...

... connection the Entomologist ... Director of Agriculture, under date 27th ..., has ... the following ...

"I venture to raise the point, that no matter how important ...ntrolling of pests on crops may be, it is only a branch, and not the ... important branch of Economic Entomology.

"In most of the diseases which affect man and domestic animals ... the Protectorate, insects play a most important part and practically ...ing is known of their distribution, their seasonal prevalence, their ...eding places, life histories, or length of life.

"Some of the insects which cause disease either directly or ...irectly are known but there are possibly many others and every insect ...ch lives on or sucks blood from man or animal is a potential carrier ... disease. Every citizen has a right to demand that facilities be ...vided for the careful study of the feeding, breeding, and disease ...rying habits of all such insects.

"Such a study must of necessity take time and must to some ...nt disappoint the almost universal desire for immediate results.

"Such a study is of particular importance now on account of the ...ised influx of new people and the consequent speeding up of ...elopment.

"There is no need to enlarge on the importance of the subject ... it is recognised that ... little is known here of the diseases ... that a ... study of the ... would ... way to help ... the control and ultimate eradication of many of these diseases. ... been done ... and can be done here."

Further, ... that the staff of the Division of ... should ... visit settlers not merely to give help at ...cial times of difficulty, but in a systematic ...

... very desirable both in order ... in touch ... more ... conversant with field conditions.

[illegible] advantages to be gained when such [illegible] at the same time and [illegible] an increased staff [illegible]

This being the present condition of Economic Entomology in this country, the Entomologist, in the letter from which quotation has already been made, put forward the following proposals :-

"I suggest, therefore, that a Bureau of Entomology be instituted, the scope of the work enlarged to include the following :-

1. Insects which may spread disease.
2. Insects which directly injure or annoy human beings.
3. Insects and Agriculture.
4. Insects and domestic animals.
5. Household Insects.
6. Insects damaging stored products.
7. Useful or beneficial Insects.
8. Insects yielding useful products.
9. An entomological survey of the Protectorate.

For such a Bureau, the following would be necessary :-

BUILDINGS

The new Entomological Laboratory at Kabete, not yet completed, is suitably situated and is an excellent start in the way of suitable accommodation.

With a recurrent vote of £400 for Insecticides and Laboratory [illegible], no further sums would be necessary for Buildings [illegible] during the next [illegible] years.

STAFF

To begin with, the [illegible] would be necessary [illegible]

Chief of Bureau	£600 - [illegible] per annum.
Senior Assistant (2)	£400 - £600 per annum.
Junior Assistant	£400 per annum.
Clerk, Stenographer, Librarian	£250 per annum.

The present Vote of £200 for Labour would be sufficient until [illegible]

...velopments took place, ...

HOUSING

F. W. Dry.

Ag. Entomologist.

...ember 18th. 1919.

19th December, [illegible]

No. 16/69/30.

THE HON. THE AG. CHIEF SECRETARY,
N A I R O B I.

re Economic Resources of the British Empire.
Ref. No. S 20329/2 of 19.2.19.

I have to make the following observations :-

WATER POWER :- Water power in small units ranging from five to five hundred horse power are numerous and well distributed over the Kenya, Ukamba and Nyanza Provinces, but far the more frequently ranging between five and twenty-five horse power. These latter are rapidly being brought into use for farm purposes, i.e., the treatment of coffee and flax and the grinding of corn. The larger units are being gradually utilized as power in the treatment of sisal fibre and hydro electric installations, and their use will extend with improvements in communications. There is no unit, or close group of units, sufficiently large to justify the Government considering the question as a general public utility.

IRRIGATION :- Except the Tana in its lower reaches there is little scope for irrigation in the Protectorate, and for the following reasons :-

(a) The rivers are at their minimum of flow when irrigation is most necessary - that is during the dry season.

(b) Water used for irrigation is practically lost to the river and consequently lost for power production which does not diminish the flow.

(c) If all rivers were used for irrigation, the volume of flow is too small to irrigate more than a fraction of the cultivated area of the country.

Hence the use of water for irrigation requires serious consideration.

...ING FOR WATER. - There are large tracts of land that produce good grazing for cattle that are practically waste for want of a water supply. Professor Gregory has recommended certain lines of country where bore holes for water would have a fair chance of success. Even at the risk of complete failure, which is not likely, the geological knowledge to be obtained from such borings might be of the greatest service.

It would be advisable that two sets of boring apparatus should be obtained and experimental bore holes started. The cost would probably be £500 - £600 per set.

...ER POLLUTION : The treatment of flax, sisal and coffee requires the use of water, and the water so used if returned direct to the Rivers would injuriously affect the water supply for domestic use and for cattle.

A condition for the use of water for such purposes is that the affluent shall percolate through soil or other filtering medium before reaching the river. An investigation of the question is desirable in order that a better method of treatment of these affluents may be decided on.

A Government Hydraulic Engineer has been appointed whose duties will include attention to all the above points.

...RAP IRON : Since early in the War all scrap iron and steel have been collected by this Department with the view of being utilised. Between the Railway, this Department, and the country generally there must be a considerable quantity available. The eventual disposal of this scrap should now be considered.

It would be advisable that an estimate should first be formed of the probable annual supply. With this information it would be possible to obtain expert advice as to whether it is really an economic proposition to either export the scrap as it stands, or to convert it, before export, into ingots, and the installation recommended for this conversion