



**AGRICULTURAL  
CONDITIONS  
IN  
ESTHONIA**



**A SHORT SURVEY**  
COMPILED BY  
**EMIL VESTERINEN**

SECOND ENLARGED EDITION

---

AGRICULTURAL CONDITIONS  
IN ESTHONIA

AGRICULTURAL  
CONDITIONS  
IN  
ESTHONIA

A SHORT SURVEY

SECOND ENLARGED EDITION

COMPILED BY  
EMIL VESTERINEN

HELSINKI 1923

PRINTED  
BY THE TIETOSANAKIRJA-OSAKEYHTIÖ  
IN HELSINKI 1923

## PREFACE.

*This booklet was written with the intention of providing a short survey of agricultural conditions in Esthonia, of showing the present state of development of agriculture in Esthonia, and finally, to prove that the Land Reform now being carried out has not acted as a deterrent to farming, as its opponents have attempted to show, but on the contrary, has effectually assisted its development.*

*For much of the information contained in the following pages, the author desires specially to thank the North Esthonian Agricultural Society, the Esthonian Ministry of Agriculture and the Ministry of Foreign Affairs, for the illustrations the Eesti Rahva Museum (Esthonian National Museum) and the Suomen Tietosanakirja O. Y. (Finnish Encyclopædia Co) Helsinki, December, 1921.*

E. V.

---

## PREFACE TO SECOND EDITION.

*To facilitate the achievement of the aims of this little book, a considerable number of necessary additions and corrections have been effected in its second edition.*

*Also in the present case the Author's heartiest thanks are due to various Esthonian Agricultural Societies, the Ministry of Agriculture and the Ministry of Foreign Affairs for information readily granted. The Author's thanks are also due to J. Ū m a r i k, Agricultural Expert, for his advice and many valuable suggestions in the compiling of this new edition.*

*Helsinki, December, 1922.*

E. V.

---



Fig. 1. *Esthonia: Map of the Republic.*

## 1. HISTORICAL SURVEY.

Somewhere between the years 500—700 A. D., the Esthonianians were already established on their present site at the bend of the Baltic Sea and the Gulf of Finland. They were at that time on the same level of civilization as the Scandinavian peoples, with whom they kept up an active connection in the form of journeys for either trade or plunder. The Scandinavian myths relate how the Vikings always returned with plenteous booty and how the Esthonianians in turn ravaged the land as far as Sigtuna. Into the midst of this free people, living on agriculture and mercantile commerce, the Teutons and Danes began their crusades and voyages of conquest in the XIII century. Not without a stubborn resistance did the brave, small race give up its freedom.

## PREFACE TO SECOND EDITION.

*To facilitate the achievement of the aims of this little book, a considerable number of necessary additions and corrections have been effected in its second edition.*

*Also in the present case the Author's heartiest thanks are due to various Esthonian Agricultural Societies, the Ministry of Agriculture and the Ministry of Foreign Affairs for information readily granted. The Author's thanks are also due to J. Ū m a r i k, Agricultural Expert, for his advice and many valuable suggestions in the compiling of this new edition.*

*Helsinki, December, 1922.*

E. V.

---



Fig. 1. *Esthonia*: Map of the Republic.

## 1. HISTORICAL SURVEY.

Somewhere between the years 500—700 A. D., the Esthonians were already established on their present site at the bend of the Baltic Sea and the Gulf of Finland. They were at that time on the same level of civilization as the Scandinavian peoples, with whom they kept up an active connection in the form of journeys for either trade or plunder. The Scandinavian myths relate how the Vikings always returned with plenteous booty and how the Esthonians in turn ravaged the land as far as Sigtuna. Into the midst of this free people, living on agriculture and mercantile commerce, the Teutons and Danes began their crusades and voyages of conquest in the XIII century. Not without a stubborn resistance did the brave, small race give up its freedom.



Fig. 2. Islanders from Muhusaar.

Over a hundred years passed before this resistance finally broke down in 1345, and then the dwelling-place of the Esthonians became a continual object of contention between Denmark, the German Knights of the Sword, Russia, Po-

land and Sweden. The German conquerors settled down to live in the land, taking the cultivated lands from the Esthonians and dividing them among the manors and castles. The condition of the people during these incessant feuds and strife became such that when the Polish King, Stefan Bathory, laid the southern part of the Esthonian territory under his rule in 1561, he was able to remark that nowhere in the world, neither among heathens nor barbaric races, could a tribe be found suffering from a more pitiless oppression than that endured by this people. The Pope himself found it necessary to admonish the rulers of the Esthonians.

A similar state of affairs continued for nearly 600 years. Only the period between the years 1629—1710, when the land was under Swedish rule, forms a ray of light in this endless night. Carrying the Reformation with it, the Swedish Government endeavoured to improve the condition of the people. A peasant-law («vakuraamatud») was enacted, fixing the tenure and taxation of the peasants' lands; the rates and rents to be paid to the castles and manors were determined; the right to issue sentence of death over the peasants (*ius vitae et necis*) was taken away from the knights and nobles;

knightly estates were taken over (reduction) by the Crown; and attention was paid to the general application of the laws and the people's need for civilization (the University of Tartu was founded in 1632). The feudal barons of alien birth showed great skill in resisting these innovations and plotted against the Swedish rule, assisting the fall of Esthonia into the hands of Russia (1710). These »good Swedish times» were followed by over 200 years of oppression for the Esth-



Fig. 3. Esthonian peasant girl in national costume.

onians, while the German landowners recovered the privileges partly lost during the Swedish rule. For the Esthonian population of the land this period denoted a descent into slavery and oppression of the worst type. Thus the Land Councillor (residierender Landrat) Baron Rosen made an official declaration to the Russian Government regarding the peasants, i. e., the Esthonian population to the effect that:

- 1) The peasants belong body and soul to the landowner and are his property,
- 2) They may not own anything themselves, but only

gather property for their lord, who disposes of everything according to his desire,

3) Taxes and the degree of the peasants' slavery are decided by the landowner according to his wishes, there being no limit to the landowner's power in this respect,

4) The landowners have unlimited power to punish their peasants, against which no appeal can be made by the latter.

And in the year 1765 the Diet of Livland termed the population »slaves (servi) in the strictest legal Roman sense of the word».

The years 1816 and 1819 are deserving of mention in the history of Esthonia and its people, their slavery being abolished in these years by proclamation, an event characterized by the investigator of natural history K. E. von Baer, himself a member of the landowning aristocracy of the land, in the following apt words: »The complete conquest and subjugation of the land was brought to a finish by the German barons in the year 1816.» The population were proclaimed free from bondage, but all property, including that of the people, both in its inert form (land) and portable, were annexed by the barons.

Not until 1860 were laws, intended to bring about an amelioration of the aforementioned state of affairs, enacted and the Esthonians given the right to buy their own land for themselves. The purchasing of land progressed slowly, so that before the outbreak of the Russian revolution only about two-thirds of the peasants' land had been redeemed from the ownership of the manors. The hunger for actual possession of land was naturally great. Great numbers of peasants journeyed during the years 1870—1910 as emigrants to Russia and Siberia, where land could be purchased and held cheaper (the number of emigrants living outside of their own country is about 250,000).

Legally, the privileges of the Germans remained unchan-

ged until the revolution of 1917, and for over half a century no law for the protection of the weaker classes was passed. That the Esthonian people were able to develop both materially and in the sense of an increased civilization is marvellous, when the fact is taken into account that the Russian Government during the whole time supported the dominion of the Germans, who in their conservatism filled the Russian ideal, so that the Esthonians had to struggle for each step upward against both the Russians and the Germans.

It was during these decades, however, that the Esthonian peasant class brought forth a strong educated class, an intelligentsia, polished in the Universities, which during the new winds of 1917, and chosen by the people themselves, took over the administration of the country. And when the Russian revolution degenerated into bolshevistic chaos and undisciplined freedom, the people took over the sole control of their own affairs through their representatives, in November of 1917, and, appealing to the right of nations to self-government, proclaimed themselves a sovereign state, which was finally accomplished on the 24:th February, 1918. The whole of the European countries and many others outside of its boundaries have later acknowledged the independence of this new State. In 1921 Esthonia was admitted to membership of the League of Nations.

But even after the Declaration of Independance the German armies occupied the young nation and working together with the German element of the population (about 3 % of the total population) endeavoured to crush the budding dreams of freedom. The annexation of the land with Prussia as a new Duchy was planned and a scheme for the colonising of the country (Esthonia, Livonia and Kuronia) by 2 1/2 million Germans was broached. This proved, however, to be the last measure of oppression.

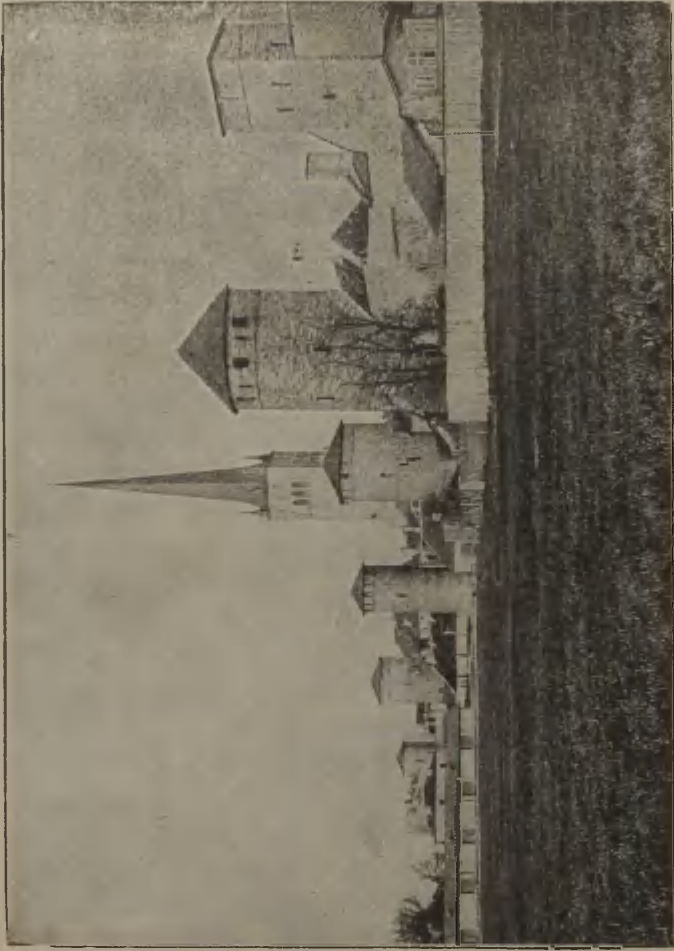


Fig. 4. Part of the old town wall of Tallinn, showing many towers. In the background the Church of St. Olaf.

The people and the Government were provoked by it to the final abolishment of German rule by the drastic *Land Reform Laws*. On Oct. 10:th 1919 the Constitutional Assembly of Esthonia passed a law according to which the whole of the baronial estates with all their privileges became the property of the State. Restitution for all portable property

is to be made to the former owners of these estates according to a *fixed scale*, the matter of *payment for the land* itself being left open until a special law has been drafted for the occasion.

Despite its enormous difficulties Esthonia has been able to create a civilization of comparatively high degree. The Bible has not been translated later into



Fig. 5. Windmill on Saaremaa.

Esthonian than into the languages of the neighbouring countries. The first newspaper began to appear already in 1763. At the present day there are 60—70 newspapers and periodicals. One hundred per cent of the people can read. Elementary education is now compulsive. The total number of schools is about 1,700, of which 79 secondary schools with 23,000 pupils in 1920. And further, the percentage of educated people is as high as in the Scandinavian lands (the Tartu University has 3,500 undergraduates in its rolls). The literature in the Esthonian language can in many respects be regarded as being on a level with any in Europe. Science has found a congenial abode in the old University of Tartu. Also art can show many original creations.

Lack of space only hinders a more detailed account of these latter.

The *Constitution* of Esthonia was confirmed on June 16:th, 1920. According to this, Esthonia is a Republic. The highest power is in the hands of an assembly (Riigikogu) chosen by the people. Entitled to vote are all Esthonian subjects over twenty, regardless of sex, who have been subjects of the Republic for at least one year. The assembly or Diet comprises one hundred members chosen by general, secret ballot on the principle of proportional representation. Government is wielded by a Cabinet of nine (Vabariigi valitsus) responsible to the Diet, the Prime Minister being at the same time Head of the State (Riigivanem). At the first elections in December, 1920, the various parties were represented as follows: Labour Party 22, Agrarian League 21, Social-Democrats 18, People's Party 10, Social-Revolutionary Party 11, Christian People's



Fig. 6. Exterior of the Esthonian House of Parliament in Tallinn.

Party 7, Independent and Sundry Lists II. It will be seen thus that agrarian interests are fairly well represented in the Diet. A new and modern place of assembly for the Diet was completed in the autumn of 1922.

The *Colours* of the Esthonian Republic are blue, black and white.

The Republic of Esthonia has, by its centuries of struggle for existence and efforts to attain its independence, shown itself worthy of a place among the nations. And it would seem that this people, of whom a chronicler of the XIII century says that they will resist the admittance of an alien invader into their land »while one single male of over one year or one yard in height remains alive in the land«, will also in the future value their dearly-bought freedom and will not fall below the standard of defence set by their ancestors.

## 2. GEOGRAPHICAL SURVEY.

The geographical situation of Esthonia is extremely favourable. In the north the placid Gulf of Finland, in the west the temperate Baltic Sea, in the east a natural frontier formed by the River Narova, rich in rapids, and Lake Peipus with its abundance of fish; only in the south is there a land frontier against Latvia, equal in its resources with Esthonia. The *total length* of frontier is about 2,000 kilometres, of which 1,000 kilometres is sea-frontier. The greatest length of the land from east to west is 360 kilometres, and from north to south it measures 240 kilometres. The total *area*, including the strip of land beyond the River Narova obtained at the making of peace and Petseri, is 46,500 sq. kilometres (e. g., Belgia, Holland, Switzerland and Denmark are smaller in area than Esthonia).



Fig. 7. Oil-shale quarries at Kohtla, in North Esthonia.

This area is peopled by 1,250,000 inhabitants, working out at 26 inhabitants per sq. kilometre. According to the statistics for the year 1920, 77.2 % of the population dwell on the land and 22.8 % in the towns. Of the latter there are 12, the capital Tallinn (Reval) being the largest with a population of 120,000. The University town of Tartu (Dorpat) comes next with a population of 52,600. Of the different nationalities dwelling in the country, the Esthonians come first with over 90 %, between 2—3 % is formed by Germans, the rest being made up of Russians and other nationalities. The birth-rate was 26—27 and the death-rate 18—19 per thousand inhabitants before the war, so that the annual increment was 0.8 %. The greater part of the population is Lutheran, about 15 % confessing to the Greek-Catholic Faith.

*Geologically*, Esthonia is a moraine-plain, formed of layers from the paleozoic period. These layers of rock, called »glint», are close to the surface in Northern Esthonia and form, near the Gulf of Finland, a steep bluff from 10—30 metres in height. Further south the layers lie deeper. The layers in North Esthonia contain milliards of tons of oil-shale, a combustible rock, which can be used as fuel and from which various oils are distilled.<sup>1)</sup> Here also are phos-

<sup>1)</sup> The entire deposits of Esthonian *oil-shale* are estimated at about 5 billion tons. The area easiest exploitable at present, about 80 kiloms. long and 10 kms. wide — between the boroughs Jöhvi (Jewe) and Rakvere (Wesenberg) (both on the Tallinn—Narva Railway) — should yield, at the most cautious estimate, at least 1.5 milliard tons. In thickness, the oil-shale layers, which are found in three separate strata, vary between 1.5 and 2 metres.

The following oil-shale mines are at present being worked in Esthonia: the Kohtla and Wanamöisa (open quarries) and Kukers (pit-mine). The oil-shale is sometimes called »Kukersite», after the place (Kukers) where it was first discovered.

The daily output is 40—60,000 poods, which amount is used up chiefly at Tallinn. In 1920 the total production of oil-shale was 2.8 mill. poods and 1922 8 mill. poods.

Analysis by the Kohtla Oil-shale Laboratory showed from 28 to 29% oily substance. The amount of ash in the oil-shale is 18—35%; heat in calories 2,800—5,500 per kilogram.

Oil-shale is used in Esthonia as follows

- 1) Distilled — for oils.
  - 2) Gas Works — for gas (e. g. the Tallinn Gas works have been worked three years already exclusively on oil-shale).
  - 3) In form of powder — by cement factories.
  - 4) In dry powder or lumps — by locomotives and steamships with specially constructed grates.
  - 5) For various steam-engines, the construction of which allows the removal of sufficient ashes.
  - 6) In smitheries — specially constructed vaulted furnaces necessary.
  - 7) For heating houses and kitchen stoves — where double doors and the construction of grates allow perfect combustion.
- Etc., etc.



Fig. 8. Narva Rapids, with  
60,000 horse-powers.

phorite layers for the fertilizer industries. Silurian marble appears here and there in the country, and in North-east Esthonia, in Petseri, Devonian gypsum is met with. The soil of North Esthonia is impoverished and meagre in earth on account of the proximity of the layers of rock. All the more fertile does it become as one proceeds southward. Especially worth mentioning in this respect are the districts around Viljandi and the lands surrounding Tartu and Võru. Bogs are frequent in the lowlying districts. The formation of the ground is generally wavy, flat, affording in some places a view of fertile fields of grain stretching to the horizon, broken by forest and bogs and dotted with little pools. The highest hills are in South Esthonia (Munamägi 324 metres and Vällamägi 308 metres).

The coast affords good harbours (Tallinn, Baltischport) Of the islands the largest are Saaremaa, famous for its beauty, and Hiiumaa, Muhu, Naissaare, Wormsi. The largest rivers are the Narova, on the banks of which is one of the largest cotton factories in the world (Kreenholm) and which further contains the Narva Rapids, calculated to produce power equalling 60—70,000 h. p., and Emajögi, which connects the Wirtsjärve Lake with Lake Peipus and is suitable for navigation. Worth mentioning is further Pärnujögi, on the banks of which the most famous of the cloth factories of Esthonia (Sindi) is situated. Fishing (Baltic herring, sprat and flounder) is extremely remunera-

tive in the coastal districts. And further, ship-building and maritime commerce have been of old one of the chief means of existence of the coast dwellers.

*Climatically*

Esthonia is situated in the northern temperate

zone, the influence of the Gulf Stream making itself felt here in no inconsiderable degree. The mean annual temperature is  $4.4^{\circ}\text{C}$  ((Saaremaa  $5.5^{\circ}\text{C}$ ), annual rainfall 550 millimetres. The climate is comparatively favourable for agriculture.

*Botanically* Esthonia forms part of the mixed forest zone of North-east Europe. The area covered by forest is 20.1 % Fir and pine are the chief trees. But considerable amounts of also the birch, alder, asp and the so-called nobler leaf-trees, the oak, lime, maple and the elm are to be found. Especially rich in forest are the neighbourhood of Pärnu, the lands around Võru and the district north-west of Lake Peipus. Deer, bears, wolves, foxes, squirrels, hares etc., still dwell in the forest, though the first-named are scarce.

*Esthonia is primarily an agricultural country*, its qualifications in this respect being among the best. Over two-thirds of its population live on the proceeds of agriculture. Its industries and trade are by no means negligible, and particularly if the situation of the country as a land of tran-



Fig. 9. Jägala Rapids in the north of Esthonia.



Fig. 10. Small farms in the south of Esthonia.

sit to Russia be taken into account, the possibilities for trade are great indeed.

The following agricultural products are obtained in quantities sufficing for export: potatoes, starch, apples, butter, cheese, milk, eggs, sausages, flax, flax-seed, chicory, meat and also a certain amount of grain. Industrial products for export are the products of the flax industry, timber, paper, cellulose, cement, bricks and alcoholic products. As a result of the war, the country has been obliged to import in greater quantities than normally foodstuffs, colonial produce and machinery, so that the trade balance for the first four years of the country's existence (1919—22) has been unfavourable, but a considerable improvement in this respect has been discernible year by year. Thanks to its agriculture, Esthonia has been able, by the sale of the refined and unrefined products of the same, to shorten considerably its wartime loans, at a time when many older nations have been obliged to seek additions to their public debt.

The Esthonian *railways* total 1,006.7 kilometres in length, working out at 2.1 km. per 100 sq. kilometres and 8.4 km. per 10,000 inhabitants. Locomotives numbered 181 in 1921, passenger-carriages 435 and freight-trucks



Fig. 11. Fishing-nets and shelters for fishing implements on sea-coast.

5,011. Railway receipts for the same year amounted to 698 million Emks, and expenditure 679 mill. Emks. The total length of highways is about 5,000 kilometres, that of telegraph-line 1,400 versts, and of telephone-line 5,700 versts. The railways have proved fully able to satisfy the country's demand for traffic, having further in recent times played an important part in transit traffic to and from Russia.

At the beginning of 1922 the Esthonian *mercantile marine* comprised 53 steamers with a total tonnage of 21,075 reg. tons, 82 sailing-vessels with auxiliary engines (2,107 tons) and 399 sailing-vessels (18,958 tons), total 42,140 tons. The Treaty of Peace with Russia provides for the surrendering of a further 16 vessels from that country. When these are obtained the total tonnage will be over 50,000 tons. The harbours are good. That at Tallinn is 30 feet deep with quay accomodation for 65,000 tons. The necessary cranes up to a maximum lifting-capacity of 100 tons are found here, likewise an elevator for grain. Extensions are at present in progress in the harbour by means

of which quay accomodation will be increased to 100,000 tons. Another good harbour is that at Baltischport. Both are open for traffic throughout the winter, good icebreakers being further available.

The country possesses a sufficiency of *labour*. The people are accustomed to work on the land. The number of industrial works in 1921 was close on 3,000, of which 175 were engaged in mass-production. The number of workmen employed was over 32,000.

The *monetary* unit of Esthonia is 1 mark = 1 franc. The amount of currency in circulation in January, 1922 was 2.8 milliard Emk. In addition to paper currency, metal coins have been issued during the present year. The right to mint money for circulation is in the hands of the *Bank of Esthonia* (Eesti Pank), the Diet having empowered an issue of 3,200 million Emk. The Eesti Pank is the Central Bank of the State, its founding capital of 250 million Emk having been supplied by the State. But in its business the



Fig. 12. The Reval Credit Bank premises at Tallinn. The Bank is one of the oldest Esthonian Banks.

Eesti Pank is wholly autonomous, fulfilling practically the ordinary duties of a Joint Stock Bank. Other larger banks in Esthonia are The Esthonian Industrial and Commercial Bank, the Harju Pank, the Reval Credit Bank, Reval City Bank, Dorpater Bank, Põhja Pank, C. Scheele & Co.

*Division of the area of Esthonia.* Esthonia is divided into 9 provinces, each of which possesses its own provincial governing organs. The largest province is that of Tartu, with the town of Tartu as its capital.

Regarding the different classes of land and the usages to which they are subjected, the statistics of 1919 give the following division of the whole area, lakes and other water-areas included:

Tillage	938,074	desj.	(1 desj. = 2.7 acres =
Meadows	963,805	»	1.09 hectare)
Pasturage	680,150	»	
Forest	822,223	»	
Bogs, land unsuitable for agriculture and water	604,521	»	
	10,357	»	
<b>Total</b>	<b>4,019,130</b>		

In these figures are included also the belt of land beyond the River Narova and Petseri, which were obtained at the signing of peace. Without these lands and waters, the country was divided according to the 1919 figures into:

	Esthonia	(Denmark)	(Finland)
Tillage	877,287 desj.	22.90 %	43.3 % 5.7 %
Meadows	937,334 »	24.47 »	} 31.6 » 2.9 »
Pasturage	669,774 »	17.49 »	
Forest	770,062 »	20.10 »	8.3 » 46.9 »
Bogs and waste land	576,211 »	15.04 »	16.8 » 30 »
<b>Total</b>	<b>3,830,668</b>		

Of these areas 57.95 % was in the possession of the large estate-holders, and 42.05 % owned by the peasants.

### 3. AGRICULTURAL EDUCATION.

Already in the past century, about 30—40 years ago, steps were taken for the establishment of a national School of Agriculture in Esthonia. The desire was expressed to change the Alexander School, which had been founded and kept up by means of funds collected among the Esthonians, into a school for agriculture. In spite of the unanimous desire of the people, the attempt to obtain the sanction of the Russian Government for the opening of a school for agriculture in the Esthonian language proved unsuccessful. Agricultural education could be dispensed in the beginning only by advisers, who gave short courses and held lectures on the subject.

The first long-term (six months) course in agriculture was held in 1907 at Põltsamaa, in the Russian language.

*The first six-months courses in agriculture in the Esthonian language were inaugurated at Tartu in the year 1912.*

At Tallinn permission was withheld even for similar courses. The petition of the Farmer's Society (Tallinn) regarding such courses brought forth an answer from Petrograd to the effect that the courses might be held, but in

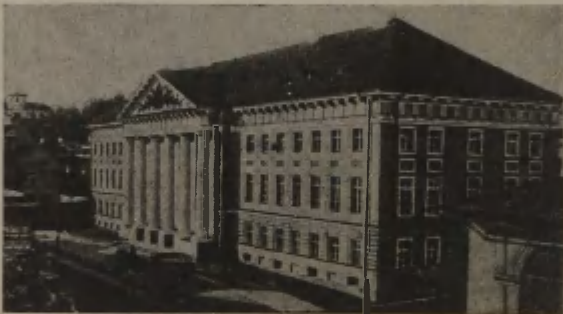


Fig. 13. University of Tartu, with faculties of agriculture and forestry, and for veterinary surgeons.



Fig. 14. The North Estonian middle-school of agriculture on the Jäneda estate (former manor castle).

Russian, and *agricultural book-keeping and education in co-operative ideas were to be struck out of the prospectus!* At the same time a preliminary German school for agriculturalists was active at Tallinn, having been founded in 1912 by the large estateholders.

Not until 1914 did the Estonian people succeed in obtaining permission from the Russian Government for the establishing of the first school for agriculture, on condition that the language used was Russian. The school, with a three year's course, was opened on the Kõo Estate in the following year. And not until 1917 was its language changed to that spoken by the great mass of the people.

At the present day, in addition to the agricultural-economic faculty at the University of Tartu, there are in Estonia 15 schools: 2 agricultural middle-schools (one in Northern and one in Southern Estonia), 7 two-year lower



Fig. 15. The Liplap school for gardening and domestic economy.

schools, 3 one-year schools or courses, one gardening and household course, one school for cattlekeeping and one dairy-school. In the near future it is intended to establish: 3 lower agricultural schools and 5 household schools. The public agricultural schools are evenly distributed throughout the country. They have been founded and are kept up chiefly by the governing organs of the respective provinces and different societies, and receive in addition subsidies from the Ministry of Agriculture for the payment of salaries to teachers and the securing of educational material. These subsidies amounted in 1922 to 5.5 mill. Emk.

The intention of the agricultural middle-schools is to equip their pupils with the necessary agricultural education for practical farming and to eke out the supply of trained agricultural advisers. The foundation course of the schools takes up three years and to them are admitted persons possessing a higher preliminary school education, with a minimum age of 16, who have practised or otherwise taken part in work on farms for at least one year. The theoretic part of the school-work is at least 25 weeks each year. In the summer the pupils take part in practical work on the farms belonging to the school experimental-stations or practising-fields.



Fig. 16. »Estonia» theatre and concert hall at Tallinn, where meetings of the Agricultural Societies are often held.

The duty of the lower schools is to give agricultural education in conformance with local demands, in the degree necessary for the greater mass of practical farmers. They are divided into one-year and two-year schools. Pupils are admitted who have undergone the enforced preliminary school education, have filled at least 16, and have practised or taken part in practical farm-work for a period of at least 1 year.

Practising-areas have been secured for the teaching of practical farming. These are chosen and the demonstrative teaching for the same arranged by the provincial practising-committees. The general organization is in the hands of the Ministry of Agriculture, in which organ a special Council for demonstrative teaching exists.

Agricultural *literature* has developed greatly during the past few years. A dearth of educational handbooks on this subject was apparent in the beginning, the majority of such books having been printed earlier in Russian or German.



Fig. 17. The Polli manor-house at Viljandi, at present the seat of a school for agriculture.

Now, however, many important works on agriculture have been published in the Esthonian language. Many periodicals appear also, the most important being the «Agro-noomia», a periodical for agriculture and the hygienic care of cattle, published by Agricultural Experts' and Veterinary Surgeons' Societies. Of the others the following deserve mention: — «Pöllumees», issued by the Agricultural Societies; «Uhistegewuseleht», organ of the Co-operative interests; «Eesti Mets», the magazine of the Foresters' Society. Periodicals are also published dealing with poultry-keeping.

*The Esthonian farmer-peasant is of a lively temperament and possesses a thirst for knowledge. Newspapers are read by him not only for the latest news from his own particular country, but also for the purpose of following the world's events. He is hospitable and naturally diligent, so that the idea of an eight-hours day has no appeal for him; instead, he works with his family from the early morning to eve in the summer. The dwellings of the peasants are comparatively small, the roofs high and steep, skilfully made straw roofs being still met with in profusion. The buildings are set in a surrounding of luxuriant trees and orchards (apple, pear, cherry, plum and other fruit-trees abound) and ringed*



Fig. 18. Modern small farm in the vicinity of Pärnu.

round with bee-hives, and their appearance on the great plains sown with grain is extremely pleasant. Beekeeping and the care of rabbits and geese are common. Home crafts and handiwork have always flourished in the homes of the small farmers. Especially beautiful are the women's embroideries and the home-woven cloths of flax. National costume is in use at the present day only on the islands and in the Petseri district. The Esthonian peasant household has always been chiefly self-containing, families living on the products of their own small farms. Communism has no possibility of thriving among them. And further, the new Land Reform, by creating a new class of small landowners, has turned the unstable element among the people into a fast safeguard against communism.

*Sport-life* has developed greatly in Esthonia during the past few years. Numerous athletic clubs have been formed all over the country. Physically the Esthonians are sturdily-built and have great staying powers. At the Olympic Games at Paris an Esthonian was second in the Marathon Race. Later, fine results have been obtained by Esthonian competitors at international athletic sports contests in Finland, Sweden, England, France and Germany.

#### 4. AREAS SOWN AND HARVESTS.

The opponents of the new Land Reform in Esthonia have often stated that the carrying-out of the reforms has diminished the area of land under cultivation, and otherwise lessened the scope of agriculture. The official statistics show this decrease to have been comparatively slight, and the reasons for the decline have to be sought elsewhere, in the destruction caused by war, appropriations and despoilings (The Russian army, the German army of occupation, the short rule of bolshevism) and in the fact that the farmers were compelled to serve 4—5 years in the Russian ranks and later take part in the liberation of their country. Luckily, the people and the land are beginning to recuperate from the effects of those times.

The areas of cultivation of the important cereals and the amounts harvested are shown in the following figures supplied by the Ministry of Agriculture:



Fig. 19. Harvesting rye on a small farm.

	1919		1922	
	Area cultivated Desj. <sup>1)</sup>	Harvest Poods <sup>2)</sup>	Area cultivated Desj.	Harvest Poods
Rye .....	121,140	7,842,970	143,562	8,868,677
Wheat .....	12,060	783,753	8,133	544,565
Barley .....	95,894	5,945,428	122,716	8,525,017
Potatoes .....	50,135	30,486,052	69,148	40,814,234
Oats .....	124,175	6,824,643	147,745	9,584,525
Mixed grain ....	38,069	2,476,374	58,873	4,517,300
Flax fibre .....	12,623	379,077	21,921	590,137
Linseed .....	—	366,169	—	549,151

Altogether 572,120 desj. were sown with grain in 1922. The corresponding figure for 1916 was 507,238 and 1919 454,096. Increase in 1922, compared with 1916 is, thus, 12,8 %. A development in this respect is thus obvious.

The intensivity of agriculture is shown by the following figures giving the harvest in poods per desj. and year:

	Rye	Wheat	Barley	Oats	Potatoes	Flax	
						Seed	Fibre
1912—16	73.5	70.9	61.5	63.2	707.7	27.0	24.1
1917—21	71.5	70.0	62.7	64.5	732.2	26.4	22.5
1921	81.5	79.0	73.9	77.3	793.3	30.7	26.3

The figures show that although results declined somewhat during the Esthonian War of Independence owing to irreparable conditions (men and horses at the Front), a gratifying increase is shown by the following years. If harvest results in Esthonia be compared with those of other countries, Esthonia will not be found among the very best, though already during the czardom the harvests in Esthonia were

<sup>1)</sup> 1 desj. = 2.7 acres = 1.09 hectare.

<sup>2)</sup> 1 pood. = 16.38 kilos.



Fig. 20. Harvest of rye in the south of Esthonia.

among the best in Russia. For the sake of comparison the average harvests of Esthonia, Finland and Denmark, calculated in poods per desjat. for the last ten years, are given in the following<sup>1)</sup>:

	Rye	Wheat	Oats	Barley	Potatoes
Esthonia . . . . .	72.5	70.1	62.1	62.1	719.9
Finland . . . . .	71.7	71.0	57.7	60.4	403.2
Denmark . . . . .	99.9	87.9	113.8	146.9	998.5

Harvest results in Esthonia are usually bigger than those in Finland, but considerably less than those secured in Denmark. In any case, grain is produced in quantities exceeding home consumption, a matter of high importance in the fiscal wars endangered by the present state of economic politics.

In addition, now that the land is actually owned by the Esthonian population, production can be considerably increased. A great help in this respect will be the present

<sup>1)</sup> Calculated in kilogrammes, harvests in Esthonia per year and hectare averaged: rye 1,087.5 kilos, wheat 1,051, barley 931, oats 935, potatoes 10,798.5, flax 350 and linseed 400 kilos.

»Annuaire International Statistique Agricole 1909–1921.»

method of procuring new agricultural machinery by cooperation between farmers. In this manner, 100 tractors have already been imported, of a type specially suited to Esthonian conditions, the number



Fig. 21. Fine harvest of oats on marshy ground.

of such engines before the war being only 3 or 4 in the whole country. Regarding methods of agriculture, it is well to take into account in considering the areas used for cereals that Esthonian agriculture inclined more and more before the war to dairy-farming. This branch of agriculture was favoured on the one hand by the steadily increasing prices for dairy products, more particularly in the St. Petersburg market, and the ease with which good fodder was obtainable for the cattle, and on the other hand by the cheapness of Russian grain, which made competition from the side of the agriculturalists extremely difficult. For reasons of this nature a great part of the land cultivated was used for grass, oats and mixed grain. A great part of the barley grown was used for malt by the beer and spirits industries, another part for feeding pigs. Rye was used for home consumption, but as has been mentioned, large quantities were brought to the towns from abroad.

At present, however, the situation is changed; together with political independence, the ensuring of economical independence has become necessary. Without doubt, an increase in the area sown with grain and the use of more powerful fertilizers will render Esthonia independent of a

bread supply from without (the import of grain in 1921 was 1,000,000 poods seed-grain).

At the time of writing the present survey, all the figures for the 1922 harvests have not been concluded. It may be mentioned here, that the grain harvest for 1922 was *18 million poods greater than that of the year 1919*, that the home demand is fully covered and that a surplus of several mill. poods for export is assured.

Similarly, the apple harvest of 1921 was extremely good and is calculated to reach 1,178,430 poods. Abundant quantities have already been shipped abroad. The fruit harvest for 1922, and likewise that of potatoes, was comparatively weaker.

The new Land Reforms have thus in no way exercised a disintegrating influence on agriculture in Esthonia, but instead, signs of development have appeared. When the necessary implements and machines have been procured, the difficult interim phase can be regarded as being over and Esthonia will be able to hold its own as an agricultural land in the economic competition of the nations.

It may here be stated that besides rye, also wheat can be grown in Esthonia. The difficulty in this respect — which has contributed to the unwillingness of farmers to cultivate wheat — being the harvesting, as the time for the latter is generally rainy, which in the case of wheat is of more importance than in that of rye. The products of most importance as export wares have hitherto been potatoes and flax.

## 5. THE CULTIVATION OF POTATOES.

The main potato-growing districts of Esthonia are in the north (Viru—Harju—Järvamaa). The area under cultivation is altogether about 50,000 desj. and the average annual yield about 30—40 mill. poods. The extent of potato-cultivation will be seen most clearly from the following figures:

	Area sown Desj.	Harvest Poods
1910	71,182	52,614,111
1911	73,627	48,898,978
1913	66,764	45,654,569
1914	65,658	32,738,669
1915	62,697	50,322,658
1916	58,663	41,638,997
1917	51,389	36,614,662
1919	50,135	30,486,052
1920	58,254	35,289,598
1922	69,148	40,814,234

Impetus was given to potato-growing by the eminently suitable soil and also by the favourable markets. The soil is rich in lime, which produces tasty and healthy crops: the percentage of starch is 18—22 %. Before the war the most important market for these wares was St. Petersburg, where potatoes for human consumption were sent, and in some degree, Finland. Potatoes of poorer quality were sent to the distilleries, where they form, on the one hand, the chief raw material of the spirits industries, on the other hand, as dregs, an important cattle-feed. The growing of cattle for both dairy and slaughtering purposes in North Esthonia is founded on the supply of potato-refuse from the distilleries. Before the war there were 281 distilleries in Esthonia, the possible annual production of which was 350 mill. graads (43 mill. litres). During the war a kind of stoppage occurred in potato-growing. The distilleries were also closed down. The secession of Esthonia from Russia brought about the loss of the St. Petersburg markets. At the present time the spirit industries are undergoing a rapid new development, 77 factories being worked already in 1919 with a total production of 27.7 mill. graads of spirits and using up 1,700,000 poods of potatoes as raw material



Fig. 22. Picking potatoes on ploughed field of an estate.

The period 1921—22 is expected to show a total of 183 factories producing 69 million gaads (8.5 mill. litres) of spirits and using up 4.2 million poods of potatoes.

The following figures show the amount of potatoes used up annually in the preparation of alcohol:

Year	Number of factories	Gaads	Potatoes used as raw material
1913—14	281	350,000,000 (43 mill. litres)	14,800,000 poods
1918—19	13	2,948,000	205,000 »
1919—20	77	27,745,000	1,765,000 »
1920—21	135	51,600,000	3,280,000 »
1921—22	183	69,000,000 (8.5 mill. litres)	4,250,000 »

Besides the manufacture of spirits, potato-flour and potato-syrup have begun to be made. Two establishments for the drying of potatoes have been completed, the duty of which will be the preparing of an auxiliary substitute for flour.

In the year 1920 potatoes to the amount of 1.5 mill. poods were exported and spirits to the amount of 84,500 poods. The harvest for the year 1921 is calculated at 32.6 mill. poods, of which 1.2 mill. poods were exported. During last year potatoes have been shipped even to England.

## 6. FLAX.

This was earlier one of the most important sources of income for the farmer. 25,032 desj. of land were used for flax in 1916. Its cultivation in Esthonia is shown most clearly by the following tabulated statement:

Year	Area sown	Harvest in poods	
		Seeds	Fibre
1906	40,515	1,073,563	1,334,001
1916	25,032	667,328	588,252
1919	12,623	379,077	366,169
1920	18,537	290,265	314,744
1922	21,921	549,151	590,137

As will be observed, the cultivation of flax also declined during the war, but is now increasing again. The harvest of fibre has averaged 17—31 poods and seeds 16—35 poods per desjatin. Esthonian flax is famous (known generally as Petseri or Võru flax) in Western Europe. In the form of seed it is well-known in Belgium and Holland, to which countries great quantities were earlier exported under the denomination crown-seeds. Contrary to the case of the potato, flax-growing is confined chiefly to South Esthonia: the provinces of Petseri-Võru, Viljandi, Pärnu and Tartu producing the most. Already before the war, with the rise in dairy-farming, but still more during the war, the cultivation of flax suffered from a lack of suitable labour and the fluctuations in prices abroad. In the year 1919 only 12,600 desj. were sown with flax. One of the most important factors in the cultivation of flax is the mechanization of the cleaning process. The farmer should be freed from this work and only the growing left to him. The question is of great interest in Esthonia at the present day. The flax-cleaning works of Halliste have been in use for some time now, and similar industrial works for the cleansing of raw flax have sprung



Fig. 23. Removing flax-seeds from the stalks. Estonian flax is of very high growth.

up here and there, viz, the Wõru, Viljandi and Vigala Factories and six factories for the purpose are under construction, which are calculated to deal with 120,000 poods of flax per annum. The best quality flax seeds are sold abroad, the poorer qualities being used for the manufacture of oil. The Schmidt linseed-oil factory at Pärnu refines 300,000 poods of seed annually. The Estonian Co-operative Wholesale Society has planned an oil-cake factory, the same society being the largest sellers of flax and linseed in Estonia. In the year 1921 340,000 poods (225,000 poods in 1920) of flax were exported.

## 7. SEED-GRAIN. — SPECIAL CULTIVATIONS.

Great interest has been centred on the cultivation of special species of grain for sowing purposes. The best results in this respect have been brought about by the *Estonian Seed-grain Society* (Eesti Seemnevilja Ühisus). Established three years and a half ago, it has already gathered the seed markets into its own hands and has at the same time commenced an energetic action for the regulation of the refining



Fig. 24. A seed-cultivation field of the Estonian Seed-grain Society at Jõgeva in 1922. »Extra-Kolben» brand summer-wheat.

of seed-grain in Esthonia: adding new species of cereals from those best suited to the purpose, and side by side with this activity itself growing garden-seed and organizing their cultivation. By means of the special station for seed-growing established at Saaremaa there are hopes of obtaining for home growing such seeds (gherkins, etc.,) which for climatic reasons would otherwise not ripen in time on the mainland. Garden and vegetable seeds were brought from abroad in 1919 to the value of £ 20,000 and in 1920 to the value of £ 10,000. But already at the present time the export of some amount of seeds can be counted on. The work of the Seed-grain Society for the refining of different products is intensive in nature and was accorded special recognition at

the great Agricultural Fair at Tallinn last autumn (1922). In 1921 the Society rented from the Government the Jõgeva and Luunja Estates, 150 desj. being used for the cultivation of seeds on the former and 125 desj. on the latter. In the future one of the most important tasks of the Society will be the enriching of the number of cereals cultivated, for which purpose a *Society for the Improvement of Seeds* (Sordi-parandus) has been founded. The object of this Society is to increase the production of the home types of grain by selection and improvement of their seed, for which purpose comparative experiments are arranged, exhibitions of seed held and education given in the improvement of seed. In order to estimate the purity of species of the seed exhibited or offered for sale a special garden for the control of quality has been arranged at Jõgeva. Similarly, an experimental station for the improvement of cereals and root-crops, potatoes and grasses has been established at the latter place. The Society also controls the cultivation, purification and despatch to the market of the seed grown by the Esthonian Seed-grain Society. Among special cultivations the growing of tobacco has lately gathered impetus, the annual yield almost sufficing for the home demand. Further, the cultivation of medical herbs deserves mention, the site most engaged in this work being the vicinity of Tartu. Some amount of medical herbs may have been exported during last year.

## 8. AGRICULTURAL MACHINES.

A serious lack of agricultural machines and fertilizers has lately made itself felt in the agriculture of Esthonia. Naturally, they have had to be procured from abroad. The principal countries of import for agricultural machinery have been Germany, Great Britain, America and



Fig. 25. Reaping-machine in rye-fields.

Sweden, while recently a certain amount has been imported from Finland. Ploughs in particular, have been purchased from Germany, threshing-machines from Great Britain and Germany, horse-rakes from America, separators from Finland, tractors from America, etc.

Owing to the interruption in imports the present demand is many times greater than the import before the war. A home industry for agricultural machines is developing, but its main task will obviously be the manufacture of the simpler iron parts for machines in the construction of which wood is the chief material. At present ploughs, portable engines, double-breasted ploughs, sorters, threshing-machines and machines for cleansing grain are manufactured (Ilmarine, Fr. Krull, Tegur). The demand for machines calling for steel-casting in their manufacture will in all probability continue to be filled from abroad.



Fig 26. Threshing by machinery.



Fig. 27. Peat-fuel machine in action. There are nearly 200,000 desj. fuel-peat bogs in Esthonia.

Because of the war and the resulting stoppage in imports a lack of agricultural implements and machines, as stated earlier, has made itself felt in Esthonia. Although this is actually the case with the farms recently established, the older farmers

possess a sufficiency of equipment. In order to give some impression of the present supplies, the following inventory of the most important agricultural implements and machines is appended:

	1920 Number	Per each 100 desjat.
Simple ploughs .....	87,065	9.9
Single-shared ploughs .....	74,983	8.5
Many-shared » .....	10,271	1.09
Harrows .....	147,643	16.8
Cultivators .....	7,429	0.9
Rollers .....	1,879	0.2
Broadcast seed-drills .....	2,265	0.25
Seed-drills .....	991	0.1
Mowing-machines .....	8,418	0.95
Reaping-machines .....	6,015	0.7
Horse rakes .....	10,796	1.2
Steam threshing-machines ...	1,640	0.15
Horse-propelled rotary threshing-machines .....	4,184	0.45
Winnowers .....	10,225	0.9
Sorters .....	748	—

	1920 Number	Per each 100 desjat.
One-horse waggons .....	110,097	—
Separators .....	14,419	—
Churns .....	9,234	—

During the last few years about 100 tractors have been taken into use.

## 9. EXPERIMENTAL WORK.

Up to the present, organized scientific investigation and experimental work in the field of agriculture under governmental auspices has not been possible in Esthonia, as hitherto subsidies for the purpose have been lacking.

At the initiative of the Ministry a network of agricultural meteorological stations has been formed for meteorological



Fig. 28. Seed-cultivation by the Esthonian Seed-grain Society at Jögeva in 1922. »Sangaste rye».



Fig. 29. Garden-seed cultivation by the Esthonian Seed-grain Society at Luunja, in 1922.

observations. This network comprises the Tartu Observatory, a central station, 3 second class meteorological stations, 26 third class stations and 150 observation posts. Activity has been energetic. In the short period the network has been in use, the former meteorological observations have been collected and last year a formidable work will appear from the press, containing the meteorological observations made in Esthonia during the last 50 years, which as a meteorological treatise should awaken comment even abroad. In addition the network has published a general study of the 1919 hailstorms.

Practical experimental work in the cultivation of plants has been done by the «Jõgeva Plant-refinery», the experi-



Fig. 30. Raadi estate near Tartu, the Esthonian National Museum, in the vicinity the University's experimental Station for plant cultivation.

mental station of the Plant-cultivation and Seed-growing Development Society of Esthonia, and the experimental fields of the Sangaste grass cultivations.

A marsh-cultivation station is situated at Tooma, founded by the Marsh-cultivation Society of Esthonia (marsh soil in Esthonia 300.000 desj.). All these experimental stations are in receipt of subsidies from the Government, in order to secure their services also for the profit of the State. The Government itself has not as yet any experimentals stations of its own. A station has been established at Tartu for the benefit of the University in its teaching. In addition, stations have been planned for each of the respective types of soil. Experiments have been made at the initiative of the Ministry with the various mineral fertilizers found in the country, phosphorite and glauconite, and are to be continued next year. The experiments in fertilizing were made at the Aruküla experimental station at State expense, the matter being at present subject to re-organization.

## 10. THE FERTILIZER QUESTION AND ESTHONIAN PHOSPORITE.

Esthonia has been obliged to import the fertilizers necessary to agriculture. These imports were before the war (1914) as follows; Superphosphates 770,000 poods, Thomas's phosphate 625,000 poods,  $K_2O$ -salt 350,000 poods, Kainite 100,000 poods, Chili salpetre 50,000 poods and sulphuric acid ammonia 100,000 poods. But in the field of phosphorus the phosphorite-layers of Esthonia promise a complete revolution.

A novelty in fertilizers is the phosphorite mentioned in the foregoing as a mineral fertilizer found in Esthonia. The Ministry of Agriculture has carried out quite a number of experiments during the last few years for the purpose of



Fig. 31. Phosphorite-quarry at Ulgaste, near Tallinn, owned by »Eesti Vosvoriit».

ascertaining the hitherto unknown layers of phosphorite in Esthonia and its use as a fertilizer. The layers are discernible on the shores of the Gulf of Finland from Tallinn to Narva in a great many places, and further, on the banks of the Pirita, Jägala and Narova rivers, from which it may be concluded that phosphorite is possibly to be found all over the country, now deeper, now nearer the surface. A spot where the layers of phosphorite are quite on the surface is Aseri. The section of these layers is as follows:

*Surface soil.*

Lower Silurian strata	}	Orthoceratite limestone	approx. 10.0
		Glauconite	» 2.7
		Glauconite sandstone	» 1.3
		Dictionema gravelstone	» 2.8
Upper Cambrian	}	Ungulite sandstone	» 2.5—20.0
		In the middle of this layer	
		the phosphorite-layer encrusted in <i>Obolus apollinis</i> (sea-shells)	0.30—1 mtrs

The thicknesses of the different strata are approximate, as their dimensions vary. Often the phosphorite layers are near the surface (4—8 metres), at times even exposed on the surface.

Analysis shows the phosphorite to contain 10—27 %  $P_2O_5$ , of which 5—6 % is dissolvable in 2 % salts of lemon. It is noticeable that a 2 % solution of salts of lemon can apart dissolve as much as 50 % of the  $P_2O_5$ , which is assuredly uncommon in the case of phosphorites. Gradually, during a fixed period perhaps, the whole of the  $P_2O_5$  dissolves, thus making possible the use of the phosphorite as such. The average of  $P_2O_5$  in the phosphorite is 14—18 %. The chemical analysis of a couple of samples showed the following:

	I	II
$P_2O_5$ .....	18.02 %	17.85 %
$SiO_2$ .....	41.85 »	39.56 »
$CaO$ .....	21.10 »	30.67 »
$Fe_2O_3 + Al_2O_5$ .....	3.35 »	3.15 »
$MgO$ .....	0.39 »	0.34 »
$Co_2$ .....	4.36 »	3.75 »
Loss in firing .....	2.93 »	4.18 »
$P_2O_5$ dissolved in 2 % salt of Lemon solution .....	9.70 »	9.55 »

As the Esthonian phosphorite contains a great deal of  $P_2O_5$ , the question was awakened in the Ministry of Agriculture whether the phosphorite might be ground and used as such. In order to obtain light on the matter, experiments were arranged, the results of which were remarkably good. The experiments, carried out under the direction of the agricultural expert *J. Ūmarik* at the Aruküla experimental station, were made with a view to comparisons between the effects of phosphorite and superphosphate either alone or in combination with  $K_2O$  salts on the growth of hay, oats, potatoes, hemp and turnips, on both marshy ground and in ordinary fields.

Of special interest is the fact that the harvest is greatly increased by the use of phosphorite, but still more when the latter is mixed with  $K_2O$ . Phosphorite +  $K_2O$  gave the greatest yield of turnips; in the case of hay and potatoes it was not far behind superphosphate.



Fig. 32: Experiments in the use of phosphorite as a fertilizer on marshland at Aruküla in 1922. Experimental-area N:o 21 without fertilizer, N:o 20 with  $K_2O$  salts (2,9 kilos) and phosphorite (9,8 kilos per area).

Note the visible results achieved by the use of phosphorite.

The experiments carried out with phosphorite during 1920—22, have shown clearly that phosphorite can compete successfully with phosphate, not only on marshy soil, but also on mineral soil. It has been established that twice the weight of phosphorite as compared with Thomas's phosphate, gives equal results with the latter, but that in the following years the after-effects of phosphorite are more favourable than those of either Thomas's phosphate or superphosphate. Especially good results have been obtained in the case of fodder-roots, hemp, clover and barley. And in all cases, Esthonia has discovered in its phosphorites a magnificent and cheap fertilizer, which cannot but have great effects on the development of its agriculture. A Joint Stock Company «Eesti Vosvoriit» was founded in 1921 and has already commenced the preparation of phosphorite for use as a fertilizer, the first consignments to farmers being despatched in 1922. The works and quarries are situated at a distance of 25 versts from Tallinn. The existence of a local and cheap fertilizer now makes it possible to embark on larger enterprises in marsh cultivation, work which the dearness of fertilizer has hitherto prevented from attaining its full scope. Plans are also afoot for the founding of a superphosphate factory. And in a distant future the manufacture of nitrogen may also be possible, in the form of sulphuric acid ammonia, in connection with the dry-distilling of the oil-shale, when the rapids of the Narova River will give the necessary power for the further manufacture of salpêtre.

## 11. AGRICULTURAL SOCIETIES.

The first farmers' societies came into being during the great national awakening of the Esthonians in 1870 and the years following, but a greater momentum was given to their

founding about twenty years later. The beginning of the present century showed already some scores of local farmers' societies. Now there are 130, with a total membership of 13—14,000 (the largest being the *Tallinna Farmers Society* — Tallinna Põllumeesteselts). The leaders of these societies soon realized that but few difficult problems could successfully be vanquished so long as the societies remained apart from one another. The question then arose of the establishment of a common central organization, which would gather the scattered societies into one strong front. The question was developed at many meetings of Esthonian agriculturalists at the beginning of the present century. No practical solution was reached at the time. The Russian Government refused the right of combining even to societies directed to the forwarding of economical and educational ideas. After the events of 1905 the hope arose that out of the breath of freedom the possibility of the rules of the agricultural societies being ratified would arise, as long as their activity was kept strictly within the bounds of the different provinces. And thus, the plans for two societies were drawn up: one for the province of Esthonia and the other for Livland. But as these plans were year by year repeatedly returned unratified after renewed sendings to the Russian Cabinet, the representatives of the Esthonian farmers' societies chose in 1907 and those of the societies in the part of Livland populated by Esthonians in 1908 between them the so-called Central Committees, of which the first commenced at Tallinn and the other at Pärnumaa in connection with the farmers' society of Enge the carrying-out and organization of the widespread duties of a Central Society, until in 1910 and 1913 the *Agricultural Societies of Esthonia and North Livland* (The North Esthonian and South Esthonian Agricultural Central Societies) were granted right of constitution and their rules ratified, the two Central

Societies being further united in 1922, when work was taken up according to mutual, common rules. In 1920, a third society, the Saaremaa Agricultural Society was formed.

For membership in the Esthonian agricultural societies only societies and associations are qualified, individual members not being admitted. Member-societies are comparatively represented according to their own membership at the annual meetings. The work of the central societies is directed by a Board of Directors with the right of decision in important matters and a Board of Management for current work. Decisions are carried out and proposals are made for the same by a paid secretary with higher agricultural education, under whom are arranged all the other officials of the society.

The income of the central societies is derived from the following sources: 1) Membership dues, 2) subsidies from the co-operative societies, 3) the fees of the Central Societies' technical advisers and 4) Government subsidies. The two first items have always been of slight importance, also fees have been obtained only from some few tasks, as the greater part of the organizing, awakening and advising work of the societies is done free. Thus the only considerable income of the Central Societies is Government help. The Russian Government granted a small subsidy first in 1912. In the years 1916 and 1917 the subsidy of each of the societies was already 30,000 roubles per annum. During the German occupation and the first year of Esthonia's independence no subsidies were received at all; both societies received the next year only 50,000 Esth. marks. Besides monetary help, the Government assists the Central Societies by placing a few advisers at their disposal.

The programme of the Esthonian Agricultural Societies comprises the development and advancement of every branch of agriculture. For this purpose, the societies publish

the periodical »Pöllumees» and books, pay the salaries of farmers' advisers, procure technical experts in the fields of agriculture, dairy-work, cattlekeeping, seed-culture, gardening, the cultivation of fish, poultry-farming, bee-keeping, the use of machinery and book-keeping for different purposes, arrange shorter courses of lectures and longer practical courses for farmers and womenfolk, keep up agricultural schools, etc. During the last years of Russian rule both societies had in their service 30—40 technical experts, but now there are only half a dozen in each, as the lack of means will not admit of the paying of others.

Besides the central organizations for the local Farmers' Societies here mentioned, Esthonia possesses other agricultural central societies. The Society for the Improving of Seeds has already been mentioned, likewise the Marsh-Cultivation Society. In the field of cattlekeeping there are the *Esthonian Society for the Improving of Home-breeds*, the *Esthonian Angler-cattle Society* and the *Dutch-Frisian Cattle Society* — all three working for the improvement of the respective breeds of cattle, keeping pedigree-books of the same, founding Breeding Clubs and Inspection Societies. Further, we may mention the *Esthonian Society for Improving Horse-breeds*, the *Esthonian Arden Horse-breeding Society*, and the *Esthonian Tori-Roadsten Horse-breeding Society*. These labour for the breeding and improvement of their respective breeds of horses, markings, foal-shows, pedigree-books, etc. In course of founding are still the potato and flax-growers' unions and a Pig-keepers' Society. All the aforementioned societies and their branches have numerous members. In 1921 Esthonia could show 2,453 societies and associations, with close on 300,000 members; co-operative societies alone number close on 1,000. Great agricultural fairs are organized by the societies. Thus, there were about 150,000 visitors to the Fair at Tallinn

in 1921. A greater *Agricultural Fair* to comprise the whole of the country has been planned for 1924.

The knowledge of modern agriculture possessed by the Esthonian farmer can undoubtedly be placed to the credit of the agricultural societies. The land has, for the last decade, been full of local farmers' associations and the use of fertilizers, agricultural machinery, refined seed, oil-cake, breed cattle of high milking capacity and many branches of agriculture of great economic value has become general. The farmers of Esthonia believe that in the present independent state of the country the wounds caused during latter years by the war will soon be healed, and with the aid of the Central Societies the development of agriculture in Esthonia will resume its former momentum.

## 12. DAIRY-FARMING.

As far back as the history of the Esthonians can be traced, they have been known as a cattle-keeping tribe. Cattle formed the most important part of their property. The cattle were kept mainly for the sake of leather and meat, but were used also as a means of barter in trade with other tribes. Later — when the Esthonians had settled down to agriculture and the land required for new cultivations prepared according to the old method of burning the stumps of trees and undergrowth on it began to grow scarce, necessitating the use of land already cultivated, which naturally without manure yielded only unsatisfactory harvests — cattle-keeping became again of importance in a new way, i. e., for the sake of the manure. Solely for the foregoing reasons — and in addition for the sake of a little milk to moisten their food with in the summer — have cattle been kept by the Esthonian farmer, with the slight difference only, that the meat and skins were no longer used directly

for barter, but were exchanged first into money. The phrase »cattle are a necessary evil for the sake of manure« has become a proverb. --- Thus were cattle reared earlier, a considerable part, depending on the size of the estate, being sold each year, mostly two-year old bulls, cows being kept in lesser quantities in the degree necessary for breeding purposes. The cattle supplied manure and as a factor of less importance, milk. --- In the following a short historical survey of cattle-keeping in Esthonia, based partly on information given by the Instructor *P. Kallit*, and partly on the reports of several Cattle Inspection Societies and the periodical »Agronomia« will be given.

In order to obtain more money for the cattle sold, animals of the greatest possible size and quickness in growing were the most desired, a matter which explains the fact that when the large farmers — the estateholders, began to import pedigree stock from abroad, larger in size and quicker in growth than the home breeds, the smaller farmers wished also to obtain similar animals. The buyers from the latter were often the large estateholders, as it was cheaper for them to let the small farmers bring up the cattle and then buy them for a little more than the price offered by the



Fig. 33. Esthonian cows bred in neighbourhood of Tartu.

slaughterer The large estate-holders could also act as agents in the purchase and sale of cattle, thereby securing the profit on such transactions. They bought »estate-breed» cattle from the peasants, selling the same to Russia as the products of their own cattle-yards and of pure pedigree. In his simplicity, the Esthonian small farmer saw only the sum obtained by the sale and was unable to calculate what the rearing of the animals had cost him. The latter factor escaped him altogether and in no other way than by sale did he obtain any income from his cattle. In this way pedigree cattle found their way into the farms of Esthonia, ousting the home breeds of Esthonia, which were smaller in size and slower to attain maturity.

The first co-operative dairy in Esthonia was established in 1906 in the province of Viljandi, parish of Imavere, and was soon followed by others, so that in the first year of the war, when the number of dairies was at its height, the more developed districts of Esthonia were covered by a network of co-operative dairies. During the last year of the war, and especially during the German occupation, when cattle-keeping suffered from the miserable conditions then prevailing, many of the co-operative dairies were forced to close down temporarily, but during the year 1920 the majority of them resumed activity again.

The dairies, both purchasing and co-operative, accelerated the development of cattlekeeping, as the income derived from them was considerable when compared with any former source, and in this way attention became directed more and more to the maintenance of cattle and to the devising of means to further increase this income. Realizing that more knowledge was needed on the subject than they possessed at the time, the farmer's societies and other associations for the public welfare combined in order to finance advisers who were well-versed in dairy-farming and farming

in general. The duty of these latter was the teaching, uniting and awakening of the farmers. Associations for the inspection of cattle and for breeding purposes were established. The first cattle-inspection society was formed in 1909 at Vändra, and was followed by so many others that in the year 1914 there were 62 such societies in Esthonia. Their number began, however, to decrease towards the close of 1917, declining especially during the 1918 occupation and the Esthonian war of liberation so that at one time only three societies remained active. The reasons for this decline were many, the chief being the lack of fodder, more particularly, of oil-cake and root-plants. Add to the foregoing the insecure position of the farmer, spiritual depression, the lack of active individuals equal to the situation.

At present, the number of Cattle Inspection Societies in Esthonia is 26, but it is hoped to reach 40 in the present year and afterwards, gradually, the full pre-war number.

As already earlier related, the small farmers procured themselves breeding-animals from the large estates, for the purpose of obtaining animals large in size, more beautiful in build and quicker in growth. The cattle on the large estates was on the other hand extremely variegated in character: Angler in one, Frisian in another, Ayrshire in a third, Breitenburger in a fourth, etc., etc., though a majority of the first two breeds prevailed. The small farmers bought calves for breeding purposes from different estates at different times, experiment with one breed being insufficient for them. In this way many farmers came to possess cattle of an extremely mixed breed, while others who lived near estates where fullblooded animals were kept, gradually became possessed of cattle as pure in breed as that of the estates. The more developed districts in the country favoured the better breeds, sweeping aside the local breeds, remains of the latter being left only where a better class of cattle

could not exist. A scientific scheme for the breeding of cattle was totally lacking in the attempts of the small farmers, while on the other hand the large estate-holders had already their pedigree-book societies. The local Esthonian



Fig. 34. Steam flour-mill in vicinity of Tartu.

breeds seemed doomed to extinction; only a few individuals who were<sup>e</sup> unmoved by the mockery such remarks could awaken remained to speak up for them. In the year 1909 the Farmers' Society of North Livland took into its service as adviser in dairy-farming *Aleksander Lilienblatt*, who had studied in Finland and acted for many years as dairy-inspector and later as the adviser in dairy-farming for the farmers' society of the Province of Nyland in Finland. Lilienblatt had had opportunity to learn the quality of the Finnish home breeds and the main lines along which they had been developed, and believing in the correctness of the system he had seen, he began to advocate the development of the local stocks in Esthonia. His opponents were many especially in the ranks of the large estate-holders and their partisans. These attempted to prove that home breeds were already non-existent in Esthonia, and even if any did remain, they were so poor in quality and scarce in number that to discuss them was out of the question. But in the course of time apologists on principle grounds appeared and many began to take active part in the development of the home breeds. Inspections of home breeds were held and journeys were made to the more distant districts to study the state of matters there. It was discovered that



Fig. 35. Esthonian home-breed cattle at Wöhma.

cows were to be found in abundance but that good breeding bulls were scarce, so that a plan was formed to import such from Finland, the West Finnish and Esthonian local breeds being regarded, on the grounds of many similarities, as having originated from the same stock. Consequently, the first West Finnish bulls were brought over in 1910, and later at different times so that in the year 1914 they numbered nearly 20. Esthonian bulls were also made use of wherever they were found to be good enough to justify the action. The import of West Finnish local breed bulls was interrupted for a time, more particularly for the reason that the Russian government of that period would in no way show any recognition of the development by breeding of Esthonian local stocks with the aid of Finnish bulls, and any



Fig. 36. Esthonian home-breed cattle at Pärnu.

attempt to dispute the governmental opinion would have resulted in an inhibition of subsidies. The advisers of the Russian officials were in this case the large estate-holders, who were afraid that the importing of breeding bulls from Finland would raise the value of the Esthonian stocks too rapidly at the expense of the more costly breeds which were again more profitable to the large estate-holders! Another reason for the interruption in the import was that only comparatively inferior material was obtained in the beginning; a third the fact that the insecurity endangered by the war could not but affect the minds of also the dairy-farmers, inclining them to wait for better times.

At the time when the Esthonian agricultural societies were founded, in 1910 and 1913, the question of breed in cattle was gone into more thoroughly, special attention being paid to the question of how the senseless mixture of all possible breeds was best to be altered and instead all energies directed to the development of a few chosen breeds. The mutual conclusion was reached that of all the costly imported breeds, the farmer desired only the Angler breed, placing this species foremost and hoping for the assistance of the agricultural societies in the matter, subsidies in aid of the change to be petitioned for from the Russian government. Frisian and other highly bred species were to be done away with together with all other kinds that could be



Fig. 37. Later dwelling-house on a small farm in Esthonia.

regarded as unsuitable to Esthonia. *The local breeds were to be given the place of honour.* These conclusions were also immediately carried into action: only Angler and local breed cattle-associations were established and at the exhibitions prizes were given only to animals of these two breeds. From the year 1914 a pedigree-book was started at the agricultural societies for Angler and home breed cattle. Up to the end of 1921, the entries for Angler-breed cattle in the books showed 7,518 cows and 222 bulls and the pedigree-books of Esthonian home breeds 287 cows and 22 bulls. During the two years 1918—1919, all organized work in this field became impossible, as both money and workers were lacking for the agricultural societies, which had had to suspend activity, and there were no other bodies capable of carrying on the work; the state of mind of the cattle-owners was also against all organized endeavour. In the autumn of 1919, when the situation had begun to grow more secure, the *Angler Cattle-development Society of Esthonia* was formed (Angleri-Kasvatajate-Selts) the duty of which was to be an extension of the work of the Central Society. For the same purpose a *Society for the Development of Esthonian Home Breed Cattle* was founded on April 20:th, 1920. The sup-



Fig. 38. Old-fashioned farm-house.

porters of the *Dutch-Frisian breeds* followed with a society for the improvement and spreading of the Dutch-Frisian breeds in Esthonia. The two first societies continue the keeping of the pedigree-books started earlier by the agricultural societies; the

two latter began their first with the establishment of the societies. Of the Angler and Frisian stocks, over 14,000 have been taken down in the pedigreebooks of the two societies during the year 1920,



Fig. 39. An Angler breed bull on the model farm Wahi, near Tartu.

chiefly cattle from the large estates, the larger part of which had earlier been marked in the pedigree-books of the estate-owners. The number of Dutch-Frisian cattle in the pedigree-books in 1921 was 2,811 A class and 4,005 B class cows and 167 bulls. All in all, of the *pedigree cattle* in 1919, 56.5 % was Dutch-Frisian, 40 % Angler- and the remainder of other breeds. But owing to the lack of good breeding bulls, a decision was reached to import bulls again from West Finland. Four were imported already in October 1920 from West Finland and in December a further 10 bulls. The bulls brought earlier from Finland can show many very fine descendants especially on points of breed, thus awakening a new enthusiasm for the Finnish animals. A number of horses for breeding purposes have also been



Fig. 40. An Esthonian Dutch-Frisian breed cow.

imported lately from Finland.

Earlier, the large estate-holders of Esthonia imported regularly only pure-blooded animals, especially bulls for the renewal of the strain, as they had clearly observed that

otherwise cattlekeeping most certainly declined. Now, however, the growers of Angler and Frisian cattle have come to the conclusion that no more animals are to be imported from abroad, a matter which is for the first almost impossible on account of the great cost, but according to the growers, also unnecessary, as these breeds have become so acclimatized that any further infusion of new blood is uncalled for. Pureblooded breeding animals, especially bulls, are scarce in both breeding societies, a matter which will make itself felt in a greater degree after the division of the large estates.

Milking is carried out in widely differing ways in Esthonia, depending on the circumstances. In the best cattle-inspection societies the cows yield annually an average of over 6,000 kilos, while in private hands the annual yield is under 3,000 kilos. Such results are, however, rare. Thus in 12 Control Societies, comprising 74 large estates, 1,000 cows yielded in 1912 an average of 2,483 kilos milk and 85 kilos butter-fat, the percentage of fat being 3.41. During the past few years, when oil-cake was unobtainable and the feeding of home grain was out of the question, and feeding in general lost the most of its strength, the yield of milk sank to nearly one half of the former amount. The greatest sufferers in this respect were the expensive purer breeds, the milking capacity of which declined to very small amounts, especially in the large estates, the yield being in many places only 1,800 pounds (750 kilos) per annum and in some places even less. In the degree in which information is available regarding home breed cattle, the milking declined by one third of the former amounts, but has during the present year risen considerably. With regards to milking capacity, cattle of the home breed can now compete successfully with the other breeds, yielding per each 100 fodder-units more milk, and in greater degree, more butterfat.

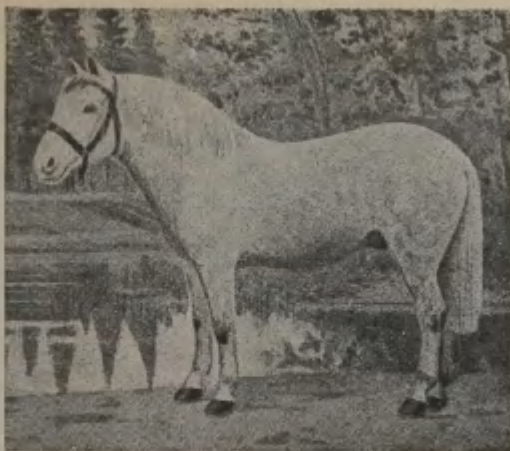


Fig. 41. A white home-bred horse on the Island Saarenmaa.  
The horses of Saarenmaa are widely known.

The higher breeds have also suffered greatly in health during the last few years on account of the diminished attention they have received. Thus on the Harjumaa Estate, close on 80 % of the cattle are diseased to a degree necessitating their destroyal. In the home breeds no disease or weakness has so far been apparent that might be derived from lessened care. Up to the present, tuberculosis has not been diagnosed in the home breeds, while in the earlier mentioned refined breeds it is apparent already in their appearance.

Future plans for the development of dairy-farming in Esthonia comprise the following: the home breeds, of which there are only small quantities at present, are beginning to spread more and more, the demand for calves for breeding purposes being so great that it is impossible to satisfy, the Home-bred Cattle Society of Esthonia receiving continually applications for membership in the hope that the Society would be apply to supply breeding cattle. If the home breeds can be bred into a greater similarity in



Fig. 42. An Estonian-breed horse  
at Kogula.

appearance and more beauty added, and their milking capacity increased by the use of picked breeding animals, the supporters of the home breeds will grow still further. The Angler breeds are being bred into purer and purer blood and a greater conformity of type by a wise choice of breeding animals. The breed, which is maintained chiefly in South Esthonia, will probably continue for a longer time to exist in the wealthier districts, where it can more easily be cared

for according to its needs. The task before this breed is the gradual exclusion of the Dutch-Frisian breeds from both North and South Esthonia, the conditions of the country in no way favouring the latter breed. Dutch-Frisian cattle can be kept temporarily now, in the lack of more suitable animals to take their place; but it would already seem that the Angler and home breeds are ousting the Dutch-Frisian cattle from the country, the general desire being now for »red» cattle in the place of »mottled». The knowledge that at some time the day when Dutch-Frisian cattle can be sold to Russia at slightly over the price for slaughter animals will dawn, is also doing much to pave the way for red cattle. Thus, in the future, it seems probable that home breed and Angler cattle will continue to be of importance on the

dairy-farms of Esthonia, though naturally the other breeds will also retain their significance.

The number of domestic animals, i. e., cows, horses, sheep and pigs kept in Esthonia in different years is shown in the following statistical account:

Year	Cows	Horses	Sheep	Pigs	Total
1916	518,947	178,447	622,227	304,288	1,623,909
1919	406,569	164,980	419,909	150,072	1,141,530
1920	442,668	164,502	530,291	260,693	1,398,154
1922	529,368	198,787	754,937	272,348	1,755,440

Despite numerous war-time pilferings and appropriations the stocks of cattle have been able to be retained at almost the same level. A slight rise (25 %) is even apparent in the figures for last year.

For the sake of comparison it might be mentioned that in Europe in 1913 there were on an average per 100 inhabitants 30 cows, 38 sheep and 17 pigs. In Esthonia, in 1922 the average per 100 inhabitants was 16 horses, 42 cows, 60 sheep and 22 pigs, more than the European average, therefore. The corresponding figures e. g. for Finland were 8, 43, 24 and 3; only Denmark, Sweden and Norway could show a higher percentage of cattle. Calculated per 100 desj. of land again, Esthonia can show 18.7 horses, 54 horned cattle and 63 sheep. Also in this respect Esthonia stands on an equal level with other European countries, but with regard to production from dairy-farming and the refining of cattle there is much to hope for yet from Esthonia.

In any case the possibilities of development and a successful competition with other countries in the field of dairy-farming exist in Esthonia, and as dairy produce forms one of the most important branches of export, the subject has been dealt with here at greater length.

### 13. CO-OPERATIVE DAIRIES.

The first co-operative dairy was established in the year 1898. Since then many others have been born.

An important part in the founding of the first dairy was played by the advisers connected with the agricultural societies. The period showing the greatest development and the greatest number of new establishments began in 1911 and continued to the outbreak of the war. For the conforming of the co-operative dairies to a certain type a central association for co-operative dairies «*Esthonia*» was formed, which commenced the collecting and export of the production of those dairies which were situated in the country. But on account of the lack of dairy-workers conforming to modern standards, many incapable dairy-men had perforce to be employed, which resulted in a lowering of the class of the completed manufactures, and consequently Esthonian products failed to attract the attention of the world's markets. For the foregoing reasons, the «*Estonia*» society took into its employment a number of dairy-work advisers, who directed the manufacture of butter, taught the necessary book-keeping, etc. Already in 1913, the dairies 145 in number, worked on a firm basis. Many had certainly foundation-debts still owing. Of these 164 dairies 70 were members of the central association and others dairies sold their products through its agency. Altogether there were 300 butter and cheese-dairies in the country in 1913.

These dairies turned in one year over 61 mill. litres of milk into butter, tvorog (whipped cream), caseine and sour cream. As the markets for these, particularly St. Petersburg, were quite close, it was possible to manufacture many different kinds of products in the dairies, such as compressed sour cream and tvorog for St. Petersburg, and partly also for Tallinn. The dairies nearest the railways



Fig. 43. The Viljandi Co-operative Dairies at Viljandi, Central Esthonia.

sent their milk direct to St. Petersburg and Tallinn, while those further off prepared butter (in barrels and in boxes), of which the barrels were sent abroad. A great part of the stepin-butter was sent to St. Petersburg and Tallinn. During the years immediately preceding the war the manufacture of butter in Esthonia was already regularized and a demand was being born abroad for its products.

At the commencement of the great war it was feared that the dairies would have to close down and much trouble and labour be wasted. A movement in this direction was also apparent, as the ceaseless appropriations for the army caused a reduction of almost one third in the milk-beasts.

Later, matters took a new turn. During the worst crisis many dairies had actually been closed down, but for those still in work better times dawned. Butter became scarce in the markets, its price rose and the dairies, many of which had struggled along beneath the load of their debts, paid

off the whole of their liabilities and continued their work unburdened by debt. The lack of provisions caused a good market for even the skimmed milk, which earlier no one had wanted to buy, the high price of cheese causing a rise in the price of skimmed milk also.—At the present day the dairies are increasing their cattle again and their production is again on a firm basis.

To further develop the matter the Ministry of Agriculture intends to found a dairy-school, where dairy-workers up to the latest standard of efficiency will be coached.

The present condition of the co-operative dairies is shown in the following figures:

In the year 1921 there were 154 dairies in Esthonia, of which 62 were co-operative dairies and 92 private concerns. Unskimmed milk was brought to 62 dairies to the amount of 37.3 mill. pounds, the average percentage of fat being 3.4 %. An amount of 33.6 million pounds was refined, producers receiving altogether 51 million Emk for milk. The dairies sold in the same year:

Butter	.....	1,317,000 pounds (1 pound = 0.425 kilo)
Cheese	.....	121,360 »
Tworog	.....	277,000 »
Sour cream	....	51,000 »
Caseine	.....	75,000 »

#### 14. CO-OPERATIVE MOVEMENTS.

In the month of October in 1921 there were in Esthonia 2,453 societies and associations, the members of which numbered nearly 300,000. Of the agricultural societies and associations may be mentioned: local farmer's societies 130, co-operative dairies 110, co-operative cattlebreeding

combines 78, co-op. cred. societies 109, farmers' associations 251, agricultural machine combines 394, co-operative peat combines 66, co-op. flax combines 5, co-op. potato combines 79, educational societies 155, etc, etc. The purely co-operative associations numbered 983 in October of 1921.

The connecting link and soul of the Esthonian co-operative movement is the *Esthonian Co-operative Central League* (Eesti Ühistegeline Liit), the members of which league are the co-operative societies of Esthonia, at present numbering 189. The chief duties of the league are the carrying-out of propaganda work and the publishing of the «Ühistegevuseleht» magazine.

Commercial co-operative activity is centred round the *Esthonian Co-operative Wholesale Society* (Eesti Tarvitajate Ühisuste Keskühisus), the membership of which in November, 1921 comprised 250 co-operative stores. Sales were in 1920, 210 mill. Esth. marks and in 1921, 850 mill Emks, rising in 1922 to over 1 1/2 milliard Emks. The central society possesses its own industrial concerns and occupies a leading position in the commercial life of Esthonia. Important duties were assigned to it during the war on account of this position. Many local co-operative stores can show annual sales of scores of millions. As remarked on earlier, the chief co-operative association in the field of dairy-farming is the «*Estonia*», which has at present 355 members. In latter times, besides the manufacture or refining of milk, butter, cheese, eggs, grain and meat for sale and export, this association has imported farmers' necessities from abroad.

In 1921, its sales reached 142 mill. Emks and during last year its sales totalled 650 mill. Emks. Deserving of mention is also the co-operative central bank, *Esthonian People's Bank* (Eesti Rahvapank) with a founding capital of 2 mill. Emk., the shares of which are in the hands

of co-operative societies only, its duties being the supporting of the finances of these and the regulation of their need for credit. The influence of the local Co-operative credit societies (109) on agriculture is also extremely beneficial, these acting as savings-banks and granting credit. During the Russian rule they were the only refuge for those seeking loans for the purchase of land. Their annual profits were made over to funds for the public benefit.

The co-operative movement has grown in scope in Esthonia with greater speed since the attainment of independence. The peasants see in the movement a defender and a power well able to watch over their rights during the present difficult times. The numbers gathering round the standard of the co-operative movement are continuedly enlarged, and a great future can safely be predicted for the idea in Esthonia.

Of the individuals who play, or have played the most important part in the development of agriculture, the co-operative agricultural concerns and the savings-banks, the following may here be mentioned: the Member of Parliament J. Tõnisson, the present Head of the State Joh. Kukk, Minister of Agriculture B. Rostfeld, the Director of the Co-operative Wholesale Society H. Namsing, the President of the Co-operative Central League A. Kask, Aug. Hanko and J. Sihver (Estonia), Dr. Masing, Dr. J. Raamot, Dr. A. Eisenschmidt, the Agricultural Experts J. Hünerson, J. Kalm, Th. Pool, J. Ümarik, the farmers H. Virkus and Joh. Ploompuu, the Instructor P. Kallit, etc, etc.

## 15. FORESTRY.

According to official statistics 720,000 desj. (1.94 mill. acres) of land are taken up by forest proper. If the forest

growing on meadow and pasture land be included, the whole forest-area of Esthonia is about 800,000 desjatin (2.2 mill. acres). Calculated per head of population this works out at 0.64 desj. per inhabitant. Only Russia (1.60), Finland (5.20), Sweden (3.87), Norway (2.93) and the Balkan States can show comparatively greater percentages of forest.

But these forests, as already mentioned, were up to the time of the Land Reform, in the hands of the large estates. Their exploitation, as also hunting and berrying in them and fishing in the forest lakes, was a privilege of the manors only. The peasants had hardly nominal holdings of forest. According to the Russian State Forestry Statistics for the year 1914, the peasants of Esthonia owned only 716 desjat. or one-tenth of the total area of forest. All the timber needed for various purposes had to be purchased by the peasants from the manors. The Land Reform enabled the State to take over the manor forests.

Up to the present, the time of growing, i. e., the period in which a forest is mature for cutting again, has varied considerably. In the Crown forests it has been 100—140 years for coniferous trees and 50—60 years for leaf trees, and in private forests, 50—60 for coniferous and 30 for leaf-trees.

At present, with the reversal of the forest of the baronial estates into the hands of the Government, the time of circuit for coniferous trees has been fixed at 100 and for leaf-trees 50 years. The forests are divided into 10 head districts and these again into 100 under-districts. The care and administration of the forests is in the hands of the *Forestry Board*, a sub-department of the Ministry of Agriculture. In the older forests the mass of wood is 200—680 sq. metres per desj. The annual growth is 3—4 sq. metres (110—115



Fig. 38. Well-developed fir-tree forest on lands belonging to the government, on the Island of Saaremaa.

sq. feet) per desj., which corresponds to a total growth in the whole of the forest (75 % coniferous and 25 % leaf-trees) areas of 90 mill. sq. feet per annum, and the area, where the annual (1920—24) cutting down of the trees can be done, 8,500 desj. Besides covering the home demand, a certain amount of timber is left over for export. The concession of 1 million desj. of Russian forest to Esthonia at the drawing-up of the Peace Treaty is also a considerable addition to the forests of Esthonia. The value of this right of use is at least 15—20 milliards Esthonian marks.

As the time of circuit in the Crown forests was exceedingly long and many private owners hoarded their own forests, it is to be taken into account that in many large forest areas, younger trees are almost completely lacking. But there are also forests belonging to the former land lords which were more or less destroyed during the last 5—6 years for the fulfilling of the demand of timber for forti-



Fig. 39. Forest for teaching purposes owned by the Tartu University.

fications and for the Army. The stoppage in the import of coal has also affected the forests. Especially in the area of the Tallinn fortifications has a great deal of forest been destroyed, partly without any reason whatever. The true state of Esthonia's forests can be finally gauged only when the Forestry Board has been able to complete its surveys in different parts of the land.

In Government service there are at present 2,112 forestry officials, of which 240 have passed higher examinations in the subject. The size of the different forestry areas varies between 5,000—50,000 desj.

Trees were planted in Government forests in 1921 over an area of 308 desj. and 554 desj. were sown.

Schools of forestry are at present in course of preparation. Higher education in forestry is given at the Tartu University.

During the war the export of timber was at a stand-still. Even in 1920 the export had not wholly reached its normal condition, as the Army was demobilized only in the same year, so that the ranks of labour could be filled. At present



Fig. 40. Fine pine-tree forest on land belonging to the town of Tallinn. The Esthonian pine and fir grow very straight and tall.

boards, deals, sleepers, cellulose and furniture are being exported. There are, altogether, 258 saw-mills in Esthonia, of which 35 are State-owned, 10 in the hands of Joint Stock Companies and 213 private. The majority of these are worked only for home supply; about 30—40 are so-called export-sawmills. Exports in 1920 reached 4.2 mill. poods timber, 350,000 poods cellulose and 819,000 poods paper and card-board.

## 16. EXPORT OF AGRICULTURAL PRODUCTS.

An important factor in Esthonian agricultural life is the *procuring of new markets*. With the closing of the old Russian market it became imperative to seek new purchasers abroad. In this, attention was concentrated on the fact that all products exported had to be unquestionably of the *finest quality*. For the purpose, special controlling bodies, working in connection with the Ministry of Agriculture, were established for the inspection of butter, cheese, meat, live animals, eggs and potatoes. The manner of inspection is fixed by certain by-laws. For the inspection of milk-products a separate Control Commission of well-known specialists was formed. Fresh meat and meat products are stamped after inspection by veterinary experts with a seal

on which, among others, the word «Esthonia» is apparent. Eggs are carefully sorted. All dairies engaged in the production of dairy produce are registered and are compelled to submit samples of all their products to a Commission (Control and Experimental Laboratory of Dairy-farming) working under the Ministry of Agriculture. These samples are examined and analyzed at the Tartu (Dorpat) University Laboratory. Butter is prepared from cream Pasteurized at a temperature of  $80^{\circ}\text{C}$ , and may not contain more than 15.5 % water. The special brand called «Paris butter» may contain at most 17.5 %. Inferior products are strictly prevented from leaving the country, being sold only for home consumption. A result of these measures is that the products of Esthonian cattle-keeping enjoy a comparatively high reputation, particularly in Sweden, Great Britain, Germany, Denmark, Finland and Russia.



Fig. 41. Grain elevator in Tallinn harbour and the «Kalevipoeg», Esthonia's finest passenger-steamer.

Up to the present time, Esthonia has possessed only small slaughter-houses and refrigeratories, which have further been lacking in minor details. Improvements in this respect have been set afoot. Among other measures, a Joint Stock Company »Külmetus» has been formed at Tallinn with a founding capital of 25 million Emks, which is to commence the building of modern refrigeratories, abattoirs etc., for the storing of such agricultural export products (butter, meat, eggs) as are easily perishable in nature.

With respect to agricultural products it may be mentioned that in addition to a plentiful supply for home consumption, the following amounts were exported in 1921 and during the first 9 months of 1922:

	1921 in poods	1922 in poods	1922 in Esth. marks
Grain .....	332.000	1.389.791	385.198.686
Flour .....	56.000	326.295	111.868.985
Potatoes ....	1.200.000	2.295.088	109.238.815
Meat products	6.000	78.969	55.723.093
Butter .....	7.802	39.007	123.474.770
Cheese .....	2.098	3.826	5.473.825
Cattle .....	673 head	5.826 head	46.157.350
Linseed .....	78.000	83.558	25.953.600
Flax .....	341.773	451.681	637.890.115
Eggs .....	9.342	9.000	10.000.000

The export of these articles during the first 9 months of 1922 was greater than that of the whole of 1921. Agricultural products form the most important staple of Esthonia's export.

To show, further, the part played by agricultural produce in the total export, the following figures are given from the years 1920—21<sup>1)</sup> (in poods):

<sup>1)</sup> At the time of writing the present survey, all the figures for 1922 have not been concluded.

	1920	%	1921	%
Paper and cardboard	819,308	9.8	739,942	10.2
Wood-pulp	350,800	4.2	52,474	0.7
Alcohol	84,500	1.0	42,615	0.6
	(1,690,000 litres)		(852,300 litres)	
Cement	325,600	3.9	448,807	6.2
Wood veneer	207,400	2.4	142,195	1.9
Potatoes	1,587,000	18.8	1,194,769	16.4
Potato-flour	—	—	23,262	0.3
Flax	228,200	2.7	339,885	4.7
Linseed	11,400	—	77,951	1.0
Timber	4,048,800	48.2	3,468,413	47.6
Rye	—	—	361,260	4.8
Oats and barley	—	—	12,498	0.1
Apples	15,134	0.2	74,451	1.2
Textiles	316,134	3.8	60,313	0.8
Scrap iron	139,589	1.7	144,707	2.0
Other goods (butter, cheese, meat, eggs, etc.)	27,5351	3.3	107,790	1.5
<b>Total</b>	<b>8,409,216</b>	<b>100 %</b>	<b>7,291,332</b>	<b>100 %</b>

Imports in 1920 were 5.4 million poods, and in 1921 9.4 million poods.

A view of Esthonia's foreign trade is furnished in the following figures, which though not quite exact, give the value of import and export in Esthonian marks:

Year	Export	Import	Proportion of export to import
1919	389,361,600	782,442,200	49.7
1920	1,228,379,956	1,395,185,291	88.1
1921	2,286,638,414	4,482,607,712	51.0

} average 62.9 %

During the past three years, therefore, exports amounted to 62.9 % of imports. If it be taken into account that

the proportion is no better in the majority of European countries, the Esthonian trade balance is not so unfavourable. In 1920 exports in France covered 63.4 % of imports, in Finland the proportion was 80.2 %, England 69 %, Greece 31.2 %, Spain 72.4 %, etc., etc. The figures for Esthonia are further to be seen in the light of the various imports necessitated by the first year of independence, viz., machinery, agricultural machinery, fertilizers for the numerous new small farms, even, owing to the destruction caused by war, grain and foodstuffs and raw material for the closed-down factories. Viewed in this light, the balance of import is easy to comprehend.

But though the trade balance is thus apparently unfavourable, it has not proved able to shake the position of the Esthonian mark. The exchange value of the latter has for an admirably long period been stable. Foreign currency has also been obtained by methods which do not appear in the trade returns. An example of such income is the lively transit traffic to Russia. Another rises from the concessions granted by the Government, e. g., for the refining of oil-shale, a third is the earnings of the comparatively large mercantile marine, the despatch of money to those at home by Esthonians living abroad also affecting favourably the financial situation of a small country like Esthonia.

And in all cases, the future of Esthonian foreign trade can be viewed with hope; there is no doubt whatever but that the Russian markets at some time or other will re-open for Esthonian goods. Already the trade balance for the first half of 1922 has been favourable, though the balance of export was certainly only small. During the first 8 months of 1922 904 horses, 1206 cows, 2193 pigs and sheep have been exported, value 34 mill. Esth. marks.

The great Agricultural Fairs held during the last two years and the Great Industrial Fair held in 1922 (120—

150,000 visitors) have by their rich array of goods proved the ability of Esthonia to compete in many branches of trade in the world's markets. The same was proved by the participation of Esthonia in the »*Nations' Food Exhibition at London*» in August, 1922, where the foodstuffs (butter, cheese, eggs, meat products) exhibited by Esthonia awakened quite particular attention. A circumstance favourable to Esthonia's ability to hold its own in economic competition is the excellence of its geographical situation from the point of view of commerce. The country possesses good harbours open throughout the year, over 1,000 kilometres of coast, large interior lakes favourable to navigation (Peipsi, Virtsjärvi), rivers (Emajõgi, Narova), and a comparative wealth of railway-lines. Fuel and provisions exist also in abundance. A drawback is the non-existence of iron and other metals.

Finally, it may be mentioned that Esthonia has formed *Trade Agreements* with Finland, France and Hungary. The Agreement with Finland came into force on Oct. 13 th, 1922. It is a fiscal agreement based on the principle of most favoured nation, imposing freedom from import duties in both countries on a variety of commodities, and to others decreased duties. With other countries also negotiations are proceeding for the drawing-up of Trade Agreements.

## 17. LAND REFORM.

When the Russian Bolsheviks invaded the land in 1918 they issued the following appeal to the peasant soldiers: »Why protect land owned by German landlords, you yourselves own nothing; only by our help can you obtain land.» The Esthonian Government responded with a proclamation to the effect that the Esthonian army was to fight for its *own land*, that all the landless were to receive land, that the

Esthonian peasant soldier was no longer called upon to defend the land of German estate-holders but, instead, his own small patch of land. The realization of the import of this proclamation undoubtedly acted as a strong stimulant on the Esthonian soldiers in this unequal, David and Goliath struggle against untold odds — the Russian bolsheviks and the German forces on the one side and Esthonia on the other.

And thus, the most important factor of development in the field of agriculture in Esthonia, one pregnant with many changes, is the Land Reform now being carried out. Before the reform, Esthonia was divided among: 1) *large estate-holders* 1,147, who owned 2,219,699 desj. of land or 57.95 % of the whole country (of this 374,949 desj. was tillage; average size of estate 1935 desj.) and 2) *small farmers* 50,961 with 502,338 desj. tillage and a total land area of 1,610,968 desj., or 42.05 % of the whole area of Esthonia. The average size of the small farms was 31.6 desj.

The large estates were divided into the following classes:

	Number	Area	%
1) Baronial manors . . . . .	734	1,404,340 desj.	63.27
2) Majority and <i>fidei-commis</i>	95	369,679 »	16.6
3) Manors of the Order of Knights . . . . .	8	40,634 »	1.83
4) Ecclesiastical manors . .	108	49,554 »	2.23
5) Crown manors . . . . .	101	219,239 »	9.98
6) Estates of the Bank of Agriculture . . . . .	19	62,435 »	2.81
7) Estates owned by towns	18	37,917 »	1.71
8) Legate and dowager estates	3	7,584 »	0.34
9) Country houses (Land- stelle) . . . . .	61	28,317 »	1.28

In use by the large estate-holders there were 1,147 households with 243,976 desj. tillage and a total land area of

1,610,318 desj., or 77.05 of the total area. Rented by the large estate-holders to small farmers were 23,230 farms with 130,973 desj. tillage and a total land area of 509,381 desj., or 22.95 % of the total area. According to the new Land Reform Law the State takes over all knightly, majority and fidei-commiss estates, the baronial estates and those of the Church, the former Russian State and Bank. These are calculated to total 1,065 estates, with an area of 2,147,822 desj., or 96.6 % of the total large estates, the enumerated having previously been in the hands of 200 aristocratic families, while 500,000 Esthonians procure their living from the land without possessing an acre themselves. The former landlords are to receive payment for the portable properties on the foregoing according to a fixed schedule; as already stated earlier, the question of compensation for the land itself is still under discussion and most probably compensation in some form will be paid for this also. The aim of the Land Reform Act is the creation of a class of small farmers in the place of the former large estate-holders; following this aim, the former rented lands have already been given over to their lessees and the act of division has merely comprised the straightening out of boundaries. The forests remain at the disposal of the Government, likewise the waste land and marshes, which form a permanent land reserve.

As set forth above, the State has taken over, in accordance with the Land Reform Law, altogether 2,147,822 desj. land. Of this, 607,505 desj., (28.3 %) has been ordered to be *parcelled* out, 494,968 desj. (23 %) to be given up to the former tenants and truck-servants on the large estates, and 1,045,349 desj. (48.7 %) placed under the care of the Forestry Board.

Of the land to be parcelled out, small farms to a total extent of 417,156 desj. had been finally divided at the end



Fig. 42. Old church on island Muhu.

of 1922, land having been granted to 18,260 applicants. A further 190,349 desj. of this land, in the form of large estates, is worked either by the State or by State institutions, rented to its former owners, or in the possession of the Church, schools, etc. But also in the case of lands in this category, the work of reparcelling continues. And when it is taken into account that a great part of these remaining estates (65 according to plan) are to be made over to institutions working for the public welfare, schools, societies, various Ministries, Rural Boards, industrial enterprises, it will be seen that only a comparatively slight part of the Land Reform remains unfulfilled.

Already in the beginning of this booklet the crying demand for land was touched on, and how a result of this hunger for land was a steady stream of emigrants to places where land was still to be obtained. An illustration of the strength of this demand is the fact that already during the debate on the Land Laws in the Constituent Assembly in 1919, over 50,000 applications for land were sent in. These laws made the return of numerous emigrants from Russia to Esthonia possible, after the complete loss of their property in the former country. It was estimated that a complete reparcelling of the large estates would yield at the very least 40,000 new farms. The War of Independence had

also shown many of the large estates to be in a state of ruin, with the accompanying danger that these would prove insufficient to feed the towns and the army. One of the causes of this decline was the appropriation by the Russian and German armies and the Bolsheviks of the portable property of the estates, while other estate-owners had left their lands uncared-for or were openly inimical to the Government of the country. In many cases capital was lacking for the care of large estates. Thus there was no recourse but to forcibly appropriate the estates for the Government, and in order to satisfy the hunger for land, to make away with the cultivation of large estates as such. The Land Reform which was the outcome, applies to the baronial estates with their forests, but is not extended to portable property. During the course of three years, 1920—22, 18—20,000 small farms have been formed out of these estates, the areas varying from 15—20 desj. in the south to 20—25 desj. in the north. Soldiers and officers who had fought at the front during the War of Independence were granted priority in the procuring of these farms. Land was at first leased for a period of six years, to be given after that period either on hereditary lease or sold outright with full property rights to its holder. The latter possibility, that of sale outright is at present under discussion. The main difficulty has been that only about one-third of the farms thus formed have earlier been fitted with the necessary buildings. The Government has, however, up to the present readily granted loans. The present amount of these loans is, in the form of fittings 130 million Emks, and in the form of buildings 36.5 million Emks, and in building loans 87 million Emks. A further 60 million Emks has been loaned by the Esthonian Ministry of Finance for the purchase of fittings. The majority of new farmers build, however, with their own resources and probably about 6,000 new dwelling-houses

on the new farms have been built or are in course of building, and, in 6—7 years time it is estimated that the whole of these farms will be fully equipped.

The opponents of the Land Reform frequently proclaim the difficulty of starting with empty hands, declaring that poverty will soon compel the colonists to leave their farms. Even a short experience has proved the opposite. The small farms have proved well able to cultivate their land, and even to compete with the large estates. Statistics already show the area under cultivation to have increased, likewise the harvests, while the number of head of cattle and horses is much greater. It has proved easier to supply the fields with fertilizers than earlier, when large estates prevailed. Now already the production of food is quite normal, large quantities being left over for export abroad.

It can thus be said that far from proving a blow to agriculture, *the Land Reform has, on the opposite, both added to and developed the same.*

It is often difficult for aliens to understand the extreme radicalism shown by Esthonia in the settling of its land question. But to those acquainted with the activities of the Baltic estate-owners, their double-dealing during the German occupation and the war of liberation, and the alien spirit cultivated by these during the centuries of their sway, when the most reasonable demands of the people remained unsatisfied and the utmost callousness was shown to the most primitive needs of the Esthonians, to those aware of the history of this land the present solution will come as no surprise. No other way was open to the Government. And yet, the new Land Reform Act is not intended to be a measure of revenge, neither is it as pitiless as the many laws under which those in power held their sway and gathered riches at the expense of the people's welfare. Its intention is: to arrange and organize the land so that equal chances

for a living from the land are open to all. Against this background the Land Reform Act should be weighed.

Naturally, the organization of conditions on the land is an interior question of Esthonia, and that the work will be successfully carried out no doubt can prevail. When the new small farms have weathered their initial difficulties, the chances for their profitable cultivation are as great as those of e. g., the »husmand» farms of Denmark. It is our unshaken opinion that this agricultural country is one of the most happily endowed of all the states which have broken away from the edge of the former Russian Empire.

---

## BIBLIOGRAPHY:

1. Statistics of the Esthonian Ministry of Agriculture's Statistical Department. 1921.
  2. Publication du Bureau Central de Statistique d'Esthonie 1920—22.
  3. Memorandum of the North Esthonian Agricultural Central Society.
  4. *M. Martna*: Estland, die Esten und die estnische Frage, Olten, 1919.
  5. *Willem Reiman*: Eesti ajalugu, Tartu, 1920.
  6. *J. Kents*: Eestimaa geograafia õpperaamat, Tartu, 1921.
  7. The Estonian Review 1919—1920.
  8. *A. Agthe*: Ursprung und Lage der Landarbeiter in Livland, 1909.
  9. *A. H. Snellman*: Itämeren suomalaiset saksalaisen valloituksen aikana 1159—1229, 1907.
  10. *M. Kampman*: Eesti Kodumaa I ja II, Tallinn, 1919, 1921.
  11. *Ed. Laamann*: Eesti lahkumine Vene riigist 1917—1920, Tallinn, 1920.
  12. *G. E. Luiga*: Die Agrarreform in Eesti, Helsingfors, 1920.
  13. »Agronomia», Põllumajanduse ja Loomatervishoiu ajakiri 1921—22, Tartu.
  14. Bericht über die Tätigkeit der Kontrollvereine in Estland für das Jahr 1913—14.
  15. Manchester Guardian Commercial, Reconstruction in Europe, 7. September 1922, Berlin.
  16. Peoples of All Nations, art. Esthonia, The Baltic State & Its Unconquerable People, by *Florence Farmborough*, London, 1922.
  17. Annuaire Internationale Statistique Agricole 1901—21, Rome.
-

# CONTENTS.

	PAGE
PREFACE .....	5
1. HISTORICAL SURVEY.....	7
2. GEOGRAPHICAL SURVEY .....	15
3. AGRICULTURAL EDUCATION. ....	24
4. AREAS SOWN AND HARVESTS.....	30
5. THE CULTIVATION OF POTATOES .....	34
6. FLAX .....	37
7. SEED-GRAIN — SPECIAL CULTIVATION .....	38
8. AGRICULTURAL MACHINES ..	40
9. EXPERIMENTAL WORK.....	43
10. THE FERTILIZER QUESTION AND ESTHONIAN PHOSPHORITE ....	46
11. AGRICULTURAL SOCIETIES .....	49
12. DAIRY-FARMING.....	53
13. CO-OPERATIVE DAIRIES .....	66
14. CO-OPERATIVE MOVEMENTS .....	68
15. FORESTRY .....	70
16. EXPORT OF AGRICULTURAL PRODUCE .....	74
17. LAND REFORM .....	79
BIBLIOGRAPHY .....	86

---