

APPENDIX TO SECOND REPORT OF FLAX COMMISSIONERS.

XV.—FURTHER REPORTS FROM HOME AGENTS.

(Received 16th October, 1871. Continued from page 97 of Appendix to First Report.)

(No. 179).—Mr. MORRISON to the CHAIRMAN.—24th August, 1871.

With reference to my letter No. 270, 27th July, 1871, I have the honour to inform you that I have forwarded per book post by this mail eight copies each of Dr. M'Nab and Professor Church's Reports on the New Zealand Flax, which have been lithographed, after revision by the reporters. I beg also to state that an equal number of copies will be forwarded by the mail *via* Southampton and Suez, on the 2nd proximo.

The originals of the Reports will be handed over to I. E. Featherston, Esq.

(Enclosure).

REPORT IN REPLY TO LETTER FROM CHAIRMAN TO DR. HOOKER, OF 27th DECEMBER, 1870.
[See Appendix I., p. 2].

Royal Agricultural College,

Cirencester, 31st July, 1871.

SIR,—

In the records of experiments and observations which follow, we have confined our attention to the points of enquiry indicated in the Progress Report of Flax Commission, No. 38, page 19*; and we may here further state, that neither the time given to it, nor the other conditions of the inquiry, has enabled us to treat the subject exhaustively. On this account, the Tables of Breaking Strain could not be undertaken, as this investigation would have necessitated the use of elaborate and expensive apparatus.

The Tables of Contents, prefixed to the accompanying microscopical and chemical reports respectively, will enable the Flax Commissioners to see at a glance the subjects which have been more specially studied by the reporters.

We have, &c.,

W. R. M'NAB, M.D., Edinburgh, &c.,

Professor of Botany.

ARTHUR H. CHURCH, M.A., Oxon., F.C.S.,

Professor of Chemistry.

Dr. J. D. Hooker, C.B., F.R.S., &c., &c., &c.

* The following were the points suggested for investigation :—

1. Comparative microscopic analysis of the structure of different parts of the fresh leaf :—*a.* Butt ; *b.* blade ; *c.* tip ; *d.* glossy surface ; *e.* bloom surface ; in each case showing the relative proportions and arrangement of the various tissues in the various parts.

2. Prepared fibres—microscopic comparison of the varieties of *Phormium* fibre, Manilla hemp, Irish flax, Russian flax, —showing relative form and dimensions of the ultimate fibre, and the mode in which they are in contact laterally.

3. Chemical analysis of the proximate constituents of the different parts of the *Phormium* leaf, for the purpose of determining the chemical reaction of the different gummy and extractive matter, and the relative proportion in which these exist in the butt and blade of the leaves. A most desirable point to determine chemically is whether any change analogous to ripening takes place in the juice of the leaf which would indicate the best period for cutting it.

4. The tables of the relative strength of fibres given in books being defective, it is desirable that a series of experiments should be undertaken to determine the breaking strain of all the different kinds of fibre in the market, tested both as straight fibre and when twisted into strands.

5. The investigation of the peculiar action of sea water on rope made of *Phormium* fibre, and the reason for its not absorbing tar, as has been alleged, will naturally form part of the third branch of the subject already indicated.

(Signed) JAMES HECTOR,

Chairman of Flax Commission.

27th December, 1870.

A.—MICROSCOPICAL EXAMINATION OF PHORMIUM TENAX.

REPORT by WILLIAM RAMSAY M'NAB, M.D., Edinburgh, Professor of Botany in the Royal Agricultural College at Cirencester, England.—July, 1871.

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