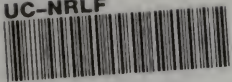
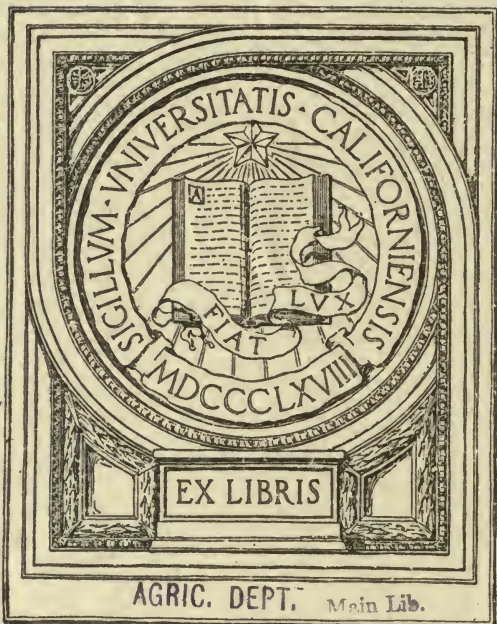


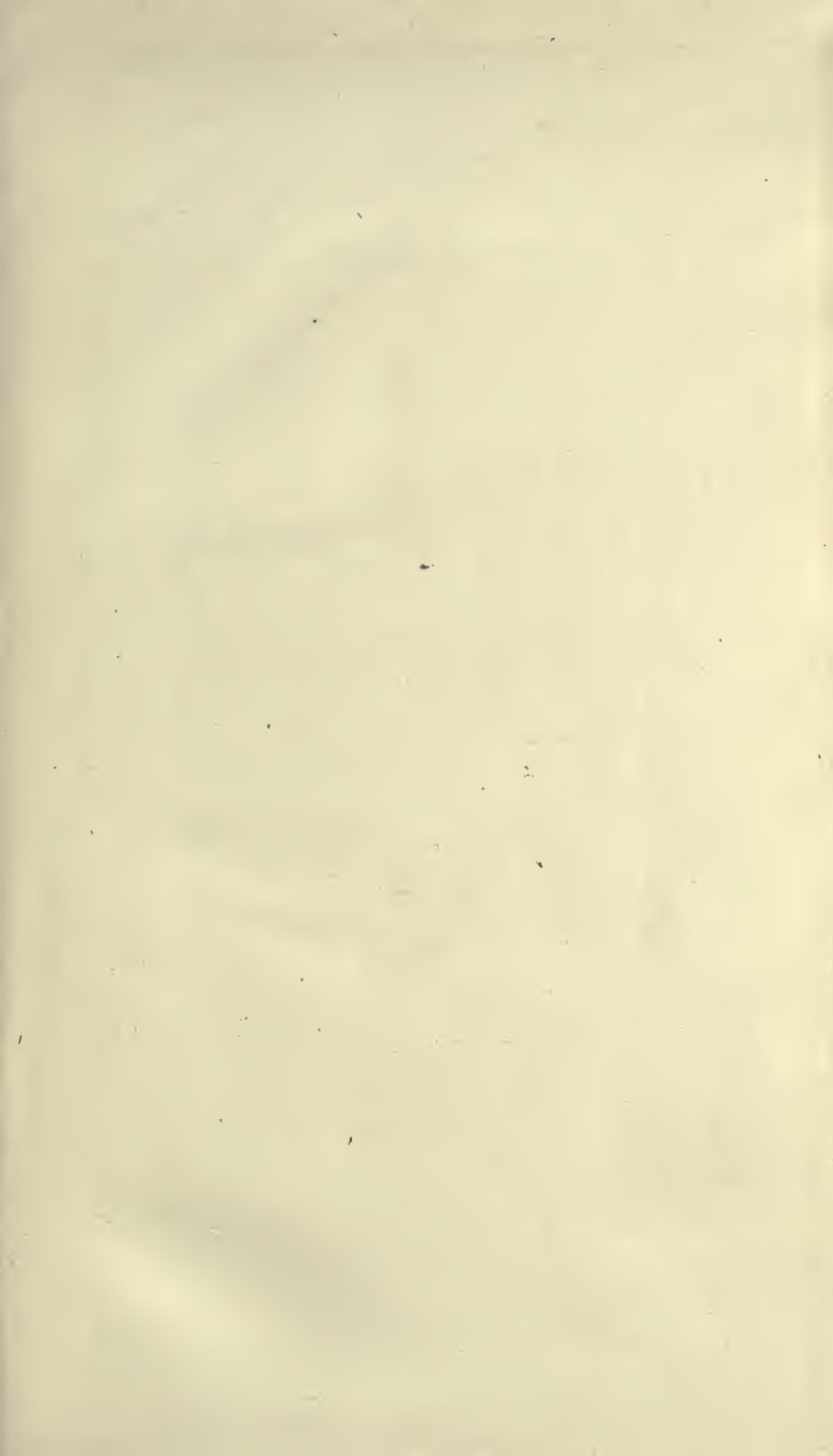
UC-NRLF



\$B 69 061

YC 59106







Digitized by the Internet Archive
in 2007 with funding from
Microsoft Corporation

UNIVERSAL EXPOSITION ST. LOUIS 1904



KINGDOM of BELGIUM



DEPARTMENT
OF

AGRICULTURE

AGRICULTURE

1788

—

AGRICULTURAL EDUCATION

Printed by CHARLES BULENS
75, RUE TERRE-NEUVE, 75
BRUSSELS

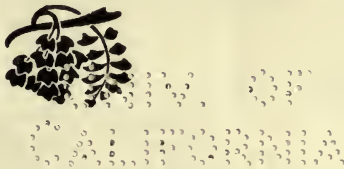
Saint-Louis Universal Exposition

KINGDOM OF BELGIUM

DEPARTMENT OF AGRICULTURE

AGRICULTURE

AGRICULTURAL EDUCATION



MINISTÈRE DE L'AGRICULTURE

3, RUE HENRI-BEYAERT, 3

BRUSSELS

1904

3469
B4A3

THE UNIVERSITY OF CHICAGO

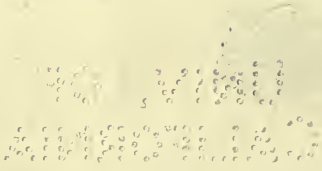
DEPARTMENT OF AGRICULTURE

PLANT PHYSIOLOGY

PHOTOGRAPHY

PLANT PHYSIOLOGY

Main Lib.
Agric. Dept.



PLANT PHYSIOLOGY

PLANT PHYSIOLOGY

INDEX

Object of this publication	7
<i>Introduction.</i> — Organisation of the Department of Agriculture	11

PART I

THE RURAL ECONOMY OF BELGIUM

I. — Agricultural Statistics	15
II. — Official and private Agricultural Asso- ciations.	25
III. — Animal Husbandry. Breeding.	38
IV. — Animal Husbandry. Sanitary Police	47
V. — The Crops	50
VI. — Agricultural Industries.	57

PART II

AGRICULTURAL EDUCATION

I. — State School of Veterinary Medicine	66
II. — Agricultural Institutes	71
<i>a)</i> State Agricultural Institute of Gembloux	71
<i>b)</i> Agricultural Institute of the University of Louvain	81
III. — Secondary Agricultural Instruction	88
IV. — Teaching of Agriculture and Domestic Eco- nomy for Girls	101
V. — Popular Instruction	111
<i>a)</i> Agricultural and Horticultural Profes- sional Sections or Schools.	111
<i>b)</i> Popular Teaching for Adults	117
VI. — Service of State Agriculturists	124
VII. — Institutions connected with Agricultural Education	134
<i>a)</i> The Belgian State Botanic Garden	134
<i>b)</i> The State Chemical and Bacteriological Institute. — The State Analytical Labo- ratories	138
<i>c)</i> Study Association of the State Agricul- turists and Agricultural Teachers.	144

OBJECT OF THIS PUBLICATION

The Belgian Department of Agriculture, thought it would be useful to issue, for the International Exhibition of St. Louis, a publication illustrating the principal services of the department, and giving an idea of the Rural Economy of the Country and the organisation of Agricultural Instruction.

The exhibits referred to in this pamphlet are divided into two groups :

- 1° *The group of Rural Economy;*
- 2° *The group of Agricultural Education.*

The chapters concerning the administration of the Department of Agriculture have been drawn up by the various divisions of the Department.

The information concerning Rural Economy and Schools has been furnished by the collaborators who have contributed to the organisation of the various sections.

* * *

CLASSIFICATION IN THE CATALOGUE

These two sections are classed in the catalogue as follows :

Groups 78, 83, 84

DEPARTMENT OF AGRICULTURE

GROUP OF RURAL ECONOMY

*Group 83, classes 506 (see class 14), 507, 508,
509 (see class 14), 510, 511 (see class 14)*

Exhibitors

- I. Agricultural statistics. — Agricultural associations.
(*Administration of Agriculture.*)
- II. Sanitary police of domestic animals.
(*Administration of Agriculture.*)
- III. Crops.
(*Administration of Agriculture.*)
- IV. Agricultural industries, etc.
(*Mrs. J. Melotte, manufacturer, Remicourt.*
E. Tibbaut, deputy, Ghent.)

Group 5, class 14

DEPARTMENT OF AGRICULTURE

GROUP OF AGRICULTURAL INSTRUCTION

Regulations. — Statistic documents. — Books. — Programmes, etc.
of Agricultural Education.

Exhibitors

- I. State Agricultural Institute of Gembloux.
(*Director : Mr. Hubert.*)
- II. Agricultural Institute of the University of Louvain.
(*Professor : Mr. Leplae.*)
- III. State Veterinary School of Cureghem.
(*Director : Mr. Degive.*)
- IV. State Botanical Garden at Brussels.
(*Director : Mr. Durand.*)
- V. State Chemical and Bacteriological Institute. —
State Analytical Laboratories (see class 509).
(*Administration of Agriculture.*)

- VI. State Secondary practical Agricultural School at Huy.
(*Director : Mr. Dijon.*)
- VII. State Secondary practical Agricultural School at Ghent.
(*Director : Mr. Ronse.*)
- VIII. Agricultural Household Schools.
(*Mr. Wauters, director of the Agricultural Household School of Bouchout.*)
- IX. Primary Agricultural Schools.
(*Mr. Poll, director of the Reformatory School of Ruysselede, near Beernem.*)
- X. Courses of lectures to farmers.
(*Administration of Agriculture.*)
- XI. Service of State Agriculturists (see class 506, experiments).
(*Administration of Agriculture.*)
- XII. Study Association of State Agriculturists (see class 511).
(*Rue de Linthout, 25, Brussels.*)
-

INTRODUCTION

ORGANISATION OF THE DEPARTMENT OF AGRICULTURE

The Department of Agriculture, of Industry and Public-works was instituted by a Royal Decree of the 16th of June 1884, by which all the services relative to agriculture, industry, bridges and roads, mines, and fine arts were detached from the Department of the Interior and transferred to the new department.

By a Royal Decree of the 20th of April 1885, the Bureau of Forestry was also placed in this Department.

The Royal Decree of the 25th of May 1895 detached from this Department the administrations of Industry and Labour, and the Royal Decree of the 5th of August 1899 detached the Road Surveying Service.

From the 5th of August 1899 the Department has been called « Ministère de l'Agriculture ».

It is composed of the following branches :

1° THE GENERAL SECRETARY'S OFFICE which includes :

- a) *The general supervision of the Department and of its agents.*
- b) *Control of the accounts and pensions.*

2° THE ADMINISTRATION OF AGRICULTURE including :

- a) *The first division : which has in charge all necessary measures concerning the Improvement of domestic Animals ; the Veterinary service ; the sanitary police Laws and Regulations affecting domestic animals ;*
- b) *The second division : this division has charge of Agricultural instruction ; the State Botanic Garden ; and the service of State Agriculturists ;*

c) *The third division* which deals with :

Agricultural Associations ; Agricultural Statistics ; the Chemical and Bacteriological Institute and the Analytical Laboratories.

It also has charge of the work connected with the Agricultural Insignia, and publishes the Bulletin de l'Agriculture, which is the official journal of the Department.

3° THE ADMINISTRATION OF FORESTRY :

This bureau has a central administration in Brussels and provincial branches.

It is charged with the preservation and management of the forests belonging to the State, Communes and public establishments, and arranges for prosecutions in cases of injury to forests.

The improvement of waste lands, still extensive in Belgium, is also carried out by the Bureau of forestry.

It also superintends fishing in canals and rivers, the services of inland and sea fisheries and the execution of measures destined to favour the increase of fresh and salt water fish.

Finally since the 1st of November 1895 the services of shooting and hunting were transferred to the Bureau of Forestry, which now sees to all matters concerning forests, waste lands, fishing and shooting.

A special branch instituted by a Royal Decree of the 28th of June 1896 is charged with the organisation of experimental fields on rational and uniform lines and with the gathering of statistics of research work carried out in Belgium and other countries.

The inspector who has to see that these researches and experiments are duly carried out, is also always at the disposal of any persons wishing to consult him on the rational treatment of forests or the improvement of waste lands.

The Department of Agriculture also includes :

The Administration of Public Health, of Public rural Roads and the Direction of Fine Arts ;

The following boards are attached to the Department of Agriculture ;

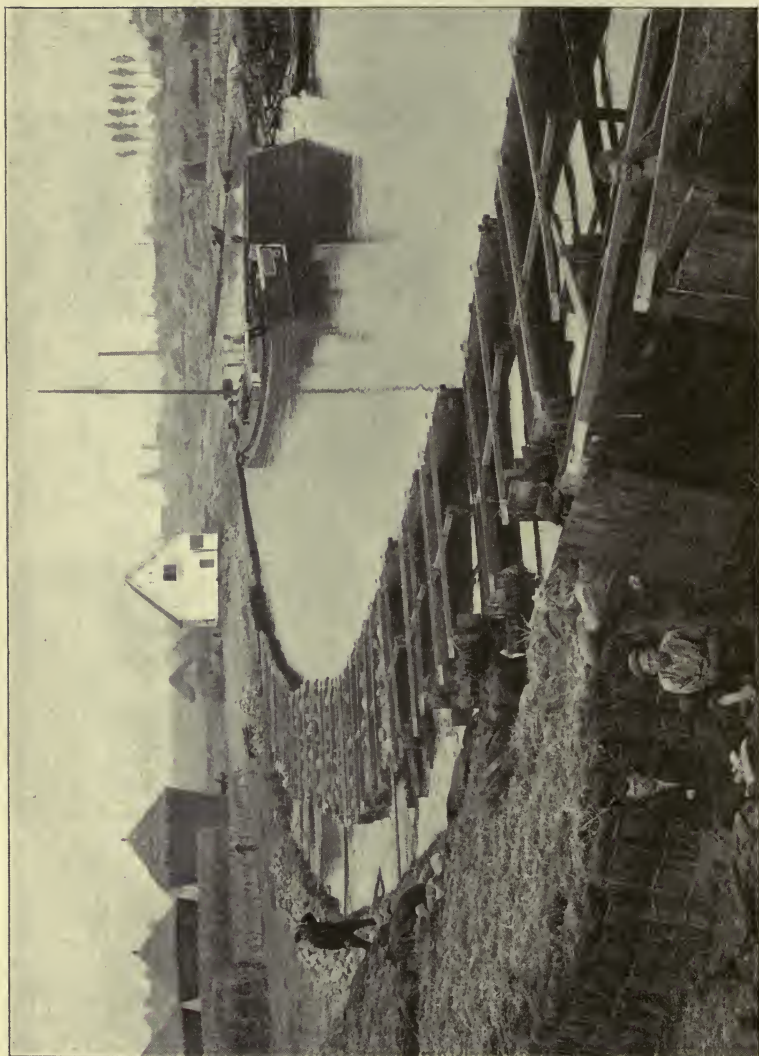
The superior board of Agriculture ;

The » » Forestry ;

The committee on sea fisheries;
The » » pisciculture;
The » » oyster fisheries;
The superior board of Public Health.

The following services carry out work in the provinces :

The service of Veterinary Inspectors;
The » » Agricultural Inspectors;
The » » State Agriculturists (Agricultural Engineers);
The » » Inspectors and general keepers of rivers and forests;
The » » dairy Experts;
The agricultural section of the State's commercial Museum;
The service of the State analytical laboratories;
The State Bacteriological and Chemical Institute at Gembloux;
The Dairy Station annexed to the Agricultural Institute of Gembloux.



FLAX RETTING IN THE GOLDEN RIVER NEAR COURTRAI

PART I

The Rural Economy of Belgium

I. — AGRICULTURAL STATISTICS

The following data are taken from the general agricultural census of 1895 and from the annual statistics issued since 1900. The latter only include farms of at least 1 hectare (1) and upwards.

The total area of Belgium is 2,945,557 hectares, of which in 1895, 2,607,514 hectares were cultivated and distributed under the following :

		hectares
Cereals and farinaceous products	Wheat.	180,377
	Spelt	33,854
	Meslin.	18,446
	Rye.	283,376
	Barley.	40,243
	Oats	248,694
	Buckwheat	4,701
	Total . . .	809,691
Leguminosae	Horse-beans	15,965
	Peas and vetches	10,360
		Total . . .
Industrial plants	Hemp	611
	Flax	30,615
	Rape and other oil producing plants	1,807
	Tobacco	2,148
	Hops	3,705
	Chicory	12,756
	Sugar beet.	54,099
	Total . . .	105,741

(1) One *hectare* contains one hundred ares and is equal to 2.47 *english acres*.

Root crops	}	Beets	40,561
		Carrots and parsnips	3,827
		Turnips, swedes, cabbages.	9,413
		Potatoes	184,691
		Total	238,492
Fodder crops	}	Clovers, serradella, meadows, orchards, etc.	637,907
Other crops	}	Various unspecified plants	3,383
		Vegetable and kitchen gardens	41,868
		Vineyards	70
		Nursery gardens.	3,025
		Osier-beds	3,348
		Parks	15,725
		Total	67,419

An area of 721,939 hectares is occupied by woods, waste lands and bare fallow.

191,234 hectares included in the above figures are occupied by catch crops.

Some rather important modifications have occurred in the distribution of crops in recent years, as will be seen from the following table which shows the percentage of the total area occupied by different crops :

GROUPS	1846	1866	1880	1895
Cereals and farinaceous products	33.73	36.30	34.55	31.05
Leguminosae	2.64	1.42	1.22	1.01
Industrial plants	2.52	4.33	3.58	4.06
Root crops	5.10	7.52	8.71	9.15
Fodder	19.87	20.40	21.25	24.46
Other crops	1.92	1.83	2.46	2.60
Bare fallow lands, woods and waste lands.	34.22	28.20	28.23	27.67
	100.00	100.00	100.00	100.00

It will be seen from the preceding figures that the cereal crops have diminished, while fodder crops have greatly increased.

This is due in the first place to the depreciation in the price of cereals, and to the increasing attention given to cattle breeding in Belgium.

* * *

In 1895 the crops mentioned in the annual census covered an area of **1,818,156** hectares.

The annual statistics for 1902, not taking into consideration holdings of less than one hectare, give a cultivated area of **1,736,174** hectares.

Thus the area occupied by the farms of less than 1 hectare is very unimportant.

As to farms of 1 hectare and above, they were distributed as follows in 1902 :

CATEGORIES	NUMBER		AREA	
	Absolute	Relative	Absolute	Relative
1 hectare and less	9,489	PER CENT 3.32	8,323	PER CENT 0.48
Over 1 hectare to 2 hectares	84,425	29.56	123,036	7.09
" 2 " 3 "	50,040	17.52	123,730	7.13
" 3 " 4 "	30,537	10.69	106,166	6.11
" 4 " 5 "	20,369	7.13	91,508	5.27
" 5 " 7 "	26,886	9.41	159,640	9.19
" 7 " 10 "	23,269	8.15	194,580	11.20
" 10 " 15 "	18,335	6.42	222,871	12.84
" 15 " 20 "	8,264	2.89	141,952	8.18
" 20 " 30 "	7,040	2.46	170,312	9.81
" 30 " 40 "	2,671	0.94	91,917	5.29
" 40 " 50 "	1,390	0.49	62,364	3.59
" 50 " 100 "	2,370	0.83	163,418	9.41
" 100 " 150 "	449	0.16	52,788	3.04
" 150	111	0.04	23,569	1.36
	285,645	100.00	1,736,174	100.00

This table shows the extreme subdivision of Belgian agricultural land : this is still more visible in examining separately certain provinces.

In east Flanders 40 p. c. of the cultivated area is occupied by farms of less than 5 hectares.

*
* * *

A comparison of the production per hectare from 1846 to 1856, and from 1880 to 1895 shows that great progress has been made in farming.

The average yield per hectare in decennial periods ending with the years quoted is shown below.

CROPS	AVERAGE PRODUCE FOR ONE HECTARE				
	1846	1856	1866	1880	1895
	Kilogr.	Kilogr.	Kilogr.	Kilogr.	Kilogr.
Wheat, grain.	1,435	1,679	1,418	1,529	1,931
Rye	1,326	1,475	1,569	1,422	1,786
Oats	1,404	1,522	1,664	1,614	1,759
Beets for cattle food	29,000	»	29,000	32,284	44,730
Potatoes	10,392	12,832	10,037	12,235	15,598

The following figures taken from the statistics of 1900, 1901 and 1902 show that the produce of these crops vary considerably from one year to another, for reasons quite independent of the care taken in their cultivation.

CROPS	AVERAGE PRODUCE DURING THE YEARS		
	1900	1901	1902
Wheat.	2,221	2,322	2,349
Rye.	2,057	2,143	2,144
Oats	2,245	2,363	2,530
Beets for cattle food	57,689	58,043	55,884
Potatoes	16,963	19,067	15,917

Here are a few figures relative to the use of commercial manures in Belgium.

DIFFERENT KINDS OF MANURES AND FERTILISERS	QUANTITIES APPLIED IN 100 KIL. DURING THE YEARS		
	1900	1901	1902
Lime.	705,349	733,558	910,745
Sugar factory waste.	1,586,116	1,398,628	1,177,360
Marl.	276,972	244,652	232,367
Sulphate of lime	4,599	5,515	6,381
Nitrate of soda	739,214	767,030	735,576
Sulphate of ammonia	54,044	67,318	88,264
Dried blood	8,674	6,517	7,390
Wool waste	70,855	81,778	78,822
Guano	200,651	206,168	222,134
Superphosphate	767,632	894,797	986,257
Basic cinder.	664,429	643,504	607,879
Mineral phosphate	35,115	15,762	12,486
Muriate of potash.	17,077	21,581	22,593
Sulfate of potassium	12,525	12,926	14,719
Kainit and other potash salts	109,072	177,314	213,344
Refuse cakes.	158,678	128,874	147,180
Mixed manures.	618,994	718,300	659,056

The variations from one year to another shown by these figures are due to different reasons.

Firstly, the farmers understand more and more every year the usefulness of these manures by the effects they produce in the character of the crops.

Secondly the variations in the weather of the year influences the growth of the plants and their wants in manures.

The variation in prices of these manures also influence more or less their use.

*
* *

In connection with the attention given by farmers to crops grown for animal foods it may be interesting to show the quantities of commercial feeding stuffs employed by farmers for the same purpose.

Commercial Feeding Stuffs

DESIGNATION OF PRODUCTS	QUANTITIES USED IN 100 KILOGRAMMES IN	
	1901	1902
Linseed cake and linseed meal	1,342,325	1,508,210
Cotton cake and cotton meal.	141,237	126,056
Other cakes and meals	246,298	256,941
Meat meal.	6,758	8,677
Malt combs	88,910	66,696
Maize and maize meal	558,385	546,502
Dried brewers grains	167,306	133,345
Fresh brewers grains.	4,742,814	5,643,595
Pulp from sugar factories	14,436,375	10,277,792
Bran	2,030,404	2,099,980

What has been said about the causes affecting the use of commercial manures applies also to feeding stuffs of the same origin.

The extent to which they are used is affected by diverse reasons such as : the fluctuations in prices, the success or failure of fodder crops.

* * *

In 1895 the census of our live stock gave the following results :

Horses (those not used for agricultural purposes [55.328] included).	271,527
Cattle	1,420,978
Sheep	235,722
Swine	1,163,133
Goats	257,669

As the annual census does not take in account the farms of less than 1 hectare, thus a great number of pigs are not counted, as these animals are generally kept on very small farms.



BELGIAN HORSES AT A SHOW

The censuses of 1900, 1901 and 1902 gave the following number of horses, cattle and swine.

YEARS	HORSES USED FOR AGRICULTURAL PURPOSES	CATTLE	SWINE
1900	241,553	1,657,494	1,005,501
1901	244,752	1,646,320	1,015,322
1902	246,881	1,646,556	1,136,786

The number of farm animals is rapidly increasing, thus in 1902 on the farms of 1 hectare and above the number of pigs nearly equalled the total number of swine returned at the census of 1895.

The following tables show the way in which these animals are distributed as regards their age, and sex; the number of births and deaths per thousand animals; and the relation between the number of mares, cows and sows and young animals.

Horses

PER THOUSAND HORSES

3 YEARS OLD AND ABOVE			ONE YEAR AND LESS THAN 3 YEARS			LESS THAN ONE YEAR OLD		
YEARS	STALLIONS	MARES	GELDINGS	STALLIONS	MARES	GELDINGS	COLT FOALS	FILLY FOALS
1902 . . .	12	436	204	19	117	82	66	65
1901 . . .	12	439	202	18	114	82	65	68
1900 . . .	12	440	201	19	111	81	68	68

YEARS	PER 1000 HORSES	
	DEATHS	BIRTHS
1902	38	160
1901	42	159
1900	46	161

The number of births per thousand mares 3 years old and above was

366 in 1902
 362 » 1901
 366 » 1900



BELGIAN DAIRY COW

Cattle

PER 1000 ANIMALS

YEARS	2 YEARS OLD AND ABOVE				ONE YEAR AND LESS THAN 2 YEARS				Six months and less than one year old		Less than 6 months old	
	BULLS FOR BREEDING	COWS	OXEN	FATTENING ANIMALS	YOUNG BULLS FOR BREEDING	BULLOCKS	HEIFERS	YOUNG OXEN	MALES	FEMALES	MALES	FEMALES
1902 .	6	510	18	40	5	14	147	35	39	96	33	55
1901	6	506	19	43	6	15	153	37	38	92	31	53
1900 .	6	500	19	40	6	14	156	38	41	97	30	53

YEARS	PER 1000 ANIMALS	
	DEATHS	BIRTHS
1902	48	437
1901	46	427
1900	46	420

Number of births per 1,000 dairy cows :

- In 1902 . . . 857
- » 1901 . . . 843
- » 1900 . . . 840

Swine

PER 1000 PIGS

6 MONTHS OLD AND ABOVE				2 MONTHS AND LESS THAN 6 MONTHS	LESS THAN 2 MONTHS OLD
YEARS	BOARS	SOWS FOR BREEDING	PIGS KEPT FOR FATTENING		
1902	3	122	369	276	230
1901	4	121	378	274	223
1900	4	121	388	265	221

YEARS	PER 1000 PIGS	
	DEATHS	BIRTHS
1902	236	1,515
1901	211	1,467
1900	197	1,488

Number of births per 1,000 sows :

- In 1902 . . . 12,403
- » 1901 . . . 12,070
- » 1900 . . . 12,257

*To illustrate the Belgian agricultural statistics,
the following objects are exhibited :*

Maps representing the proportional distribution of the various crops in 1895.

General census of Agriculture (5 volumes).

Monographic descriptions of the agricultural districts of Belgium (9 volumes).

Annual census of Agriculture (3 volumes).

II. — OFFICIAL AND PRIVATE AGRICULTURAL ASSOCIATIONS

A great number of societies have been formed in Belgium for the advancement of agriculture, horticulture, etc.

The official agricultural societies were established in 1848.

Most of the agricultural guilds were instituted during the years 1894, 1895 and 1896.

Prior to 1893 the number of agricultural cooperative societies and mutual insurance associations was insignificant.

It is only since that year that real progress has been made towards the establishment of these societies (1).

The Government has favoured this movement by granting subsidies, by the institution of lectures showing the use of these societies, by publishing model statutes and by the establishment of a Bureau in which free information is given upon all subjects concerning agricultural associations.

A sum of 137,000 francs is granted yearly to the official agricultural associations.

The subsidies to private associations are ruled as follows :

I. — AGRICULTURAL PROFESSIONAL ASSOCIATIONS ESTABLISHED ACCORDING TO THE LAW OF THE 31st MARCH 1898

A. — *Local and cantonal Associations*

1° Subsidies are granted to help these bodies to buy agricultural implements and machines which remain the property of the union and are to be used by members. These subsidies are equal to one fifth of the

(1) See : Experiment Station Record, vol. 9, 1897, n° 1, pp. 3-19, Agricultural Associations in Belgium, by P. DE VUYST.

commercial price of these implements which is determined by the State Agriculturist after he has examined the implements which have been bought. The Associations must have at least 40 members if they want to purchase implements of a value of more than 4,000 francs.

2° Subsidies to help them to cover the expenses of their exhibitions and shows.

The Central Administration before granting these subsidies has to consult the district State Agriculturist as to the programme and expenses of the proposed works.

These subsidies may not exceed one third of the expenses required for the execution of these enterprises.

3° A free subscription to the *Bulletin de l'Agriculture*, which is the official publication of the Department.

4° Two hundred membership books containing the rules of the Union.

More membership books are supplied if the Union applies for them to the Department before the publication of the statutes in the *Moniteur*.

B. — Registered provincial Federations of professional Associations

Subsidies to help cover the expenses of superintending the local and cantonal Associations.

These subsidies amount to 25 francs for every Association that is inspected.

Subsidies to institute lectures on agricultural insurance and credit.

These subsidies amount to 15 francs per lecture.

II. — NON REGISTERED AGRICULTURAL SOCIETIES, AND REGISTERED AND NON REGISTERED HORTICULTURAL SOCIETIES

The subsidies granted are the same as those in § I, litt. A, 2°.

These subsidies are paid to the national Committee for the advancement of horticulture, which has to divide these subsidies between the federated horticultural societies

according to the importance of the work undertaken by each society.

The horticultural societies receive members books on the same conditions as stated in § I, litt. A, 4°.

III. — REGISTERED AND NON REGISTERED APICULTURAL AND AVICULTURAL SOCIETIES

The subsidies granted are the same as in § I, litt. A, 2°.

1° The subsidies granted to apicultural societies are paid to the provincial federations for apiculture and those granted to avicultural societies are paid to the national federation for aviculture.

These societies have to divide these subsidies under the same conditions as the National Committee for the advancement of horticulture (see § II).

2° Subsidies for the institution of lectures on Apiculture and Aviculture under the superintendance of the State Agriculturists.

These subsidies amount to 15 francs for each lecture.

3° The societies for apiculture and aviculture enjoy the same privileges as in (§ I, litt. A, 4°).

4° Subsidies are granted to the recognized avicultural societies for buying avicultural appliances which remain the property of the Associations and are reserved for the use of the members.

These subsidies are equal to one fifth of the commercial value of these goods, as estimated by the State Agriculturist who has examined them.

IV. — CO-OPERATIVE AGRICULTURAL CREDIT SOCIETIES

A. — *Raiffeisen credit banks*

1° A subsidy of one hundred francs is granted when these banks are established.

2° Membership books (see § 1, litt. A, 4°).

B. — Central Agricultural credit banks

1° Subsidies are granted to enable these banks to superintend the Raiffeisen banks.

The subsidies amount to 25 francs for each bank inspected by the central banks.

2° Membership books (see § I, litt. A, 4°).

V. — FEDERATIONS OF CO-OPERATIVE DAIRIES

Subsidies are granted to enable these federations to superintend the co-operative dairies.

These subsidies amount to 25 francs for every dairy inspected by the federations.

VI. — REGISTERED MUTUAL INSURANCE SOCIETIES AGAINST CATTLE MORTALITY

A. — Local Mutual Insurance Societies

1° A subsidy of one franc for each animal insured is granted by the State at the founding of these mutual insurance societies.

The lowest subsidy fixed is a hundred francs and the highest 600 francs;

2° Annual premiums of 25 francs are granted to the societies which send up a report of the proceedings of the preceding year's work before the 1st of March.

3° Membership books (see § I, litt. A, 4°).

B. — Federations of Reinsurance Societies

1° Annual subsidies are granted equal to the amount of the premiums lodged with the Federative bank by the local societies.

These subsidies may not exceed 15,000 francs for each province.

2° Membership books (see § I, litt. A, 4°).

VII. — REGISTERED MUTUAL INSURANCE SOCIETIES AGAINST THE MORTALITY OF HORSES KEPT FOR AGRICULTURAL PURPOSES

A. — *Local, cantonal or provincial Societies*

1° Subsidies are paid on the establishment of these societies at the rate of 3 francs for each mare, gelding or foal and 10 francs for each stallion insured at the time of the legal recognition of the society.

2° Annual premiums of 25 francs at the same conditions as in § VI, litt. A, 2°.

3° Membership books (see § I, litt. A, 4°).

B. — *Provincial Reinsurance Federations against the mortality of mares, colts and geldings, also the National Reinsurance Federation against the mortality of stallions*

1° The same subsidies are granted as in § VI, litt. B. The subsidy granted may not exceed 15,000 francs.

2° Membership books (see § I, litt. A, 4°).

VIII. — REGISTERED MUTUAL INSURANCE SOCIETIES AGAINST THE MORTALITY OF GOATS AND PIGS

A. — *Local Mutual Insurance Societies*

1° Subsidies of 0.50 francs are granted for each goat or pig insured at the time of the legal recognition of the society.

The lowest subsidy granted is 50 francs and the highest 300 francs.

2° Annual premiums of 25 francs are granted on the same conditions as in § VI, litt. A, 2°.

3° Membership books (see § I, litt. A, 4°).



AGRICULTURAL SHOW OF BRUGES 1903
organized by the Provincial Agricultural Society.

B. — *Federations of Reinsurance Societies*

1° Annual subsidies equal to the amount of premiums lodged by the local societies with the Federative banks.

These subsidies may not exceed 7,500 francs for each province.

2° Membership books (see § I, litt. A, 4°).

IX. — NON REGISTERED MUTUAL INSURANCE SOCIETIES
AGAINST THE MORTALITY OF GOATS AND PIGS

Premiums of 25 francs at the same conditions as in § VI, litt. A, 2°.

Development of Agricultural Associations

The following tables illustrate the extension and development of Agricultural Societies.

Societies for the advancement of agriculture, apiculture, horticulture and the improvement of cattle.

1° *Agricultural Associations* (Official cantonal societies).

YEARS	NUMBER OF SOCIETIES	NUMBER OF MEMBERS
1895	149	23,173
1896	159	22,735
1897	151	24,372
1898	152	25,746
1899	155	27,402
1900	156	28,133
1901	157	28,077
1902	157	28,518

2° *Free agricultural guilds* (local societies).

YEARS	NUMBER OF SOCIETIES	NUMBER OF MEMBERS
1895	410	34,203
1896	550	44,710
1897	572	47,603
1898	607	49,284
1899	638	50,475
1900	626	45,059
1901	776	42,659
1902	924	42,508

3° *Apicultural societies* (local).

YEARS	NUMBER OF SOCIETIES	NUMBER OF MEMBERS
1895	177	6,817
1896	189	7,108
1897	210	8,688
1898	227	9,326
1899	242	9,872
1900	247	10,262
1901	245	9,689
1902	250	9,561

4° *Horticultural societies* (local and cantonal).

YEARS	NUMBER OF SOCIETIES (1)	NUMBER OF MEMBERS
1895	135	16,586
1896	136	18,461
1897	132	17,871
1898	130	17,795
1899	128	17,761
1900	127	18,794
1901	133	19,202
1902	163	27,181

5° *Avicultural societies* (local).

YEARS	NUMBER OF SOCIETIES	NUMBER OF MEMBERS
1898	29	2,107
1899	41	2,493
1900	51	3,228
1901	54	4,164
1902	62	4,580

6° *Syndicates for the improvement of cattle*
(local and cantonal).

YEARS	NUMBER OF SOCIETIES	NUMBER OF MEMBERS	NUMBER OF ANIMALS ENTERED IN THE REGISTERS OF THE SYNDICATES
1897. .	71	3,945	10,396
1898. .	187	5,694	14,796
1899. .	263	9,492	31,015
1900. .	302	12,314	44,106
1901. .	312	11,183	43,211
1902. .	312	11,072	38,140

(1) Most of these societies are simply groups of gardeners organized by the agricultural guilds; only 72 (the most important) are established as co-operative societies according to the law of 1873 on commercial societies.

7° *Syndicates for weighing, taring, and fixing the density of sugar beets delivered to sugar works by the members.*

YEARS	NUMBER OF SYNDICATES	VALUE OF EXAMINED BEETROOTS
1899	16	1,871,733
1900	30	3,128,995
1901	26	1,692,161
1902	25	1,013,373

Societies or syndicates established for buying seeds, commercial manures, food products for cattle, and agricultural implements for the members.

YEARS	NUMBER OF SOCIETIES	NUMBER OF MEMBERS	AMOUNT OF PURCHASES (in francs)
1895. .	337	26,726	5,127,747
1896. .	469	38,487	7,445,679
1897. .	585	47,206	8,427,328
1898. .	602	48,747	11,730,764
1899. .	623	50,357	12,969,414
1900. .	731	51,979	11,192,393
1901. .	780	49,165	14,430,168
1902. .	837	52,228	14,902,781



COOPERATIVE DAIRY OF OOSTCAMP
One of the first and largest in Belgium

Cooperative dairies. — Societies established for making butter, cheese and the sale of the same.

YEARS	NUMBER OF SOCIETIES	NUMBER OF MEMBERS	AMOUNT SOLD (in francs)
1895. .	69	3,501	3,236,939
1896. .	118	9,890	5,359,722
1897. .	167	17,022	9,142,273
1898. .	237	24,519	12,802,785
1899. .	298	34,205	17,772,345
1900. .	356	40,706	20,772,920
1901. .	427	47,447	22,556,480
1902. .	467	50,890	27,514,729

*Cooperative societies of Agricultural Credit :
Raiffeisen banks.*

YEARS	NUMBER OF SOCIETIES	NUMBER OF MEMBERS	NUMBER OF LOANS	AMOUNT OF LOANS
				francs
1895. .	33	1,160	266	111,050
1896. .	77	2,852	765	282,672
1897. .	158	5,689	1,371	467,453
1898. .	199	7,812	1,933	740,424
1899. .	229	9,593	2,065	1,053,971
1900. .	264	11,669	2,269	1,544,909
1901. .	286	13,308	2,678	1,906,026
1902. .	313	15,348	2,879	1,801,002

Registered and non registered Mutual Insurance companies against the mortality of animals of the bovine race, of horses used for agricultural purposes, and of goats and pigs.

1° *Mutual Insurance companies against the mortality of cattle.*

YEARS	NUMBER OF SOCIETIES	NUMBER OF MEMBERS	NUMBER OF BEASTS INSURED	NUMBER OF INDEMNITIES PAID	AMOUNT OF THESE INDEMNITIES
1895. .	279	27,355	75,833	1,650	139,384
1896. .	353	33,860	96,787	2,443	212,711
1897. .	436	41,024	119,253	3,292	303,328
1898. .	509	49,578	139,859	3,762	354,318
1899. .	596	57,186	164,028	4,847	457,786
1900. .	641	61,843	179,807	5,276	504,676
1901. .	729	67,570	198,313	5,852	530,976
1902. .	791	72,735	209,887	6,231	592,241

2° *Mutual Insurance companies against the mortality of horses (stallions, mares, colts and geldings).*

YEARS	NUMBER OF SOCIETIES	NUMBER OF MEMBERS	NUMBER OF ANIMALS INSURED	NUMBER OF INDEMNITIES PAID	AMOUNT OF THESE INDEMNITIES
1897. .	4	223	349	4	1,539
1898. .	12	380	584	9	2,845
1899. .	13	631	908	17	7,949
1900. .	22	2,055	3,307	62	43,340
1901. .	59	5,089	8,804	179	121,780
1902. .	97	8,706	16 079	360	188,149

3° *Mutual Insurance companies against the mortality of goats.*

YEARS	NUMBER OF SOCIETIES	NUMBER OF MEMBERS	NUMBER OF GOATS INSURED	NUMBER OF INDEMNITIES PAID	AMOUNT OF THESE INDEMNITIES
1900 . .	7	1,237	1,573	56	735
1901 . .	14	1,993	2,498	109	1,441
1902 . .	37	5,286	6 640	341	4,388

4° *Mutual Insurance companies against the mortality of pigs.*

YEARS	NUMBER OF SOCIETIES	NUMBER OF MEMBERS	NUMBER OF PIGS INSURED	NUMBER OF INDEMNITIES PAID	AMOUNT OF THESE INDEMNITIES
1900 . .	3	169	691	8	245
1901 . .	3	211	703	11	491
1902 . .	12	921	1,751	47	1,795

These figures are taken from the Report on the Agricultural Associations published every year by the Department of Agriculture.

Exhibits of the Section of Agricultural Associations :

- I. A map of Belgium showing the places where Mutual Insurance Companies against the mortality of cattle, of horses, pigs and goats exist.
- II. A map of Belgium showing the places where Societies of Agricultural Credit exist.
- III. A map of Belgium, showing the places where there are Cooperative Dairies.
- IV. A map of Belgium showing the places where there are Legal Professional Unions.
- V. Publications of the Department of Agriculture concerning Agricultural Societies.
- VI. Private publications on the same subjects.



BELGIAN DRAUGHT HORSE

III. — ANIMAL HUSBANDRY. BREEDING

a) *Horse breeding*

The provinces of Belgium have for a long time possessed regulations relative to the improvement of the native draught horse, some of which date as far back as 18th century.

About 1840 may be taken as the period when the first attempts were made to bestow upon all our provinces a scheme of regulations of which the main principles have varied very little.

Under the influence of the *Sociétés d'Élevage*, this system has become more and more uniform, especially in what concerns the main points. Accordingly, in 1901, all the provincial councils of the country, without exception, adopted almost uniformly a scheme of regulation drawn up by the Minister of Agriculture with the aid of the *Comité Supérieur Hippique*.

The provincial regulations have a double aim: 1° to eliminate from breeding the stallions which do not possess

the qualities desired to improve the breed to which they belong; 2° to encourage, by means of money bounties, the preservation of the animals, both male and female, of native breed.

EXAMINATION AND TRIAL OF STALLIONS

In the months of October or November, each year, an examination is made of all the stallions of native breed intended for service in the course of the year. As regards the examination of stallions of native breed (Belgian breed of draught horse), each Province is divided into a certain number of districts, which the committees of examination visit. It is owing to this selection of the breeding sires, which had been in operation for several years earlier in some of our provinces, that Belgium is, in possession of a breed of draught horses of the highest rank.

The committees for the examination of stallions are also charged with the awarding of bounties of which mention will be made later.

The committees are formed of 5 members, of whom four are elected by the permanent deputation of the provincial Council, the fifth is elected by the Minister of Agriculture. The members elected by the permanent deputation hold office for four years, they are only re-eligible after an interval of one year. One exception to this rule is generally made as regards the President, whose tenure of office may be permanent.

The country includes 44 district meetings of examination of stallions, as follows :

Province of Antwerp	3 meetings
» Brabant	3 »
» West Flanders	6 »
» East Flanders	5 »
» Hainaut	6 »
» Liege	5 »
» Limbourg	2 »
» Luxembourg	5 »
» Namur	6 »

Since the month of January 1902 the Minister of Agriculture has elected, in accordance with the provincial regulations and the recommendation of the *Belgian Jockey Club*

a committee of examination composed of three members and a veterinary surgeon who are charged with the examination of animals intended for public breeding purposes. In the month of February this committee visits the residences of owners of thoroughbred stallions. Applications for procuring the examination of stallions are received at the office of the Secretary of the Club before the end of the year.

A committee, elected by the Minister of Agriculture, on the recommendation of the *Société Royale Hippique de Belgique* acts under the same conditions for the examination of half bred stallions and of thoroughbred stallions which habitually serve half bred mares. The applications are received at the office of the Secretary of the *Société Hippique*.

This is the scheme adopted for the examination of stallions of all breeds.

Lists with names and descriptions of all the stallions approved for their duties are issued by the Governors of the provinces and posted in all the parishes. The examination is valid for one year.

ENCOURAGEMENT OF HORSE BREEDING

Neither the Government nor the Provinces grant financial assistance for the breeding of the thoroughbred horses. The *Société Royale Hippique de Belgique* receives from the State an annual subsidy of 10,000 francs, for the purpose of encouraging the breeding of half bred. The Belgian Jockey Club and the *Société Royale Hippique* publish studbooks of the breeds of which they encourage the breeding.

The encouragement afforded by the provincial regulations relative to the improvement of horses affects exclusively the breeding of the native horse (Belgian draught horse).

The cost of the execution of these regulations, money bounties and committee expenses, are born to the amount of 40 p. c. by the provinces and of 60 p. c. by the State. The total annual expenses amount to about 350,000 francs. These expenses serve to meet the cost of the shows of foals, fillies, mares and broodmares which are fixed by the provincial regulations. In the 44 places of meeting, all the

examinations of stallions are immediately followed by a show of stallions three years old and a show of stallions four years old and over.

In each of these shows, there may be awarded to the owners :

(a) For the two best stallions a 1st prize of 400 francs and a 2nd of 300 francs and;

(b) For the two best stallions four year old and over, a 1st prize of 550 francs and a 2nd of 400 francs.

There may be awarded further extra prizes of 150 francs for the stallions of 3 years and of 300 francs for those of 4 years and over, according to each group of 5 stallions approved of by the committee, above size, in each of these two classes.

In order to retain in the country the stallions passed as the best by the committees of examination ; there may be awarded a maintenance bounty of 700 francs to the owner of every stallion to which has been awarded, at at least one previous annual show a 1st competition prize in the class of stallions of not less than four years old. This prize is increased by 100 francs for stallions to which a provincial prize has been awarded.

A maintenance prize of 500 francs to the owner of the stallion to which has been awarded, during two years, a 2nd competition prize, in the class of stallions of four years and over.

When the committees of examination consider a stallion to which a maintenance prize has been awarded, obtained after a first competition prize, to be of exceptional value, they can nominate it to compete for a bounty of 6,000 francs payable by fifths annually, so long as the horse remains approved by the committee of examination and retains its value. In the event of a stallion being sold out of the country, to which a bounty of 6,000 francs has been awarded, the fifths already paid must in every case be returned to the Treasury, either by the present owner, or by the original possessor.

At the end of the five years, the owner of a stallion which has obtained a bounty of 6,000 francs, if it remains approved, can continue to enjoy an annual maintenance prize of which the amount may vary from 600 to 800 francs.

Finally there is arranged in each province an annual provincial competition for the stallions which have obtained a prize in the class of 4 years and over, or a 2nd prize in one of the shows of the year or of the preceding year. In this competition there are two prizes: a first of 900 francs and a second of 700 francs.

These prizes can be gained the same year with the 1st competition bounty, but the owner of a stallion which has obtained a second competition prize can only claim the provincial bounty.

The examination of the stallions is followed, sometimes in the same year, but generally in the succeeding year by shows of foals, and fillies of two years and three years, and by shows of brood mares. Considerable prizes are awarded at these different shows. Maintenance bounties may also be awarded to the owners of the best brood mares.

By these means the provincial regulations encourage the maintenance of good breeding stock from the age of 18 months, and encouragement is continued during a long period if the condition of the horses justify it. As regards the stallions of merit, the maintenance bounties are paid to the owners so long as the committees of examination pass the horses as fit for service.

In 1886, the Belgian Draught Horse Society: *Le cheval de trait belge* was founded. This association has a double object:

- a) Encouragement is given to the breeding of native horses by the organisation of annual national shows;
- b) The keeping of a *Studbook* of Belgian horses.

All horse breeders of Belgium may participate in the annual shows of the society.

Most of the horses awarded prizes at the provincial shows come and compete in Brussels. The shows of the Draught Horse Society have greatly contributed to make the best breeds, known and appreciated. They have also greatly influenced the decisive direction given to horse breeding in Belgium; the excellent qualities of these horses is universally recognized (1).

(1) A Special publication concerning *The Belgian draught horse*, will be distributed at the Horse shows of Saint-Louis of 24th August to 3th September 1904.

The Government grants an annual subsidy of 30,000 fr. to the Draught Horse Society.

The Studbook of Belgian draft horses is published by a special commission, appointed by the Draught Horse Society : it contains actually 11 volumes; 12,630 stallions and 21,767 mares have been inscribed.

In addition to the encouragement mentioned above, the Government has offered since 1890, *national premiums for the best stallions*.

These rewards number 18 and amount to 1,500 francs each, they are awarded in four district shows, to the three years old stallions which have gained a first prize at the shows instituted by the provincial regulations.

Every year an exhibition is also organised in one of the agricultural districts of Belgium, as well as a great many exhibitions of agricultural associations, at which horse shows of local interest are held.

* * *

The study of matters concerning horse breeding is entrusted to the Administration of Agriculture, officially assisted by the *Comité supérieur hippique*, which was established in April 1898.

b) *Cattle breeding*

The Belgian Government encouraged by grants the importation of the Shorthorn breeds of cattle by the provincial authorities.

These animals were bought in England by a Committee delegation named by the Government or the Provinces, and were publicly sold in Belgium; the difference between the cost price and the sale price was paid one half by the State and the other half by the Provinces.

The irrational enthusiasm for the Shorthorn breed, the small judgment shown by farmers in using the English bull, the bad choice of the purchased animals in England, the difficulty of cross breeding Belgian breeds with the Shorthorn, and the difference in the living conditions and feeding of the two races, were the principal reasons for

the poor results obtained in the improvement of our native breeds by the infusion of English blood.

Belgian farmers have consequently given up breeding the Shorthorn-race for twenty years past.

A great many Dutch cattle are imported into Belgium as a number of farmers find it advantageous to buy certain classes of these Dutch animals rather than to breed them at home.



DAIRY CATTLE

(Farm of baron Peers, Oostcamp)

A certain number of provinces have possessed for a long time regulations for cattle breeding similar to those relative to the improvement of the breed of horses; obligatory examination is prescribed for bulls intended for service and prizes are awarded to encourage the preservation of the best animals, both male and female.

At the present time all the provinces possess regulations having this double object in view.

These regulations encourage the keeping of first class male and female animals and are a means of preserving the bulls capable of maintaining the stock.

The cost of providing the money prizes is borne in certain cases entirely by the Government, in others the Government bears up to 75 p. c. of the expenses.

The Government and provincial authorities share the expenses entailed by the execution of the provincial regulations for the improvement of the bovine race.

The total annual expenses amount to about 200,000 francs for the State and 150,000 francs for the provinces.

Since 1896, several breeding syndicates and herdbook societies have been formed in Belgium having as their principal object the improvement of breeds by selection.



TYPICAL BULL OF BELGIAN BREED (CENTRAL DISTRICT)

Some of these societies confine their operations to the cattle of one district whilst others improve the cattle of one or two parishes only.

Some provincial regulations for the improvement of the bovine race (East Flanders and Luxembourg) are administered in conjunction with the operations of the cattle breeding syndicates.

All these efforts are evidence of the strong desire to improve the native cattle, but it will take some time before the beneficial effects of these attempts will be felt. It is nevertheless undeniable that in certain parts of the country great progress has been obtained by the operations of these provincial regulations and breeding syndicates.

The Government encourages the syndicates and the federations of syndicates by grants for first establishment, and by grants for the keeping of studbooks of the breeding stock.

A few syndicates have been formed with the object of buying breeding bulls.

The National Society for the improvement of cattle in Belgium was instituted in 1899.

This society held several shows in April 1900, 1902 and 1904, which were very successful and contributed in a large measure to spread amongst the rural populations the ideas of uniform and definite races.

This Society also published an album showing the types of the different Belgian races.

The Government encourages this association by granting important subsidies, in aid of the biennial shows.

Independently of these encouragements we must take into consideration the shows open to cattle breeders at the agricultural exhibitions referred to above in connection with the encouragements given to horse breeding.

c) *Pig breeding*

In 1899, the Government instituted a commission for the improvement of the breeds of pigs in Belgium.

This commission set to work immediately and tried to show the advantages of increasing the Yorkshire breed as these animals yield bacon of excellent quality.

The society held several breeding shows in 1901, 1902, 1903 and 1904.

These shows were most successful.

The society also organized shows in Brussels in 1900, 1902 and 1904 at Hasselt in 1900 and at Namur and Bruges in 1903, open to all Belgian breeders : they have greatly contributed to the promotion of pig breeding in Belgium.

IV. — ANIMAL HUSBANDRY. — SANITARY POLICE

In execution of the law relating to the sanitary police of domestic animals of Dec. 30, 1882, the Government has framed several regulations for the protection of horses and cattle against contagious diseases:

These regulations prescribe a series of measures which concern the keeping of domestic animals in the interior of the country and enforce a stringent control over the importation of foreign animals.

In order to facilitate the execution of measures applicable to the animals which are in the country, the Government publishes leaflets on the subject of preventive hygiene, for the use of farmers, and grants indemnities, sometimes very high, in the case of slaughter of animals attacked or suspected of being attacked by contagious diseases. It also grants indemnities in certain cases of seizure of animals declared to be unfit for human good. (Cattle and swine tuberculosis.)

The rate of these indemnities and the conditions which define their allowance are fixed by Royal Decrees.

The application of the sanitary police measures has brought about very happy results in the interests of farmers, for instance, the complete disappearance of cattle plague, contagious pleuro-pneumonia, and of mouth and foot disease and the almost complete disappearance of glanders and farcy.

Removal and destruction of animal carcasses unfit for consumption on account of contagious diseases.

It has been proved that there is serious danger, as regards the interests of agriculture and public health, in burying carcasses attacked with contagious diseases.

In order to deal with this matter, the legislature, by a law of April 4th 1900, authorises « the Minister of Agriculture to contract for undertaking the removal and destruction of these carcasses and a Royal Decree of

Dec. 31, 1900, gives necessary powers to the Minister to prohibit the burial of such carcasses.

This prohibition has been enforced in certain parts of the country, viz :

- a) In the district of Brussels, and in a part of the districts of Nivelles and Louvain;
- b) In the districts of Mons, Soignies, Charleroi and Thuin, and in a part of the district of Ath;
- c) In the province of West-Flanders;
- d) In the territory of the city of Malines;
- e) In the part of the province of Namur situated on the left bank of the Meuse from Givet to Namur, and to the left of the Namur-Gembloux railway.

The prohibition will be shortly extended to the whole Kingdom.

The carcasses which are found in the above mentioned parts of the country are removed, without expense to the owners, by a service specially organised for the purpose, and burnt by fire in places set apart for that purpose at Jette, Cuesmes, Châtelet and Thorout.

PREVENTIVE VACCINATION

The propagation of certain cattle diseases can only be effectually defeated by preventive vaccination. This is notably the case as regards anthrax in cattle and swine-fever.

The Government furnishes the requisite vaccine free of charge to approved veterinary surgeons, who are charged with inoculating animals against these maladies, at the request of their owners.

The owners are expected to arrange with the surgeons for the isolation of the animals, which the inoculation requires.

Inoculations are performed at the risk of the owners.

In like manner the Government supplies gratuitously :

- a) The tuberculin necessary to test a beast for tuberculosis;
- b) The mallein to test the existence of glanders.

The owners, who desire to make trials of tuberculin or mallein, arrange with the veterinary inspectors for their district for this purpose.

VETERINARY SERVICE

To facilitate the execution of the laws and regulations of the sanitary police of domestic animals, the country has been divided into 15 veterinary districts, each of which is served by an Inspector; a Veterinary Inspector is also attached to the Department of Agriculture. The names and addresses of the 15 district inspectors are given below.

1 st	District :	Mr. De Caestecker, Ypres.
2 nd	»	Mr. Limbourq, 15, avenue de la Toison-d'Or, Bruges.
3 rd	»	Mr. De Rycke, 11, rue de la Concorde, Ghent.
4 th	»	Mr. Remy, Ledeberg.
5 th	»	Mr. Van Huffelen, rue Van Beers, Antwerp.
6 th	»	Mr. Moens, Neerpelt.
7 th	»	Mr. Claes, Bilsen.
8 th	»	Mr. Remy, 134, rue du Paradis, Liège.
9 th	»	Mr. Hougardy, Huy.
10 th	»	Mr. De Roo, rue Léopold, Laeken.
11 th	»	Mr. Van Hemelryck, Ath.
12 th	»	Mr. Dehaye, Gosselies.
13 th	»	Mr. Chauveaux, rue de l'Indépendance, Namur (Salzinnes).
14 th	»	Mr. Bacus, Bouillon.
15 th	»	Mr. M. Putzeys, Marche.

As has been said above, persons interested can address these officials, in writing or personally, to obtain information about the application of the different regulations on the subject.

All veterinary surgeons are expected to cooperate in the execution of the measures of sanitary police of domestic animals within the limits which are prescribed by the said regulations.



V. — THE CROPS

The climate of Belgium is typical of the climate of the temperate countries of Europe; it shows some very important variations. The average temperature of the low lands of Belgium up to the Meuse is 10 degrees (Centigrade); but in Condroz and Ardennes, on the high tablelands (400 to 600 metres) the thermometer marks a temperature of three degrees lower than that existing in the plains of Brabant and Flanders. The average extremes of cold and heat in the year in the centre of the country are represented respectively by a minimum of -15 degrees Centigrade (below zero) and a maximum of $+30$ degrees Centigrade, that is an average difference of 45 degrees.

In Belgium it rains on about 192 days a year. The annual rainfall is 726 millimetres. It snows on 25 days a year, representing a fall of water of 55 millimetres. But from the month of May to September there are only 3 or 4 days when it hails. There are 65 foggy days mostly in winter time. There are 20 or 25 days when it thunders.

The geological constitution of Belgian soil is still more varied than the climate.

The Belgian soil can be divided into nine geological regions; there are special systems of cultivation in each one of these regions.

The geological formations grow older as we leave the sea coast towards the interior of the country : these

different soils yield different products : on the Polder clay, the principal crop is barley; on the sands of Flanders, rye; on the loam of Hesbay wheat; in Condroz spelt is grown, and in the Ardennes oats.

There is not more uniformity in the *mode of tenure* : in one part of the country the farmers own their own land, in other parts the land is rented by farmers; in some parts there are farms of 50 to 150 « hectares » and above; in others farming is done on small holdings, the whole work being accomplished by the farmer and his family : this last method of farming is particularly noticeable in Flanders. Attached to his little bit of land and work, the Flemish farmer has succeeded in changing the unproductive sand of Flanders into one of the richest soils of Europe in the variety and excellence of its products. His holding extends only to two or three hectares, great quantities of manure are applied, and with the aid of his family, he cultivates his land as though it were a garden.

A rapid glance may now be directed to the main features of Flemish farming :

1° *The variety of crops.* — The most varied crops are grown in succession according to fixed rules. These include *cereals* : wheat, meslin, rye, barley, and oats; *industrial plants* : hemp, flax, rape, tobacco, hops, and chicory; *root plants* : mangels, carrots, turnips and potatoes; and *fodder plants* : clover, lucern, ray grass, maize, etc.

Flanders possesses also fertile pasture grounds on which splendid cattle are fed and fattened.

2° *The rotations.* — The rotation of the crops mentioned above is very varied in the districts where industrial plants are grown.

The following rotation is very often adopted :

First year : wheat;

Second year : rye followed by turnips ;

Third year : potatoes or flax followed by carrots, beets or chicory;

Fourth year : barley or meslin followed by turnips ;

Fifth year : oats;

Sixth year : clover.

Clover is often sown in mixture with flax; beet roots are sometimes followed by wheat.

Clover is often sown with turnips late in the season when the turnips sown with oats do not succeed. As to rape, it is frequently sown with wheat and rye or more often after rye instead of turnips.

The general rule adopted is that the ground should never remain fallow.

3° *Intensive cultivation.* — Nowhere, apparently, is more care given to cultivation than in Flanders. *The soil there is heavily manured*: dung being the principal manure applied.

During the rotation *three applications of 40,000 kilogrammes* of farm dung are given especially in the case of rye, potatoes and oats.

Besides this, *liquid manure is applied four or five times* to wheat, rye, turnips and sometimes to beetroots and oats.

Chemical manures are given to all kinds of crops; lime is generally used only for potatoes and *wood ashes* are frequently used for clover.

To till the soil, and to till it well, is a primary condition of success in agriculture: it is by the numerous tillages of the land that the Flemish farmer has obtained such remarkable crops.

4° *Extension of catch cropping.* — By means of catch crops the cultivated area in Flanders is increased by *one third*.

Turnips and *carrots* constitute the two principal crops produced as catch crops. Turnips are used principally for feeding in winter time, and are favourable for the production of milk. In the spring, rye and crimson clover are given as green fodder for cattle.

5° *Small holdings.* — As has been stated above the land is divided into a very large number of small holdings in Flanders. This fact has been a cause of progress for the Flemish farmer: it is indeed on the small holdings that we find the most intensive cultivation. These small farms keep many labourers always employed on the crops

which require constant care. To cultivate 100 hectares in Flanders about a 100 labourers are employed as compared with 30 in England, 40 in France forty and 60 in Ireland (1). The population is extremely dense in that part of the country. The parcelling out of the land has some inconveniences, but happily education and cooperation which have had such a large extension under the influence of the Agricultural Department, partially remedy these unfavourable conditions.

* * *

Special mention may be made to the cultivation of flax and turnips as catch crops, because they form the principal crops of Flanders.

The production of flax has always been very much appreciated in Flanders. — It is one of those characteristic crops which suit advanced regions : it needs a rich soil as well as great care; it is only possible on farms disposing of a considerable amount of labour, especially as until just lately the farmer used to undertake the whole of the preparation of the flax himself, which was a very lucrative operation giving occupation to himself and his family during the winter time. Now the preparation and stripping of flax are no longer done on the farm. Nevertheless, in many cases, the farmer still does the retting.

The best Belgian flax and much foreign flax is retted in the waters of the *Lys*, which is called *the golden river* on account of the precious qualities of its waters. The flax steeped in the *Lys* is rich to the touch and the fiber has such lustre and such suppleness that it has gained a universal reputation.

For retting, the flax is placed in « bunches » formed of two bundles joined end to end. These bunches are placed vertically in perforated wooden cases of rectangular form, called ballons 1.25 metres to 1.50 metres deep and 3.50 metres to 4.35 metres long. There are various ways of constructing these ballons. Before closing the ballons a cloth is laid over the opening and a coating of straw is spread against the sides to preserve the flax

(1) *The Belgian Agriculture*, by Emile de Laveleye.

from the impurities which the water carries. The case when filled up, is closed with boards after the contents have been covered with another layer of straw. The balloon is then made fast with ropes and then let down into the river and loaded with stones so that it floats under water until the end of the operation.

When taken out of the water, the bunches are untied and placed in meadows near the river in such a way that all



RETTING FLAX

parts of the flax are one after another exposed to the air in order to hasten the drying. The flax has to go through this treatment twice; after a first retting it is placed for a certain time in stacks to be afterwards submitted again to the same operation. Sometimes it needs to be retted in water a third time when the first two operations are insufficient. The retting time begins in April and ends in October. This industry employs about 11,800 labourers during those six months of the year.

A curious crop is the *catch or secondary crop of turnips*; « Do not leave your land bare » seems to be the motto of farmers in Flanders. As soon as the first

wheat, barley and rye are cut, the sheaves are left in the middle of the field and a very superficial ploughing is given, with applications of chemical manures, and the land is then immediately sown. It is not rare to see some fields cut, ploughed and sown on the same day! While the turnips are growing, two or three hoeings are given and liquid manure is applied. At the end of a few weeks the farmer has a crop of 40,000 kilogrammes of turnips which are consumed on the land, or siloed. If there is still time enough, the land will be manured with farm manure and ploughed ready to be sown next spring.

*
* *

Horticulture is a very important branch of the Belgian agriculture. Since 1830, horticulture has been making continual progress in Belgium. At the present time the cultivation of plants for ornamentation and exportation is principally carried on in Ghent and the environs.

The ancient town of Ghent is known in the whole of Europe under the name of « *Ville de Flore* ».

Anciently the Ghent horticulturists used to grow a great variety of exotic plants, but now each horticultural establishment cultivates a very limited number of species.

The principal plant grown at Ghent is the *Azalea indica* : several foreign horticulturists have vainly tried to grow the same species, but they have never succeeded in producing such fine and vigorous *Azalea* as those produced in Ghent. More than a million of these plants are grown every year.

Palm trees especially *Kentia* represent the second important plant produced by the horticultural industry of Ghent : about the same number of palm trees as *azalea* are grown annually.

The next most important plant grown is the *Orchid*, produced for exportation and seed.

The number of orchids produced is not as considerable, but they are of great value.

Hot house plants namely : the *Croton* and *Dracæna* are also extensively grown.

Several horticulturists have grown the *Laurus nobilis*, but the horticulturists of Bruges still hold the record for the cultivation of this plant.

Several hundred thousand *Araucaria excelsa*, and a great many *Rhododendron* and plants native to the Cape and to Australia are also produced by the horticulturists of Ghent.

* * *

A special feature of Belgian horticulture is also the growing under glass of grapes in the neighbourhood of Brussels.

Exhibits. — The participation of the Department of Agriculture is intended to illustrate the main facts of Belgian Agriculture, as described above and also to show its connection with the United-States. The objects on exhibition concern especially the cultivation and the manufacture of flax, the selection of seeds, etc. On the other hand some statements and diagrams show the exportation to the United-States of certain agricultural products, such as flax, potatoes, etc.; others show the cost of production of the same products, their yields, the rotations adopted, some results of analyses, of experiments, and of new methods, etc. Finally, two photographs are shown of some factories connected with the flax industry in Belgium.

VI. — AGRICULTURAL INDUSTRIES

Agriculture has given birth to a large number of branches of industry employing either the products of Belgian soil alone or those of the country together with others of foreign extraction.

The principal industries amongst these are : brewing, malting, the extraction and refining of beet sugar, starch making, dairy farming, the production of oils, the manufacture of vegetable preserves, of fruit sirups, of chemical manures, etc.

One of the principal industries is the making of machines and implements for cultivating the soil.

SUGAR PRODUCTION

The area in Belgium devoted to the cultivation of sugar beets was :

63,515	hectares	in	1900;
61,528	»	»	1901;
47,592	»	»	1902.

That is to say about 5 1/2 p. c. of the whole extent of cultivated land in Belgium. The average production of one hectare is 35,000 kilogrammes of beets containing 15 p. c. of sugar.

The number of beet sugar factories was :

121	in	1900,	producing	303,118,589	kil.	of	raw	sugar;
121	»	1901,	»	303,959,868	»	»	»	»
113	»	1902,	»	180,484,799	»	»	»	»

The refineries are twenty five in number and produced :

In	1900,	73,883,000	kilogrammes	of	sugar.
»	1901,	82,789,000	»	»	»

The duty on beet sugar has been twenty francs per 100 kilogrammes since 21st August, 1903 (International Convention of Brussels), before which date it was 45 francs.

PRODUCTION OF BEER

Beer is the national drink of Belgium. The country possessed :

		Hectolitres	
3,223	breweries in 1900, producing	14,616,535	of beer.
3,253	» 1901, »	14,660,330	»
3,276	» 1902, »	14,431,418	»

The duty is fixed at the choice of the brewer, on one of the following bases :

a) On the quantity of raw material declared; the duty on each kilogramme of raw material declared is 10 centimes (2 cents per 2.20 pd); or

b) A duty of 4 francs on each hectolitre of the total capacity of the mash-tun.

PRODUCTION OF ALCOHOL

Before the law of February 18th (1903) the distilling of alcohol gave employment to a great number of factories. Their number has since diminished but those remaining have a larger productive power.

The number of distilleries at work were :

		Hectolitres	
270	in 1900, producing	716,951	of spirit at 50° G. L.
274	» 1901, »	736,905	» » »
257	» 1902, »	657,165	» » »

The duty, which was 100 francs per hectolitre before the law of February 18th 1903, has been increased to 150 francs per hectolitre at 50° tested by the alcometer of Gay-Lussac and at a temperature of 15° centigrade; this increase in the amount of the tax was made with a view of diminishing the consumption of alcohol, which result was eventually obtained.

PRODUCTION OF GLUCOSE SUGAR

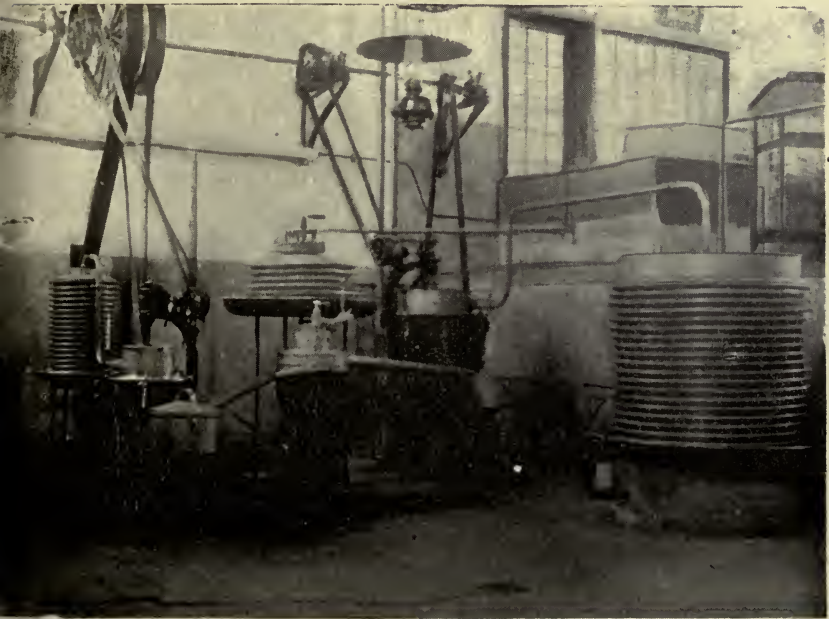
<u>Number of factories</u>	<u>Approximative production</u>
6 in 1900.	9,968,124 kilogrammes.
6 in 1901.	9,286,240 »
5 in 1902.	8,853,021 »

PRODUCTION OF YEAST

14 factories producing, in 1900,	5,469,038 kilogrammes.
14 » » in 1901,	6,154,451 »
14 » » in 1902,	6,912,084 »

DAIRIES

There are in Belgium 850,000 dairy cows. Of this number 129,000 belong to 47,500 farmers, who are members of one of the 493 cooperative dairies existing in Belgium on December 31st 1902.



INSIDE VIEW OF THE DAIRY OF BASEL

The manufacture of butter has attained a total of 70 millions kilogrammes; there are also a few cheese factories.

MANUFACTURE OF CHEMICAL MANURES

This industry has greatly expanded owing to the extensive employment of manure in cultivation and the preparation of superphosphates and concentrated manures for exportation.

The statistics concerning manures have already been given above :

MANUFACTURE OF AGRICULTURAL IMPLEMENTS

Agricultural implements and tools are manufactured in several parts of Belgium.

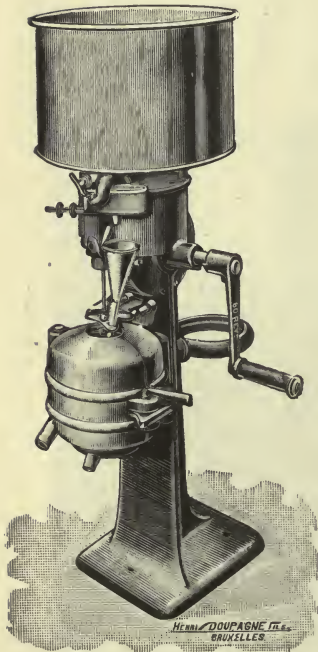
The principal importations from foreign countries are harvesting machines, mowing machines and other similar implements.

Belgium is especially noted for the manufacture of cream separators such as those of Melotte, Persoons and others.

The manufacture of Melotte separators is very important : more than 14,000 centrifugal cream separators of three different models are produced yearly. The workshops are fitted up upon the American system and work according to the best methods and with the most up to date plant (1).

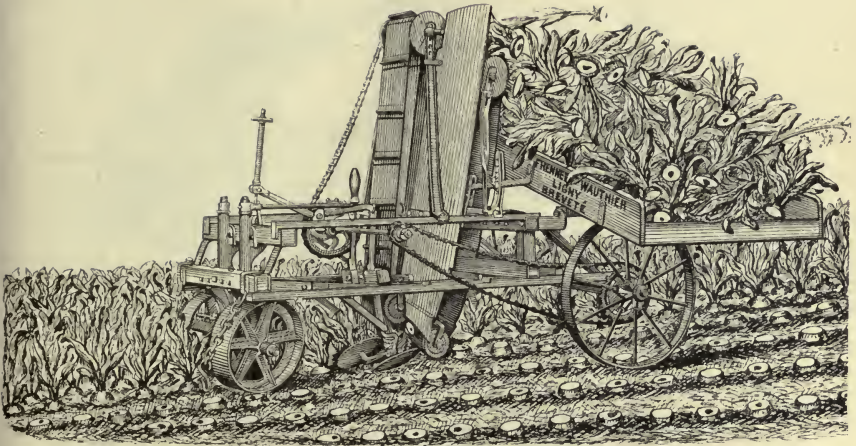
The greater part of the machines manufactured are exported.

Other firms manufacture cultivators, ploughs, etc., which are highly appreciated both in this country and abroad.

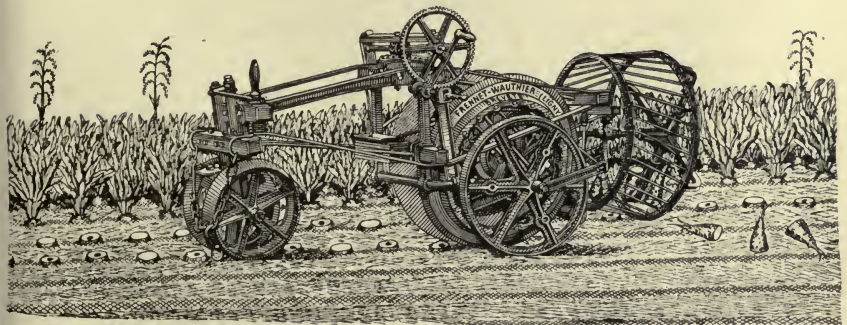


MELOTTE SEPARATOR

(1) See : « Situation of the dairy industry in Belgium ». Report of the Department of Agriculture 1903, p. p. 45 and following.

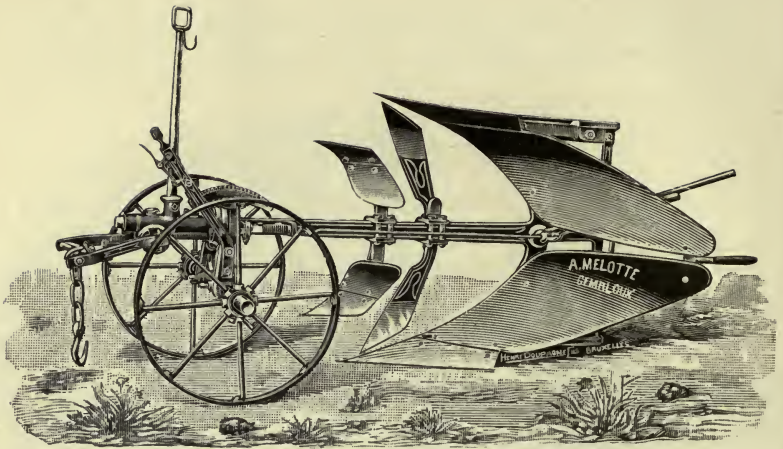


FRENNET-WAUTHIER'S LEAVE-CUTTER AND STACKER FOR BEETHOOTS



FRENNET-WAUTHIER'S BEET-PULLER AND CLEANER

Special mention must be made of the Frennet-Wautier beet pullers which are built upon a special model, and of



MELOTTE'S « DOUBLE BRABANT » PLOUGH

the ploughs made by Melotte, at Gembloux, who possesses an important factory in which work is carried on with a view to exportation.

AGRICULTURAL INDUSTRIES

In this section are exhibited :

1 Diagram showing the use of chemical manures per hectare;

1 Diagram demonstrating the impoverishment of the soil by crops and the restitution of fertilizing elements by chemical manures;

1 Photographic views of a plough manufactory;

1 Photographic views of a separator manufactory;

1 Photographic views of a manufactory of threshing machines;

Various albums with views of factories (interior and exterior);

Various catalogues of Belgian manufacturers.

PART II

Agricultural Education

The various Decrees, Regulations, and Programmes relative to Veterinary and Agricultural Instruction are published in parts, of which the whole will form a complete summary according to the following scheme :

- Part I. Law of 4 April 1890 relative to Agricultural Instruction. Law of 4 April 1890 relative to the instruction of Veterinary Medicine.

HIGHER INSTRUCTION

- » II. State Veterinary School. — Regulations. — Programme.
- » III. State Agricultural Institute. — Regulations. — Programme.

INTERMEDIATE INSTRUCTION

- » IV. State Horticultural and Agricultural School. — Regulations.
- » V. State and Private Horticultural Schools. — Regulations. — Programmes.
- » VI. State Agricultural School. — Regulations. — Programmes.

- Part VII. Subsidised Agricultural Schools. — Regulations. — Programmes.
- » VIII. Course of Agriculture in the State Intermediate Schools and in the Private Intermediate Schools. — Regulations. — Programme.
- » IX. Agricultural Domestic Economy Schools. — Regulations. — Programmes.

POPULAR INSTRUCTION

- » X. Travelling Agricultural Domestic Economy Schools. — Regulations. — Programmes.
- » XI. Schools for Cheese making. — Regulations. — Programmes.
- » XII¹ Technical Agricultural and Horticultural Sections. — Regulations. — Programmes.
- » XII² Technical Sections of special Instruction.
- » XIII. Course of Agronomy for Adults. — Regulations. — Programmes.
- » XIV. Course of Agronomy for soldiers. — Regulations. — Programme.
- » XV. Course of Farriery. — Regulations. — Programmes.
- » XVI. Course of Arboriculture. — Regulations. — Programmes.
- » XVII. Course of Market gardening. — Regulations. — Programmes.
- » XVIII. Course of Aviculture. — Regulations. — Programmes.
- » XIX. Course of Apiculture. — Regulations. — Programmes.

VARIOUS SUBJECTS

Part XX. Various courses.

» XXI. General Regulations.

» XXII. Institutions connected with Agricultural Instruction.

» XXIII. State Botanical Garden.

» XXIV. Table of contents.

Parts II, VI, XXIII and XXIV are not yet published.

* * *

Every three years the Minister of Agriculture publishes a full report of this branch of instruction. It can be obtained on application, to the Minister of Agriculture, Brussels.

The information, which will be given later on, is mainly drawn from the documents mentioned above. These documents have been lately epitomised in M. A. Vermeersch's *Manuel Social* (1), which has facilitated the editing of some of these notices (2).

(1) A. VERMEERSCH, S. J., *Manuel social*, 2^e edition. Uyspruyt, 10, rue de la Monnaie, Louvain. See the chapter on *l'Enseignement agricole et vétérinaire*.

(2) See also : *Experiment Station Record*, 1893, p. p. 703-708. Agricultural Education in Belgium, by P. DE VUYST.

I. — STATE SCHOOL OF VETERINARY MEDICINE

The Belgian School of Veterinary Medicine dates from 1832. It was founded in Brussels under the protection of the Government by D^r Graux, with the assistance of D^r Froidmont and the Veterinary Surgeons Brogniez, Crèveœur, Delwart and Gaudy.

In 1836 the Government adopted this School, organised it at the expense of the State and gave it the title of *State School of Veterinary Medicine and Agriculture*. Later, owing to the separation of the agricultural instruction, this title was reduced to the present denomination, *State School of Veterinary Medicine*.

Under the old management, from 1836 to 1890, the instruction given at the School of Veterinary Medicine comprised, besides the different branches relative to Zootechny and Veterinary medicine, two groups of subjects, one relative to the Natural Sciences; Physics, Chemistry, Botany, the elements of Zoology; the other relative to Medicine and Veterinary Economy : Descriptive and Comparative Anatomy, General Anatomy, Physiology, Pharmacology, Therapeutics, general, internal and surgical Pathology, Zootechny, etc.

These subjects formed the object of four years of study and of two examinations, one for the candidateship and one for the degree in veterinary medicine.

The first examination, held after the second year's course, had then a mixed character; the veterinary candidateship comprised the candidateship of Natural Science and the candidateship of Veterinary Medicine.

After having decided on the suppression of the boarding establishment in 1888, the Government thought it useful to make a more serious modification in the regulations for the study and practice of veterinary medicine, and had a law passed placing the instruction of veterinary medicine on the same level as that of human medicine.

By the terms of that law, in order to be accepted as student at the State School of Veterinary Medicine, and to be admitted to the examination of veterinary candidate, a person must hold the diploma of Candidate of Natural

Science preparatory to the diploma of Doctor of the same science.

The instruction at the School of Veterinary Medicine thus became purely professional; it comprises the following subjects: Descriptive, Systematic and Comparative Anatomy of domestic animals; Topographical Anatomy; general and special Histology; Physiology, including Embryology, Experimental Physiological Physics and Chemistry; the Exterior; Pharmacognosy and Pharmacy; Therapeutics, including Pharmacodynamics; Pathological Anatomy; general Pathology, including Bacteriology and Parasitology; Medical Pathology; Surgical Pathology; Zootechny, Hygiene and the general principles of Agronomy; Sanitary police, Legal Medicine, Commercial Legislation and Deontology; Toxicology, including Chemical Analysis applied to clinics; Farriery; Inspection of foods; Flemish terminology: Equitation.

The course of Flemish terminology is optional.

The instruction is theoretical and practical.

The duration of the studies is fixed at one year and a half for the veterinary candidateship and two years for the diploma of veterinary surgeon.

The Minister can admit to one or several courses occasional students who are desirous of devoting themselves to certain branches of instruction, and who can not be held to fulfil the conditions required of regular students for admission.

The annual scholastic fee is fixed for regular students at 200 francs; for the last term of studies only comprising six months, the amount of the fee is reduced to 100 francs. The occasional students pay 50 francs for each course that they are authorised to follow.

Scholarships may be granted to students who distinguish themselves by their good conduct and progress; these scholarships are allotted by the Minister of Agriculture, on the recommendation of the Director, according to the result of the general examinations. Two exhibitions, each of the value of 1,500 francs, can be given annually by the Government, on the recommendation of the jury of examination, to Belgians who have obtained the degree of veterinary surgeon with the highest distinction.

Four students charged with superintending the Clinical Service are resident; all the others are non-resident.

A committee composed of 6 members is charged with the entire supervision and management of the School.

The staff of the School comprises : a Director, 10 professors, 5 supernumerary or assistant professors; an accountant, a secretary, a librarian, a superintendent, laboratory attendants, a gardener, a farrier, a porter, grooms and servants.

*
*
*

The School possesses hospitals where animals are received on payment of the following fixed fees for each day's board :

- 1° For a colt that has not reached the age of two years, 75 centimes (1);
- 2° For a horse of two years or more, 2 francs;
- 3° For a cryptorchid horse, 3 francs;
- 4° For a dog not more than 40 centimetres in height, 50 centimes;
- 5° For a dog above 40 centimetres, 75 centimes.

EXAMINATIONS FOR THE DEGREES

The Examinations for the Degree of Veterinary Candidate or Veterinary Surgeon are held in April; for Veterinary Medicine a record session is held each year in August. For admission to the examinations of Candidate and Veterinary Surgeon, students must send in their names to an officer of the Ministry of Agriculture, and the amount of the expenses of examination are fixed at : 30 francs (2) for the degree of candidate in Veterinary Medicine, and 70 francs for that of Veterinary Surgeon.

The Examination for the degree of Veterinary Candidate comprises : the systematic and comparative Anatomy of Animals, topographical Anatomy; general and special Histology; Physiology, including Embryology; Pharmacognosy and Farriery.

The Examination for the degree of Veterinary Surgeon comprises : Therapeutics, including Pharmacodynamics, Pathological Anatomy; general Pathology, including Bacteriology and Parasitology; Medical Pathology; Surgical Pathology; Sanitary Police; Legal Medicine, including the elements of Toxicology; Commercial Legislation and

(1) 5 centimes = 1 cent.

(2) 5 francs = 1 dollar.

Deontology; Zootechny : Hygiene and the elements of Agriculture.

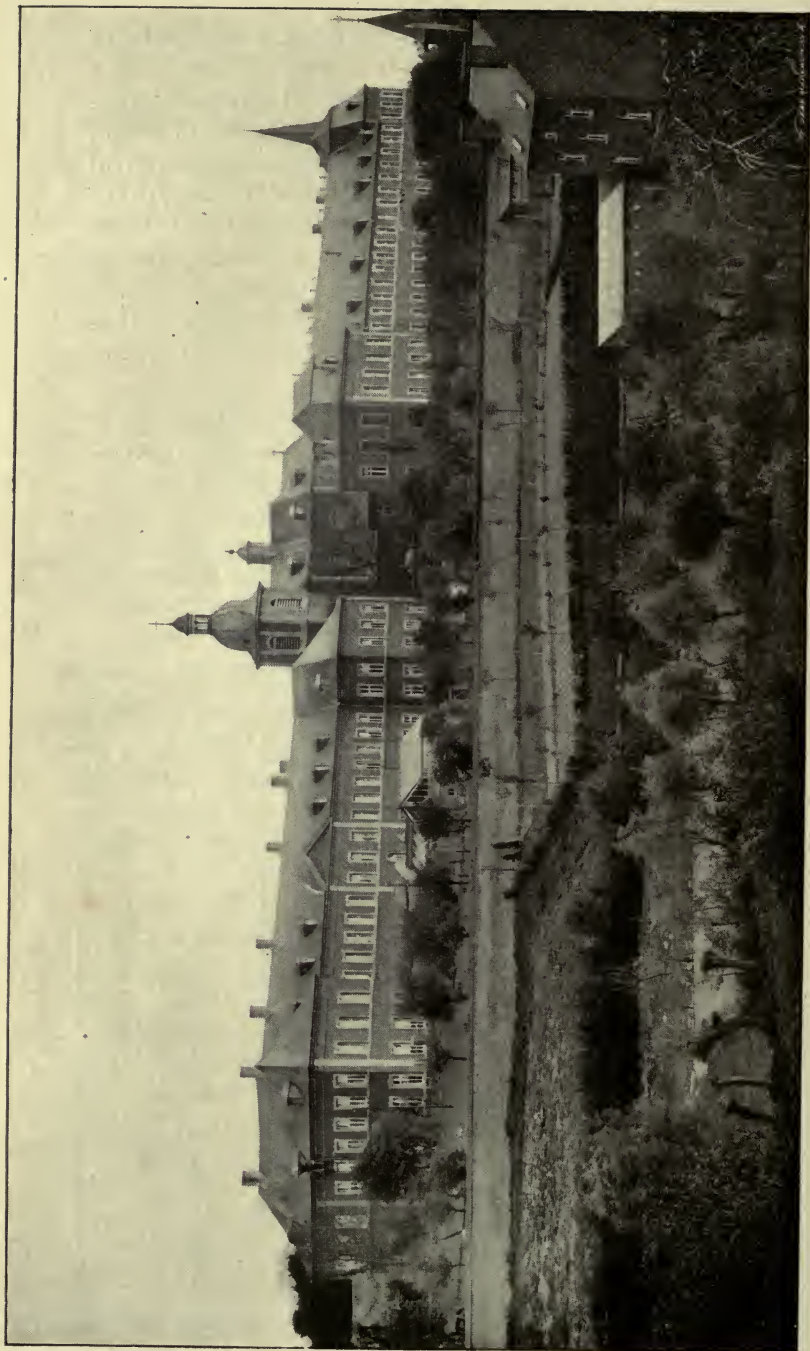
These examinations are oral : there is besides, a practical test, which comprises : *a*) for the degree of Veterinary Candidate : Macroscopical and Microscopical demonstrations of normal Anatomy; *b*) for the degree of Veterinary Surgeon : Pharmacy; Surgery; Clinics; Obstetrics the External form; and Macroscopical or Microchemical demonstrations of pathological Anatomy.

Only the students, who have passed the oral examination, and, if required, the written examination, are admitted to the practical examination.

To facilitate the study of Veterinary Medicine for the students, all the professors are required to furnish a precis of their courses at the expense of the State; which are placed at the disposal of each student at a small fee.

Of the young men who have been admitted as students at the School of Veterinary Medicine, since its origin to the opening day of the Academical year 1903-1904, 1,757 have obtained the diploma of veterinary surgeon, as follows :

YEARS	NUMBER OF DIPLOMAS CONFERRED	YEARS	NUMBER OF DIPLOMAS CONFERRED	YEARS	NUMBER OF DIPLOMAS CONFERRED	YEARS	NUMBER OF DIPLOMAS CONFERRED
1836	36	1853	12	1870	16	1887	12
1837	30	1854	18	1871	9	1888	13
1838	27	1855	14	1872	13	1889	13
1839	33	1856	10	1873	13	1890	31
1840	27	1857	14	1874	18	1891	30
1841	24	1858	15	1875	13	1892	28
1842	18	1859	13	1876	12	1893	25
1843	20	1860	12	1877	15	1894	18
1844	4	1861	17	1878	19	1895	18
1845	14	1862	13	1879	13	1896	14
1846	11	1863	15	1880	14	1897	16
1847	8	1864	16	1881	16	1898	15
1848	20	1865	19	1882	15	1899	20
1849	9	1866	14	1883	22	1900	30
1850	11	1867	10	1884	20	1901	30
1851	10	1868	14	1885	14	1902	31
1852	10	1869	14	1886	15	1903	24



STATE AGRICULTURAL INSTITUTE OF GEMBOUX

II. — AGRICULTURAL INSTITUTES

a) *State Agricultural Institute of Gembloux*

Historic. — The State Agricultural Institute was founded at the time of that remarkable scientific forward movement when agriculture, freeing itself from vague theories, entered boldly upon new and experimental paths. It was established by the law of 18th July 1860 and organised by a Royal Decree of the following 30th August; it has consequently entered upon its 44th year of work.

Belgium had allowed herself to be outdistanced in agricultural education by her neighbours. She had, indeed, possessed since 1849, schools intended for this form of instruction but these were organised on different lines in the various provinces; the teaching was but of secondary importance, an efficient staff was lacking in almost every case; and the schools were but little used and were successively closed. Only Thourout College (Western Flanders) which was better organised and combined practical work upon a farm of some importance with lectures from well instructed teachers, continued fairly prosperous. The lease however expiring in 1859 the Government was unable to accept the onerous conditions required by the proprietor for a renewal and it was therefore closed. It was at this point that M. Rogier, the Minister of Agriculture at that period convinced of the necessity of agricultural teaching in our country and of lifting it to a higher plane, resolved to endow our country with an Upper Agricultural Institute, modelled upon similar foreign establishments, especially those of Grignon and Hohenheim.

Installed in the magnificent buildings of the old abbey of Gembloux, in the heart of the country, in the centre of an agricultural district, surrounded by industries dependent upon agriculture, the Institute is provided with

immense premises for its lecture halls, its laboratories and its collections.

The intention of the Government in founding the Agricultural Institute was to train a body of men who having been equipped with the necessary scientific acquirements, and having undergone a practical agricultural training, could be capable of superintending in an intelligent and remunerative manner their own properties or those confided to them. Spread over the whole country they were to become the apostles of agricultural progress, the pioneers of new methods based upon science. They were further to be capable of directing the many new agricultural industries which were springing up every where, such as sugar refineries, distilleries, the manufacture of fertilisers, etc.

A farm was added to the Institute for the practical instruction of the pupils. It was not intended as a model farm; there exists no farm of that class.

It served as a workshop for the practical application of the principles taught.

The various operations of agricultural enterprise can there be seen at work and the greatest pains are taken that every lesson to be drawn from the farm-school shall be made clear to the students. At the commencement the farm comprised an area of 38 hectares but was soon enlarged to 58 hectares; to day the total area occupied by the buildings, courts and gardens is 69 hectares.

The first members of the teaching staff were nominated by Royal Decree in October 1860, but the lectures did not commence until January 1861.

The post of Director has been successively filled by :

- Mr. Lejeune from 1860-1881;
- Mr. G. Fouquet from 1881-1882;
- Mr. Genonceaux from 1882-1890;
- Mr. C. Hubert since 1891.

ORGANISATION

The Institute is placed under the supervision and under the administration of a *Commission*, consisting of seven members nominated by the King, the members being reelected, in two groups, every three years. The

Minister of Agriculture nominates the secretary without consulting the commission.

The members of the Commission together with the general Inspector of Agriculture, the Director and the members of the professional staff act as a *Superior Council* which regulates the programme of instruction and deliberates upon the position of the Institute and the possible improvements.

The staff includes a Director, 6 ordinary professors, 2 extra-professors, assistant professors, assistants, an accountant, a manager, 3 inspectors, 2 gardeners-demonstrators, and the clerks necessary for the interior service.

The minimum age for attendance at the classes is seventeen. The regular pupils are obliged to pass an examination upon entering unless they hold a University degree, or have obtained admittance to the Military School, or to one of the special schools or technical colleges attached to the universities.

For day-pupils a certificate in the ordinary subjects is sufficient; the number of such pupils may be limited by the Minister.

The course of instruction for the degree of Agricultural Engineer is one of three years.

Pupils may not enter more than twice for the same subjects. Day-pupils and boarders are received. Those not living in the Institute can easily obtain board and residence in the town.

Gembloux, the chief town of the district, consisting of 4,300 inhabitants, lies 40 kilometres from Brussels, the capital of the Kingdom and 18 kilometres from Namur, the chief town of the province.

Situated at the intersection of five lines of railways the town is in communication with all parts of the country, besides which its proximity to Namur and Brussels, which are served by the great international express trains, renders it of easy access to visitors from abroad.

The fees for board and residence and instruction combined are 700 francs per annum for Belgian pupils and 1,000 francs for foreign pupils.

The fees for day-pupils are 300 francs for Belgians and 400 francs for foreigners.

The Minister of Agriculture is empowered to admit non-collegians to the lectures, who wishing to devote themselves to certain branches of instruction only, are not bound by the rules and conditions to which the regular pupils are subjected.

The fees for such non-collegians are 50 francs for each course of lectures which they have been authorised to follow.

The degree of Agricultural Engineer is conferred upon those pupils who, after having completed their three years studies have given proof in a special examination of their fitness for such post.

INSTRUCTION

The instruction given at Gembloux embraces the numerous branches of agricultural science.

The study of *physics* is undoubtedly of great importance; it initiates the pupils to numerous problems, the knowledge of which is absolutely necessary and with which every one ought to be familiar, and it enlightens pupils on the progress made in physics.

The instruction given in physics is especially of an intuitive and experimental character; it aims exclusively at practical applications and in the realisation of this aim the very complete installation of plant and materials at the Institute is of great service.

The manifold applications of *chemistry* to agriculture would suffice of themselves alone to justify the necessity of a solid and extensive acquaintance with this science.

At the present time, Mr. Droixhe is professor of general chemistry; Mr. Poskin, doctor of science, of analytical chemistry; Mr. Marcas, agricultural engineer, of technology.

Here again it is recognised that the study of chemistry must before all things be practical; numerous experiments illustrating the lessons in theory are carried out, and it is recognised that it is in the laboratory that students can verify the theories, group results and learn the science.

The laboratories now occupy an area of 500 square metres and their equipment is perfect.

The progress of natural science necessitated the creation of a special professorship of botanical science which was entrusted to Mr. Em. Laurent who established a laboratory of instruction for the students in which the latter devote several hours a week to microscopic work.



BOTANICAL LABORATORY

The collections of living plants at the Institute have increased so considerably in the last ten years that to day they constitute a genuine botanical garden worthy of a university.

In this garden may be seen a collection of plants from equatorial Africa and of the economic plants of the tropical regions.

The botanical laboratory also serves as a station for vegetable pathology.

Mr. Marchal is at the head of this station.

The teaching of *zoology* and *entomology* is directed to give the students a knowledge of the grand divisions of zoology by studying one type of each of them.

A laboratory with rich entomological collections has been established for the benefit of the students and the public.

This service promises to be considerably extended each year.

The course in *mineral sciences* comprises the detailed study of mineralogy, geology and hydrology.

The courses in *rural legislation* and in *social and political economy* are also very important and useful.

Rural engineering with its mechanical and hydrological applications is most necessary for future agricultural engineers.

Practical work and numerous excursions enable the students to gain acquaintance with the details of this important section of the general programme of instruction.

The instruction in *book-keeping* has been in the hands of a specialist during the last 12 years. All the operations in the farm have to be controlled. The result of which is shown in the books of the college. The accountant in charge of the classes gives thorough practical instruction.

The agricultural industries are dealt with in the classes of *agricultural technology* where attention is directed to the developments necessary for industrial progress. The surrounding works and laboratory provide the pupil with the opportunity of a practical application of the theories taught in the lectures.

The lectures on the microscope treat of the corruption and adulteration to which foods and the raw materials of agriculture and agricultural industries are exposed. The instruction in *forestry* is extensive and is aided by a splendid arboretum which occupies a large area and is quite close to the establishment; it includes the principal ligneous species to be found in temperate climates, which makes it one of the finest dendrological collections of Belgium.

The courses of *zootechny* and *hygiene* have undergone great improvement thanks to the influence of the present professor Mr. Raquet. The lectures include anatomy, physiology and general hygiene applied to human beings and animals; the prophylaxis of contagious diseases, sanitary police and the description of the outward parts of horses and oxen. For the class in zootechny there is a laboratory on the farm which is always largely utilised.

The lectures on *farming* occupy by right an important place in the programme of instruction and since 1882 an *agricultural experimental garden* has been available which has become of the greatest use in the instruction of the pupils.

For many years Mr. Damseaux, professor of the classes has been conducting scientific investigations which have proved of the highest importance to the agricultural world.

The engineering pupil at the college follows various classes, but, independently of the practical work carried on in the microscopical and chemical laboratories, which are admirably fitted up and furnished with instruments, the botanical and geological excursions, the visits to factories, irrigation works, cattle shows, and farm work, the pupils of the third year undertake in the month of June, under the direction of the professors of cultivation, rural economy and zootechny an excursion in Belgium or abroad which lasts from 8 to 12 days.

As already stated above a farm is attached to the agricultural college entirely for the use of the pupils. The same has in the course of time undergone all the improvements necessitated by the progress in agriculture. The premises are large and well arranged the stock of implements is complete and up to date. A steam motor of 50 h. p. provides electric light to the whole establishment. An electrical motor transmits power to some distance and is also useful for numerous experiments.

The *capital* of the farm now amounts to 105,726 francs for 65 hectares of ground and meadows; the stock of cattle was valued in the last balance sheet at 54,652 francs and the net profit for 1902-1903 at fr. 10,813.27.

The college finally includes the Dairy Station, and the State Station of Chemistry and Bacteriology which are of the greatest value for the practical studies by the pupils.

FOURTH YEAR OPTIONAL STUDIES

Owing to the increase in the number of subjects taught the programme became over weighted, and in order to allow for the more complete development of each subject it was decided to eliminate from the three years study all

instruction which was not absolutely necessary for the preparation of well instructed agriculturists, capable of managing their own property or that of others, and, if necessary, of superintending industries which might be carried on in connection with a farm.

This change was made in the three years course of instruction. As a corollary to this change a fourth optional year of study was created by Royal Decree of the 27th March 1897.

This fourth year's course is divided into three parts :

- A. Rivers and Forests.
- B. Chemical and Agricultural Industries.
- C. Theory of Agriculture and Agricultural Instruction.

This course enables young men holding agricultural engineering diplomas to complete their knowledge in forestry, chemistry, and agricultural industries and to prepare themselves to give instruction in the theory of agriculture. This change has given excellent results.

Statistics

The number of pupils attending the college is continually increasing.

In 1861 eleven pupils followed the lectures.

» 1861-62	thirty one	were in the books of the college.
» 1870	the college was attended by	61 pupils.
» 1880	»	»
» 1890	»	»
» 1900	»	»
» 1901	»	»
» 1902	»	»
» 1903	»	»
» 1904	»	»

On the 1st January 1904 the college had 156 pupils viz : 60 boarders, 96 day pupils and 7 non collegians (90 Belgians and 66 foreigners).

The foreign students were of the following nationalities.

Poles, Russians, Germans	13
Greece	12
Spain	11
Italy	5
Turkey	2
Syria	1
France	1
Mexico	1
Portugal	1
East Roumelia	1
Asia minor	1
Roumania	1
Bulgaria	2
Chili	1
Russia	2
Serbia	1
Brazil	2
Borneo	1
Sardinia	1
England	1
Algeria	1
Siberia	1
Africa	1
Argentine Republic	2

The college is much appreciated in foreign countries and the fact that there is not another of the same kind so much frequented by foreigners, alone shows its reputation. Three years ago the Peruvian government asked the college of Gembloux to send them Agricultural Engineers to organize superior agricultural instruction in their country. The pupils from the college are dispersed throughout the whole world and the high value of the instruction they have received is recognized everywhere.

A school where the instruction is so extensively varied as that of this college calls for incessant improvement. The ministers who have succeeded each other have considered it a point of honour to keep the college up to the very latest standard both in instruction and in equipment with improved plant and apparatus. This has been especially the case since the institution of a Department of Agriculture in 1884.

With the increasing number of pupils the college can look forward to the future with confidence.

b) *Agricultural Institute of the University of Louvain*

Historical. — The University of Louvain, founded in 1426, closed by the French Revolution, and reopened in 1835, consists now of 5 Faculties (Law, Philosophy, Medecine, Divinity, Science). The staff numbers 110 Professors; 2,070 Students attended the lectures in 1903.

The Faculty of Science is subdivided in several branches : Mathematics; General Science; School of Mines and Engineering; Agricultural Institute; High school for Brewery; Geography.

The Agricultural Institute was founded in 1878; its Professors and Students belong to the Faculty of Science.

Course of Instruction. — The fixed course of instruction extends over a period of three years; it may be completed by a 4th year devoted to special work.

Diplomas. — The regular diploma (three years) confers the title of *Agricultural Engineer*. A special diploma is given for each one of the four branches of the 4th year course.

Entrance. — All regular Students must pass the Entrance Examination before they can be admitted to the Institute. They must satisfy the Examiners in the following subjects : Arithmetic, Algebra, Euclid, Trigonometry, General History and Geography, French.

Fees, Vacations. — The University year begins in October; the vacations being a fortnight at Christmas, three weeks at Easter, and the months of August and September.

The fees for Instruction are 300 fr. (\$ 60), and for examination 100 fr. (\$ 20). Students live and board in town.

Staff. — In 1903 the teaching Staff numbered 15 ordinary, extraordinary and supplementary Professors. The number of Students was 126.

Buildings. Museum. Experimental grounds. — The lectures are given in several of the University Colleges, as follows.

Biological Institute (Founded by Carnoy. — Botanical Museum and library). Classes in Botany, Agricultural Chemistry, Diseases of Crops, Fermentation, Microbiology.

Præachers College (Physical and Mechanical Museum. Electric plant). Classes in Physics, Mechanics, Agricultural Hydrostatics, Applied Physics.

Kings College (Zoological Museum). Practical demonstrations in Zoology.

Mary-Theresia's College (School of Mines. Geological Museum). Practical drawing and engineering.

Agricultural Institute (Agricultural and Forestry Museum). All the remaining classes, and practical Chemistry.



UNIVERSITY OF LOUVAIN. — MUSEUM OF THE AGRICULTURAL INSTITUTE

Heverlé Institute. A Dairy School with a farm of 180 acres. Experimental grounds. Practical work in Agriculture, Machinery, etc.

University Hall and *Botanical garden.* Library. Conservatories.

Syllabus of Classes

FIRST YEAR

- A. *General Philosophy.*
- B. *Natural History :*
Experimental Physics.
Chemistry, organic and inorganic.
Botany : a) Morphology;
 b) Systematic;
 c) Anatomy;
 d) Physiology.
Zoology, with special reference to Entomology.
- C. *Applied Science :*
Agriculture. History. General Facts.

SECOND YEAR

- A. *Natural History :*
Geology. Geogeny;
 Mineralogy;
 Agrology.
Botany. Chemical Physiology.
Zoology. Anatomy and Physiology.
- B. *Applied Sciences :*
Chemistry. Qualitative and quantitative analysis.

Engineering : a) Kinematics. Hydrostatics ;
b) Topography ;
c) Agricultural Machinery ;
d) Farm buildings ;
e) Drawing.

Agriculture. The crops grown in temperate climates.
Agricultural chemistry ;
Book-keeping: General methods.

Forestry. Forest Trees and Shrubs. General cultivation.

THIRD YEAR

Applied Sciences :

Chemistry. Agricultural analysis ;
Rural industries : Sugar, alcohol, milk,
manures.

Physics. Physics applied to industry ;
Meteorology.

Engineering. Prime-movers, and their management ;
Drawing : Farm buildings. Surveying.

Agriculture. Estate management ;
Diseases of crops ;
Farm book-keeping ;
Drainage and irrigation.

Zootechny. a) General notions ;
b) Chemistry and valuation of food
rations ;
c) Management of stock.

Forestry. Forest management ;
Timber measurement and sale.

Political Economy and Law. General principles of Political
Economy ;
Rural law : Forest law ;
The law on agricultural asso-
ciations.

On the satisfactory completion of the fixed course, and after showing the required proficiency in the three yearly examinations, the diploma of *Agricultural engineer* of the University of Louvain is granted.



UNIVERSITY OF LOUVAIN. — COMBINED LABORATORY AND LECTURE-ROOM FOR ZOOTECHNY (ACCOMMODATION FOR 60 STUDENTS).— SHOWING SOME TABLES MADE READY FOR DEMONSTRATION (CRANIOLOGY — THE EXTERIOR OF THE HORSE).

FOURTH YEAR

The course of studies may be completed by the holders of the aforesaid diploma, by a supplementary and optional course of one year's special work, in one of the following subjects.

I. *Agronomy*. — Natural history and agriculture applied to Belgium and temperate climates, and to agricultural teaching.

Principal lines of work : Crops. Stock-breeding. Improvement of land. Farmers associations. Rural laws. Estate management.

Special Diploma : *Engineer in agronomical science*.

II. *Chemistry and Technology.* — No one is admitted to this course unless he has done special work in chemistry during the second and third year.

Principal lines of work : Detailed study of general Chemistry, specially organic; general Analysis. Bacteriology. Rural industries, and fiscal regulations affecting them.

Special Diploma : *Engineer in agricultural chemistry and industry.*

III. *Forestry.* — Natural history and Mathematics applied to the management of forests.

Principal subjects : Forestry. Topography and Road construction. Noxious and useful animals and plants. Forest laws.

Special Diploma : *Engineer in Forestry.*

IV. *Tropical agriculture.* — Natural history and agriculture applied to tropical and subtropical climates.

Principal lines of work : Geographical Botany. Agrology. Tropical Crops. Topography. Irrigation. Hygiene.

Special Diploma : *Engineer in tropical agriculture.*

Exhibited at Stan 1 : Photos of museums, lecture rooms, experimental grounds, power house, etc.

III. — SECONDARY AGRICULTURAL INSTRUCTION

AGRICULTURAL SCHOOLS AND AGRICULTURAL SECTIONS

I. *General notions and organisation.* — Comparison of schools and sections.

In Agricultural Schools the instruction is exclusively professional: obligatory and accessory courses are organised to attain this end and absorb the whole time.

In Agricultural Sections on the contrary more general instruction is given.

At least five hours a week instead of eight are devoted exclusively to agricultural lessons.

In this way farmers get general education as well as professional: this transformation of Agricultural Schools into Agricultural Sections has rendered many a school more popular and successful.

Experiment fields and scientific collections adjoin these agricultural or horticultural schools and courses.

The programme of studies embraces two or three years.

In the first instance one year of special preparation devoted to general instruction gives the most satisfactory results.

Pupils have to pass examinations at the end of each year, besides a final examination, after which a diploma is awarded.

A delegate from the Department completes the jury for this final examination.

II. *Agricultural Sections.* — The professors of these special courses are chosen as much as possible from amongst agricultural engineers, doctors of science, and holders of a diploma of scientific studies.

Pupils must have attended a form corresponding to the first one of second grade schools, or must be 12 years old and possess a sufficiently good primary education.

The *obligatory courses* are : Physics, Chemistry, Botany, Zoology, Agronomy, Agricultural Chemistry, Special Cultures, Zootechny, Book-keeping.

The following *supplementary courses* may be added : Analytical Chemistry, Fruit Arboriculture, Market Gardening, Forestry, Poultry keeping, Entomology, Bee keeping, Agricultural mechanics, Rural Buildings, Agricultural Technology, Commerce and Rural Economy.

The course consists of : a preparatory year, in which at least one hour a week is devoted to theoretical lessons in natural sciences, one hour to lessons in agronomy, two hours to demonstrations and practical exercises ; and two ordinary years during which there are in each week five hours of theoretical and five hours of practical lessons.

The theoretical instruction of obligatory courses is given as much as possible during the winter time and the *methods* adopted are intuitive and deductive ; the practical instruction consists in excursions, applications and repetitions, and exercises in drawing.

Each school carries out at least one voluntary experiment a year.

A report on these experiments is sent to the Administration of Agriculture.

Each School draws up a detailed *programme* and sends a copy to the Minister and the Inspector : the latter also receives at the beginning of each year a list of the hours of lessons.

The grants and scholarships are described in the first article, pp. 429-431.

III. *Agricultural schools.*— In the Agricultural Schools pupils receive a course of general instruction and special instruction, containing obligatory and supplementary courses.

A three years general course is adopted and supplementary branches are mostly reserved for the third year.

For grants and scholarships see above.

The other information given above may also be applied to these Schools.

* * *



STATE SECONDARY AGRICULTURAL SCHOOL AT HUY

State secondary Agricultural school at Huy. — The Agricultural School at Huy was instituted by Royal Decree of 18th October 1890, in consequence of numerous applications from the Committee of the Royal Agricultural Society of the East. The town of Huy was chosen, being halfway between Condroz and Hesbaye, two very important agricultural districts possessing very different characteristics. The school was temporarily installed in premises which the town of Huy placed at the disposal of the State. The increasing number of students

and the necessity of adding practical cultivation to the work of the school, necessitated its removal to premises of greater dimensions. In 1899, the State purchased the splendid estate of St. Victor. Before the French Revolution, this estate was a convent of the « Dames Chanoinesses de St. Victor »; in 1793, it was converted into national property. During the Wars of the Empire, it was transformed into a military hospital. In 1812, Napoleon I established his head quarters there, and occupied it for several days. The estate was next sold to M. Ouvrex, landowner at Huy, from whom the family Dijon-Rome inherited it, and kept possession of it until 1899, when the State purchased it.

The buildings contain large and airy lecture rooms, filled with interesting collections serviceable for instruction, chemical laboratories, separate rooms for instruction in physics and drawing, carpenter's workshop, etc.

A part of the establishment is set apart for boarders; this contains large dormitories, an infirmary, dining hall, room for amusement, etc.

With a view to hygiene, the farm buildings are entirely separated from the school buildings.

The farm buildings consist of stables, cattle sheds, pig styes and poultry yard, all perfectly fitted up, a loft, and a machinery hall, which contains a stock of agricultural implements.

Independently of the ground devoted to field cultivation, the school possesses a vegetable garden, a vine yard, wall fruit trees, etc.

As the agricultural school is intended for the sons of farmers who wish to continue their father's vocation, the instruction is theoretical and practical.

To be admitted to the school, students must be fourteen years of age, and have had a good elementary education. The duration of the courses is fixed at two years and the instruction is free. The theoretical instruction includes : the French language, Arithmetic, Geometry, Surveying, Commerce, Agricultural Book-keeping, Agricultural Geography, Sketching, Botany, Agricultural Zoology, Phy-

sics, Chemistry, Agronomy, Market gardening, Cultivation, Agricultural Technology, Rural Economy and Rural Legislation.

The school is placed under the supervision and patronage of a board of governors consisting of 7 members.



FARM OF THE PRIVATE CARLSBOURG INSTITUTE

There are 17 other subsidised establishments, amongst which we may describe, as a type of a school with a three years course, the Carlsbourg Institute. The programme is more comprehensive than that required for an intermediate school. Besides religion and French, the instruction includes Agricultural Mathematics, Geography, Surveying, Land-measuring, Mineralogy, Geology, General Chemistry, Analytical Chemistry, Agricultural Chemistry, Physics, Hygiene, Microscopy, Bacteriology, Botany, Agriculture, Forestry, Market gardening, Special Crops, Zoology, Entomology, Zootechny, Aviculture, Pisciculture, Commerce, Agricultural Industries, Drawing, Agricultural Constructions, Agricultural Machines, Agricultural Book-keeping, Meteorology and Industrial Physics, Rural Economy and Rural Législation.

To the above must still be added courses in the management of a Dairy or Brewery. In fact, the 3rd year of study is set apart for specialisation; the students devote themselves, in a more or less exclusive manner, to the Study of *Agronomy*, *Brewing* or *Dairy farming*, with

the object of gaining the diploma of *Agriculturist*, or *Head Brewer* or a certificate of fitness in the duties of a *Manager of a Dairy Farm*.

The result of the preliminary examinations is shown by certificates granted to the students before their departure for the vacations. The final examination is held before a special board, which includes some members who are not attached to the establishment, and is presided over by an examiner appointed by the Government. It includes a written, an oral and a technical test. Each student presents to the jury, a detailed *report* on some subject chosen by himself, and a complete *plan* of a farm, a brewery, or a dairy farm.

The staff of instructors consists of 9 teachers; the students, all living in the school, number about 50.

Results. — Our intermediary schools have enabled our agriculturists, small landowners and farmers, to obtain a reasonable return from the working of their holdings; they have made them abandon routine, and capable and desirous of utilising their acquirements; in a word, they have thoroughly trained our agriculturists to carry out that intensive system of cultivation which alone can secure us the advantage in the international struggle.

Further, these establishments have contributed largely to develop the spirit of association. Union between comrades has facilitated the formation of societies and syndicates. The schools naturally develop into centres of consultation and information, and their professors are distinguished lecturers.

But the greatest service rendered by these schools has been in raising the agricultural profession to an interesting art, and of infinitely varied applications, an art which fascinates the learner and which he never desires to abandon. The poet celebrates the happiness of labour in fields; the schools help us to realize the condition that he attached to this happiness :

O fortunatos nimium sua di bona norint Agricolas!



STATE HORTICULTURAL SCHOOL OF VILVORDE
PUPILS GOING TO PRACTICE

Professional Instruction in Horticulture

SECONDARY PRACTICAL SCHOOLS

General.— Since 1848, several establishments of instruction have been founded in Belgium with the object of supplying young men, who wish to gain a living in the horticultural industry, with theoretical and practical knowledge sufficient to raise them above the level of intellectual development of ordinary labourers, and so to equip them, as adequately as possible, to meet the continued demands for improvement in modern horticulture.

Since 1849, the Belgian State has maintained the Schools of Ghent and Vilvorde, which are attached directly to the Agricultural Department. They are both organised in accordance with the law of April 4th, 1890, and regulated by the Royal and Ministerial Decrees (October 17 and 18, 1890). They have also the same programme of studies

(that of 1903). Nevertheless their interior administration is different, and is especially adapted to local circumstances.

They are both intermediate practical schools, training their students in different special studies, although these studies rest on one common scientific basis.

These two schools bear the title of *Horticultural and Agricultural Schools*, but the teaching of the science of horticulture is their most important feature. The studies cover a period of three years. In 1901-1902, the Ghent School numbered, 37 students, and gave its diploma to 10, Vilvorde had 79 students, of whom 57 received the diploma for horticulture : in the colonial section, 45 students were entered and 5 received the certificate. The expenditure of the State, in 1902 amounted to 40,409 francs for Ghent and 54,008 francs for Vilvorde.

There are in addition to the two State Schools, 4 subsidised schools : *the Horticultural School* at Mons : about 20 students, two year's theoretical and practical course, receiving (1) 3,400 francs subsidy : that at Tournay (2) ; 25 students, three year's course, 3,600 francs subsidy ; professional Horticultural School, established at Liège (3) and devoted entirely to the professional training : 22 students, three year's course, 3,200 francs subsidy ; and the *Horticultural School* at Carlsbourg under the direction of *Les Frères des Écoles chrétiennes* which receives a subsidy of 2,000 francs. The programme at Carlsbourg is the same as that adopted, in 1903, by the Government for the schools at Ghent and Vilvorde, and comprises a three year's course, followed by 22 students.

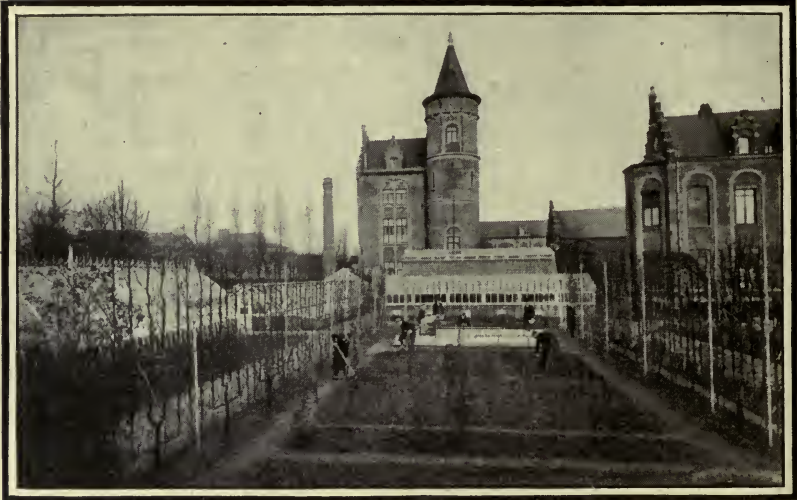
Special statistics. — A brief description of the State Horticultural and Agricultural Intermediate Practical School at Ghent may serve as an illustration of the character of these intermediate schools. The School of

(1) From the State.

(2) Established by the town, with the cooperation of the province and the *Société royale d'agriculture et d'horticulture*.

(3) Formed by the three principal societies of the town, the *Société royale d'horticulture*, the *Cercle royal d'arboriculture*, and the *Union horticole*, and with the pecuniary assistance of the town, the province and the State.

Ghent was formed by an agreement between the celebrated horticulturist Louis Van Houtte and the Minister of the Home Department, Charles Rogier, which was ratified by the Royal Decree of April 30, 1849.



STATE HORTICULTURAL SCHOOL OF GHENT

From that date until 1870, the school buildings were attached to the well known establishment of its founder, situated at Gentbrugge, an outlying district of the town of Ghent.

In 1871, the School was transferred to the buildings attached to the Botanical Gardens of the University of Ghent, and in 1889, it was definitely settled in a part of the premises and gardens of the State Training School, situated in the public park at Ghent.

In 1899, the School celebrated the Jubilee of its foundation, by organising a grand Horticultural Exhibition, to which its past students contributed, and by an international Congress for the improvement of horticultural instruction.

For admission to the school of Ghent, candidates must be 16 years of age and must have sufficient experience to be able to perform regularly ordinary work in agriculture.

There are two categories of students : regular students and « free auditors » ; the latter follow the courses accor-

ding to their choice, for which their names have been entered, and they do not go in for examinations.

Regular students must pass an entrance examination, which is quite easy. They are obliged to follow regularly all the practical and theoretical lessons.

At the end of each scholastic year they must pass an examination in all the subjects taught during that year, to enable them to pass to the next higher division.

At the end of the 3rd year of study, a thorough examination in the professional subjects is held for the Diploma of Horticulture.

The students, who gain 80 p. c. of the maximum marks in this examination can obtain scholarships to allow them to take up practical study at the Brussels State Botanic Gardens or in a special horticultural establishment at home or abroad. Those who make 90 p. c., may continue their scientific studies for one more year.

At the end of this period these graduated students can present a report, followed by a special examination in the particular subject they have studied, on account of which a special Diploma may be granted them.

The instruction of regular students of Belgian nationality is entirely free. Scholarships are offered by the State, the Provinces and the Parishes to the best pupils who are not well off.

Regular students of other countries pay an annual fee of 150 francs.

The school does not receive boarders.

TIME TABLE OF THE DIFFERENT BRANCHES
OF HORTICULTURAL SCHOOLS

DURING THE SCHOOL YEAR 1903-1904

Number of hours devoted to each of these branches a week

THEORETICAL AND DEMONSTRATION COURSES			
(Given in the morning from nine o'clock to twelve)			
NAMES OF BRANCHES	YEARS		
	1 st	2 nd	3 rd
Drawing	2	2	—
Flower painting	—	—	2
Geometry	3	—	—
Horticultural buildings	—	2	2
" " theory	—	1/2	—
Garden architecture	2	2	2
" " theory	1/2	—	—
Floriculture	1	1	1
Flower trade	—	—	1
Colonial crops	—	—	1
Arboriculture	1	1	1
Market gardening	1	1	1
Botany	1	1	1
Agronomy	1	—	1
Land-measuring	1/2	—	—
Physics	1	—	—
General Chemistry	1	—	—
Agricultural and Horticultural Chemistry	—	1	—
Applied Chemistry	2	2	—
Cultivation	1	—	—
Commerce and Book-keeping	—	1	—
PRACTICAL COURSES			
(Mostly given in the afternoon)			
Repetitions (practical demonstrations) .	2	2	2
Wood work	—	2	2
Horticultural work (winter season). . .	13	16	19
" " (summer ")	22	25	28

* * *

RESULTS. — As has been stated above, a large part of the course is reserved to practical instruction in the school of Ghent, but enough theoretical instruction is given to enable students to fill with success appointments in different branches of horticulture.

The value of this instruction is clearly shown by the number of situations obtained by the students :

Amongst these are : 1° country gardeners; 2° special gardeners; 3° land agents; 4° directors of plantations and botanic gardens; 5° explorers; 6° agriculturists; 7° horticultural lecturers; 8° professors and directors of horticultural schools; 9° garden and hot house architects; 10° nursery men; 11° horticultural merchants.

The school of Ghent has largely contributed to the progress of Ghent's horticulture, which has a world wide reputation.

A great many foreign countries have asked for technical and intellectual horticultural men who achieved their studies at the Horticultural School of Ghent.

LIST OF ARTICLES EXHIBITED

1. The school's buildings and hot houses.
2. Participation of the school in the XV^e exhibition (1903) which takes place every five years at Ghent.
3. Students at work. (Reproduction hot house.)
4. » » (Orchid house.)
5. » » (Colonial plant house.)
6. » » (Peach frame.)
7. » » (Vegetable hot beds.)
8. » » (Wall fruit trees.)
9. » » (Collection of annual and perennial plants.)
10. » » (Collection of rose trees.)
11. » » (Various trees and shrubs.)
12. » » (Coniferae.)
13. » » (Bee hive and kitchen garden.)
14. » » (Agricultural experiments.)
15. Floral composition carried out by pupils.

16. Table decorated by pupils at the Jubilee Exhibition of the school.
 17. Excursion of pupils.
 18. Post card views of the school.
 19. A page of the herbarium.
 20. A few specimens of grafts.
 21. Diagram of the differential development of the different branches of instruction.
 22. Diagram of the admission of regular pupils at the conferring of diplomas of horticulturist.
 23. Diagram of the appointments obtained by graduated pupils during the last quarter of the XIXth century.
 24. Plan of the hot house section.
 25. Plan of the garden collections.
 26. Plan of the nursery and kitchen garden.
 27. Specimens of paintings done by pupils.
 28. Time table for 1903-1904.
 29. Plan of the arrangement of class rooms.
 30. Plan of a garden, by a student of the 3^d year.
 31. Two model flowers beds, done by a student of the first year.
 32. An experiment in market gardening.
 33. Publications of the teaching staff.
 34. Specimens of plants which have been presented to the members of the teaching staff.
-

IV. — TEACHING OF AGRICULTURE AND DOMESTIC ECONOMY FOR GIRLS

AGRICULTURAL SCHOOLS OF DOMESTIC ECONOMY

Purpose of these schools. — An intelligent farmer's wife must be a good housekeeper: she must be able to take her part in all the work done on the farm.

The agricultural housekeeping schools have for their object the instruction of farmers daughters in these duties and to encourage them to take an interest therein.

There are permanent and travelling schools.

A. — PERMANENT SCHOOLS

Division and programme. — A volume published by the Agricultural Department gives the regulations concerning agricultural teaching which is divided into *housekeeping sections* and *schools*; the next grade of school being the agricultural high school.

1° « The object of the *sections* is to give young girls some general instruction in agriculture. » The special teaching includes the elements of Agriculture, of Dairy farming, Domestic Economy and Accounts.

At least one hour a week must be devoted to theoretical instruction and two hours to practical exercises;

2° The object of the *Schools of Domestic Economy* is to give a sound professional education to young girls who intend leading an agricultural life; but general instruction is not omitted. The special teaching is theoretical and

Reference works : *Agricultural teaching for young girls*, by P. De Vuyst.

Leaflet (n° 13), concerning the teaching of housekeeping and agriculture.

Pamphlets 9 and 11 on the *regulations of agricultural teaching*; Organisation of the Department of Agriculture : book published for the Universal Exhibition of Paris in 1900.

Triennial report on the situation of veterinary and agricultural instruction.

practical. It includes the following courses : the elements of Natural History, the elements of Agriculture, of Market gardening and Floriculture; the elements of Zootechny, Dairying, Domestic Economy, and the elements of Commerce and of Accounts.

A good place in the programme is given to hygiene, and to the training, and physical, and moral education of children. At the request of the Department of Agriculture *elementary lessons in physical, intellectual and moral education* were published for the use of the schools of domestic economy (1). These lessons are arranged according to the ages of the children (from 1 to 3 years and from 3 to 7; from 7 to 15; from 15 and above). An excellent periodical on education adopted by these schools is the *Revue de l'Education familiale* (2).

Supplementary courses in Rural Laws and Social Economy may be added if wanted.

The minimum time given to the special courses is ten hours a week for theoretical and twenty hours for practical teaching;

3° *The High Schools of Agriculture* are established for young girls who want a more complete education in agriculture to enable them to undertake the management of large farms or to teach in agricultural schools of domestic economy.

The courses of scientific and practical education last at least two years. At the high schools of domestic economy students have to learn training of children, methodology, rural laws and social economy. At least ten hours of theory and twenty hours of practical work are given every week.

STATISTICS. — The Institute of the Sacred-Heart and of the Immaculate Conception, established at Heverlé is a school in which higher agricultural instruction is given. The courses last three years. To the theoretical lessons are added practical work and excursions; the practical work is done in the morning.

In this way the school work corresponds more closely to life on the farm : the housekeeper is generally busy in the morning with farm work.

(1) By Mrs. Hallet, Monseur and Miss Deleu, Arlon.

(2) Administration, rue Rubens, 44, Brussels (Belgium).



AGRICULTURAL SCHOOL OF DOMESTIC ECONOMY AT BOUCHOUT NEAR ANTWERP

Belgium possesses 10 second grade schools of domestic economy, established at :

Bastogne, Bouchout, Brugelette, Herve, Gooreind, Gysegghem, Oosterloo, Overyssehe, Graveurdegel and Virton.

Except the establishments of Bouchout and Virton, all the agricultural household schools are superintended by a Central Board of instruction.

Besides the agricultural household schools, there are four agricultural household sections, established at Cortemarck, Haute-Croix, Heule and Moorslede.

* * *

The manufacture of cheese is taught in every agricultural household school.

A special section for cheese manufacture is also annexed to the schools of Heverlé and Overyssehe.

* * *

*Agricultural School of Domestic Economy at Bouchout
near Antwerp*

This school, represented at this exhibition, is a real farm-school; it was founded on the 3^d of January 1893. It is maintained by the State, the Province and the provincial Committee of agriculture, each being represented by two delegates in the board of management. There are also two delegates from the local Agricultural Societies.

The course, limited to one year, is theoretical and practical. It is on the farm and in the gardens that most of the courses are given.

The theoretical lessons are given as much as possible in the forenoon.

For the practical work, the students are divided into four groups :

The students of the first group have to look after the cattle and the poultry, milk the cows, prepare the food for the animals of the farm and calculate the cost of it.

Those of the second group are charged with the dairy work and the manufacture of cheese.

The students of the third group take care of the garden of the school, cultivate vegetables, prune the fruit trees and work in the apiary.

Those of the fourth group have to do all the house work.

The expenses of the household and the daily bills are entered in a journal.

Each pupil, in turn, keeps the accounts of the farm. The courses in sewing (two afternoons a week) and some other exercises, such as washing and ironing, are done in the same room.

No fee is required for instruction; pupils pay for their food which they buy and prepare themselves, the cost of the food is estimated at 60 or 70 centimes a day. Candidates for admission must be at least 15 years old. The number of pupils is limited to twelve.

At the end of 1903, ten diplomas had been given.

Exhibits

1° A board with 6 photographs representing the work of the pupils in the school at Bouchout, namely: milking cows, pruning trees, a visit to the apiary, baking bread, washing linen and preparing dinner.

2° One diagram showing the Belgian farmer's diet, according to an inquiry made by the Agricultural household schools.

It shows besides the daily food, calculated by the week, the composition of the food, the cost of it and proposed improvements.

3° A glass-case with twelve types of the costumes of old and modern farmers.

This exhibition is a representation in small scale of the collective exhibition of costumes of the Belgian farmers in the different ages, executed by the teachers of the agricultural household schools, for the agricultural show at Bruges (1903).

4° The works issued by the personnel of the Bouchout school namely:

P. Wauters: *The improvements to be introduced in the Agricultural Household Schools.*

P. Wauters : *Short introductory lectures in agriculture.*

P. Wauters : *Farm vegetables.*

P. Wauters : *Notes on secondary agricultural middle grade instruction.*

P. De Vuyst and P. Wauters : *Chemistry of the farm.*
(The same in Flemish.)

P. De Vuyst and P. Wauters : *Recent progress in dairy-farming.*

P. De Vuyst and P. Wauters : *New improvements in dairy-farming.*

P. Wauters, Van Damme, L. Versnick : *Elementary zootechny.* (The same in Flemish.)

P. Wauters, H. Van de Velde, L. Versnick : *Elements of Agriculture.* (The same in Flemish.)

H. Van de Velde, P. Wauters : *Treatise on manures for gardens and agriculture.*

Dr M. Henseval and P. Wauters : *The Science of House-keeping.*

Van Engelen and P. Wauters : *Contribution to the study of Butter fat.*

Van Engelen and P. Wauters : *Contribution to the study of Cows-milk.*

J. Taymans : *Elementary compendium of some lectures in milk preparation.*

5° The class books used in the Agricultural Household Schools :

Elements of Natural History, by Terfve and Picalausa.
— Wesmael-Charlier, publisher at Namur.

(The same, in Flemish.)

Elements of Agriculture and Horticulture, by Wauters, Van de Velde and Versnick. — Vanderpoorten, editor at Ghent.

(The same, in Flemish.)

Elements of zootechny, by Wauters, Van Damme and Versnick. — Vanderpoorten, editor at Ghent.

(The same, in Flemish.)

Elements of farmer's housekeeping, by E. Vliebergh, lawyer at Louvain.

Elements of Common Law, by Mr. Dijon. — Charpentier and Edmond, editors at Huy.

Lessons on Microbiology applied to the Dairy, by Mr. Henseval. — Louvain, Polleunis and Ceuterick, rue des Orphelins, 32.

Ten lessons on the elements of Chemistry applied to Agriculture, to the Dairy and to Domestic Economy, by P. Wanters. — Polleunis and Ceuterick.

(The same, in Flemish.)

Elements of Commerce and Accounts of the household and the farm, by Mr. H. Minet, at Leers-Fosteau.

Elements of Commerce and Accounts for household schools and farmers, by Adriaensen and Delange, according to the above book of Minet. — Vanbiesen, publisher at Louvain.

Manual of Domestic Economy, by Mr. Du Caju. — Lebègue and C^o, publishers at Brussels.

The perfect housekeeper, by Mr. Du Caju. — Siffer, publisher at Ghent.

Elementary lessons in physical, intellectual and moral Education, by Mrs. Hallet, Monseur and Miss Deleu. — Presse Luxembourgeoise, publisher at Arlon.

Courses in Dairy-Farming, by J. Maréchal. Published by the author, at Neuville en Condroz.

Courses in Dairy-Farming, by Th. Deleu and L. Dhont. — Siffer, at Ghent.

6^o The Bulletin of the Study Association founded by the teachers of the Agricultural Schools of Domestic Economy.

7^o Leaflet, n^r 13, relating to the teaching of agricultural housekeeping.

8^o Regulations concerning the teaching of agricultural housekeeping (leaflet 9 of the collection).

B. — TRAVELLING SCHOOLS

These schools were founded with a view to establish the national milk trade on a sound basis and to teach improved methods of making butter and cheese. They were called *temporary dairy schools*.

On the Belgian farms, the farmer's wife looks after the cow-shed and the dairy, it is for this reason that the teaching of rational feeding, hygiene of cattle, and the elements of dairy-farming was carried out in these schools.

The temporary dairy schools are moved every three or four months, going from one agricultural district to another, in order to enable young girls who wish to learn the newest processes of dairying to get the necessary instruction.

The first school was founded in 1890; at the present time ten schools are working regularly.

Organisation of these schools. — The establishment of a temporary dairy school is generally made at the request of the agricultural associations, with the pecuniary help of the State, the province (county), the city and of the Agricultural Associations of the district.

A grant of 2,000 francs is awarded to these schools for three months courses.

The teaching is theoretical and practical.

The courses are given every day except on Sundays; two hours are devoted to theory and three hours to practical work. All the pupils are day scholars: the number of pupils may not exceed twenty. The attendance at the courses is absolutely free of charge.

For admittance to the school, the young girls must fulfil the following conditions:

1° They must be at least fifteen years old; 2° possess a good elementary education, testified by a certificate; 3° they must be strong enough to do all the work taught in the classes.

The staff of the school is composed of:

1° A Director, who has to give the courses of agronomy and of zootechny; he superintends the organisation of the whole school. The functions of Director are performed by the State Agriculturist;

2° Two dairy teachers (ladies), who live in the school; they have to give the courses in dairying, cheese making and accounts; they direct the practical work of the pupils.

Results. — Since the foundation of the first school, in 1890, more than 2,000 diplomas have been awarded.

These schools have given the most satisfactory results; they have spread the use of improved machinery and

favoured the establishment of cooperative dairies. More than 7,000 centrifugal cream separators are now used on the farms; more than 500 cooperative dairies work the milk produced by 40,000 farms.

At the present time the courses last four months, the teaching of domestic economy and aviculture having been included in the programme.

Articles exhibited

1° A Map of the Province (County) of Antwerp, showing the towns in which the travelling schools of this province have been at work, and the localities where special lectures in dairyfarming have been given;

2° A photograph showing the practical work of the pupils;

3° The account books written by the scholars;

4° The class books in use;

5° Leaflets n^r 10 and 11 relating to the teaching of dairyfarming and the production of cheese;

6° Leaflet n^r 2 for farmers, entitled : the temporary dairy schools for young girls.

OTHER INSTITUTIONS CONNECTED WITH DAIRYING AND HOUSEKEEPING

Study Association for teachers of agricultural house-keeping schools. — This society was founded under the patronage of the Minister of Agriculture, in order to favour the rapid development of science and the improvement of teaching methods, and also to uphold the professional interests of its members.

This society publishes an annual report (1).

Advanced courses for teachers. — The directors of the Study Association have organised with the help and under the control of the Minister of Agriculture, a course for the teachers of the permanent and travelling schools.

(1) For full information apply to Mrs Deleu, secretary at Borsbeke (Burst).

This course was held during the school holiday of 1902 and 1903.

Dairy Experts. — The Agricultural Department has instituted a special service of dairy experts. The duty of these experts is to give free information to all promoters of dairy syndicates or of the cheese trade, on the organisation of the cooperative societies, and to give to farmers any advice they may need in the making of their butter and cheese.

The following experts are engaged in this special service :

Mrs. Thiers, Tanghe, dairy teacher at Bisseghem;
Mrs. Hallet, Monseur, dairy teacher at Arlon.

V. — POPULAR INSTRUCTION

a) *Agricultural and Horticultural Professional Sections or Schools*

The sons of small farmers or gardeners could not, after the elementary school, attend the secondary courses which are so numerous in Belgium for children living in cities and in industrial centres.

This lack of secondary teaching is remedied by the foundation of Professional Sections of an elementary grade in agriculture and horticulture to enable the children of farmers to get good agricultural instruction.

These sections are generally established in rural or horticultural centres of some importance, near public or private elementary schools. Only boys who have passed all the courses of the primary school are allowed to attend the classes.

The instruction is free. The programme of the courses is slightly varied in different localities.

The agricultural sections. — These Agricultural Sections are organized by the Departments of Public Instruction and of Agriculture.

General instruction is given in Arithmetic and Drawing; special instruction is given of a practical character for which a garden of at least five « ares » (1) and the necessary material are required.

The instruction comprises a minimum of 25 hours lessons in Agriculture, 25 hours lessons in Zootechny and 10 hours lessons in Rural Economy and Accounts. The programme also includes 30 practical demonstrations in the fields or two hours excursion.

These lessons can be given in two terms of six months each, either in one year, or in two years.

The professors, are chosen among the Agricultural Engineers, the lecturers or the teachers having obtained a Special Diploma and the teachers who have obtained

(1) 1 are is equal to 119.6 square yards.

a first class Diploma in two competitions for agricultural teaching. The inspection of agricultural instruction is performed by a State Agriculturist of the district; the other branches of instruction are supervised by the Inspector of elementary education.

The classes must to be attended by at least 15 students. At the end of the courses, the students pass an examination before the State Agriculturist, the District Inspector and the Professors. A certificate is given to those who obtain in this examination 60 p. c. of the marks allotted to the whole examination and 50 p. c. in each of the two tests (oral and written).

The Departments of Agriculture and of the Interior contribute to the cost of these sections. The Department of the Interior allows the same grants as those given to adults schools; the Department of Agriculture grants an annual subsidy of 350 to 750 francs and contributes half the cost of the equipment necessary for the agricultural teaching.

The agricultural professional school of Ruyssede

The section annexed to the State Reformatory School of Ruyssede in 1900 is a type of an elementary professional School.

This school pos-



sesses about 125 hectares. Nearly 80 students follow the agricultural courses. This section is for the training of small farmers and agricultural labourers.

The courses extend over one year and the programme adopted is prescribed by the Agricultural Department. The students receive two lessons a week, on wednesday and thursday, from 1 to 2 o'clock in the afternoon.

Except when they are at lessons, they are all occupied in the numerous duties of the farm the vegetable garden or the fruit garden. The lessons are given in the form of conversations, and as much as possible in the fields.

A garden containing 15 ares (1) is attached to the agricultural section and is made use of for experiments in cultivation.

Most of the students who have already left the Reformatory School, have utilised their agricultural knowledge in practical works at their parents homes. Two of them have recently been engaged as nurserymen.

Articles exhibited. — The Professional School of Ruysselede exhibits :

1° Some photographs : a) of the Farm attached to the Reformatory School; b) of the classes; c) of the work done by the students;

2° A subject for an agricultural lesson : the advantages of drilling over sowing broadcast by hand ;

3° A plan of a kitchen-garden with a four course rotation ;

4° A frame containing the principal graminaceous plants of the meadows in this district ;

5° An album with photographs of animals ;

6° A herbarium ;

7° Some students copy books, some results of experiments.

Dairy Schools for young-men

The object of these schools is to train Directors or Managers of dairies. Besides this, they enable agriculturists to acquire rapidly practical knowledge of dairy-farming.

(1) See page 111.

The Department of Agriculture instituted the first school of this kind at Deurle; two successive schools were then organised at Hansbeke; a school was afterwards permanently established at Borsbeke near Alost.



DAIRY SCHOOL OF BORSBEKE (BURST)

A second school was founded at Betecom and later on transferred to Oplinter.

The programme of teaching includes :

A course in dairying and cheese making; a course in mechanics; a course in zootechny; a course in accounts; practical teaching is given in connection with these courses.

The duration of these courses is four months.

Provincial School of Agricultural Mechanics at Mons.— The school, instituted at Mons by the Provincial Society of Agriculture, and aided by the public authorities, is intended to initiate those attending it in the use and construction of agricultural machinery, the new applications of mechanics in agriculture, the fitting up, the keeping in repair, and the management of farm implements.

It is open gratuitously to farmers, foremen labourers, managers of syndicate machines, contractors for agricul-

tural mechanical works, country farriers, and sellers of agricultural machines.

The various courses of lectures are given during the months of December, January and February, every tuesday, thursday and saturday morning.

The professional apprenticeship is continued for one year.

The afternoons of the lecture days are occupied in drawing, workshop labour, and in practical work on the farms and establishments in the neighbourhood.

In the remaining months, the students are practised in regulating and managing ploughing, sowing and reaping machines which can only be worked in fine weather.

They are employed, in groups, in all kinds of agricultural work, in various parts of the province.

The school confers the certificate of *mécanicien-conducteur de machines agricoles* upon those students who show themselves capable and possess sufficient practical knowledge.

* * *

Horticultural Sections. — The horticultural sections are supervised by the Department of Agriculture. The teaching consists of at least 60 theoretical lessons of 1 hour each on the elements of horticulture, and 30 practical lessons by excursions or practical exercises of at least two hours each. This instruction is given in one year or in two successive years to students divided in two classes.

The details of the programme of the special courses are elaborated by the professors of the section; a duplicate is sent to the State Agriculturist of the district, who has to inspect the classes.

« Theoretical and practical lessons are given bearing on the special forms of horticulture of the district. »

For the practical teaching, the sections are provided with the necessary equipment for all practical work and for the teaching in class.

« The teachers of the special classes are generally chosen among the certificated pupils of the horticultural schools and among men possessing a diploma from the Horticultural Schools. »

At the end of the school year, a board composed of a delegate of the Department of Agriculture and the profes-

sors of the section, after an oral theoretical examination and a practical examination, award certificates to the students who, after obtaining 60 p. c. of the marks allotted to the theory, get at least half of the marks in each division of the practical examination, and at least 60 p. c. of the marks allotted to the whole examination.

The annual subsidy from the Department of Agriculture ranges from 450 to 850 francs. The Department also contributes half the cost of the equipment, after a favorable report from the State Agriculturist.

Statistics. — Doctor Jacques founded the first Agricultural Professional Section at Florenville long before the State had established any similar Schools. This school is open in the evening from 7 to 9 o'clock, three times a week, from the 1st of November until the 1st of March. The course lasts three years. This school is a travelling school. There are five professors; 35 students attended the school from 1900 to 1902. A subsidy of 500 francs is granted.

Another School, at Schadeck-Attart, is about as old. During the three years of study, including one preparatory year, there were, 52 students in 1901-1902. The number of diplomas awarded annually does not exceed 5. More recently Schools have been established at Aerschot, two years course, about 30 pupils; and at Mariakerke-Ostend : one year course, about 25 pupils.

The horticultural sections are established at Wetteren at Louvain, at Knesselaere and at Wasseiges.

The school is open on Sunday at Louvain; at Wasseiges, it is open in the evening on weekdays.

b) *Popular Teaching for Adults*

Popular teaching for adults consists in courses of lectures having the following objects :

- 1° Agriculture for adult Farmers and farmers wives;
- 2° Agriculture for soldiers;
- 3° Farriery;
- 4° Arboriculture and Market gardening;
- 5° Apiculture;
- 6° Aviculture;
- 7° Miscellaneous lessons and special lectures.

1° *Courses of lectures in agriculture*

The teaching of agriculture was undertaken in 1887. At first 30 lectures were given but later this number was reduced to 15 as this gave better results.

Since that time the number of municipal administrations which have applied to the Department of Agriculture for these lectures during the winter has rapidly increased.

Since the organization of these courses up to 1903, 3,643 lectures have been given which have been attended by 163,055 pupils.

In 1902, lessons were given to women with much success.

These lectures treat of household economy, hygiene, dairy-farming, household and farm book-keeping, aviculture, gardening and the making of preserves.

These lectures were followed by 16,312 persons.

To encourage pupils, the lecturer distributes an abridged summary of his lectures. Books are given as prizes to the six pupils who have obtained the most marks in a special and optional examination.

The following are the principal subjects dealt with in the lectures to farmers :

- The Soil and Subsoil;
- Seeds and their Germination;

Agricultural hydraulics ;
Elements of Agricultural Physiology and Chemistry ;
Special Crops ;
Cattle Foods and Feeding
Hygiene, Zootechny ;
Dairying ;
Agricultural Book-keeping ;
Rural Laws ;
Elementary notions of Rural Economy ;
Mutual Assurance and Co-operation ;
Agricultural Institutions.

2° Courses of lectures in agriculture for soldiers

For these lessons the same programme is adopted as for those given to farmers. Twenty two lessons are given instead of 15.

Every year bills are posted up in the different barracks requesting soldiers who wish to follow these lectures, to have their names inscribed.

The soldiers who attend these lectures are not exempted from any military duties.

Elementary and interesting subjects as above are treated in these lectures : on Sundays a few excursions are taken to the farms of the district.

Rewards are given by the Department of Agriculture to auditors who have obtained the most marks in a special examination on agricultural subjects.

On the recommendation of the lecturer books are awarded to the pupils who are the most attentive to the lectures.

During the last three years 86 courses of lectures have been given and these have been attended by 2,195 men.

3° Courses of lectures in farriery

Lectures in farriery are given in the districts where they are really necessary and are sure of being attended by 12 pupils at least.

These courses are organized every year during the month of September, on the recommendation of the Veterinary Inspectors.

They begin on the second Sunday in January and consist of twelve lessons, of which four are essentially reserved to horse shoeing.

In the interest of persons wishing to get a certificate, the professor decides after the third or fourth lesson which pupils seem most likely to pass the final examination successfully.

Pupils have to pass an oral and a practical examination before a commission composed of the Veterinary Inspector, the State Agriculturist of the district and the professor.

Certificates are only given to pupils who obtain at least $5/10^{\text{th}}$ of the marks allotted to the theoretical examination and $6/10^{\text{th}}$ of those allotted to the practical examination.

This certificate admits the pupils to the central practical farriery school of Brussels.

4° Courses of lectures in Arboriculture and Market gardening



PRACTICAL LESSON IN ARBORICULTURE

At first these lessons were given under the patronage of societies receiving various subsidies from the Department of Agriculture.

The programme consisted of 12 lectures in arboriculture and a few elementary lessons in market gardening.

In 1895, this programme was organized on better lines and a series of courses of 15 lessons in arboriculture and market gardening were established in districts where they were necessary. The Department now pays the lecturers directly.

A general Decree specifies every year the districts in which these lectures are to be organized.



LECTURE ON VEGETABLE GARDENING

The communal municipalities or the horticultural societies who ask for these lectures to be given, must place a sufficiently large room and a moderate sized fruit garden at the disposal of the lecturer.

These courses are only given in cases where an attendance of at least 20 is guaranteed.

The students who wish to get a certificate may attend examinations held yearly during the months of August and September at the State schools of Horticulture and Agriculture of Vilvorde, Ghent and Huy.

Only persons having followed the Government courses for at least one year are allowed to go in for these examinations.

The board of examination issues certificates : the form of the latter is prescribed by the Minister of Agriculture.

These certificates are only given to pupils who have obtained half the marks allotted to the theoretical part of the examination and to each of the three divisions of the practical examination.

Since the reorganization in 1903; 1,628 pupils have been up for this examination, of which 731 have obtained a certificate for Arboriculture and 104 for Market gardening.

5° Courses of lectures in Apiculture

During recent years apiculture has become an important agricultural industry, new apiaries are being established daily.

The apicultural federations have started series of lectures in the country.

Until 1902 the lectures were equally divided amongst the districts where members of apicultural societies existed.

From that date these lectures have been given in series of at least five in the same locality.

During the last three years, 1,574 lessons have been given and have been attended by 3,000 persons.

6° Courses of lectures in Aviculture

As aviculture promises larger returns than apiculture it is not astonishing that lectures in aviculture have met with great success.

The lectures organized by the Minister are very well attended.

Four or five lectures are given according to a programme drawn up by the societies interested in aviculture.

The lecturers have to pass an examination before they are allowed to give these lessons.

During the past three years, 924 lessons have been given and attended by 20,000 pupils.

7° *Special lessons and special lectures*

Apart from these lessons subsidies are granted by the Department of Agriculture for a certain number of special lessons.

A few years ago the agricultural association of Verviers organized lectures in various localities on the choice and feeding of dairy cows. These lectures have been most successful in that grazing district.

Lessons in agricultural chemistry given by the same association have also been very successful.

The agricultural associations of Tinlot and Ciney have organized series of lectures in agricultural book-keeping : the elements of commercial and agricultural book-keeping are taught in these lessons.

A great many farmer's sons adopt the methods of book-keeping which have been taught at these lectures.

The town of Brussels has organized jointly with the Department of Agriculture lectures on Natural Sciences specially adapted to agriculture.

These lessons are public and are given by the professors of the university in the rooms of the university and are usually very well attended.

Two years ago lectures on elementary agricultural and horticultural sciences were established by the Society for Home Education.

These lectures are specially arranged for persons residing in the country during one part of the year.

The lectures are given in Brussels and are attended by a great many pupils.

850 lectures have been given during the last three years by private Agricultural Associations.

* * *

In the section of popular teaching for adults are exhibited :

1° A travelling bag containing the necessary articles for lectures on animal foods ;

2° A box containing the necessary articles for lectures on arboriculture ;

3° A travelling bag containing the necessary articles for lectures on domestic economy;

4° Various programmes of lectures;

5° Abridgments of the different lectures given;

6° A map showing by conventional signs the localities where lectures were given in 1903 in arboriculture, market gardening and floriculture;

7° A map showing the localities where lessons in apiculture and aviculture were given during the year 1903;

8° A map showing the localities where lessons in agronomy to adults and soldiers were given during the year 1903;

9° A recapitulatory table showing how these lectures were attended during the year 1903 throughout the whole Kingdom.

* * *

Teaching agriculture in primary schools. — Elements of agriculture are taught in all the rural primary schools of Belgium. This is considered as a branch of general instruction and is under the supervision of the Department of the Interior and Public Instruction.

VI. — SERVICE OF STATE AGRICULTURISTS

The staff of State Agriculturists was instituted by a Royal Decree of 26 September 1885.

Only holders of a diploma of Agricultural Engineer are included in this service.

The principal duties of State Agriculturists are the following :

a) To popularize the notions and proceedings of agricultural science, by written or oral consultations, lectures, experiment fields, demonstrative tests on cattle feeding, etc.

They put themselves in direct communication with farmers, and give them free advice.

They fulfil the functions of technical adviser and agricultural lecturer.

b) To teach farmers the advantages of cooperation, and to give precise information on the organisation and operations of these agricultural associations.

c) To inform the Central Administration as to the work done by these agricultural societies, in their respective districts, on the pecuniary encouragements that ought to be granted and the honorary distinctions that ought to be accorded to the most deserving members of these societies.

d) To organise and direct courses of agricultural lectures for adults, travelling agricultural Schools of Domestic Economy, courses of Horticulture, Arboriculture and Market gardening etc., instituted by the Department of Agriculture.

In order to facilitate the work of these officials, the Central Administration is authorized to nominate a limited number of assistants.

The staff of State Agriculturists numbers actually twenty three Agriculturists, three of these are attached to the Central Administration in Brussels.

The State Agriculturists have to send to the Central Administration reports relating to their lectures, the state of crops and experiment fields, the associations of farmers, and as to markets and shows, agricultural implements, rural industries, and on the sanitary condition of Cattle.

The honorary functions of « Correspondent of the Administration of Agriculture » are fulfilled by specialists who give the State Agriculturists precise information on various subjects.

The Agricultural Inspectors superintend the service of State Agriculturists, their task is facilitated by the diaries of journeys sent to them by the Agriculturists at the end of each month.

The Central Administration, is able to follow the work done by State Agriculturists, by the general journey table annexed to their annual report.

The following tables show the number of lectures and written consultations given by the State Agriculturists from 1895 to 1903 : they also indicate the journeys undertaken by these functionaries.

PROVINCES	STATE AGRICULTURISTS	RESIDENCE	LECTURES				WRITTEN CONSULTATIONS				JOURNEYS						
			1895	1896	1897	1898	1899	1896	1897	1898	1899	1895	1896	1897	1898	1899	
Antwerp	Van Elst	Réthy	33	36	35	41	37	53	38	62	95	32	216	214	197	212	215
Brabant	Van de Velde	Lierre	31	31	36	42	17	34	43	44	49	39	197	201	208	189	218
West Flanders.	Vandervaeren (1)	La Hulpe (1)	17	23	24	27	12	112	137	142	103	82	183	221	218	195	193
East Flanders .	Smeyers	Louvain	40	30	35	32	30	63	60	66	77	72	205	202	202	200	209
	Bauwens	Bruges	43	41	36	40	27	164	120	140	132	83	226	219	217	217	217
	Vandenwouver	Courtrai	29	30	26	35	31	59	55	96	98	70	188	186	200	188	204
	De Caluwe	Ghent	26	27	19	22	22	83	126	79	106	88	221	208	217	218	216
	Peffier	Termonde	7	26	17	20	23	37	80	90	106	99	190	202	200	200	221
	Lonay	Mons	57	53	46	28	8	225	297	325	278	183	217	218	224	218	219
Hainaut	Boisdenghien	Rœulx	37	31	31	26	33	78	96	102	132	105	204	196	202	197	197
Liège	Jadoul	Wamont	32	30	30	32	29	22	186	147	171	227	215	200	192	185	170
	Thomas	Liège	59	46	45	30	21	72	81	117	101	99	194	199	207	209	217
	Schreiber	Hasselt	33	33	30	30	30	31	46	35	50	37	216	217	217	217	217
Limbourg	Derwa	Tongres	29	31	29	30	31	35	67	50	83	69	196	20	173	196	213
Luxembourg . .	Delvaux	Bastogne	36	44	32	41	32	48	66	66	46	49	209	232	209	215	213
	Lejeune	Virton	34	36	42	47	44	40	40	41	6	59	153	166	144	138	132
	Marousé	Marche	31	37	36	48	34	24	44	67	78	74	209	195	190	190	208
Namur	Piret	Namur	25	29	28	23	19	63	38	41	70	56	99	120	132	141	115
	Furnemont	Ciney	41	29	29	37	24	65	60	59	79	71	227	213	220	213	221
West Flanders.	De Keyser (2)	Courtrai	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hainaut	Raskin (2)	Thuin	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Namur	Journée (2)	Namur	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	TORAUx		640	643	608	628	503	1472	1635	1793	1960	1582	3750	3801	3762	3723	3797

(1) Since 1902. — (2) Charged recently of new districts.

PROVINCES	STATE AGRICULTURISTS	RESIDENCE	LECTURES			WRITTEN CONSULTATIONS			JOURNEYS					
			1900	1901	1902	1903	1900	1901	1902	1903	1900	1901	1902	1903
Antwerp	Van Elst	Réthyl	32	23	18	23	33	46	35	32	224	206	229	222
Brabant	Van de Velde	Lierre	14	12	11	18	27	29	24	42	208	223	225	220
	Vandervaeren (1)	Vilvorde (1)	16	10	17	16	51	56	33	72	184	152	155	213
	Smeyers	Louvain	10	27	15	21	61	76	76	107	183	253	238	217
West Flanders.	Bauwens	Bruges	18	16	19	31	92	61	71	77	227	222	234	217
	Vandenwouwer	Courtrai	29	33	27	29	55	45	53	58	195	189	222	213
East Flanders.	De Caluwe	Ghent	18	10	13	22	76	85	74	122	233	227	248	221
	Peiffer	Termonde	16	14	13	26	83	94	100	147	236	223	221	236
Hainaut	Lonay	Mons	14	16	13	19	200	222	212	207	219	221	217	217
	Boisdenghien	Rœulx	28	32	20	15	68	59	63	98	182	202	190	186
Liège	Jadoul	Wamont	22	21	17	32	161	179	172	125	177	177	146	21
	Thomas	Liège	39	32	20	35	63	89	123	91	226	226	226	229
Limbourg	Schreiber	Hasselt	35	37	40	43	37	50	36	44	210	217	221	222
	Derwa	Tongres	19	22	22	18	73	106	123	117	204	162	223	215
Luxembourg	Delvaux	Bastogne	31	31	29	31	47	44	60	73	222	214	223	215
	Lejeune	Virton	45	39	46	54	47	68	67	88	148	169	175	171
	Marosé	Marche	27	31	29	29	72	68	54	63	214	217	208	210
Namur	Piret	Namur	18	10	19	8	71	65	108	88	129	139	103	152
	Furnemont	Ciney	20	16	10	7	58	55	47	55	224	232	219	241
West Flanders.	De Keyser	Courtrai	21	43	47	38	51	103	85	81	135	248	251	220
Hainaut	Raskin	Thuin	—	—	80	131	—	—	242	512	174	248	252	263
Namur	Journée	Namur	—	—	66	76	—	—	28	69	176	235	236	249
		TOTAUX	472	475	591	722	1422	1600	1886	2468	4261	4602	4664	4570

(1) Since 1902.

ADVICE TO FARMERS

The administration publishes « advice to farmers » in the form of leaflets.

The State Agriculturists distribute these leaflets, when they give their lectures or through their correspondents, or through the professors of public courses.

DEMONSTRATIVE AND EXPERIMENTAL FIELDS

The arrangement of experiment and demonstration Fields takes place under the supervision of the State Agriculturists.

They are established on land easily accessible to the public and representing the average conditions of a widely extended zone.

The experiment fields are established, as far as possible, on plots of land belonging to intelligent farmers who possess good implements, close to the places in which courses of lectures for adults are given and to establishments in which courses in agriculture are provided; in this way they are a useful adjunct to the theoretical instruction.

Whatever land is chosen, the soil must be uniform, and not close to tree plantations, enclosures or buildings; and the whole plot chosen must have been submitted to the same rotation and had the same application of manures.

The experimenter must prepare and keep the soil in good cultivation condition, and supply the necessary farm manure.

The crops belong to him, but the State Agriculturist may take samples for experimental purposes.

The Department of Agriculture provides seeds, roots and chemical manures.

The results obtained by these experiment fields are published in the *Bulletin de l'Agriculture*.

The following tables show the average results obtained, in each agronomical district, on the State Experiment Fields, during the years 1897-98-99, for two important crops of this country.

Experiment fields for potato crops

DISTRICTS	NUMBER OF TESTS	WITH EXTRA MANURES				
		WITHOUT EXTRA MANURES				
		LOCAL VARIETY	RED MECHLIN POTATOES	WHITE LILLOISE	IMPROVED PEACH BLAIR	LOCAL VARIETIES
		kil.	kil.	kil.	kil.	kil.
Campine.	16	20,284	26,144	25,406	22,416	24,822
Flanders.	12	18,436	31,033	26,752	26,152	24,606
Loam.	26	18,069	25,037	20,637	20,692	24,720
Sand and loam . . .	12	18,456	25,776	22,920	23,311	23,314
Polders.	5	15,865	23,127	15,700	16,810	16,835
Ardennes	9	15,158	22,492	21,064	14,906	21,782
Condroz	16	16,424	19,408	17,003	14,719	20,416
Jurassic	8	20,483	24,247	22,037	17,504	25,309
Average for the Kingdom . . .	104	18,086	24,943	21,688	20,090	22,554

Experiment fields for oat crops

DISTRICTS	NUMBER OF TESTS	WITHOUT EXTRA MANURES						WITH EXTRA MANURES					
		LOCAL VARIETY		LOCAL VARIETY		HESBAYE'S IMPROVED		SWEDISH		LIGONVO			
		GRAIN	STRAW	GRAIN	STRAW	GRAIN	STRAW	GRAIN	STRAW	GRAIN	STRAW		
		kill.	kill.	kill.	kill.	kill.	kill.	kill.	kill.	kill.	kill.		
Campine	14	2,805	4,044	3,293	4,956	3,305	5,008	3,255	4,604	3,122	4,358		
Flanders	7	3,171	4,559	3,629	5,559	3,641	5,696	3,454	5,597	3,620	5,181		
Loam	29	2,925	4,063	3,377	4,788	3,464	4,894	3,396	4,779	3,420	4,645		
Sand and loam.	8	2,654	4,800	3,079	5,469	3,178	5,818	3,243	5,251	3,284	5,253		
Polders	2	2,750	4,025	2,925	4,400	2,687	4,262	2,844	4,137	2,937	4,312		
Ardennes	9	1,902	3,252	2,322	4,100	2,569	4,122	2,585	4,186	2,558	4,021		
Condroz	18	1,822	2,798	2,308	3,869	2,500	4,042	2,353	3,630	2,453	3,465		
Jurassic	6	1,896	2,554	2,296	3,446	2,423	3,908	2,108	3,441	2,206	3,498		
Average for the Kingdom	93	2,527	3,748	2,969	4,589	3,072	4,722	2,985	4,466	3,019	4,097		

DEMONSTRATION TESTS IN ANIMAL FEEDING

The State Agriculturists have to organise one or two tests in the rational feeding of Domestic Animals. These tests are arranged as far as possible when courses of dairy lectures or domestic economy lectures for adults are given in which these matters are treated: they are arranged with the help of Breeding Syndicates, Cooperative Dairies, etc.

The results of the tests performed during the winters of 1901-1902 and 1902-1903 in the feeding of dairy cows are shown below.

	1901-1902	1902-1903
Number of tests	89	53
Number of cows.	129	156
Average net profit obtained per day and per cow.	0 fr. 33	0 fr. 327
Annual profit to be obtained, during the winter feeding, by each cow (160 days).	52 fr. 80	52 fr. 32

ARTICLES EXHIBITED BY THE SERVICE OF STATE AGRICULTURISTS

1. A map showing the various agricultural districts of Belgium and indicating :

- a) The respective stations of State Agriculturists;
- b) The places in which they give their lectures;
- c) The stations of their assistants.

1. A map showing :

a) The experimental fields established at the cost of the State in 1902.

b) The places, where tests in the feeding of dairy cows were carried out in 1902.

1 Diagram : Results obtained on the experiment fields during the years 1897-1898 and 1899.

1 Diagram : Results of the demonstration tests accomplished in 1901 and 1902, in the feeding of dairy cows.

1 Table : Photographic views of the experimental researches undertaken by Mr. Schreiber, State Agriculturist at Hasselt.

BIBLIOGRAPHY

Various publications and documents. — Monographs on the different districts of Belgium.

Advice to farmers. — Reports on the results furnished by the experiment fields. — Reports on the tests in the feeding of dairy cows.

Bulletin de l'Agriculture. — Years 1900-1901 and 1902.

Monographs on the various Agricultural districts of Belgium.

Statistics of Belgium. — Agriculture, Agricultural Census.

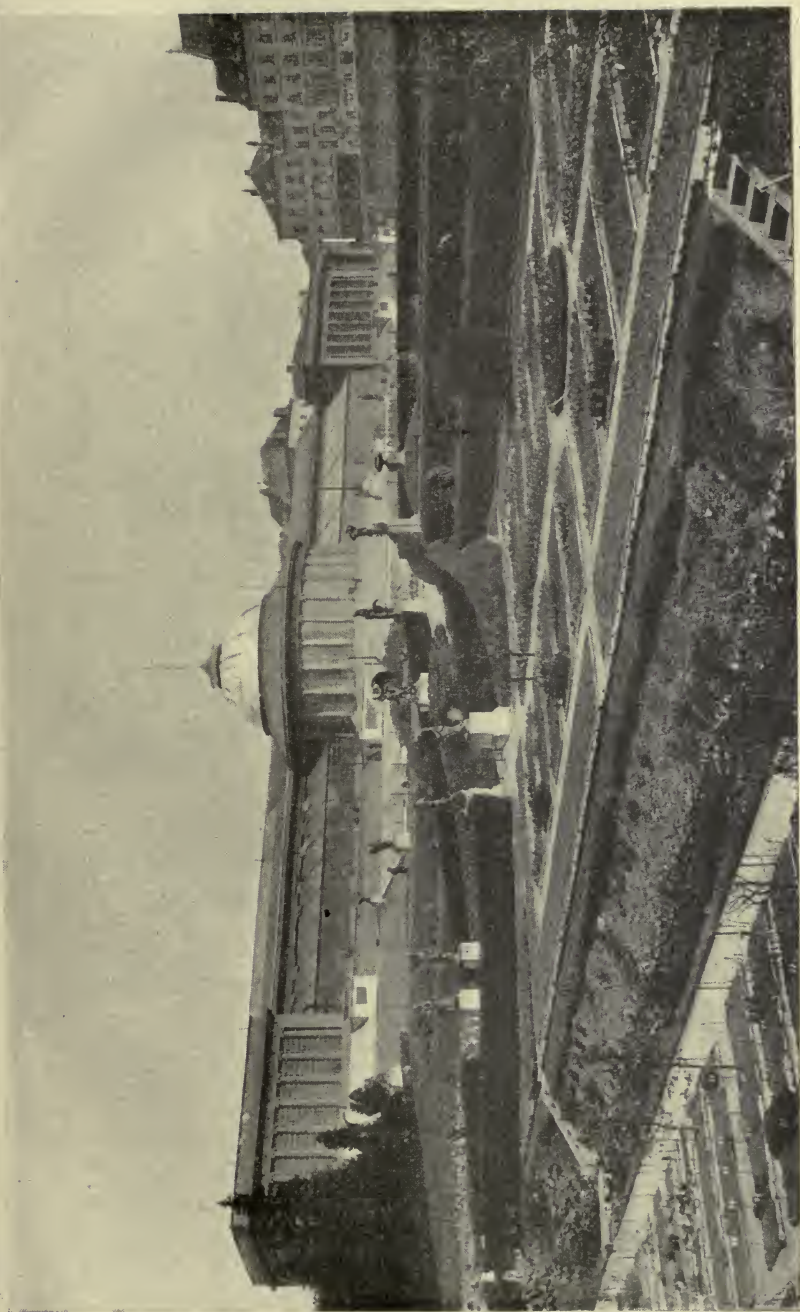
Situation of the Agricultural and Veterinary instruction. — Triennial report of 1900-1901 and 1902.

Regulations concerning the Service of State Agriculturists.

Kingdom of Belgium. — *Organisation of the Department of Agriculture.*

Physiological analysis of a few Belgian soils : Schreiber, State Agriculturist at Hasselt.

Researches on the comparative value of phosphates : Schreiber, State Agriculturist at Hasselt.



STATE BOTANICAL GARDEN OF BRUSSELS

VII. — INSTITUTIONS CONNECTED WITH AGRICULTURAL EDUCATION

a) *The Belgian State Botanic Garden*

The Botanic Garden of Brussels was founded in 1829 by an association of amateur horticulturists known as the Royal Society of Horticulture of Belgium. The object of this Society was the sale of new or interesting plants.

In 1870 the Society handed over the Garden with its botanical collections to the Belgian Government, and it was then called the State Botanic Garden.

The organisation of the Botanic Garden is directed to two main objects : firstly it is designed to promote the knowledge of botany and horticulture; secondly the Garden fulfils a special and more scientific purpose : it has, by its rich collections and by the work of its active directors contributed to the progress of the Science of Botany.

The Scientific organisation of the Garden is divided into four sections.

- I. The Herbarium (Phanerogames and Pteridophytes);
- II. The Museums and Vegetable Paleontology;
- III. The Experimental section;
- IV. The section of Cryptogams (Bryophytes and Thallophytes) and Vegetable Pathology:

I. — THE HERBARIUM

It has four divisions :

- 1° The general herbarium (240,000 sheets) ;
- 2° The European herbarium (30,000 sheets) ;
- 3° The Belgian herbarium (26,000 sheets) ;
- 4° The herbarium of tropical Africa (18,000 sheets).

The most important collections are those of the African flora (Congo) and the flora of tropical America (Brazil and Central America).

II. — THE MUSEUMS AND THE DIVISION OF VEGETABLE PALEONTOLOGY

Two divisions : one botanical and one forestry.

Each of these divisions is also divided in two collections viz : a collection for the promotion of general knowledge of botany and forestry; and a collection for study and research.

The first is arranged for general instruction, the second is open only to persons engaged in scientific and technical work.

Museum of Botany	}	Public collection	{	General systematics. Morphology. Etiology. Botanical Geography. Paleontology.
		Collection for Study and Research	{	Systematics. Palaeontology.
Museum of Forestry	}	Public collection	{	Timber essences. Pathology. Sylviculture. Technology. Commercial collections of woods.
		Collection for Study and Research	{	Special collection of woods. Forest herbarium. Pathology.

III. — EXPERIMENTAL AND COLONIAL SECTION

The laboratories and conservatories specially designed for this section are not yet built; but it already possesses special rooms reserved for experiments.

Experimental grounds in various parts of Belgium are arranged in connexion with this section. They are used for experimenting on plants brought up under natural conditions.

To the Experimental section belong the collections of plants growing in cold conservatories and of plants growing in the open air, all of which are specially disposed for providing instruction.

These plants are arranged in five groups.

1° *Systematic Botany*. This collection is classified according to Engler's system. All the vegetable groups, from the Schizophytes, the Mushrooms and the Algae to the Phanerogams, are represented; they are placed in one single series, including also the aquatic plants, the plants growing in the shade, trees, etc.

2° *Etiology*. In this class, the specimens are arranged according to their adaptations to the medium in which they are living : a) vegetative adaptations for the preservation of the individual; b) adaptations for reproduction and dissemination having as object the preservation of the species.

To show the adaptations frequently peculiar to equatorial plants, hot houses are provided, one for vegetative adaptations, another for reproduction and dissemination, while a third is reserved for the aquatic plants and creepers.

3° *Phylogeny*. These collections are arranged in the best way to show the different kinds of variations (streaks, double flowers, etc.) and hereditary characteristics (hybridisation, difference in characteristics, etc.); they also show the different varieties of cabbages, pansies, etc.

4° *Geo-botanics*. Hitherto these collections consist only of plants growing in cold conservatories.

5° *Horticulture* : the ornamental plants are disseminated throughout the whole garden.

IV. — SECTION OF CRYPTOGRAMS AND VEGETABLE PATHOLOGY

This section includes the herbarium (90,000 sheets) the cryptogamic material in the garden and specimens for the study of Phyto-pathology. Numerous specimens of diseased plants and of parasites are sent to the garden.

An experimental ground, established nearly six years is situated behind the low conservatories of the garden. This ground already offers many advantages for the study of the various diseases of plants and also for the cultivation and determination of parasitical mushrooms.

Collections of plants growing in hot houses are attached to section I. The winter garden contains a series of fine tree ferns. The conservatory of the *Victoria Regia* possesses a good series of aquatic plants and creepers, as does also the conservatory of the aroidae.

The collections of open air plants and of plants living in cold conservatories are in section III.

The schools of botany contain thousands of choice plants grouped in such a way as to represent the largest number of different kinds.

The conservatory of *Cactei* is also worthy of notice.

N. B. — Photographic views of the conservatories of the Botanic Garden of Brussels have been published in an album; it can be obtained in applying to the superintendant of the Agricultural Section in the Belgian Pavilion at the price of 2 dollars.

b) *The State Chemical and Bacteriological Institute*
The State Analytical Laboratories

The State Agronomic Station was instituted in 1871 by the association for the institution of agricultural stations in Belgium and taken over by the State in 1883.

Since the 15th of June 1901 it has been called the State Chemical and Bacteriological Institute.



STATE CHEMICAL AND BACTERIOLOGICAL INSTITUTE OF GEMBLoux

The personnel of this institute includes : a Director, a chief for the chemical service and one for the bacteriological service, assistants, a book-keeping clerk and several attendants.

As the Institute does not perform analyses for the public and as those required by the technical services of the Department of Agriculture are not paid for, it has to be entirely maintained by the State.

Equipment. — A garden, hot house and boxes for vegetation experiments. A meteorological observatory; chemical and bacteriological laboratories; electric lighting; oil and hot air engines. An office, library and collections.

Work. — The Institute is an establishment for chemical bacteriological and physiological research applied to agriculture and hygiene.

It is also the laboratory of the Department of Agriculture.

The other departments may solicit the services of the Institute through the agency of the Department of Agriculture.

A Meteorological Service was instituted 15 years ago; the observations are published in the *Bulletin de l'Agriculture*, and in agricultural papers and are sent to the Royal Observatory of Uccle.

Publications. — An account of the work of the Institute is published in the *Bulletin de l'Agriculture* and in the Bulletin of the chemical and bacteriological Institute.

THE STATE ANALYTICAL LABORATORIES

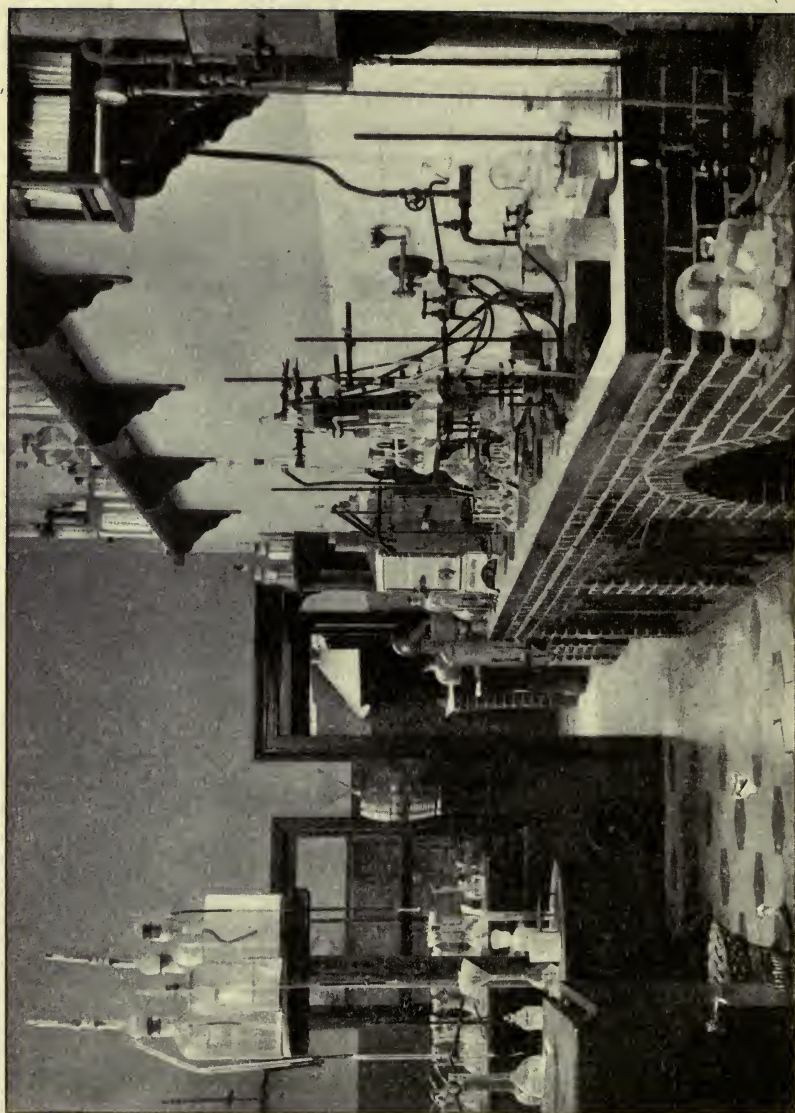
The laboratories of Gembloux, Ghent, Hasselt and Liege were founded by the Association for the establishment of agricultural stations and taken over by the State in June 1883.

Since that date the State has established the laboratories of Antwerp, Mons and Louvain.

The staff attached to each laboratory consists of : a Director, one or two chief chemists, one or more chemists, one or more assistants, a book-keeper, one or more laboratory attendants.

Funds. — The State laboratories are maintained by the Department of Agriculture, the sums received for analyses as well as the subsidies from the provincial authorities are deposited at the Treasury.

Each laboratory forms an independant institute having a special budget.



STATE LABORATORY AT MONS

Duties. — The State laboratories are at the disposal of the public and undertake, according to a scale of fees fixed by the Minister, the analyses of fertilizers, of human and animal food products, of agricultural products and the testing of seeds.

Besides this they have also two special services to fulfil :

1° To control the goods delivered by manufacturers and merchants who have accepted the control of the State laboratories ;

2° To analyse samples in execution of the regulations relative to the superintendance of food products.

Publications. — The directors are required to issue an annual report on the work done in the laboratories.

They have to state the number and nature of the samples analysed, and the origin and average maximum and minimum composition of the same.

They also indicate the facts of general interest which they may have noticed concerning the manufacture of and trade, in fertilizers, and agricultural foods, and they draw attention to new articles on the market.

The *Bulletin de l'Agriculture* publishes these reports which can be obtained from the directors of the laboratories.

Uniformity of analytical methods. — The Minister arranges for conferences of the directors of the State laboratories to discuss the means of improving analytical methods.

PRIVATE CHEMISTS EMPLOYED BY THE STATE

The Minister of Agriculture may ask private laboratories to examine in the shortest time possible, manures, seeds and feeding stuffs delivered to farmers.

A Royal Decree of the 12th of August 1895 and a Ministerial Decree of the 29th of November 1895 state the conditions to be fulfilled by chemists who have to analyse these materials.

Actually 18 chemists are employed by the State and have to analyse about five or six hundred samples.

*List of analyses performed in the State's Laboratories
from 1872 to 1902*

YEAR	GEMBLOUX	GHENT	LIEGE	HASSELT	ANWERP	MONS	LOUVAIN	TOTAL
1872	94	—	—	—	—	—	—	94
1873	339	—	—	—	—	—	—	339
1874	492	—	—	—	—	—	—	492
1875	549	—	—	—	—	—	—	549
1876	608	210	—	—	—	—	—	818
1877	877	375	—	—	—	—	—	1,252
1878	1,036	485	117	48	—	—	—	1,686
1879	1,201	560	310	234	—	—	—	2,305
1880	1,560	671	306	194	—	—	—	2,731
1881	1,590	1,000	525	1,228	—	—	—	4,443
1882	1,586	1,035	514	1,038	—	—	—	4,173
1883	1,915	1,349	1,129	931	—	—	—	5,324
1884	2,234	1,238	1,243	763	—	—	—	5,478
1885	1,941	1,221	1,561	728	120	277	401	6,249
1886	2,060	741	2,069	752	831	961	911	8,325
1887	2,689	568	2,356	650	911	1,311	1,320	9,805
1888	2,823	914	2,658	544	1,090	1,641	1,781	11,451
1889	2,613	906	3,296	885	1,321	1,772	1,304	12,097
1890	2,345	904	3,051	564	1,680	2,286	1,206	12,036
1891	2,408	901	4,059	709	1,866	1,781	1,584	13,308
1892	3,867	1,635	5,039	960	1,759	2,460	2,055	17,775
1893	4,822	3,062	6,682	1,373	2,575	3,321	2,555	24,390
1894	5,104	3,702	7,432	1,484	2,575	3,520	3,021	26,838
1895	4,164	3,553	4,879	1,371	2,786	3,607	2,733	23,093
1896	5,000	4,116	5,954	1,648	2,830	4,289	3,200	27,037
1897	4,840	4,419	5,523	1,606	3,746	3,593	3,210	26,937
1898	4,647	4,304	5,278	1,539	3,224	3,439	3,031	25,462
1899	3,561	4,328	4,780	1,757	3,221	3,525	2,970	24,142
1900	4,176	5,161	5,101	2,017	3,158	3,568	3,295	26,476
1901	4,842	5,419	5,418	2,130	3,255	4,703	3,228	28,995
1902	3,957	2,947	5,108	1,445	2,825	3,378	2,597	22,257

The following products have been analysed in these laboratories :

- Fertilizers;
- Food products for cattle;
- Food products for man;
- Seeds;
- Sugar beets;
- Various plants.

* * *

The exhibition of the Belgian laboratories at St. Louis consists in :

A List of works published by members of the staff of the laboratories and of the Chemical and Bacteriological Institute.

Views showing the premises of these institutions.

A diagram showing the number and nature of analyses performed by these laboratories since their establishment.

Rules, Royal Decrees and administrative regulations concerning the State Laboratories and the Chemical and Bacteriological Institute.

e) *Study Association of the State Agriculturists
and Agricultural Teachers*

Secretary's office : Rue de Linthout, 25, Brussels.

This Association was founded for the intellectual improvement of the associates.

Each member makes an abstract of some agricultural paper or publication; the numerous analyses obtained are published in the annual reports of the *Bulletin* of the Association.

Members meet twice a year, for scientific discussions.

At these meetings some of the following subjects were discussed : tests in cattle feeding, tests on telegraphic transmission of weather forecasts; elementary agricultural teaching was much discussed formerly.

A study was made on tenures by lease (1).

The Association organised a very interesting competition for plans of farms; it will also publish a report which will be a *vademecum* for the organisers of agricultural shows (2).

The Association edits a very interesting *Bulletin* containing all the proceedings of the society (3).

A very complete study of Belgian Agricultural Bibliography has been carried out by the Association and most of the books are exhibited at the exhibition of St-Louis.

The catalogue will be most useful to all Agricultural Institutions (4).

A similar association exists for lady agricultural and dairy teachers. [Secretary: Mrs. Deleu, Borsbeke (Burst).]

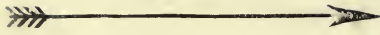
(1) Price : 50 centimes = 10 cents.

(2) Price : 5 francs = 1 dollar.

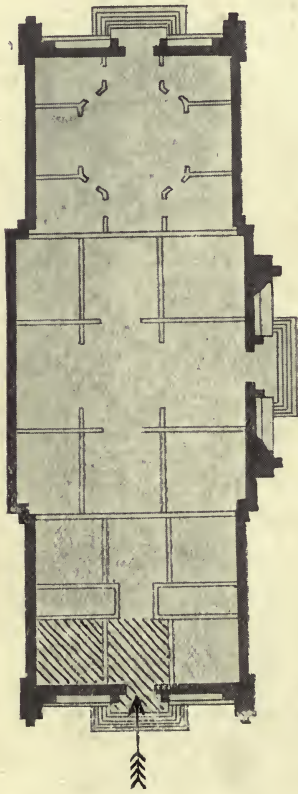
(3) Subscription : 2 francs.

(4) Price : 1 franc.

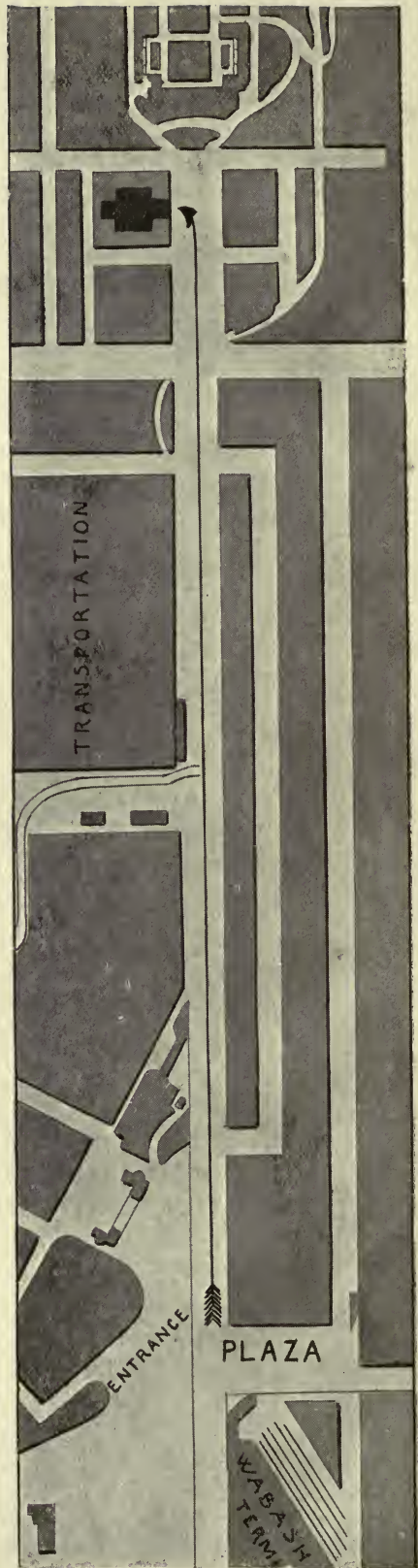
BELGIAN



EXHIBITION



**DEPARTMENT
OF AGRICULTURE**



YC 59106

Supp
Exp 4

274453

Belgium

UNIVERSITY OF CALIFORNIA LIBRARY

