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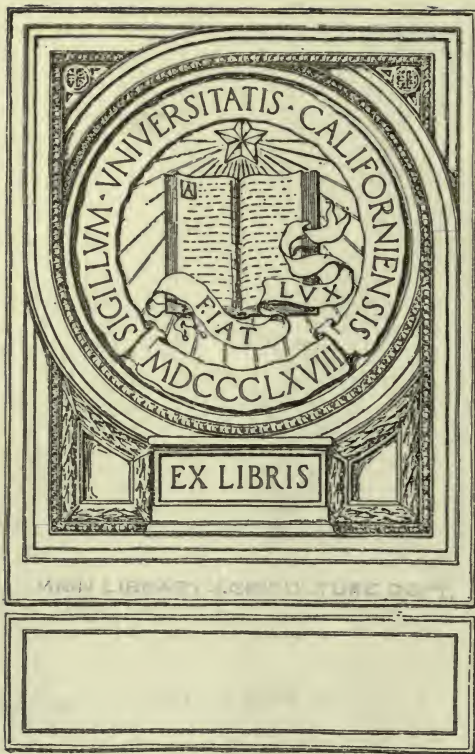


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NOTES ON
AGRICULTURE IN CYPRUS
AND ITS PRODUCTS

BY W. BEVAN
Director of Agriculture, Cyprus

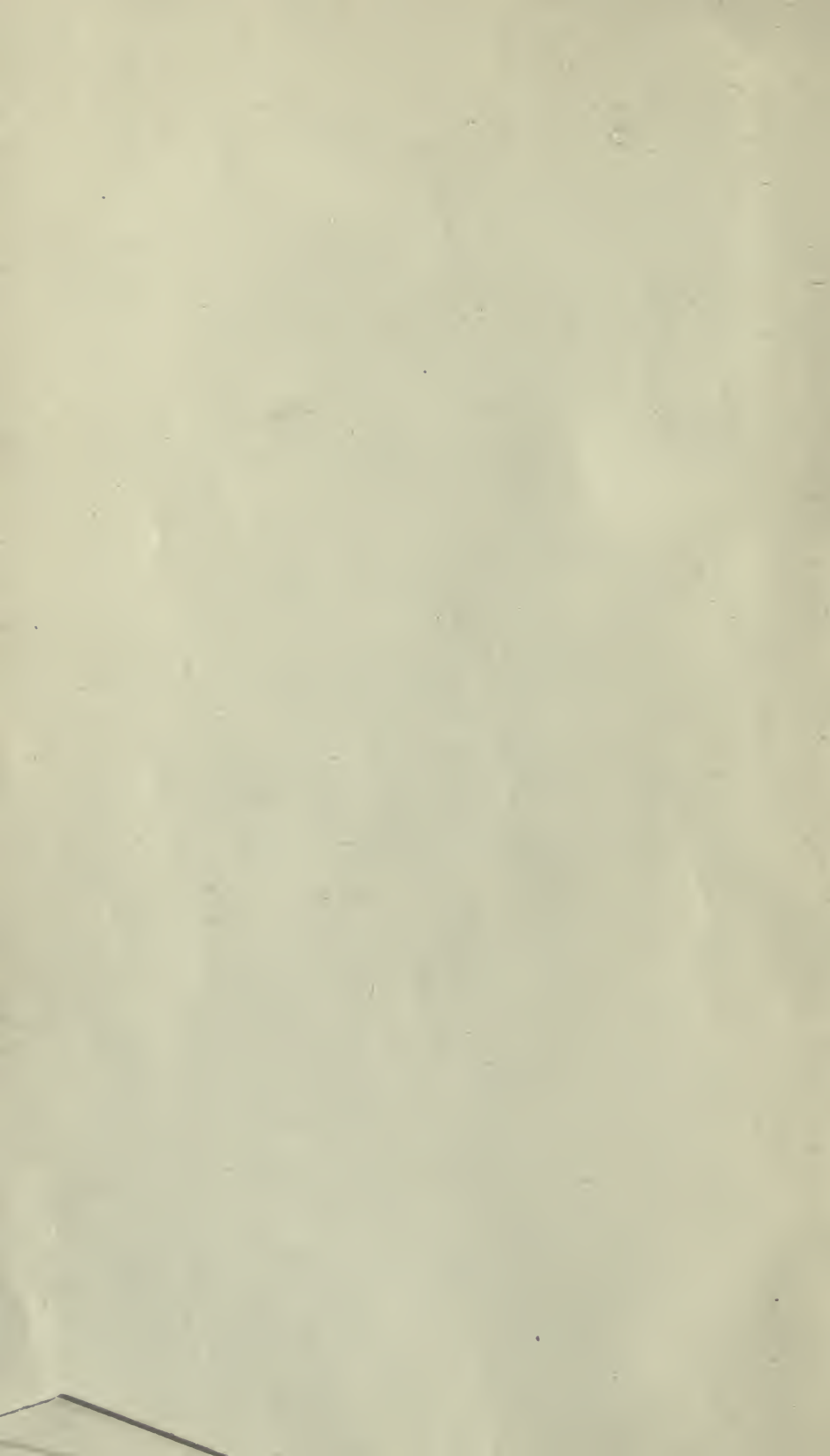
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BY W. BEVAN

Director of Agriculture, Cyprus

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NOTES ON AGRICULTURE IN CYPRUS AND ITS PRODUCTS¹

BY W. BEVAN

Director of Agriculture, Cyprus

THE intention of these notes is to make available to those interested in the agriculture of Cyprus some of the information scattered in various reports, leaflets and correspondence not readily accessible to the general public.

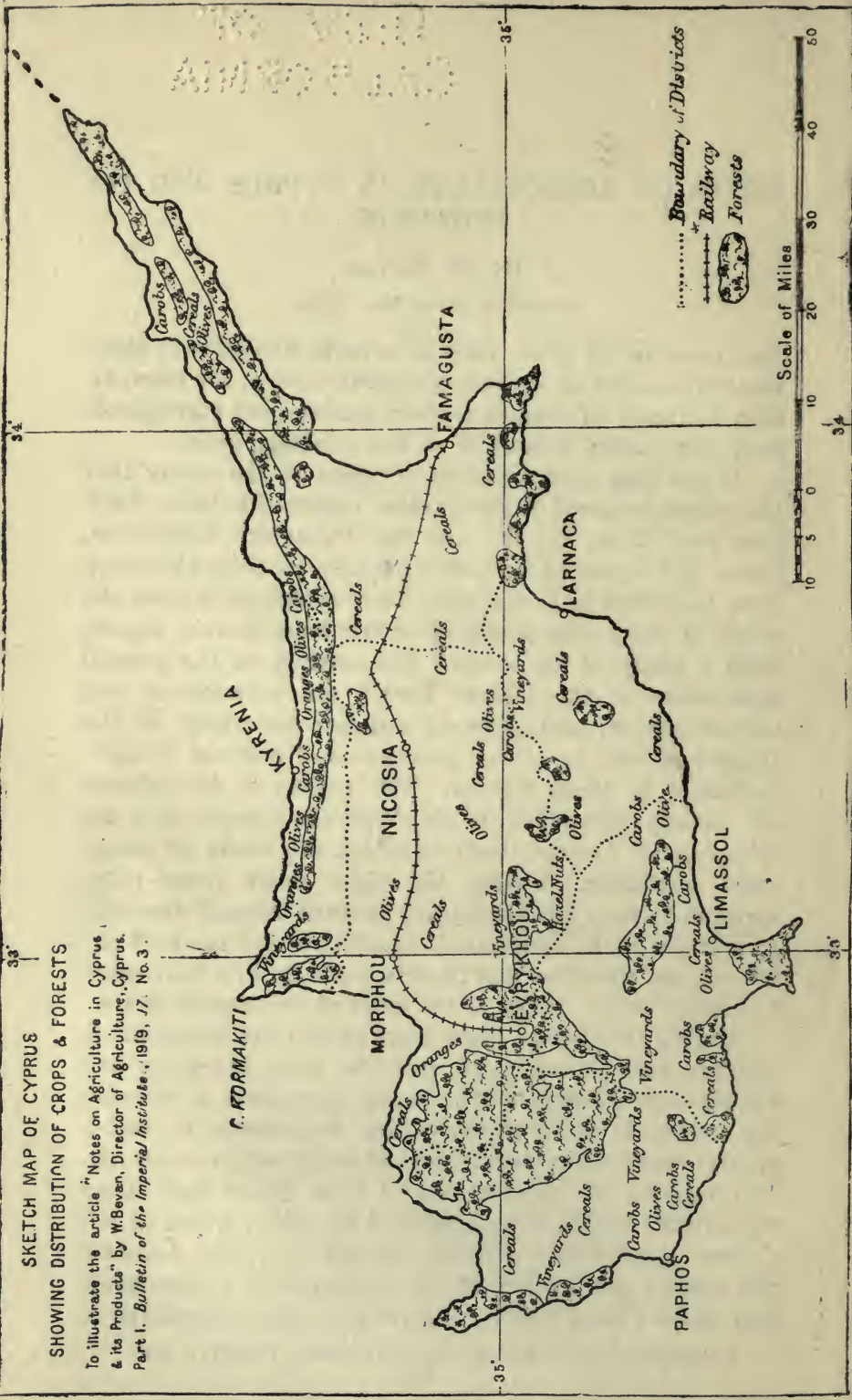
It has long been a matter of regret to the writer that the valuable stores of information collected with so much care and ability by the late Mr. Panayiotis Gennadius, formerly Director of Agriculture in Cyprus, through having been published in Greek only, have remained beyond the reach of many who might otherwise have derived benefit from a study of his works. His writings on the general agriculture of the "Near East" are voluminous and comprehensive, and show an intimate knowledge of the subject as well as of the practices and customs of agriculturists in these regions. The results of his labours are mainly embodied in his *Helleniki Georgia* and his *Phytologikon Lexicon*, both of which are works of recognised authority. During his eight years (1896-1903) spent in Cyprus Mr. Gennadius devoted himself specially to a study of the agricultural conditions and needs of the Island, and the notes and reports made by him have been, to a large extent, taken as the basis of the present Notes.

During the sixteen years since he left the Island many changes have taken place, and the more receptive and enlightened attitude of the rising generation of farmers has helped to bring about various improvements, and a greater readiness has been shown to adopt modern methods. In compiling the present Notes I have drawn freely from the articles which have appeared for many years in the *Cyprus Agricultural Journal* (formerly *Cyprus Journal*), the official publication of the Agricultural Department, and which I have edited; I have also taken advantage of

¹ Reprinted from the BULLETIN OF THE IMPERIAL INSTITUTE, 1919.

SKETCH MAP OF CYPRUS
SHOWING DISTRIBUTION OF CROPS & FORESTS

To illustrate the article "Notes on Agriculture in Cyprus & its Products" by W. Bevan, Director of Agriculture, Cyprus, Part I. *Bulletin of the Imperial Institute*, 1919, 17, No. 3.



..... Boundary of Districts
+ + + + + Railway
Forests

Scale of Miles
10 5 0 10 20 30 40 50

the very admirable and reliable information contained in the *Handbook of Cyprus*, edited by Messrs. Lukach and Jardine.

I am greatly indebted to the willing assistance of Mr. Procopios Symeonides, Inspector of Agriculture, whose thorough acquaintance with local conditions and usages has enabled him to contribute much useful and informative material. I have also to offer my acknowledgments to Messrs. M. G. Dervishian, C. Pelagias, Z. Solomides, G. Frangos, A. Klokaris, A. Panaretos and others who have kindly supplied me with data of various kinds.

It will scarcely be necessary to add that little more than a summary of the agricultural practice and resources of the Island has here been attempted, and in no sense does it pretend to be anything more. The aim has been to give the reader a general idea of what Cypriot agriculture is and, to some extent, what it is capable of doing.

I. GENERAL

Geographical Features

The Island of Cyprus is situated in the innermost basin of the Mediterranean Sea ; about 40 miles distant from the Asia Minor coast on the north, and about 60 miles from Syria on the east, and 238 miles from Port Said to the south. It is the third largest island in the Mediterranean, ranking next to Sicily and Sardinia. The larger part of the Island is in the form of an irregular parallelogram, 100 miles long and from 30 to 60 miles broad ; while on the north the eastern extremity runs out beyond this into a peninsula 40 miles long by 5 to 6 miles broad. The total area is 3,584 sq. miles. The main topographical features are the northern and southern mountain ranges running east and west and enclosing the great plain of the Messaoria. The mountains of the northern range are of an altitude ranging from 2,000 ft. to over 3,000 ft., the highest point being Buffavento, 3,135 ft. ; those of the southern range are more lofty and culminate in Mt. Olympus, 6,406 ft. above sea-level. The rivers are nearly all mountain torrents, and are dry from about July to November or December.

The area of cultivated land is approximately 1,200,000 acres, and that of the uncultivated land 1,093,760 acres, of which about 450,000 are forest land and 320,000 are susceptible of cultivation. The Messaoria plain is the great corn-growing area.

Climate and Rainfall

There are considerable extremes of temperature in the plains. In summer it is very hot and dry with temperature ranging during June to September from 80° to 110° Fahr., while in winter slight frosts not infrequently occur. The climate is more equable, but also more humid, along the coasts. In the plains there is, during the greater part of the year, a marked variation between the day and night temperatures.

Official records show that for a period of thirty-two years up to 1915 the average rainfall for hill and plain for the whole Island approximated to 20 inches. Up to 1902 records were kept only in the six district towns, but since then there have been some fifty recording stations. The mean rainfall during the winter months for the twelve years ended 1914 was 18.55 inches. That for the whole year during the latter period was 21.18 inches.

The incidence of rainfall, apart from its volume, is of importance. It is on the rainfall of the six winter months, October to March, that the prosperity of the Island depends, and any shortage during this period cannot be balanced by heavier summer rains, which are more liable to cause harm than good, by damaging the corn lying on the threshing-floors and by causing sudden floods.

Much importance attaches to the rains in March, without which the grain crop, however ample the earlier rains may have been, will not be satisfactory, as described in a maxim which I have attempted to render in English.

If twice in March it chance to rain,
 In April once, a shower in May,
 In weight in gold of man and wain
 The farmer's crops are sure to pay.
 If roads are dry at Christmas time,
 But Epiphany finds both mud and slime,
 And at Carnival they still hold many a pool,
 The farmer finds his barns quite full.

Administration

The Island is administered by a High Commissioner. There is an Executive Council and a Legislative Council consisting of six official members and twelve elected members, of whom three are elected by the Moslem and nine by the non-Moslem inhabitants. The Island is divided into six districts, in each of which the Executive Government is represented by a Commissioner.

Weights, Measures and Currency

Nearly everything except corn, wine, oil, carobs, cotton and wool is sold by the oke.

An oke, dry measure, equals 400 drams, or $2\frac{1}{2}$ lb.

The liquid oke is reckoned as equivalent to a quart.

Grain is measured by the kilé, regarded as equal to a bushel.

Wool, cotton and oil are sold by the litre of $2\frac{1}{2}$ okes, but commonly reckoned as $2\frac{1}{2}$ okes.

Carobs are sold by the Aleppo cantar of 180 okes. This cantar is further divided into 100 litres of 1 oke and 320 drams each.

Wine is sold by the kartos = 4 okes, the kouza = 8 okes, and the gomari = 128 okes.

1 kilé of wheat weighs 20 to 22 okes.

1 kilé of barley weighs 14 to 18 okes.

1 kilé of oats weighs 13 to 14 okes.

1 kilé of vetches weighs 23 to 24 okes.

1 sack of straw weighs about 40 okes.

1 camel-load of straw weighs about 200 okes, consisting of 2 sacks, each weighing about 100 okes.

Measures of Length

Metron or metre.

Yarda or yard.

Pic = 2 ft. or two-thirds of a yard.

Inch = English measure.

The land measure is the donum (called by the villagers "scala"), but it is very uncertain, and varies in different parts of the Island. As recognised by law, 1 donum, called

“ tappoo donum,” equals 60 pics = 40 yards square = 1,600 square yards, or 14,400 sq. ft. ; 3·025 of these donums go to the acre. There is also a farmer’s, or “ reshper ” donum, which is commonly used by agriculturists and is equal to about $1\frac{1}{2}$ Government donums. For general purposes a legal donum is about one-third and a Cypriot farmer’s donum about one-half of an acre. “ Stremma ” is also a synonym for the farmer’s donum, or scala, although its actual measure is very much less.

Currency

£1	= 20 shillings or 180 copper piastres.
1 shilling	= 9 copper piastres.
1 cp. (copper piastre)	= 40 paras.

II. AGRICULTURAL CONDITIONS

General

Agriculture is the main industry of the Island, which is favourably situated for the markets of Egypt, Syria and Asia Minor, although the former is practically the only buyer of its perishable produce. During recent years the Cypriot agriculturist has come to realise more and more the value of the Egyptian market and a considerable trade with that country has grown up.

Land Tenure and Labour

The small farmer mostly cultivates his own land, whereas the large landowner rarely does. The metayer, or metairie, system is fairly common, and has much to recommend it when honourably carried out by both parties, but it is open to very serious abuse.

Under this system the one party, or contractor, gives the seed and often lends the cattle. A valuation of the latter is made at the time of entering into the agreement, and a re-valuation is made on termination, any depreciation being made good by the other party, or metayer. The latter finds the necessary labour and feeds the animals and pays an agreed rate for their hire. The crops, after deduction of Government tithe, are usually divided equally

between both parties, but the conditions vary according to circumstances and the nature of the crops grown.

If cultivated land be given to the partner, such land must be returned to the contractor in the same state of cultivation as received, or the contractor, at his option, may claim the return of the seed his partner received with it.

There are also a considerable number of leaseholders paying a fixed rent. The monasteries are the largest landowners, and both cultivate their own land and let out portions to the monks or to private farmers. Much land is also held by the Church, and this is frequently let out on a yearly lease, with the result that it is badly farmed and speedily worked out.

The country is rather sparsely populated by about 275,000 inhabitants, and although the cultivators are laborious when working for themselves and when free from the hands of the usurers, they are still very backward in their methods and appliances. A less conservative attitude has of late been observed, and a greater readiness has been manifested in seeking and following the advice of the Agricultural Department. There is a great amount of indebtedness among the peasantry and usurious practices abound. This undoubtedly checks progress, as few of the smaller farmers are free agents. The matter has lately been the subject of a special Commission appointed by Government. Laws have this year (1919) been passed by the Legislative Council dealing with usury and indebtedness.

Tithes and Taxation

The tithe, which forms the principal source of Government revenue, is one-tenth of the produce of the land on wheat, barley, oats, vetches, rye and favetta, measured on the threshing-floors and delivered in kind at the Government Grain Stores. Certain allowances are made to the tithe-payers for transport. In the case of carobs, which are also subject to this tax, the tithe is taken in money from exporters at the Custom House at the rate of 9 cp. (1s.) per cantar from the districts of Nicosia, Larnaca and Limassol, and 8 cp. per cantar from the other three districts.

There are certain export dues, in lieu of tithe, payable on the following commodities: Aniseed 33 cp., cotton 55 cp., linseed 18 cp., mavrokokko (black cummin) 7 cp., and raisins 10 cp. per 100 okes; silk cocoons $6\frac{3}{4}$ cp., wound silk 18 cp., silk manufactured by other than hand looms 18 cp. per oke.

An annual tax is levied of $3\frac{3}{4}$ cp. per head on every sheep and of 5 cp. per head on every goat one year old and upwards, and of $4\frac{1}{2}$ cp. per head on every pig over three months old.

Credit and Agricultural Societies

The spirit of co-operation has hitherto been singularly lacking, but there are signs that a change is in progress and that, with proper guidance, the cultivators will ere long come to realise the advantages of combined effort in the production and distribution of their crops.

The establishment of village co-operative Credit Societies has long been advocated, but although a law was passed in 1913 for this purpose, there has so far been little practical outcome. Co-operation in its full modern significance is not yet understood; but one or two little village co-operative banks have nevertheless been started and show encouraging results.

There are also a few small village agricultural societies springing up, which, if properly conducted, may prove the pioneers of a general movement in this direction. The existence of such societies would greatly facilitate the work of the Agricultural Department, which would be able to influence and assist farmers through their societies, whereas now it is often not possible to reach them individually.

Irrigation

The most common method of raising water is by means of primitive water-wheels or "alakatia," often described as "Persian wheels" and resembling the "sakia" of Egypt. By these the water is carried in earthenware cups attached to the rim of a large vertical wooden wheel fixed in the mouth of a well and made to revolve by a mule

or donkey by means of a horizontal wheel and beam, or by modern air-motor. Myrtle branches are mostly employed for attaching the cups to the wheels, as these are pliable and resist the action of water.

These "alakatia" were formerly made entirely of wood, but in the nineties, iron ones ("noria") were introduced from Greece, and these have become fairly general, and are gradually supplanting the older types. They have the advantage of being more durable and lighter to work. Good iron wheel wells are now locally made. Water-wheels of this description cannot be used for raising water from a depth of more than ten fathoms below the surface of the ground.

Of late years a large number of air-motors of Canadian pattern have been introduced and are found satisfactory.

There is abundant evidence in the remains of old disused Venetian wells and cisterns that in pre-Turkish times, when the country was far more densely populated than at present, a larger quantity of underground water was utilised than now. Abundant subterranean water for agricultural and gardening purposes is to be found in almost all the coast lands as well as in many parts of the interior. Such waters are either brought to the surface along subterranean channels or by means of wells, and, for the most part, have their origin in the mountain ranges, specially in the southern range, which is the rainy region of the Island.

Artesian well-boring experiments have been made in recent years in different parts of the Island, but without substantial results. In the Famagusta district large reservoirs were constructed several years ago for impounding the surplus water of the rivers of Pedias and Ialias, but these have only been very partially successful as the water is mostly lost before it reaches them.

A satisfactory solution of the water problem is of supreme importance to the Island. There are large fertile areas which every year remain fallow, but which, if capable of irrigation, would grow excellent cotton and other summer crops, thus providing a better system of rotation. Vegetable growing and fruit culture could then also be very greatly extended.

Agricultural Implements

Ploughs.—The old wooden plough of the East is still the common plough of the country (see Plate I, fig. 1). Efforts were made from 10 to 15 years ago to introduce iron ploughs by selling them through the Agricultural Department at half the cost price and even less. High-water mark was reached in 1908 when 102 of these ploughs were so sold. These were much approved of, and the further sale was then left in the hands of merchants. The demand at once fell off and since then only a few have been introduced. For a year or two a certain number of iron ploughs of Russian make were imported and sold through the Jewish settlement at Margo.

There is now a considerable demand which it may be possible to satisfy when normal conditions are resumed. There is some prejudice against English-made ploughs on the score of weight, as they are mostly heavier than those of French, Russian, Greek and American make.

Harrow.—The native harrow, "saraelo," is a wooden beam about 10 ft. long by 12 to 18 in. broad and 3 in. thick, on which the labourer stands as it is drawn over the newly sown land. It is ineffective inasmuch as it does not break the clods, but merely presses them into the ground. Iron-toothed harrows and spring-toothed harrows have been lent by the Department for demonstration purposes to different persons, and these, particularly the second kind, have found favour and are likely to be in demand for covering the sown seed. The usual method is to cover the seed with the native plough, but the European harrow is seen to do the work more effectively and with a great economy of time.

Among the more common agricultural tools of native pattern are the following (see Plate II) :

Tsappa (hoe).—The wider tool, 5 in. to 6 in., is mostly for garden use ; the narrow *tsappa*, about 3 in. wide, is for field work.

Skalistiri.—A kind of small *tsappa*, 2 in. wide, having two prongs 4 in. to 5 in. long at the opposite end. It is mostly used for hoeing vegetables.

Xinari (axe or hatchet).—One end of the implement



Fig. 1.—Ploughing on a Mountain-side with Native Plough,

3 3 2 2 3 3 2 2 2 2 2 2
3 3 2 2 3 3 2 2 2 2 2 2
3 3 2 2 3 3 2 2 2 2 2 2
3 3 2 2 3 3 2 2 2 2 2 2
3 3 2 2 3 3 2 2 2 2 2 2
3 3 2 2 3 3 2 2 2 2 2 2
3 3 2 2 3 3 2 2 2 2 2 2
3 3 2 2 3 3 2 2 2 2 2 2
3 3 2 2 3 3 2 2 2 2 2 2
3 3 2 2 3 3 2 2 2 2 2 2



Fig. 2.—Newly-prepared Beds in Experimental Gardens.

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is a sort of hoe, and the other end is shaped like a mattock. Used for cleaning off weeds, shrubs, etc., from the fields; also for cutting or splitting wood.

Kouspos.—These are of two kinds. The larger is used like a tsappa, but in stony or rocky places; the smaller is the tool used by well-sinkers. It can be conveniently handled in a confined space.

Karetta or *Cart*.—This has almost entirely superseded the old Cypriot type of cart, but the latter may yet be seen very occasionally in the Karpas and possibly in the Paphos district. It is still in use in some parts of Anatolia. In its construction no iron nails are needed.

Doukani.—The common threshing-board (see under "Cereals," p. 29). This is the primitive implement handed down from classic times and generally seen throughout the East (see Plate V, fig. 2).

Thernatchin.—A wooden shovel used for winnowing grain. It is deeply serrated, or divided, into 5 or 6 triangular-shaped teeth.

Arvalin.—A corn sieve. A goat's or sheep's skin, perforated with holes, is stretched across a round wooden frame, 12 in. to 18 in. in diameter. Instead of a skin, leather thongs or gut are stretched, crosswise on the frame. Perforated tin is now sometimes employed. These sieves are used for cleaning grain after winnowing.

Arkon.—Another kind of sieve, similar to the above, but with smaller holes for sifting fine seeds, dust, etc. Mostly made of skin, but now tin is being used.

Patourin.—A similar sieve, used for still finer work.

Skala.—An iron dibber, fitted with two wooden handles, used for planting vine cuttings.

Some advance has been made of late in cleaning the land, but foul land is pretty general. Squills, thistles, thorny bushes, and so forth abound; these are mostly deeply rooted, drought-resistant plants, and the labour required for uprooting them is not forthcoming.

There are a fair number of reaping machines now in use, but little care is bestowed on them, and when slightly out of order they are often put aside as useless. More enlightened ideas are now prevailing, and the abundant crops of the last few years have created a strong desire

for more reapers and also for threshing machines, of which there are at present barely half a dozen in the Island.

The Agricultural Department

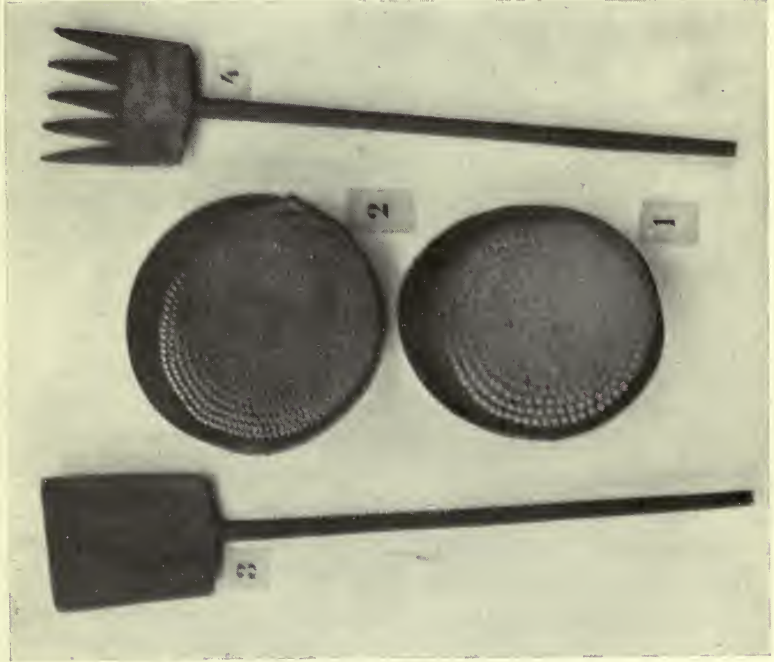
The Agricultural Department was established on a small scale in 1896, under the direction of Mr. P. Gennadius. It continued much on its original lines until 1912, when its establishment was enlarged, and the Government Farm and the Veterinary Branch were attached to the Department, and again in 1914 it underwent a further slight extension which was necessarily checked by the war. There is now a staff of inspectors, district overseers and agricultural demonstrators who are occupied in continually travelling in the country, advising and giving practical assistance to cultivators, lecturing on village wine-making, poultry-keeping, bee-keeping, on the action to be taken against various pests and so forth.

There are some eight Government Nursery Gardens in the districts from which large numbers of trees, plants and seeds are issued. A system of Model Orchards and Vineyards, newly started, is giving satisfactory results. These are intended to assist those engaged in the production of fruit and vegetables, for which an unlimited market is close at hand in Egypt.

Seventy School Gardens are in existence throughout the Island under the guidance and control of the Department. By their means many young fruit trees and other plants and seeds are annually distributed at low rates, better methods of cultivation and new kinds of vegetable and fodder plants are being made known, and the village boys are being taught something about the work on which they will later depend for their livelihood.

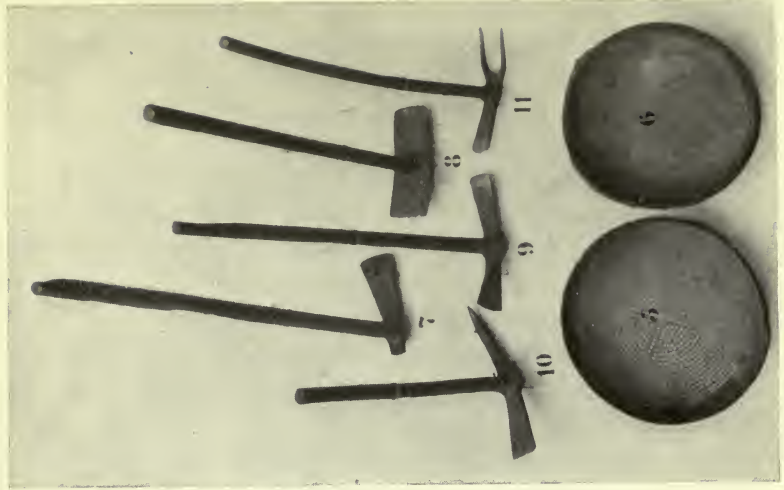
An Agricultural School for the sons of farmers was opened at Nicosia in 1913 under the direction of the Agricultural Department. Some twenty to twenty-five lads between sixteen and twenty years of age, both Greeks and Moslems, receive a two-year course of instruction with a view to fitting them to cultivate their own properties later. A few of the more promising students have been retained as student-labourers in the Department,

PLATE II.
Agricultural Implements.



1 2 3 4 5 6 7 8 9 10 11

1, Arvalin for barley and oats. 2, Arvalin for wheat and vetches. 3, Shovel for winnowing. 4, Thernatchin. 5, Arkon. 6, Patourin. 7, Tsappa, narrow, for field use. 8, Tsappa, wide, for garden use. 9, Xinari. 10, Kouspos. 11, Skalistir.



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after the termination of their school course, and of these again a few have been given minor appointments in the Department. A scheme for training young Cypriots abroad, which was in abeyance during the war, makes it possible to give the more capable of these some further training in Europe in the higher branches of agriculture. It is hoped, by this means, to form a group of native experts from among whom the technical staff of the Department can be recruited.

The Government Farm, Athalassa, though somewhat ill-placed for purposes of education and demonstration, has done good work in improving the live stock of the country, as evidenced at the Animal Shows held every year. Periodical auction sales of Athalassa stock take place in the different districts.

During the three years 1915-18, there were reared at the Farm and distributed 41 cattle, 264 sheep, 8 donkeys, 332 pigs and 2 mules, besides a considerable head of poultry.

The total value of the live and dead stock was estimated on March 31, 1918, at £3,128.

For breeding purposes there were 6 stallion horses, 8 jack donkeys, 8 bulls and 7 boars in 1917-18 stationed either at Athalassa or at the stud stables which have been established in the districts. Some 30 cast army mares have been obtained free of cost from the Remount Department, Egypt, and have been lent out on contract to farmers for mule breeding.

During 1917-18 the Farm produced 169 cheeses and 1,036½ lb. of butter. In the winter of 1917-18 some 314 donums of land were under cultivation, the chief crops being barley, oats, wheat and gavetta (*Lathyrus sativus*).

The Veterinary Establishment provides for 1 Veterinary Surgeon, 2 Stock Inspectors and 1 Veterinary Compounder. There is a good deal of endemic contagious disease among the flocks and herds of the Island, mainly anthrax and goat- and sheep-pox, and the Veterinary staff is kept busy. Cattle plague is unknown in the Island.

Cattle breeding should become a paying industry when once the lesson of proper feeding and management has been learnt (hitherto sadly neglected by the Cypriot

farmer), since Egypt provides a ready and remunerative market.

Perhaps no work is of more importance than that of combating the numerous insect and other pests which every year cause heavy loss to the agricultural community. The addition of an Entomological Laboratory and the appointment of an Entomologist have enabled the Department to afford relief to many cultivators, and a small but active entomological staff are constantly engaged on various pest campaigns.

The Department possesses a small but well-equipped Chemical Laboratory under the charge of an Agricultural Chemist. In the absence of any law, the Department has, in the interests of importers and agriculturists alike, offered its services for analysing and reporting upon samples, sealing bags and giving advice as to the use of the different types, and this action has been readily availed of. This in itself, however, is not enough to check malpractices or safeguard the cultivators.

For the last four years the Department has had trial plots in which new varieties of cereals and fodder plants have been experimentally grown (see Plate I, fig. 2). The seed has been obtained from England, South Africa, India and Australia, but so far none of the varieties have been found in any marked degree superior to the native kinds. One or two varieties introduced two years ago are promising, and when fully acclimatised may be worth the attention of farmers. Experimental sowings are often made in the villages when it is desired to bring any particular crop to the notice of the agricultural classes.

The *Cyprus Agricultural Journal*, published quarterly in English, Greek and Turkish, is the official organ of the Agricultural Department.

Fungoid Diseases and Insect Pests

The Cypriot agriculturist has to contend against the attacks of many species of insects and a number of fungoid pests. Little could be done to bring these under control until, in 1914, an Entomological Branch of the Agricultural Department was established. Much valuable research

and descriptive work had been carried out by Mr. Gennadius, but no organised field work could be undertaken until the last three or four years.

A detailed description of the numerous pests cannot here be given, but the more important ones are enumerated below. Happily Cyprus is one of the few Mediterranean countries which has not been invaded by *Phylloxera*.

Cereals.—*Eco-phora temperatella* (Limassol district only), smut and rust, hessian fly (occasionally), grain weevils (*Calandra granaria*), grain moth (*Sitotroga cerealella*).

Carobs.—*Cecidomyia ceratonixæ*, scale (*Aspidiotus ceratonixæ*) *Myelois ceratonixæ*, borer (*Cossus liniperda*), *Oidium ceratonixæ*.

Olives.—*Capnodium*, scale (*Lecanium oleæ* and *Aspidiotus oleæ*), aphid (*Psylla oleæ*), olive fly (*Dacus* sp.), *Tinea oleela* and various borers.

Citrus and other Fruit Trees.—Gummosis (Citrus and all stone fruits); scale (all); ermin moth (apples, pears and plums); downy plant louse, *Schizoneura lanigera* (apples); aphides (almond, peach, plum and apricot); *Tingis pyri* (pears and apples); codlin moth, *Carpocapsa pomonella* (apples, pears, quinces and walnuts); peach leaf curl, *Exoascus deformans* (peaches); black aphid (peaches); Mediterranean fruit fly, *Ceratitis capitata* (all); mites, *Acarus* sp. (all); various borers, thrips, and barkbeetle (*Scolytids*).

Vines.—*Oidium Tuckeri*, *Peronospora*, anthracnose, *Cladosporium*, root rot, *Zygæna ampelophaga*, thrips, *Cochylis*, *Lita solanella*.

Vegetables.—*Peronospora infestans* (potatoes), *Cladosporium*, *Altica*, aphides, mole crickets.

Much damage is done to carobs by the large rat, *Mus Alexandrinus*.

The large fruit-eating bat is a great pest. Hornets attack all kinds of fruits and cause much loss.

The chief cotton enemies are the cotton boll worm (*Earias insulana*), aphides and *Capnodium*.

Locusts are no longer the formidable plague they were in the eighties. They are limited almost to the Famagusta district, where they annually breed and do a certain amount of damage to early cotton and to vegetable crops. If not

vigilantly kept under control they would quickly multiply and become a serious danger.

III. LIVE STOCK

Cattle

The cattle of the country have been bred, until the last two or three years, exclusively for draught purposes. Cattle breeding as a business is unknown. Farmers, as a rule, aim only at raising a calf or two every year in order to maintain one or more yokes of oxen. Some of the draught animals are very fine (see Plate III, fig. 1, and Plate V, fig. 1). These belong mostly to the monasteries; one animal exhibited at a recent show measured over 17 hands. The race is presumably the result of many crossings with imported breeds, but has acquired a definite type. The cows are in colour and conformation not unlike Jerseys, but larger and without the udder development of that breed. The oxen have mostly a more or less pronounced hump, possibly acquired through many generations of progenitors used exclusively for draught purposes. In some of the best bulls this hump is particularly marked.

In 1912 some Devon bulls and cows were imported and a herd of this breed was started at the Government Farm, Athalassa. An impetus was thus given to breeding dairy cows, and a number of half- and three-quarter-bred cows are now to be found, which command high prices for milking purposes. The Devon bulls, however, have never come into favour among farmers for raising draught cattle.

There was a fair export of cattle to Egypt before the war, a good proportion of the animals being consigned to the Serum Institute, Cairo, as Cyprus cattle, alone among the cattle in this part of the Levant, have so far been free from plague.

The number of horned cattle in 1917 is officially given as 48,761.

The exports for the five years preceding the war were :

Year.	Number.	Value.
		£
1909	2,357	11,314
1910	4,240	20,218
1911	9,664	44,871
1912	5,751	34,303
1913	3,017	20,110

PLATE III.



Fig. 1.—Native Bull.

PLATE III.
FIG. 1.—NATIVE BULL.



Fig. 2.—Native Ram.

1875

There can be no question that if more attention were paid to growing fodder crops, cattle breeding could be greatly increased, and a good trade with Egypt might be done.

The establishment of the Athalassa Stock Farm has had a most useful influence on the improvement of the live stock of the Island.

Beef has only lately become an article of food for the country people, and is still so only on a small scale. The townspeople, having become Europeanised to a greater degree than formerly, are now becoming beef consumers, and the high price of beef has had a stimulating effect upon breeding for the butchers. Before the British occupation the killing of an ox for eating purposes was considered by many villagers an act of sacrilege.

Sheep

Sheep rearing is an important industry in Cyprus. The sheep are of the fat-tailed species and are allied, though superior to, the Afrikander sheep. The total number of sheep in the Island in 1917 was 255,150.

They feed almost entirely by grazing, and wander, under the charge of shepherds, over considerable areas in search of food, frequently in company with goats. They are valued chiefly for their milk and meat; their wool, though of moderate quality, is small in quantity. (See also under "Dairy Produce," p. 23.)

Large numbers of sheep are killed annually for local consumption, and there is a regular export to Egypt, as shown by the following pre-war figures :

Year.	Number.	Value. £	Year.	Number.	Value. £
1904 . . .	13,923	10,544	1909 . . .	976	716
1905 . . .	8,816	7,572	1910 . . .	3,905	3,064
1906 . . .	5,427	5,470	1911 . . .	18,143	12,311
1907 . . .	2,859	2,699	1912 . . .	17,611	13,731
1908 . . .	849	835	1913 . . .	7,920	6,724

Sheep-folding is practically unknown, and no crops are specially grown as food for sheep. Occasionally they may get a little rovi (vetch), rovi straw, lentil straw, favetta, pea-haulm or (in the hills) mavrachero (tares).

They suffer in years of drought, but on the whole thrive wonderfully well on very scanty pasturage.

Good work has been done of late years in the improvement of Cyprus sheep at the Government Athalassa Farm, and ewes and rams from the farm flock are much sought after by sheep-owners, many of whom are making efforts to ameliorate the breed. The question of providing suitable forage also is not being lost sight of.

Goats

The goat has been a cause of much controversy for many years and a source of discord between farmer and shepherd. Owing to the absence of farm boundaries the herds of goats (and sheep) continually trespass on the cultivated areas, and the shepherds are at little pains to restrain them when there is a chance of the animals getting a good meal. Large sums in the aggregate are paid by way of fines and damages, but the shepherds evidently find that even so it is profitable to continue such practices.

In consequence of the serious harm done every year in the State forests by these animals, a law "For the gradual exclusion of goats from the Island" was passed in 1913 and came into operation on August 1 that year.

As the subjoined table shows, the number of goats has decreased, but it is doubtful how far this is due to the law, and how far to the losses from goat-pox, which is very prevalent, and to the shipments for military purposes during the war:

Year.	Head.
1880	210,736
1890	237,475
1900	243,397
1910	276,794
1913 (when the law was passed)	242,524
1918	191,017

The goat is in many respects well suited to the Island, and provides the villager with milk, cheese, meat, boots and manure. The animals cost very little to keep—even apart from their depredations—and thrive, especially in the hills, under conditions unsuited to sheep and cattle. They are, however, great enemies to agriculture and

forestry, and if they are to be preserved in the Island, it is essential that both they and the shepherds be brought under strict control.

In Cyprus most of the goats have very short hair, which cannot be shorn. From this fact, and from the external shape of the animal, one may infer that it is either a variety of the Anatolian breed modified by local influences, or a hybrid of the Numidic and Anatolian breeds (see Plate III, fig. 2). The Anatolian goat has long and more or less thick hair, especially on the shoulders, sides and thighs, which, clipped in the spring, yields a not insignificant income for the goat-breeder (Gennadius).

The Cyprus goat gives on an average 150 drams of milk per day during a period of say 150 days, or say, 50 to 60 okes per annum.

A good proportion have kids twice a year, and many give birth to twins.

The price of a goat varies considerably in different districts, and before the war was from about 8s. to 20s. or 25s.

Pigs

The Paphos district and the Karpas end of the Famagusta district are specially given to pig raising ; but this animal is to be found fairly well distributed all over the Island. The native pig is of inferior quality, but a noticeable improvement, not only in pig breeding but in pig rearing, has resulted from the introduction by Government of the Large Black breed from England in 1907. This breed has become well established at the Government Farm, Athalassa, and the progeny is now well spread over the Island. The improvement resulting from crossing with Government stock has been so unmistakable that there is now great competition for them at all auction sales and high prices are given. This increase in outlay on the part of farmers has led to greater care in the feeding and management. They find that well-bred pigs come more quickly to maturity, and that it pays to feed them well and not leave them to forage for themselves as formerly. Excellent pork and bacon are now procurable

during the winter, and it may be hoped that pig breeding in Cyprus has a good future before it.

The number of pigs counted in the spring of 1914 was 38,850, the third highest number on record. Since then, owing to the prohibition of export, breeding has been checked and the number declined, but now it appears to be again on the upward grade.

Before the war there was an average annual export of about 2,000 animals; but there is now a better local market than formerly.

Camels

Camels are still used to a fair extent, and the breed is good, but owing to the improvement in the roads and increased facilities for more rapid transport, these animals are less in demand than formerly.

Horses

The native breed of horse is best seen in the Paphos pony, which though small, about 13 hands, is remarkably strong and hardy (see Plate IV, fig. 1). It is said that some eighty years or so ago the breed was improved by the introduction of two Arab stallions from Turkey. A useful stamp of pony mare is also to be found in the Karpas. A marked improvement in the quality of the local horses took place from the importation, some years ago, of English pony stallions; and more recently a further advance has resulted from the addition to the Government stud of the two famous English thoroughbred stallions "Téméraire," by Greyleg out of Tereska by Isonomy out of Violetta by Hermit, and "Huckle-my-buff," by Isinglass out of Snip by Donovan out of Isabel (dam of St. Frusquin).

Donkeys

The Cyprian donkey at its best is a fine animal (see Plate IV, fig. 2). It is the common beast of burden of the villager, and is capable of carrying a load of from 160 to 224 lb.

A large number of donkey stallions have been exported



Fig. 1.—Cyprus Pony.



Fig. 2.—Cyprus Donkeys.

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to India, Uganda, South Africa, Syria and Egypt from time to time, and the local breed has no doubt suffered owing to the best jacks having left the country. Although the villagers depend so much upon these animals, very little care is taken by them, either in the matter of breeding, feeding or proper management. The animals are mostly worked far too early, and underfed, and the majority are consequently undersized and of poor quality. Where good jacks are used, the progeny is generally satisfactory, and at shows and fairs some fine specimens are usually brought in. Owing to the increasing demand for jennets, the village breeder is inclined to put his she-donkey to a pony stallion rather than to a jack-donkey. The donkey mares range from 13 to 13.2 hands, with girth measurement of 58 in. to 60 in. and shank $6\frac{1}{2}$ in. They have great room, and are well shaped with a straight back and good quarters.

It has been recommended that every encouragement should be given to the production of good donkeys, from which the best mares could be selected for mating with suitable pony stallions, such as the Exmoor and Welsh cob, for the breeding of jennets; and at the same time an improvement in the jacks would naturally follow.

Jennets and Mules

“Owing to the excellence of the Cyprus donkeys and the poor class of Cyprus horses, the superiority of the jennet’ (the result of mating the pony stallion with the donkey mare) is very patent over the ‘mule’ (the product of the donkey jack and the pony mare). The jennet of from 13.1 hands to 14.1 is doubtless the most paying animal that the Cyprus villager or landowner can produce, and its excellence for army or general pack purposes cannot be surpassed in any country in the world. Therefore, in my opinion, it is to this class of animal that the most encouragement in breeding should be given. To maintain the excellence of the Cyprus jennet every help should be given to the breeding of big donkeys, so that the plentiful supply of donkey mares of from 12.3 to 13.3 hands is available for mating with suitable imported pony stallions,

which should be placed by the Government at the breeders' disposal."¹

Both jennets and mules, indiscriminately called "mularia," are largely used for transport purposes throughout the Island, and perform practically all the carting work of the country, but, as explained, the jennet is regarded as greatly the superior animal.

Poultry

The ordinary barn-door fowl is met with in Cyprus, as everywhere else. The local breed is a mixture of all the various races which have been imported by private persons for many years past. The most general types met with resemble the Leghorn and Ancona breeds.

The Island, owing to its climate and its corn production, is admirably suited to the poultry industry, and a sure and profitable market in Egypt can always be relied on. Something has been done of late years by the introduction of Wyandottes, Langshans and Orpingtons which have been bred by the Agricultural Department.

Proper poultry management among the villagers is practically unknown, and until regulations can be made enforceable by law for the control of poultry diseases and for the disposal of diseased carcasses, poultry keepers will continue to suffer heavy losses and the industry will not prosper.² Lectures on poultry-keeping have been instituted in the districts by the Agricultural Department, and it is hoped that these may arouse some interest and lead to improvement.

Given the necessary guidance and control, the industry should have a good future before it.

Turkeys are very plentiful and, except in the hills, are seen in nearly every village. There are three varieties—the bronze, by far the most general, the white, and a dark brown kind which is not common.

Ducks and geese do well at Kythrea, but elsewhere are

¹ Report by Captain Goodchild, Remount Department, E.E.F., when visiting Cyprus in 1916 and 1917 to purchase mules and donkeys for army purposes.

² Legislation in this direction has been effected during the session of the Legislative Council just ended. (Law No. VII of 1919.)

little seen. At this village, however, they are largely bred.

Pigeons also are fairly abundant, and as they mostly feed on a neighbour's corn, they are considered profitable birds to keep.

Preserved Meats, etc.

A good deal of meat and fat is pickled, dried and smoked for consumption by the native population.

Hams and sausages are much eaten, the latter especially in the Karpas. Among the various kinds of preserved meats may be specially mentioned that known as "apokti." This is the salted and dried flesh of the he-goat, which, when cooked, is much appreciated by the villagers. The meat is sometimes minced, and after the addition of ground origanum leaves and spearmint, is placed in jars and slowly cooked. It is said that from 3,000 to 5,000 he-goats are annually slaughtered for making "apokti."

IV. DAIRY PRODUCE

Milk

Sheep and goats' milk is principally used for cheese and butter making. Fresh milk of any kind is not much consumed by the native population, although within the last few years the more well-to-do townspeople have taken to drinking cows' milk, when obtainable, and it is in growing demand in some country parts for invalids when prescribed by the local doctor.

The flavour of sheep and goats' milk is a good deal affected by the herbage or shrubs on which they feed, and thus varies according to locality. A characteristic odour is imparted, for instance, by the alnifolia oak (*Quercus alnifolia*) and the cistus, which are common in many parts of the Island, and the cheese and butter produced from such milk are in better demand in the local markets. The places in which this quality of milk is chiefly produced are the Paphos District, the neighbourhood of Kykko and Troöditissa in the Troödos mountains, and Akanthou to the north-east of the Island.

A considerable impetus has been given to the production and consumption of fresh cows' milk by the establishment of a herd of Devon dairy cows at the Government Farm, Athalassa. Cows of Athalassa strain fetch high prices, as much as £80 having been given recently for a cow and several others have changed hands at £50 to £60.

Cheese

The Cypriot is a great cheese eater. The most popular and commonly made cheese in Cyprus is that known as Halloumi; the next in order being the Paphos and Akanthou cheeses, and then, in imitation of the Greek cheeses, the Agrafta, Kefalotyri and Kaskaval, all of which are of a hard kind, while there is a small production of the Greek soft cheeses Fetta and Telemés.

There are no statistics as to production; the export figures in recent years as given in the official trade returns are as follows:

Year.	Quantity. <i>Cwts.</i>	Value. £
1904	5,606	8,040
1905	4,705	7,245
1906	2,511	4,238
1907	2,200	4,559
1908	2,786	5,824
1909	2,367	4,927
1910	3,345	6,564
1911	3,647	6,624
1912	3,335	7,203
1913	3,699	9,268
1914	4,582	10,132

Halloumi.—This cheese, though rather insipid, is very popular, and forms a large part of the dietary of every household. It is easy to make, needs no special appliances, and is almost entirely made by the shepherds themselves. It is made either from sheep's milk only, or, in the hills where goats are numerous, from sheep and goats' milk mixed, or in some places from goats' milk only; especially is this so in the mountains where sheep are not found. The two kinds of cheese, *i.e.* that made from sheep's milk and that from goats' milk, are easily distinguished, as the former is rather soft and crumbly, while the other is hard and separates out into flakes.

This cheese as it comes from the mould is in the form of a slab called "kefali." This is then divided into four or more pieces.

There are two kinds of halloumi : one called "mona" (single), the other "dipla" (double). The latter is most in demand. It differs from the first in being finished off by being well hand-pressed, and then doubled or folded over, salt and spearmint being sprinkled between the fold.

"Myzithra," or, as it is more commonly called, "anari," is a soft cheese produced by boiling the whey, whereby all albuminoid substances not previously coagulated are now coagulated and rise to the surface together with any pieces of curd still remaining in the whey. A good quantity of fat is also enclosed in the coagulated mass, which is placed in rush moulds or in cloths and pressed so as to squeeze out the whey. "Anari" thus made is specially known as "bastard," and is an excellent soft cheese, very popular among the European residents as well as among the native inhabitants.

A rather finer "anari" with slightly different flavour is made by adding 5 to 10 per cent. of pure milk. This added milk is known as "prosgalo."

Both kinds are dried in the sun.

From "anari" is made a kind of fat used as cooking butter, by crushing and rubbing it between the hands in warm water. A thin paste is thus formed from which a fat separates, which rises to the surface, and is then collected.

Paphos and Akanthou Cheeses.—These are prepared in much the same way as "halloumi," but are made in smaller, barrel-shaped moulds, and are steeped longer in the whey, which produces a rind and renders them tougher and less liable to crack. They are well rubbed with salt. Their characteristic flavour is doubtless due to some extent to the milk of those districts, as explained above. Owing to their small size they become very hard.

Kefalotyri.—The best cheeses of this type are made with sheep's milk, which is coagulated at its natural temperature immediately after milking. Rennet is added so as to produce coagulation within an hour. The cheeses are placed in moulds, pressed and salted. They are turned

and salted every day for a week ; and this continues for two or three weeks, until the cheeses cannot absorb more salt.

Fetta.—The process for making this cheese is much the same as for Paphos cheeses, but differs in regard to temperature. It is placed in bags and hung up, or left in cheese cloths on the table to drain. It is made up in 100 or 200 dram pieces, and turned and lightly salted for three days ; then placed in barrels filled with brine. This cheese ripens in a few days. It is soft, and has a sharp, pungent flavour. It is the first to come on the market. It is not consumed in Cyprus, but made entirely for the Egyptian market, where it is much liked. Being soft, it does not keep well, and should always be kept covered in brine. For these reasons it is exported in small barrels of a gross weight of 40 to 50 okes. If care is taken in this respect, if all leaky barrels are kept refilled and cool storage provided, it may be preserved for a year ; but these conditions are rarely fulfilled in Cyprus.

Telemes.—This is another soft cheese, prepared in a similar manner to “ *fetta*,” but it is cut into square blocks and placed not in barrels or vats, but in tins which, when completely filled with cheese and brine, are soldered down. This cheese is also made entirely for the Egyptian market.

Kaskaval or Kaskavalli.—This is mostly made by cheese-makers who come over from Greece or Turkey during the cheese-making season.

The curd, after the whey is drained off, is called “ *phlongos*,” and it is almost always bought from the shepherds, each shepherd preparing it in his own way. It is transported in baskets, sometimes a good distance, to the cheese factory, or “ *kassaria*,” and these drawbacks, added to lack of cleanliness, are the cause of much cheese of inferior quality being produced which has no keeping properties and must be quickly consumed.

Having reached a pasty condition, the cheese is placed in reed or willow baskets and immersed in either boiling whey or clean water and stirred until the whole mass is transformed into “ *kossimari* ” ; it is then cut into pieces weighing one or two okes, and moulded by hand into a globular form, leaving one slight depression called the

“ omphalos ” or navel. If not properly stored, this cheese soon dries and becomes rancid or tasteless.

Agrafa Cheese.—This is made entirely from sheep's milk. Coagulation should be completed in 25 to 30 minutes. The cheese remains 20 hours in the press. Salting lasts from 40 to 60 days, and the cheeses ripen in four months. If well stored, the cheese may keep for two years.

Butter

Butter making is carried on to only a limited extent in Cyprus, and with two or three exceptions is in the hands of shepherds, who use a primitive conical-shaped churn, something after the Danish pattern. Churning consists in beating up the contents of the churn with a stick, to the end of which is fixed a round wooden disc 6 to 10 in. in diameter, not unlike a piston in its action. Sheep's milk is mostly used and, with a modern churn, this will yield 9 to 12 per cent. of fresh butter. Goats' milk gives about 5 to 6 per cent. About half the above quantities may be obtained with the older, native churn.

In the Near East (Greece, Turkey, etc.) fresh butter is not used in cooking, as almost all cooked food is fried and butter containing the least water and casein cannot serve the purpose. The pure fat must therefore be extracted. Two methods are applied. The best is that of plunging the tins containing the fresh butter into hot water which heats the butter and sends the fat to the surface. It is then collected and slightly salted. This has a good flavour and keeps well.

The second method is to place the fresh butter, or the residue from the former process, into tin pans and boil until the water is evaporated, when the albuminoids solidify at the bottom of the pans. The fat which is then on the surface is ladled out. This is inferior in quality, and has a disagreeable smell imparted by the albuminoids which come in contact with the hot pan.

Xynogala or Yaourti

The former is the Greek, the latter the Turkish name for this preparation of sour milk. Unlike fresh butter, it forms,

in season, part of the diet of almost every Cypriot household. It is now made in England and sold as "Bulgarian milk" or "yaourti." It is in the form of clotted cream, but if placed in a bag of fine cloth and if the whey is left to drain off, it forms a thick paste, and has an excellent creamy flavour, and is eaten in both cases either alone or, like Devonshire cream, with stewed fruits, etc.

Trachanas

This is another favourite milk preparation, being a mixture of "yaourti" and ground wheat made into a thick paste. This is sun-dried and makes an excellent soup.

Kaimaki or Tsippa

This much resembles Devonshire clotted cream. It is the natural cream formed after boiling the milk overnight and setting it in shallow pans to cool. If the boiled milk is poured into the pans from a height, so as to make a foam, a better result is obtained.

V. CROPS AND OTHER PRODUCE OF THE LAND

CEREALS

The Messaoria plain is the principal corn-producing area of the island. Wheat, barley and oats are the chief cereals grown, and they are sown more or less throughout the whole of Cyprus, nearly up to the summit of Troödos, to an altitude of about 4,500 ft. Indian corn has been cultivated for ten years or so, and is becoming more general both for green food and for seed, and rye has begun to make its appearance during the last few years. Dari is becoming more known.

The preparation of the land for cereals is as follows: About the middle of January, when the land is soaked with rain, the fallow field (*νέασμα* or *νεατός*) is broken up, and in some cases sown with a green fallow, and in March or April it is cross ploughed (*δίβολο*). If the autumn rains are early, the field is ploughed for a third time (*ανάκομμα*), after which the crop is sown; but if the rains are late, the

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Fig. 1.—Carting Corn.

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Fig. 2.—Threshing Corn with Native Threshing Board.

sowing is done on fields which have been cross ploughed only. As a rule sowing begins after the autumn rains, and may go on until January. But if rain does not come before the end of October, many sow before the rain; and in many places farmers sow regularly before, *i.e.* without waiting for the autumn rains. This sowing is called *ξερόβολα*. Lands flooded by a river or other running water are called *πότιμα* (*Handbook of Cyprus*, p. 154). The sowing is done broadcast; the drill is not used.

Often, owing to want of sufficient hands and shortness of time or other reasons, land which has been fallowed is sown without being first ploughed up. This is called *εἰς τὸ πρόσωπον*, *i.e.* on the surface, or face of the field. Again, a field which has had a corn crop is sown the next autumn without ploughing; and this is locally called "on the stubble."

It is not uncommon for the same land to be sown year after year with a corn crop, with no rotation. This is especially the case with the deep soils in the plains, known as "kambos," as contrasted with the shallow, rocky soils called "trachonas."

At the time of harvest numbers of labourers, men and women, usually arrive from Anatolia and Syria and find employment in the fields.

The threshing-floors are practically identical with those of Biblical times. They are frequently paved with flag-stones, but as often as not are merely levelled pieces of ground. On these the sheaves are opened and spread out for the threshing. The threshing-board (*δοκάνι* or *δοκάναις*) is that referred to by Virgil as *tribulum* (Georg. Bk. 1) and is merely a stout board, studded on the underside with sharp flint stones (see Plate V, fig. 2). This is drawn round and round over the spread-out sheaves by mules, donkeys or oxen, and affords a pastime to old and young during the summer months. During the process the grain is separated from the straw, and the latter is bruised and partly shredded, and it is the rooted belief of the Cypriot farmer that only in that condition will it be relished by and benefit the animals which feed on it. The straw is then gradually cleared away and the grain is winnowed by being thrown up in the wind with wooden shovels.

The grain is then heaped up and left until measured by the tithe official. With the grain is also collected the sweepings of the threshing-floor, and the percentage of the foreign substances mixed with the grain varies from 5 to 15 per cent. There are a few winnowing machines and it is hoped that they will come into more general use as soon as they can be imported.

At Athalassa all cereal crops are reaped and threshed by machinery.

A good many reaping machines were imported by the Agricultural Department some years ago for resale to the farmers, and there is a very fair demand. This procedure has not been permitted for some years, and the work fell into the hands of an English merchant who has succeeded in placing a few machines every year. The country is ready to employ these and other agricultural machines, but the farmers need guidance in the choice of a machine and are reluctant to place orders through native merchants, who may not know the best types to supply and whose profits they fear to be exorbitant. If they could procure these through the medium of the Agricultural Department they would be encouraged to make considerable purchases. The loss of grain on the "aloni" alone may be gauged by the current opinion that each pair of oxen consumes, while threshing, one kilé of grain per day. Much damage is often caused by hot westerly winds at the time when the grain is just forming.

In the absence of any law to prevent the adulteration of cereals, dishonest practices are very frequent. A common method of adulteration is to mix with the grain the joints of the straw which are cut during the process of threshing and separated when winnowing. These are often sprayed with water in order to increase both bulk and weight. The moisture is absorbed by the grain, which thereby swells and is made to look bigger.

Under the Seed Corn Law of 1898 the Government make advances of seed wheat, barley, oats and vetches to cultivators under an agreement to repay in kind after harvest a quantity of grain equivalent to the amount of seed so advanced, together with an addition of one-fourth of the quantity so advanced, by way of interest.

This benefit is very generally availed of by smaller cultivators. It has not, however, been found possible for Government to keep separately the various kinds and qualities of tithe corn, from which these advances are made, and farmers frequently complain that the seed, so issued promiscuously, is unsuitable to the land, aspect, or special conditions on individual farms. Weevilled grain also is a source of trouble, and farmers obtaining such seed advances must be prepared to run risk of failure from this cause.

It is a well-known fact that cultivators often sell their seed corn so advanced them, in order to buy some other corn known to them as more suited to their land, and they are often justified, perhaps, in so doing.

The issues are made by District Commissioners to selected applicants who are believed to be unable to buy seed for cash. The average annual issues, for the last five years, have been : wheat, 38,013 kilés ; barley, 31,479 kilés.

Wheat

In ancient times, when the population numbered about 1,100,000, the Island was said to be self-supporting in the matter of wheat. Taking the annual consumption of wheat per head of population at 8 bushels (Gennadius's *Report on the Agriculture of Cyprus*, Part I, p. 8) and after making an allowance for seed, the annual production would then have been about 10,000,000 bushels. From British Consular Reports it appears that in 1863 the average produce was reckoned at 640,000 bushels. The average annual production of wheat for the ten years ended 1913, as shown in Blue Book Returns, was 2,292,827 kilés. For later years the figures are :

Year.	Kilés.
1914	1,924,336
1915	1,761,501
1916	1,524,484
1917	1,782,800
1918	2,424,570

Wheat is sown at the rate of 1 kilé per donum. The average yield per donum is 6 to 10 kilés, and varies between 3 to 4 kilés on dry land in a poor year, to 16 to 20 on the

best lands in a good year. When rains are very late and spring weather is unfavourable, a farmer often fails to recover even the seed.

Much might be done to increase the yield by better methods of husbandry, by the use of improved implements for cultivating and reaping, and by the use of threshing machines. An immense quantity of grain is consumed by birds (larks, sparrows, doves, etc.), which at times literally strip the fields and continue their depredations on the threshing-floors.

Wheat is sown from October to December; a field which has had a winter crop is pastured after the harvest until January; in January and February it is broken up and cross ploughed and sown immediately after with a spring or summer crop.

The crop is cut about May-June. It is cut with a sickle (*δρεπάνι*), tied into sheaves, and carried on donkeys or small carts to the threshing-floors. The sickle is larger than the European one, and is often provided with bells ("koudounia" or "sousounaria") to frighten the snakes, and the handles are ornamented with leather tassels.

Several varieties of wheat are grown in the Island, mostly of the hard kinds, these being preferred by millers.

The following English varieties have been imported and tried during the last four years: Improved Treasure, White Stand Up, and Improved Red Fife. The two former failed, being too late in maturing; the latter is still under trial, but it is not very attractive, being a late variety, and it gives a smaller yield than the native kinds. The same remarks apply to several wheats obtained from India and South Africa and which are still under trial.

Barley

This crop is sown about the same time as wheat, if anything slightly earlier; and it is ready for the sickle three or four weeks before wheat. When the straw is short the plant is uprooted, not cut.

It is sown at the rate of 1 to $1\frac{1}{2}$ kilés to the donum, and may be expected to yield from 10 to 15 kilés; but 30 kilés is not uncommon in the plains, and even much larger yields have been recorded from time to time.

There are three native varieties, viz. the common 4-row, the ordinary 6-row and the Paphos 6-row barley, also grown around Davlos in the north-east of the Island. The last-named is heavier than the two former kinds. Little success has attended the introduction by the Agricultural Department of "Prize Prolific," "Gold Thorpe" and "Chevalier," which have been experimentally grown for the last three years. They mature late and have not resisted severe drought. Their yield is small compared with native barleys, although this may improve when they are fully acclimatised.

Barley is the staple food for all kinds of animals, pigs and poultry in Cyprus, and it is often used for bread-making in years of wheat shortage.

The tithe is mainly exported to England, where it has a good name for malting purposes, especially that produced in the Paphos district. It has failed to attain the place it deserves on the English market owing to the high percentage of dirt, etc., it mostly contains.

A sample of Cyprus barley examined at the Imperial Institute in 1914 proved to be of good malting quality, and similar material if marketed in commercial quantities would be readily saleable in the United Kingdom (see BULLETIN OF THE IMPERIAL INSTITUTE, vol. xii. 1914, p. 552).

A sample of naked or skinless barley from Cyprus has also been reported on by the Imperial Institute. This type of barley cannot be employed for malting for ordinary brewing purposes, but it was considered that the Cyprus material might be used by distillers (who only require a partially malted barley), and in any case the sample would rank as a good class feeding barley (*ibid.* vol. xiv, 1916, p. 159).

The average annual production of barley, as shown by the Blue Book returns, for the ten years ended 1913 was 2,449,285 kilés. For later years the figures are :

Year	Kilés.
1914	1,957,944
1915	1,912,316
1916	1,953,628
1917	2,508,880
1918	3,080,710

These figures should be contrasted with British consular estimated average in the sixties of 960,000 bushels.

Oats

In Cyprus, oats are used on a far smaller scale than barley as food for cattle, and they are unknown, except to a few townfolk, as a food for human beings.

The cultivation of this crop is restricted, partly because it ripens late and needs late rains, and partly because it sheds its ripe grain too quickly for the ordinary easy-going farmer, who frequently finds his next year's crop smothered with self-sown oats. It is also commonly held that the crop exhausts the soil.

There are two native varieties, both white. The one is grown much more than the other, called " anoyira," which, although incomparably superior, is little cultivated outside the Limassol district.

The seed is sown at the rate of 2 to 2½ kilés to the donum, and a yield of from 20 to 30 kilés is obtained. The average annual production for the ten years ended 1913, as shown by Blue Book returns, was 394,695 kilés. For later years the figures are :

Year.	Kilés.
1914	404,917
1915	378,724
1916	446,469
1917	306,010
1918	313,260

Besides " Black Tartar," which has been regularly grown at Athalassa for several years, the Agricultural Department has introduced of late years " Black Cluster," " White Cluster " and " Supreme." All these ripen late and need late rains, and they have not given any promise of success. A black variety imported from Greece some years ago has proved much superior to the two native varieties, but its cultivation is still limited.

Reports on oats from Cyprus and on oat, straw and kyko oat plant (*Avena sativa* var. *obtusata*) are given in the BULLETIN OF THE IMPERIAL INSTITUTE (vol. xv. 1917, pp. 308-10).

Rye

Rye has only lately been introduced by the Agricultural Department, but already its cultivation, though very small, is extending. The dark colour of the rye loaf creates some prejudice against it, but its value in cases of diabetes, a common complaint in Cyprus, is greatly in its favour.

The seed is sown and cultivated here in the same manner as wheat, but at the same time or even earlier than barley. It is harvested by being cut and is threshed on the threshing-floor. The straw is fed to animals, but when threshing machines become more general the long straw will become available for other purposes than cattle food, *e.g.* in the manufacture of the native saddles ("stratura"), native straw trays and native straw hats.

Rye is also grown for green food, in the same way as barley grass.

Maize (Indian Corn)

This crop was first introduced by the Agricultural Department in 1902. Its cultivation is governed by the water-supply. It is grown mostly for green food, and is met with very generally throughout the Island, being sown among the growing crops, *e.g.* louvi, sesame, cotton, etc., as a wind-break or to afford shade. There was a good demand for the grain for grinding during the war and the meal is found to be a useful ingredient in the ordinary loaf. The stems and leaves provide a welcome change of food for cattle when exhausted from threshing and during the dry season of the year. At the Government Farm at Athalassa the stems and leaves are made into ensilage.

Dari or Millet (Sorghum vulgare)

This crop is little grown, and is mostly found in the Messaria and also at Paleochori, almost exclusively in places irrigated by river floods. The grain is used for making flour and the fresh stalks are fed to cattle.

FRUITS

Cyprus produces a considerable variety of fruits, the chief ones exported being raisins, pomegranates, oranges

and lemons, and grapes. There is a considerable and expanding export trade in the fruits enumerated, as shown by Blue Book returns as under :

Year.	£.	Year.	£.
1904	29,706	1909	29,890
1905	29,265	1910	52,267
1906	41,716	1911	57,393
1907	36,009	1912	59,887
1908	35,027	1913	69,097

The pomegranate of Famagusta is famous, and the annual export of this fruit alone during the five years ended 1913 averaged £14,682.

Among the mountain villages apples, pears, and plums are extensively grown ; the latter specially being in good demand in Egypt.

Apricots and kaisha trees are grown generally throughout the Island, and their fruits are particularly good and plentiful. The last-named is a delicious variety with a delicate flavour and externally somewhat resembles the nectarine. Peaches are mostly grafted on almond stocks, as these are hardy and good drought-resisters, but there are a fair number of European varieties. Almond trees abound in all parts and do extremely well if properly cultivated. Other fairly common fruit trees are the quince and loquat, or Japanese medlar.

For several years choice kinds of fruit trees have been imported from England, and many thousands of trees of different kinds throughout the Island have been grafted and are now beginning to produce fruit of excellent quality. Good work has been done by the Perapedhi Wine Association, whose garden has been a centre for the dissemination of choice grafts.

Unhappily the village growers have been very reluctant to apply proper cultivation or to carry out advice in treating their trees, which have become the hosts of all kinds of diseases and insect pests. A better spirit is now being shown in this direction.

Vines and Wines

Writing in 1896, Gennadius described the industry and perseverance of the peasants, who with most imperfect

implements, by breaking up the hard rock and building up the scanty soil, formed vineyards on the steep mountain sides, and often up to their very summits. These vineyards, he says, having been mostly planted in haste in the happy days of the demand for wines (when French vineyards were destroyed by phylloxera), were formed by the personal labour of the peasant eked out by the help of loans. Since then the wine trade has passed through critical times and prices have often been greatly depreciated. The small vine-growers, who are also for the most part wine-producers, fell on evil times and became heavily indebted. They have remained so until the last year or two, when, owing to the large demand and the high prices of wines in Egypt, they have been able to free themselves.

Gennadius regarded the cultivation of the vine in Cyprus as indisputably unprofitable, and was in favour of checking its extension, and even advocated the imposition of a special tax on new plantations. At the time he wrote there was an overproduction, and the value of wine had greatly fallen, and the revenue which Cypriot wine-makers could gain therefrom would hardly suffice to cover the expenses of its transport to the market, the annual interest on their debts, and the taxes they had to meet.

The village-made wine is usually clarified by means of gypsum. It is carried down from the mountain villages in goat-skins (*askos* or *ashia*) on pack animals, and then sold to the Limassol merchants, who ship the greater part to Egypt.

The production of wine as carried out in Cyprus leaves much to be desired. M. Mouillefert, who visited Cyprus in 1892 to report on the wine industry, says: "The vintage is often gathered too late. Insufficient care is given to the picking of the grapes and diseased, rotten, mildewy or unripe grapes are often used which detract from the quality of the wine.

"The grapes are trodden and the fermentation takes place in jars and chatties of porous earth, of a capacity of 2 or 3 hectolitres, which are tarred inside to counteract their porosity. The houses in which the fermentation takes place are of almost the same temperature as the

surrounding air, with the result that in the warmer parts of the Island fermentation at first is generally rapid or disturbed, and the temperature of the must becomes excessive. In the colder parts, on the contrary, the opposite takes place and the resulting wine is rough and sharp. The use of gypsum as a preservative is unfortunately very common. The tarring of the goat-skins and jars imparts a flavour which is very unsuited to the European taste."

M. Mouillefert made the following recommendations: "Tared jars for fermentation should be replaced by wooden vats, or, in the warmer parts of the Island, by tuns similar to those used throughout the South of France and in Algeria. Presses less primitive than those in use should be employed since these leave in the lees a very large quantity of wine. The wine when drawn off from the lees should be kept in tuns or in small wooden casks." "In short," he says, "to speak quite plainly, no good wine destined for ordinary consumption can be obtained with jars."

Some twenty years ago an English Wine Company was established at Perapedhi and, until the war, carried on a successful trade and produced some good wines manufactured on modern lines. The factory was well equipped with up-to-date plant, and its wine of port type was especially popular. It was throughout the greater part of this time owned by the firm of W. H. Chaplin & Co., London, but since the war it has been closed down. The excellent brandy of Messrs. Hadji Pavlo & Co. has found for some time a steady market in England, and there are other well-equipped wine and spirit factories at Limassol, notably those of the Limassol Wine & Spirit Co., Ltd., of Mr. M. Michaelides and of Mr. N. Joannides.

The firm of Messrs. Hadji Pavlo & Co. has carried out since 1872 the manufacture of spirits, and for twenty-five years they have been engaged in producing their "Zanatzin" brand of wines. Their V.O. cognac and three-star brandy are both excellent.

Various liqueurs, made from local products, aniseed, kernels of apricots and other stone fruit, etc., are made by this and other firms, and sold under the name "Zucki."

The principal wines, spirits, liqueurs and other alcoholic liquors produced are :

The ordinary black wine of the country, or "krasi."

The ordinary white wine of the country, or "aspro-krasi."

Commandaria.

Brandy. First and second quality sold in barrels ; one-star, two-star, three-star and V.O. sold in bottles.

Mastic, sold in four qualities ; Zucki, sold in two qualities.

Rum and Amer Pigon.

Alcohol. 95 C. and 36 C.

Various spirits, liqueurs and syrups : whisky, vermouth, amathus, banana, mentha, mandarini, triantaphyllo, kitro, pergamoto, vanilla, violetta, anana, benedictine.

Eau de Cologne.

Commandaria is one of the oldest and most famous sweet dessert wines. It is held indeed to have been the "nectar of the gods." In the time of the Knights Templar it acquired great fame. Existing stocks are annually added to, the original vintage having in some cases a great age, so much so that, through evaporation, the wine becomes a syrup or pulp, which imparts a bouquet to the fresh commandaria which is added to it. In making commandaria the grapes are left on the vines until over-ripe and, after picking, are spread out in the sun for further evaporation, when they undergo the usual process of wine-making. In this way a sweet wine, rich in sugar and alcohol, and having a characteristic flavour, is produced. A limited quantity only is made every year, and of this a certain quantity is exported and fetches a high price, as a speciality, in England and on the Continent.

A red mastic is made at the Kykko Monastery which has acquired local fame.

The situation at the present time is generally improved, and although Cyprus wines can never form more than an insignificant proportion of the world's supply, and could not create any special market without considerable change of system and large expenditure in advertising, they may yet, by simple improved methods, by means of co-operative storage and the application of sound elementary

principles, be able to secure a more recognised position and a remunerative, though perhaps limited, demand, at any rate for some of the special brands.

For the benefit of village producers practical lectures, with the help of special apparatus, are now being given in the wine villages during the vintage season, by officials of the Agricultural Department.

The export of wines (including commandaria) and spirits during the ten years ended 1913 were of a total value of £313,920 and £55,364 respectively. The lowest and highest figures were £20,274 in 1909 and £52,351 in 1911 for wines and £3,991 in 1906 and £8,187 in 1913 for spirits. For the last four years the exports have been :

Year.	Wines (including Commandaria).	Spirits.
	£	£
1914	29,405	4,396
1915	38,158	5,431
1916	80,165	6,865
1917	78,451	22,173

There is an export duty on wine at the rate of 8 paras per gallon, on all spirit of 20 paras per gallon and on all winegar of 5 paras per gallon.

Some seventeen varieties of *Vitis vinifera* have for a long time been grown in Cyprus ; the most largely cultivated being the following :

Mavro (black). The commonest variety, medium-sized bunch, with dark, large, oval-shaped grapes.

Xinisteri (white). Common variety, with medium-sized bunch, white roundish grapes, thin skin. These are suited to a rich moist soil.

Voophthalmo (ox-eye). Equally common variety. Rather small bunch, with black, round and rather small grapes. Suited to a dry, calcareous soil.

The Muscat comes next, being mostly grown at Omodhos. It is the common early muscatel of the East.

The remaining kinds are locally known as Bastardico (bastard), Maratheftico or Kraseti, Morokanali or Spourta (flabby-berried), Promari or Glycopromo (early or early-sweet), Xantho, Axanthi or Phinikoto, Kouphorrhovo or Katin-parmak, Verico, Sultana, Razaki, Corinthiaki (currant), Malaga (Alexandria Muscatel), Rhodities. Of

these, several are only to be found here and there in private gardens.

Five years ago several thousand Sultana vines were imported by the Agricultural Department from Crete, and these have now become fairly well distributed over the Island and the produce is beginning to appear in the market. These dried sultanas in 1918 sold for as much as 4s. per oke.

Three years ago the following varieties of table vines were imported from England by the Agricultural Department :

Black Hamburg	Lady Hastings
Alicante or Black Tokay	Royal Muscadine
Canon Hall Muscat	Muscat of Alexandria

These are now being acclimatised, and it is hoped gradually to distribute a large number of grafts.

Vine cultivation covers an area of about 140,000 donums and is in the hands of some 15,700 vine growers.

Owing to defects of planting the vines of Cyprus do not in most cases begin to bear fruit before the third or fourth year, while, if modern methods were adopted, they would bear fruit in their second year and attain their full growth in their fourth year.

What is known as the "willow-head" system of pruning has been very general, with consequently poor results. Better methods have long been inculcated and are now being more and more adopted. Manuring is but rarely practised and ploughing is confined to lightly turning the surface soil with a wooden plough, and this not every year. On the higher slopes of the mountains terracing is common and necessary.

Grape mildew (*Oidium Tuckeri*) is prevalent in nearly all the vine areas. Other diseases and pests of the vine met with are anthracnose, pourridié, *Septosporium Fuckelli*, cuscute, *Cochylis*, *Zygæna ampelophaga* and *Pyralis*. Happily the stringent regulations which for many years have been in force prohibiting the importation of any kind of living plant have resulted in keeping the Cypriot vineyards free from the scourge of phylloxera.

Sulphuring has become more general of late years.

The Government has done much to bring this about, and for fifteen years or more has imported sufficient sulphur from Sicily, which has been placed in the hands of village store-keepers and sold at a fixed price by the Agricultural Department. This has never more than exceeded the bare cost and more often has been issued at half cost and in times of distress even gratis.

The vine-owners have been stimulated by the recent high prices for wines to expend more time and money on this operation. The ignorant prejudice against the effectiveness of sulphur as a cure for grape mildew has to a great extent died out. False ideas of economy alone prevent its general use.

Fresh grapes are largely consumed locally, and considerable quantities are exported to Egypt, as shown by the following table :

Year.	Quantity. Cwts.	Value. £
1904	12,025	1,854
1905	8,607	1,208
1906	9,563	1,487
1907	7,399	1,161
1908	6,807	1,331
1909	7,078	1,094
1910	7,588	1,216
1911	11,597	1,865
1912	12,565	2,028
1913	10,303	1,487

The average annual export of raisins for the ten years ended 1913 was 54,007 cwts. valued at £24,190. The lowest price was 5s. 4*cp.* per cwt. in 1909 and the highest 11s. 4½*cp.* in 1911. During the war the exports have been : 1914, 16,395 cwts., £7,419 ; 1915, 54,189 cwts., £34,467 ; 1916, 34,361 cwts., £38,188 ; and 1917, 70,624 cwts., £90,040. The annual prices in these years were respectively 9s., 12s. 6½*cp.*, 22s. 2*cp.* and 25s. 4½*cp.* per cwt.

Up to 1905, inclusive, by far the greatest quantity of raisins had been shipped every year to Austria ; Rumania, Turkey and Egypt coming next in order. Since that date Rumania has easily taken the first place, being followed at a distance by Austria, Turkey and Egypt. Since the war the bulk has been shipped for military requirements and to France, Egypt, Malta and England

for eating and for use in confectionery, and the industry has grown.

A marked improvement has taken place in the preparation of the raisins; and specially qualified officials of the Agricultural Department every year give practical instruction on this subject in the vine villages.

Citrus Fruits

Oranges and lemons are very extensively grown in Cyprus, whilst mandarines, citrons ("kitria") and sweet limes ("glykolemonia") are also found in every part of the Island. In addition, the shaddock ("phrappa") and the bergamot orange are cultivated in the Island.

The best and most common variety of the sweet orange is the oval (sometimes round) Jaffa, grown everywhere, but specially at Famagusta, where there are numerous orange groves. Another variety of good quality is grown at Lefka. The trees of both varieties produce large, firm, thick-fleshed fruit.

Bitter oranges are largely grown from seed for stock on which the better kinds are grafted. Many thousands of these, and also of the grafted plants, are annually issued from the Government Nurseries. Much loss has been sustained from time to time through disease, and in 1899 whole orange groves at Famagusta, Lefka and Kythrea were uprooted or cut right back. With the expansion of the Agricultural Department and a small qualified staff it has become possible to bring these diseases somewhat under control, and the orange and lemon production has much increased, though gummosis and scale disease still play much havoc.

In the Varosha orange groves the trees are grown in light, sandy soil, which is banked up round the trunk. They are irrigated by means of the native alakati, or noria, or more often by air-motors, which in this locality are much in vogue.

The two most common causes of failure are the persistent planting of trees too close together and over-watering. Growers turn a deaf ear to all advice aimed at changing these two bad habits. The native agriculturist is convinced, beyond the reach of argument, that the

greater the number of trees on a given area the greater will be the profit. In a land where water is so precious the deep-rooted opinion is held that the more water a plant receives the better it will thrive, and too frequent irrigation accounts to a large extent for the widespread damage caused by gummosis. Until lately pruning was scarcely practised at all. Thanks to a system of model orchards lately instituted by the Agricultural Department, better methods are at last being introduced, and fruit-growers are able to model their practice upon the work carried out on the specimen trees, alongside their own, reserved by the Department for such demonstrations.

Lemons are largely consumed by natives with their food. The produce is of large size, thick-skinned and juicy. Until some twelve years or so ago the fruit was largely sold on the trees for shipment to Russia and Rumania, but those markets failed, owing to the prevalence in Cyprus of scale disease and partly to loss through rotting in transport. The export of oranges and lemons has of late years been confined almost entirely to Egypt.

Fig (Ficus Carica)

This tree thrives everywhere, and is particularly cultivated at Livadhia and Lefkara (Larnaca district), in Paphos and at the Tylliria, where the small, sweet, white variety, locally called "antelounika," is grown. There are but few true Smyrna figs, but this variety is being multiplied by cuttings and also by grafting. Other good kinds are the "sarilop" and "bardajik," of which there are a few private specimens only, and the "vardika" which is more or less common, particularly at Morphou. The Lefkara figs somewhat resemble those of Tylliria and, like the latter, mature naturally; they are considered very good and are divided into two varieties, the "malantzana" and the "kourtziatika." The figs of Ktema in Paphos are the common violet-coloured variety, but are larger, and are mostly ripened artificially.

Cyprus figs are only of moderate quality, though doubtless susceptible of improvement. They resist drought and generally yield good crops every year.

The native dried fig is much eaten, and is also used as an adulterant of, if not a substitute for, coffee, and makes a good beverage, like the well-known Austrian "feigen café." Dried figs are also made into a paste and mixed with flour to make fig pies ("sykopitæ").

The method of oiling, that is, smearing with oil the orifice on the top of the fig while still unripe, is applied to those varieties which ripen slowly. It is these varieties which are especially grown in Cyprus. The fruit so treated is rather tasteless and insipid, but as it comes early to market it fetches a good price. The reason for hastening the ripening process by oiling is that the fruit may become ready for picking before sparrows and hornets get it, as they would otherwise do at that season. The later crop is more or less immune from their attacks, as ripe corn is then abundant in the field or on the threshing-floor.

Figs first appear on the market in May. This early fruit is called "magiles" (possibly from Maios-gilia = May production). The fruit is produced on the wood of the preceding year, from a bud which has remained dormant. The next crop appears about mid-July, and then the fruit is called by its proper name "syka."

Cherries

The principal and almost the only cherry-growing village in the Island is Pedoulas, in the Marathassa valley. This village is about 3,600 ft. above the sea-level. The trees at that village do remarkably well, and they bring in a good revenue. They are mostly wild trees which have been grafted; but there are also a small number which have been raised from imported Malaheb seed. From time to time good kinds of young grafted cherry trees have been imported from England by the Agricultural Department and grafts from these have been freely supplied to the village.

There are two native varieties, one ("kerasi") which is almost exclusively grown at Pedoulas, the other ("vysino") which is found fairly well distributed over the Island. The former is pale yellow and pink, the latter is slightly smaller and less sweet and of a darkish-red colour,

and is used mostly in making jam and preserves, while the "kerasi" is more for table purposes.

More grafted trees are now coming into bearing and "White-hearts" are now sold in the bazaar at about 12 cps. per oke. "Black-hearts" are also beginning to make an appearance.

Efforts are being made to introduce the cherry tree to other hill villages, and there seems no reason why its cultivation should not become general in the higher parts of the Island. This fruit travels well and a fine market awaits it in Egypt.

Owing to the prohibition of fruit exports during the war, a small industry has grown up for drying the "kerasi."

Banana

The local name of the banana is Sykiton Adam (Adam's fig), from the belief that Adam made an apron of the leaves.

There is some hope that the cultivation of this delicious fruit may become more taken up in Cyprus than has hitherto been thought possible. Paphos has for several years had the reputation of possessing fruit-yielding trees of good quality. Offshoots from some of these have been transplanted to Larnaca, and there are now several gardens in which a fair quantity of fruit ripens each year. At Kyrenia and Lapithos there are also a good number of trees. The fruit is of a different variety from that of Paphos and Larnaca, the shape being longitudinally angular, whereas the latter kind is longitudinally round and larger.

Five years ago the Agricultural Department obtained some special varieties from Zanzibar. These are now beginning to yield fruit, and offshoots are being distributed in the Island.

Azarol Hawthorn

This hawthorn (*Crataegus Azarolus*), known locally as "mosphilia," grows wild scattered about over the country. The fruit makes an excellent jelly. The tree is an excellent stock on which to graft the pear tree.

In the higher regions another species, *C. monogyna*, is found.

Melons

The western end of the Messaoria plain is noted for its water-melons and sweet-melons. These are grown in "postania," a corruption of the Persian word "bustan," a garden. They are cultivated only on irrigable land. At Asha, where, perhaps, the best fruits are grown, the land is flooded by the river and no later watering, as a rule, takes place. Through a well-grounded fear of theft, the grower and his family live in their "postania" during the season of marketing. Reed shelters are erected, and the rolled-up beds and bedding with their white coverlets present a strange appearance. There is always a big local demand and a good yield is generally obtained from these "postania." High prices are paid for suitable melon-land.

The local names for the water-melons are "karpousia" or "pachia," and for the sweet-melons "piponia" or "tamboures."

The cultivation of this fruit is general throughout the Island.

Date Palm

This tree grows promiscuously throughout the plains, produced mostly by accidental seeding. Very little actual sowing takes place. The best groves are round about Nicosia.

The trunk-wood, being very hard and fibrous, is used in the construction of the old type of waterwheel ("alakati") and for beams in houses. It is also utilised as fuel in Turkish baths as it burns slowly and gives out great heat. Palm leaves are in demand for making various native baskets, specially the "zimpilia" for holding seed when sowing broadcast. Hats are made from them in a few villages.

The native varieties of date palm are not of high quality. They are: "Baltchik," the fruit of which ripens on the tree; "Phountouk" (hazelnut); "Kourmouzou" (red); and "Saraih" (yellow). The last three are artificially ripened when picked, by spraying them with a mixture of syrup and vinegar. The "Baltchik"

produces fruits suitable for fresh consumption. The "Phountouk" is somewhat inferior. The other two have large fruits which are specially suited for preserving.

Two years ago the Agricultural Department imported from Sudan the following varieties: "Condeila," "Bertamouta" and "Barakawi." They suffered much on the journey and it is doubtful if more than two or three specimens will survive.

As a rule dates ripen well in Cyprus; gathering takes place from October to December. The clusters must generally be covered with sacking to protect them from birds.

NUTS

Hazelnuts and Cobnuts or Filberts

These nuts are collectively known in commerce as "small nuts." They are all, however, the produce of a species of *Corylus*, the different kinds being distinguished by trade names according to their country of origin (see an article on "Sources of Supply of Hazelnuts" in BULLETIN OF THE IMPERIAL INSTITUTE, vol. xiv. 1916, pp. 261-7).

In Cyprus these are grown almost exclusively around a well-defined group of villages of the Pitsillia, notably Alona, Palæchori, Askas, Platanistassa, Phterikoudi, Livadhia, Agros, Alithinou, Saranti, Polystipos. In this locality the plantations are thickly grown and good yields are obtained. It is doubtful whether there are other parts of the Island equally well suited to this tree.

Hazelnuts, besides their use for dessert purposes and in the preparation of various nut foods, are employed largely as a cheap substitute for almonds, and in years when the latter are scarce, hazelnuts are in especially good demand.

The Cyprus nuts are outwardly of good size and appearance and are very attractive in the English market, but unfortunately they are usually picked before reaching full maturity, and consequently the kernels are frequently small and soon become rancid. Being gathered when unripe they lose greatly in weight, which means loss of

money to the exporters. The flavour is also impaired by premature picking and on this account Cyprus nuts compare unfavourably in this respect with those from Spain, and Trebizond and other parts on the Black Sea, with which they have to compete. If growers would pay more attention to this point, Cyprus hazelnuts would, owing to their size, hold a much better place than they do in the English market.

The export of hazelnuts is not separately recorded, but the annual average production is stated to be approximately 120,000 okes.

Walnuts

Some fine specimens of walnut trees are to be seen in the Marathassa valley and in the neighbourhood of Palæochori, and near mountain streams in several places among the slopes of the hills. These yield excellent fruit and are profitable to their owners, but unfortunately many trees have succumbed to the attacks of the Codlin moth. Special action has been taken during the last two years to deal with this pest. There has been a marked increase of late in the planting of young walnut trees.

Almonds

The cultivation of this tree has greatly extended of late. Its drought-resisting properties enable it to withstand the climate of the plains and on the level slopes of both ranges it grows well. There are several large plantations, notably at Psevdhas, Larnaca district, where the famous Jordan variety is found, and as the tree seems indifferent to soil, and thrives particularly well on the limestone which is so general throughout the Island, it may be hoped that it will be greatly multiplied. Both the soft- and the hard-shelled varieties are grown. Much good work has lately been done in School Gardens, under expert advice, in germinating the seed in damp sand. The villagers, finding the seedlings already to hand for planting, have been induced to plant them out.

Almonds are used as stocks on which to graft peaches, kaishas, apricots and plums ("mirabelles").

Spanish Chestnut

Some years ago good numbers of the edible chestnut were raised at Pedoulas by the Agricultural Department and distributed to villagers for growing in the hills. It is feared that the greater part of these trees, through want of attention, unsuitability of soil or climate, lack of moisture, and especially damage by goats, have been lost, but some remain and well-grown young trees may be found in certain localities and in moderate numbers among the mountains. As soon as adequate protection from goats can be given, this tree might be well worth more extensive cultivation. It prospers well when properly cared for, but will not thrive in soils containing more than about 3 per cent. of lime or at an elevation below about 1,000 ft.

The tree has been propagated almost entirely from seed, which must be as fresh as possible. No doubt one reason for the lack of interest hitherto shown in this tree by villagers is that it does not begin to fruit, as a rule, until about its twentieth year.

Pistacia spp.

Several species of *Pistacia* occur in Cyprus, and although they yield products of different kinds, it will be convenient to deal with them together in the present section.

The pistachio nut (*Pistacia vera*), locally called "Aleppo pistachio," is a native of Persia and Arabia and it was thought, until a few years ago, that it would not thrive in Cyprus. That is, however, a fallacy, which is rather confirmed by the fact that the *P. Terebinthus* and the *P. Lentiscus* are indigenous to the Island. It is considered that the best method of cultivation is to bud *P. vera* on *P. Terebinthus*. Though they grow more slowly, these budded trees are more robust and better resist drought, cold and moisture. The trees should yield fruit in five years from the time of grafting. A fair number of these trees have now been distributed from the Government Nursery Gardens.

This tree provides the pistachio nuts which are now imported from Syria and Chios.

Male trees do not usually flower at the same time as female ; consequently there has been difficulty in getting fruit with seeds, and recourse must in that case be had to artificial fertilisation.

The Palestine or turpentine tree (*P. palæstina*), local name " trémithos," grows in certain parts of the Island, but is seen at its best in the Paphos district, especially in and around the town of Ktima. The fruit is eaten fresh or salted and dried. It yields 10 to 15 per cent. of edible oil which has a certain local demand. A medium-sized tree may produce up to 60 to 80 okes of fruit. After crushing and expression, the residue together with the seed is found to be a good food for pigs. A small consignment of both the dried and salted fruit and of the residue was sold in Egypt in 1916 and realised 5 to 6 cp. per oke for the former, and 3s. to 4s. per kilé for the latter.

By making incisions in the trunks of both the male and the female trees a gum or turpentine known as " Paphos tar " is obtained, which fetches as much as 8s. to 10s. per oke. It is used locally for chewing.

This is one of the largest trees in the Island and is of handsome shape. It is deciduous and some fine specimens are met with.

Pistacia Lentiscus, locally known as shinia, or shinia bush, abounds all along the coasts of the Island. From the seeds of this shrub an oil is expressed which is used for culinary purposes, particularly for frying fish. The oil is also in good local demand for soap making, and a very fair soap is produced, especially at Akanthou, in which the oil is the chief ingredient.

The leaves of this shrub are largely used for tanning purposes and were at one time regularly exported to England, though in small quantities. The principal market for shinia leaves is Palermo. They are employed to no small extent for the adulteration of sumach, for which Palermo is also the leading market. Shinia leaves were also in demand at Lyons as a dyeing material for silk stuffs.

There are also a few specimens of a variety of *P. Lentiscus* (mastic tree) from which in the Island of Chios

the famous Chios mastic is obtained by incisions made in the trunks of the male stocks.

The terebinth tree (*P. Terebinthus*), locally called "tremithia," is a bush very widely grown throughout the higher regions. It is used as a stock on which to graft *P. vera*. The berries are used for extraction of oil which has a value for culinary purposes. They are also made into a cake called "tremithopites." The berries are much smaller than those of the *P. palæstina*.

VEGETABLES

The cultivation of vegetables has considerably extended of late. Good market gardens have existed in and around the principal towns for many years, but more attention is now being paid to this industry in the villages, wherever water is available, and a considerable amount of skill is shown in production.

Among the best and most generally grown vegetables are spinach, cauliflowers, cabbages, egg-plants, lady's fingers, leeks, artichokes, broad beans (also grown as a field crop), radishes, celery, beet-root, pumpkins, marrows, cucumbers, lettuces, tomatoes, lentils, kohlrabi ("kouloumbra"), kidney beans ("phasoulia"), peas, kolokas, onions and potatoes.

There is a considerable demand in Egypt for fresh vegetables, and to meet this the land around the "ports" of Famagusta, Larnaca and Limassol has been for some years specially devoted to their cultivation. In the mountain valleys a continuous series of small vegetable gardens may be seen flanking the sides of the river-banks. The exports of vegetables to Egypt in recent years are given in the following table :

Year.	Onions. Cwts.	Beans and Peas. Cwts.	Other Vegetables. Cwts.
1909	6,664	1,729	49
1910	3,807	858	60
1911	5,512	2,346	122
1912	3,659	2,583	135
1913	2,854	1,670	32

Beans and Peas

Beans are grown for market mainly at Marathassa and Pitsillia and generally in the higher regions, but only to a small extent in the plains.

Before the war there was a comparatively large importation of beans from Anatolia. This having stopped, local prices rose and stimulated production in the Island.

The Cypriot is a lover of dried vegetables, and there might well be an extension in the cultivation of beans, similar to that which has lately taken place in the case of green peas. Except in one or two places, these were not sown by the villagers until about four years ago, but so valuable have they been found, especially in recent years of scarcity and high cost of other foodstuffs, that now whole districts are being devoted to their cultivation.

The French or kidney bean (*Phaseolus vulgaris*) is locally known under the general term "louvia." This name is applied both to *Phaseolus vulgaris* and to *Dolichos melanophthalmus* (*Vigna Catjang* var. *sinensis*). To distinguish the two kinds the Cypriot describes the *P. vulgaris* as "louvia gliastra" (*i.e.* lustrous, owing to its shiny appearance), or "louvia peratica" (*i.e.* foreign), as *D. melanophthalmus* was introduced and had become acclimatised some time before. Gennadius, however, describes the "louvia peratica" as *Dolichos Lablab* or lablab bean.

Both the dwarf ("koutsoulia") and the climbing ("makrya" or "anarichomena") varieties of *P. vulgaris* are grown. There are two white kinds, the large ("adra") and the small ("psintra").

Beans of various colours are grown here and there, and one spotted variety ("patsaloudhia") merits greater attention than it receives at present, both on account of its greater productiveness and for its excellent flavour. Two of these are stringless, but a drawback to them is that they discolour the water in which they are boiled.

There are several newly imported kinds which are privately grown, and these are gradually coming into the local markets.

The lubia or cow-pea (*Dolichos melanophthalmus* =

Vigna Catjang var. *sinensis*), being a good drought-resister, is grown more or less throughout the Island. It is frequently sown in mixed crop with cotton, sesame, Indian corn, etc.

Two kinds are cultivated—the larger, “*lubia melissomatia*” (having the eye like a bee), and the smaller, “*lubia mavromatoudhia*” (dark-eyed).

The dried pods of *Phaseolus* and *Dolichos* are fed to animals and are also used for stuffing mattresses.

The broad bean (*Vicia Faba*) has been grown for some years on irrigated land in the plains, where it takes a recognised place in the rotation. Its cultivation is now spreading to the higher parts.

The soy bean was introduced a few years ago by the Agricultural Department, but has failed hitherto to attract attention. Villagers find it requires different cooking from what they are accustomed to, and local dealers are not yet prepared to deal in it. It has been found resistant to disease, and further efforts are being made to bring it into popular favour.

The Ochrus vetch (*Lathyrus Ochrus*), locally known as “*louvana*,” is a fairly common spring crop, being grown for the sake of the seed which provides a favourite Cypriot dish. The leaves are also used as a salad. This crop is sown in the plains in January, but in the Karpas and some other parts it is sown in the autumn.

Chick-peas (*Cicer arietinum*), locally called “*revithia*,” grow well and are cultivated to a moderate extent. Samples examined at the Imperial Institute proved to be of normal composition. Two firms of produce brokers in London stated that if quantities of about 5 tons at a time could be delivered in England in as good a condition as the sample they could be sold for human consumption and would be worth (1917) £20 to £24 per ton c.i.f., United Kingdom ports. If of inferior quality to the sample they would be fit only for cattle food and fetch considerably less (see BULLETIN OF THE IMPERIAL INSTITUTE, vol. xv. 1917, p. 307).

Chick-peas when roasted are locally called “*koudames*” and are eaten in the same way as ground-nuts, which they much resemble in flavour. They are little, if at all, used in Cyprus as a cattle food.

Potatoes

The potato-growing industry in Cyprus has developed considerably in recent years, as will be seen from the subjoined table of exports :

Year.	Quantity. <i>Cwis.</i>	Value. £
1909	12,586	3,105
1910	14,983	3,839
1911	36,271	8,472
1912	45,336	10,348
1913	31,310	7,003
1914	54,203	11,741
1915	82,304	28,513
1916	136,027	74,632
1917	224,453	101,120

These figures, however, are a very inadequate indication of the actual increase of production, inasmuch as the local consumption of this vegetable before the war was confined almost entirely to the well-to-do residents in the towns, whereas now it is rapidly becoming a staple food of the people. This unascertainable but large local consumption must be added to the latest export returns in order to arrive at an estimate of present production.

The most favoured variety was at first, and with many growers still is, what is known as the French potato, the original seed having been brought from France. Irish potatoes (locally called "pittakoura") have now largely displaced these, partly, no doubt, on account of the greater facility of obtaining the latter seed during the war.

A native variety of potato, believed to have been imported by Syrian Arabs in the sixteenth century, is still grown on a small scale in the Marathassa valley. This potato has deep-set eyes and a luxuriant growth above ground and possesses a characteristic sweet taste.

Great progress has been made within the last few years in the matter of cultivation, and the old practice of planting broadcast on the flat has given way to ridge planting at proper distances apart. The practice formerly was to drop the potatoes into the plough furrow. These were covered over by the return plough; every third furrow was sown.

The Egyptian demand and the purchases made for military purposes have greatly stimulated production.

The good prices obtained have led, particularly in the Famagusta district and in what are called the "red earth" villages, to much activity and no small outlay in the matter of water-supply and distribution, and in the use of chemical manures.

The custom has grown up for importers to send their seed potatoes for planting in the higher parts of the Island. The produce therefrom is exchanged with growers in the plains, who send up their plain-grown tubers as seed to the cultivators in the hills. Merchants often stipulate with the hill-growers that they shall have their crop at an agreed, and generally a fairly high, figure. In this manner degeneration of the seed has been retarded; but owing to the difficulty of obtaining seed from outside during the war a certain amount of degeneration has taken place.

Only one crop can be grown in the hills during the year, but in the plains two crops are obtained. The one is planted in January and is dug in May-June; the other is planted in July and dug in November. It is found that the tubers lifted in the summer suffer greatly from the heat, and heavy losses occur from rot, whether the tubers remain in the ground or if they are dug and stored; and it is a question whether, when these losses are taken into account, the summer crop is really profitable.

The average yield is sometimes put at 2,000 okes per donum, but 1,600 okes, or 2 tons, is probably a more accurate figure.

Kolokas (Colocasia antiquorum)

This is a favourite food of the villager, but can only be grown where there is an ample water-supply and on heavy land that holds the water. It is an exhausting crop. The root only is eaten. It is sown in March-April and dug about October-November.

Onions

These are generally grown, especially in the Paphos district; Famagusta and Limassol following in the order named. The Paphos onions are supposed to have particularly good keeping qualities. Both round ("strongyla")

and long varieties ("tolmalikia") are grown; the latter have less fleshy scales than the former.

Onions are grown either in irrigated gardens or in "livadhia," or low-lying lands which retain their moisture, no irrigation being needed. They are propagated by means of "konari" or bulblets. Lapithos in the Kyrenia district makes a speciality of producing these from seed and supplying them to the whole Island, although onions are grown for market only on a limited scale in that area. The method is to plant out the full-grown onions (locally called "mammes") and leave them to ripen their seed. The seed is sown in February–March, at the rate of 20–25 okes per donum, from which some 3,000 okes of "konari" are raised. These are then sold for planting out in October–November–December at the rate of 40–50 okes per donum.

Onions are grown either in rows or broadcast. The native variety has the outer scales of a reddish colour, but these have largely given way to superior imported kinds.

FODDERS AND FEEDING STUFFS

Carob Tree

The carob (*Ceratonia siliqua*) is indigenous in Syria, and probably also in the northern countries of Africa, whence it presumably spread to certain parts of Asia Minor, to Greece, the Greek Islands and Southern Italy.

At the time of Christ, and for some centuries later, this tree was known to the Greeks by the name of keronia or keratea, being the Greek for horns, and is given to the locust or carob bean from its supposed resemblance to goats' horns. It is also known in different parts of Cyprus under the following names; teratsia (a corruption of keratea), xylokeratea, kountouroudia, koutsoupia and charoupia. The last named is of Arabic origin (kharroub) and the same root of the word is common all over Europe. Moreover, the fruit varies slightly according to locality, and develops local characteristics which have acquired for it distinctive local names; thus in Kyrenia District we have templotiké and kyrionitiké, in the Karpas there is the sarakine (introduced by Saracens?) and elsewhere the vaklitiké and komboté. This bean or pod, which when

ripe is of a chocolate colour, contains from 6 to 10 hard seeds, embedded in a sweet, pithy, honey-like substance which imparts the flavour so much appreciated by animals.

The carob tree belongs to the natural order Leguminosæ, sub-order Caesalpinæ, and is the only species of the genus *Ceratonia*. It is an evergreen, long-lived tree, growing to a height of 30 ft. and sometimes even to 50 and 60 ft. It thrives in most kinds of soil, especially in porous, marly and even volcanic soils, but not in marshy lands. Owing to its long tap root it resists drought well, and is to be found growing well in rocky land such as is common in many of the carob areas of Cyprus. It is very generally found intermixed with the olive tree and up to about the same altitude.

A succession of flowers is produced from July to September or October, and in favourable years up to December and even later, and in July–August the tree bears both flowers and ripe fruit. The collection of the latter commences about mid-August, the exact date being annually fixed separately in each district by the Commissioner. This is done in order to prevent the fruit from being stolen.

Recent investigations made by the Agricultural Department go to prove that the fruit-producing carob tree of Cyprus is really hermaphrodite, though there yet remains much room for investigation and the point is not finally settled. The others are true male trees. The hermaphrodite carob trees which form practically the whole of the fruit-producing trees of the Island are cleistogamous (*i.e.* self-fertilised before the calyx opens) and short-stamened.

There are also certain trees self-produced from seed which are superior to the ordinary so-called wild tree. These bear fruit which is straight and short but more or less marketable, and these are known as "kountoura" (short) or "apostoliki," as though sent by chance or by Providence. The word "apostoliki" is applied in Cyprus to other kinds of trees or fruit showing similar phenomena.

There are several millions of these trees in the State forests, and yet more privately owned. It frequently happens that, owing to the wide powers of testamentary

disposition, a single tree passes by inheritance to several heirs.

Many thousands of carob plants are annually raised in the Government gardens and issued at a trifling charge. The common method of propagation has been to sow the seeds in pots, and when the plant is from 18 in. to 2 ft. high it is ready for transplanting. The seed, which is very hard, is softened by placing it in a cauldron or saucepan of cold water. The water is then brought to the boil. On arriving at boiling-point the water is cooled and should then be changed and the seed left to steep for twenty-four hours. Owing to the long tap root, sowing in ordinary nursery beds has not been satisfactory, as the plants, which certainly make better growth than in pots, do not transplant well.

The foregoing methods have to a great extent been superseded by that of germinating the seed in damp sand and sowing direct in the field in properly prepared holes. Little watering is needed if the holes are deep and the soil kept friable. A top mulch is useful to conserve the moisture.

Transplanting from pots or beds is best done when the plants are twelve months old and about 12 in. high, after that it is precarious. Grafting may be done as soon as the stem is thick enough to take a graft, either before or after transplanting.

The tree is liable to attack by insects and other pests. Scale (*Aspidiotus ceratoniæ*) is very common; but the greatest damage of late years has been caused by the fly *Cecidomyia ceratoniæ*, which lays its eggs on the flowers or newly-set fruit, and the grub feeds on the bean, causing it to become stunted and of no commercial value. This stunted condition is locally known as "brachycarpia" and has been the subject of careful scientific study and practical treatment by the Agricultural Department during the last few years. Very satisfactory results have been recorded from the campaigns, which have so far been limited to the Kyrenia District, and these have justified the extension of compulsory treatment to other infected areas. This and other pests, such as *Myelois ceratoniæ*, *Cossus liniperda* (a lepidopterous boring insect), a species of

Mycetiasis, and a small hymenopterous fly which has lately appeared and is now under investigation, have, no doubt, checked production. The attacks of *Cecidomyia*, when serious, reduce the yield by 80 per cent. or over, and normally may lessen it by 40 to 50 per cent.

Much damage is also caused by rats (*Mus alexandrinus*), which gnaw the bark of the branches, causing them to dry up. Their destruction is encouraged by Government by the payment of 1 cp. per tail.

Carob gathering commences about mid-August and lasts for about a month. The beans are knocked down with long sticks, put into sacks and brought into store, or heaped up in the open air, where they often remain for several weeks. This is a safe procedure, as there is little rainfall at that season, and what might fall would not harm the beans, which would quickly dry again.

It is not easy to estimate the yield per donum of carob trees, but assuming that the trees were planted 30 ft. apart, and there were 16 medium-sized trees to the donum, the yield would average somewhere about 1,260 okes to the donum. The yield varies from year to year, a good year generally being followed by a moderate year. The fruit may be destroyed by frost in January and February, knocked off by hail-stones in March and April or scorched by hot winds in May or June. A full-sized, well-cultivated tree can give up to 720 okes. Taking good and bad years, the value of the annual produce of a medium-sized tree is 5s.

Carobs are sold by the Aleppo cantar of 180 okes, and the normal price may be put at from 13s. to 17s. per cantar delivered into store.

Carobs are weighed on export and the tithe is taken in money from exporters at the Customs House.

The following table shows the export of carobs during the ten years ending 1913-14 :

Year.	Quantity. Tons.	Value. £
1904-05 . . .	31,887	104,301
1905-06 . . .	26,187	85,105
1906-07 . . .	44,965	157,452
1907-08 . . .	42,381	151,610
1908-09 . . .	57,010	188,841
1909-10 . . .	44,059	157,972
1910-11 . . .	37,485	145,590
1911-12 . . .	51,359	182,883
1912-13 . . .	63,658	251,750
1913-14 . . .	44,989	179,027

The falling-off in 1913-14 was mainly due to the losses caused by the fly *Cecidomyia ceratonix*.

The fruit of the carob is exported mostly to England, but also to France and Egypt, and more recently, before the war, to Germany. Gaudry mentions that about the middle of last century it was exported to Russia, Sardinia and Austria. Some is used, in Egypt and the Levant especially, as food for the poorer classes and for making sweets and sherbets. Its chief use in Western Europe is as food for animals, bovine and equine, for which purpose it is ground up and made into either meal or cattle cakes. It is also said to be employed in the manufacture of chocolate and spirit, and there is a demand for the seed for use in the manufacture of certain gums.

The juice of the bean, "carob honey," locally called "mavromelos," "teratsomelo" or "betmezi," is consumed as a substitute for bee-honey or jam and also as a flavouring for culinary purposes. From the carob honey is also made the sweetmeat "pastelli."

At one time carobs were used in Cyprus for fattening mules and other animals, but, unfortunately, this practice died out. Efforts are now being made to revive it, and the advantages of this local product are again becoming recognised.

The carob contains some 50 per cent. of saccharine matter and the interesting question has been raised in recent years as to whether the bean might not become a new source of sugar production.

Lucerne (Medicago sativa)

This plant was introduced about eighteen years ago, but in spite of its undoubted success when properly grown on suitable soil, the Cypriot farmer was for many years very slow to make use of it. Every effort has been made of late years to encourage its cultivation and during the last three or four years there has been a steadily increased demand for seed. Irrigation is necessary in order to obtain a satisfactory yield, but there are many farms where it might be grown with great advantage. Its value for cattle food is generally recognised, and now that greater

attention is being given to dairy cattle, lucerne would seem to have an assured future.

Vetch (Vicia Ervilia)

This plant, known locally as "rovi," is undoubtedly the most widely grown of the fodder crops. Being a leguminous plant, it has a restorative action on the soil, although the average Cypriot farmer still considers it to be exhaustive.

In the plains sowing begins in January, whereas in the Pitsillia, and even in the Morphou, Solea and Tylliria districts which are only at the foothills, it is sown in October–November, *i.e.* before the cereals.

Rovi is almost the only food in the form of seed given to ploughing oxen throughout the East. It is regarded as heat-giving and strengthening, and is therefore fed specially in winter. It is sometimes given unthreshed with the straw. It is harvested in May, when it is uprooted, made into little bundles, which are stacked together in small heaps in the field, until they turn yellow, when they are removed to the native threshing-floor and threshed in the customary manner. The dry stems, etc., are eagerly eaten by cattle and sheep. The average yield is very little, from 2 to 4 or 5 kilés per donum. It is subject to tithe.

Chickling Vetch (Lathyrus sativus)

The chickling vetch, known locally as "favetta" or "chavetta," has come rather more into prominence of late years, displacing the vetch (*Vicia Ervilia*) to some extent, as it gives a heavier yield. It is subject to tithe.

Vetch (Vicia sativa)

This crop, called locally "vicos," was introduced from Crete in 1913 and has been found excellently suited to this country. It is most useful in any rotation, and has to some extent supplanted rovi (*Vicia Ervilia*) as it gives a larger yield. It is a most nutritious cattle food, for which purpose it is grown. When crushed and mixed with chopped straw it is readily eaten by cattle and sheep. The plant seeds itself very freely. It is sown about November–December and is ready for harvesting in about April.

Seed is sown at the rate of 5 to 6 okes per donum and the yield is normally from 8 to 12 kilés per donum. It is a good drought-resister and needs no irrigation, and being a leguminous plant should be cut and not pulled up, as the roots left in the soil serve to increase the amount of nitrogenous salts. Being a vetch it is subject to tithe.

Tares (Vicia tenuifolia var. stenophylla)

This plant, locally called "mavracheron" or "phakacheron," grows wild in the Pitsillia district among the vineyards and other cultivated as well as uncultivated lands. It is of value in those remote localities where grain and straw are little grown and difficult to procure, as it provides a wholesome fodder for cattle. The villagers have now taken to cultivating the plant. It is cut before the seeds are fully matured to prevent loss of seed through shedding. The seeds and chaff are mixed together when fed to cattle.

Milk Vetch (Astragalus)

This plant, locally called "arkokoutsia," grows wild in some abundance among the hills. When it appears above ground it is readily eaten by animals, especially sheep; but at this stage it is apt to cause hoven. As the plant hardens the animals do not touch it, except when fully ripe, and then it is greedily eaten.

As soon as it blossoms, but before the fruit is set, the plant is gathered and tied into bundles or small sheaves and stored in a heap. When, after a few months, it is quite dry, and at a time when other foods are scarce, it forms an important part of an animal's ration.

The plants are sometimes allowed to mature their seeds, and these, after being steeped in water for two or three days to remove acidity, are given to pigs, and are considered a nourishing and palatable food.

Moha, Sulla (Hedysarum)

These have been tried for some years with success and are gradually becoming known and experimentally grown by farmers.

Teosinte (Reana luxurians)

This grass is one of the most valuable fodder plants with which the New World has enriched the Old. It is a native of Guatemala and is also largely grown in Australia.

Seed was first imported into Cyprus by the Agricultural Department in 1897, and since then the plant has been continuously grown in the Government gardens with marked success. It is sown in March-April in the same manner as Indian corn, to which it is allied.

If irrigated, three or four cuttings may be obtained during the summer, yielding 25 to 30 tons of green food per scala. It is greedily eaten by cattle. Some plants grown by the Department attained a height of 11 ft. 3 in. and of others which were left to ripen their seed, one had 93 stems and weighed 26 okes, though the leaves had begun to shrivel and had lost weight.

This plant is gradually becoming known and may be found growing on some of the more progressive farms.

Sudan-grass

Seed of this fodder grass was imported in 1915 and very satisfactory crops have been obtained each year since then from the experimental plots. The grass seems well suited to Cyprus and gives a useful yield even when un-irrigated. Occasional irrigation produces a valuable crop. Trial sowings are now being made on a few private farms.

Teff-grass (Eragrostis abyssinica)

This has also been tried experimentally with good results and it is hoped that its cultivation will extend as it becomes more known.

Mangold Wurzel

This crop has been grown for several years at the Government Farm, Athalassa, where it has done well and forms an important part of the cows' rations. It has been grown successfully on a small scale in some of the Nursery Gardens.

As irrigation, deep ploughing, thorough cultivation of the soil and special cultural operations are needed, this

crop cannot be generally recommended to farmers, but it is being grown by a few progressive stock owners under Departmental advice.

The wild beet (*Beta vulgaris*) is a native of the sea-coasts of South-eastern Europe, and the garden beet-root is much grown in Cyprus in certain localities, so, if carefully cultivated, mangold wurzel, which is a variety of *B. vulgaris*, might also do well in many parts and be of great advantage to stock owners.

Prickly Pear (Opuntia)

The prickly pear grows wild as a hedge plant in Cyprus, The fruit is eaten to some extent by villagers, but no attempt has yet been made to use the stems as food for animals. In Sicily very large quantities are so utilised, and now that milch cows are coming more into demand in Cyprus the value of the plant for fodder may become recognised. Successful experiments have been made by the Agricultural Department in mixing the juice of the stems with lime for giving brilliance and permanence to ordinary whitewash. There has been an occasional export of the fruit to Egypt for consumption by Arabs.

SPICES

Coriander Seed

Coriander seed is the product of *Coriandrum sativum*, Linn., an annual herb belonging to the natural order Umbelliferæ. The "seed," or more strictly fruit, of the plant is employed in confectionery in making bonbons, in the preparation of certain liqueurs and as an ingredient for disguising the taste of medicines. In Cyprus it is commonly used as a flavouring in cooking.

A sample sent to the Imperial Institute in 1917 was examined as a source of volatile oil, and the residue remaining after distillation was analysed as a feeding-stuff. On steam distillation the ground seed yielded 0.48 per cent. of an almost colourless volatile oil with the characteristic and pleasant odour of coriander. This yield is below that furnished by Russian and German coriander, but is about equal to that obtained from Morocco

seed. The results of the examination indicate that the residue has a fairly high feeding-value, and it would be quite suitable for the ordinary use of coriander residue, *i.e.* as a cattle food.

A sample of the seeds was submitted to brokers in London, who reported that they were very stalky, but that their value would be from 50s. to 60s. per cwt. (January 1917) as compared with 10s. to 15s. per cwt. before the war. (see BULLETIN OF THE IMPERIAL INSTITUTE, vol. xv. 1917, p. 301).

Aniseed

Aniseed, the fruit of an umbelliferous herb (*Pimpinella Anisum*, Linn.), is grown on a comparatively small scale in Cyprus, the exports in recent years varying from 1,000 to 2,000 cwts. per annum. In 1917, 1,015 cwts., valued at £3,164, were exported, all of which went to Egypt.

Seed sent for examination to the Imperial Institute was reported to consist of aniseed in good condition and practically free from extraneous matter.

A sample of the seed was submitted to brokers in London, who stated that at that time (January 1917) stocks of aniseed were quite exhausted, and the prices therefore much inflated, small stocks of Spanish aniseed having changed hands in London at 110s. per cwt. Such price could not be secured if any quantity of aniseed were placed on the market. The value of the Cyprus sample before the war would have been about 27s. 6d. per cwt. (see BULLETIN OF THE IMPERIAL INSTITUTE, vol. xv. 1917, p. 300).

White Cumin Seed

White cumin is also an umbelliferous herb (*Cuminum Cyminum*, Linn.); an account of the cultivation and uses of this and other spices is given in the BULLETIN OF THE IMPERIAL INSTITUTE, vol. xi. 1913, pp. 131-136.

A sample of the seed sent to the Imperial Institute was submitted to brokers in London, who stated that it was rather small and stalky, but that it would probably be worth between 70s. and 80s. per cwt. (January 1917), although they were of opinion that its pre-war value

would not have been much over 20s. per cwt. (see BULLETIN OF THE IMPERIAL INSTITUTE, vol. xv. 1917, p. 302).

Black Cumin Seed

These seeds, sometimes known as fennel-flower seeds, are the product of *Nigella sativa*, Linn. (Nat. Ord. Ranunculaceæ). The plant is an annual, native to the Mediterranean region, and the seeds, which are used in the East for flavouring curries, etc., and in Egypt as comfits on cakes, have an aromatic fennel-like odour when fresh and a slightly acrid taste. There is a small export of black cumin seed from Cyprus. There is, however, but little demand for this seed (see BULLETIN OF THE IMPERIAL INSTITUTE, vol. xv. 1917, p. 304).

ESSENTIAL OILS AND PERFUMES

Origanum Oil

Different opinions have been held as to the botanical identification of the plant from which the Cyprus origanum oil is produced. An interesting series of articles on this subject by E. M. Holmes appears in the *Perfumery and Essential Oil Record*, 1913, from which it would seem that this oil is derived from *Origanum majoranoides*, Wild.; while Dr. Stapf, of Kew, regards the plant as *O. dubium*, Boiss. (see BULLETIN OF THE IMPERIAL INSTITUTE, vol. xi. 1913, p. 50). Other varieties growing wild in Cyprus are *O. Onites*, *O. hirtum*, both of which are locally called "rigani," *O. Bevani* (see BULLETIN OF THE IMPERIAL INSTITUTE, vol. xv. 1917, p. 305) and *O. majorana*.

In its wild state the plant from which origanum oil is distilled is a small perennial shrub, but, if cultivated, its size may be doubled or even trebled. The first crop, consisting of shoots and flowers, may give from 300 to 500 okes per donum; in subsequent years up to 1,000–1,500 okes per donum. The latter quantity would produce 40 to 60 okes of origanum oil, which is largely used in England for perfuming soap and other purposes.

For twenty years the distillation of origanum oil has been made under Government control. The industry was started in 1899 and, though not large, has steadily

grown. It has been found that the Cyprus *origanum* oil is exceptionally rich in carvacrol (over 80 per cent.), a powerful antiseptic, and to this substance the oil owes mainly its characteristic thyme-like odour. Frequent analyses have shown that the Cyprus *origanum* oil is remarkably constant in character.

This oil has the slight disadvantage of darkening considerably on exposure to light and air, which renders it unsuitable for use in light-coloured soaps, but a method has been worked out at the Imperial Institute of refining the oil so as to yield a product which will remain practically colourless for long periods.

A report furnished by the Imperial Institute (BULLETIN OF THE IMPERIAL INSTITUTE, vol. iv. 1906, p. 299), after giving a detailed description of the oil, states :

“The foregoing results show that this oil sells readily in this country at prices which should be fairly remunerative to producers in Cyprus. It should, however, be borne in mind that the demand for this oil is somewhat limited, and that it competes with the thyme oil produced in France and Spain, and with the ‘*origanum* oil’ produced in Smyrna, and that consequently a sudden increase in production in Cyprus might lead to a considerable fall in price. The Cyprus oil has, however, the advantage that it is very rich in the odorous and antiseptic constituent carvacrol, and it is probably due to its richness in this constituent, as revealed by the analyses made at the Imperial Institute, that the comparatively high prices realised for these consignments were obtained at a time when ‘red thyme oils’ were selling at lower rates. It would be advantageous if a refined white oil could be prepared by some simple method from this material, as this probably would fetch an enhanced price, and be applicable to other purposes for which the ‘red oil’ is unsuitable.”

Until 1910 the distillation was made by the Department, but since then it has been undertaken by private contract, permission being given to collect the wild plant from the forest. The annual production is now about 2,750 lb., and the price has steadily risen from about 3s. per lb. to 8s. 6d. per lb. at the present time. But whereas the cost of transport to London before the war was £8 per

ton, it has risen to the prohibitive rate of £200 per ton, and the 1917 oil still remains in store at Alexandria.

The supply of the wild plant is limited and its cultivation is under consideration.

The following table shows the exports of origanum oil in recent years :

Year.	Quantity. lb.	Year.	Quantity. lb.
1902	2,092	1911	2,276
1903	No distillation	1912	2,230
1904	2,410	1913	2,455
1905	1,463	1914	3,776
1906	2,200	1915	3,709
1907	1,745	1916	2,756
1908	2,051	1917	2,696
1909	1,530 ¹	1918	2,066
1910	2,842		

¹ A quantity of stored plant was destroyed by fire, reducing the output.

Marjoram Oil

This is not yet a regular product, but samples of locally produced oil have been examined at the Imperial Institute and pronounced to be superior to European marjoram oil and about equal in value to sweet fennel oil (see BULLETIN OF THE IMPERIAL INSTITUTE, vol. xi. 1913, p. 50). It is distilled from a plant which is abundant in the forests of Kyrenia and Paphos, and which has been referred by Dr. Stapf to *O. majoranoides*, Wild., and by Mr. Holmes to *O. Maru*, Linn. The market is, however, restricted.

Laurel Oil

Samples of oil distilled from the leaves of *Laurus nobilis* which were examined at the Imperial Institute were found to have an aroma inferior to that of the oils usually met with in commerce (see BULLETIN OF THE IMPERIAL INSTITUTE, vol. xi. 1913, p. 430). The demand for the oil is said to be small.

Otto of Roses

This has been prepared since 1897 in a very small way with native stills at the village of Milikouri, where the Damask rose is abundant. The cultivation of this rose

has now spread to other hill villages. The closing of the market for Bulgarian otto of roses owing to the war has given an impetus to the industry in Cyprus. The Agricultural Department has for two years sent qualified officers to superintend the work at Milikouri and to carry out an experimental distillation.

A report from the Director, Imperial Institute, upon samples of the 1917 distillation states that "the constants of the Cyprus oil agree closely with those recorded for Bulgarian otto of roses." It was found that the odour of the Cyprus oil was fairly good, but rather weak. The otto sold at 70s. per ounce, less $2\frac{1}{2}$ per cent., which "in view of the very small quantity must be considered satisfactory." At the time of sale French otto was quoted at 78s. to 85s. per ounce.

Acacia Farnesiana

This tree is but sparsely represented in Cyprus, but wherever found it is vigorous and healthy. It belongs to the Mimosa tribe of the order Leguminosæ and, as other species are common in the Island and thrive remarkably well, there would seem no reason why this species also should not become more general.

It is known elsewhere under different names; that of "sweet briar" (in Barbados) on account of its numerous thorns and the exquisite scent of its flowers, and "stinking cossie" (in Antigua) owing to the highly disagreeable smell of its wood. The word "cossie" may be a corruption of acacia.

Its flowers are largely used in perfumery, and the annual crop of the flowers of this plant in France is stated to be worth thousands of francs, and a particularly delicate fragrant perfume is extracted from them. The pods are said to yield a fair amount of tannin, while from the cracks in the bark of the trunk and branches there exudes a gum very like the true gum arabic and is utilised for the same purpose. The wood makes good charcoal.

It is locally known as "skouroupathos" or "skouroupathia," and is closely allied to the extremely common weed of that name which is found abundantly in nearly every field in the plains during summer, but which, owing

to its deep-rooted system, the natives do not trouble to eradicate. It is also allied to *Prosopis juliflora* or algaroba tree, of which there are a few specimens in the Island.

OILS AND OIL SEEDS

Olives

The olive tree grows wild in Cyprus, but the wild fruit is small and bitter and yields an inferior oil. The cultivated trees are those which have been grafted. Owing to the stringent regulations which have prohibited the introduction of living plants from abroad, it has not been possible to obtain from elsewhere good grafts of new varieties. These regulations have lately been modified to allow of importations by the Agricultural Department under special restrictions, and now that the war has ended it is hoped to obtain these much-needed olive grafts.

This tree thrives well, almost all over the Island, up to an altitude of about 2,300 ft., and numbers of vigorous wild olive trees are to be met with, which only need cleaning and grafting in order to bear fruit.

Cyprus olives are divided into two classes, locally known as (a) "adrouppes" or "drouppes," which are eaten in the green or black stage, and (b) "ladoelies," which are suitable both for eating and for oil extraction.

Of the former, or "adrouppes," one kind is rather large, with rough skin, having a rough, big stone, the other is longer but of less diameter, and has a very thin, smooth skin and the stone is smooth, curved and smaller. The latter has a better taste and resembles the well-known Greek olive of Calamata. Both these "adrouppes" are prepared for the table while still green, and are known as "kolymbates," or sometimes they are called "tsakkistes," owing to the stone being slightly crushed in the process of preparation.

The "ladoelies" are of two distinct varieties, the larger of which is mostly regarded as an edible olive, and contains a less percentage of oil, while the other, or smaller kind, is richer in oil contents, and is mainly used for oil production, though it is sometimes eaten.

A few imported varieties, including one or two specimens of Spanish and Greek olive trees, are to be found here and there in private gardens.

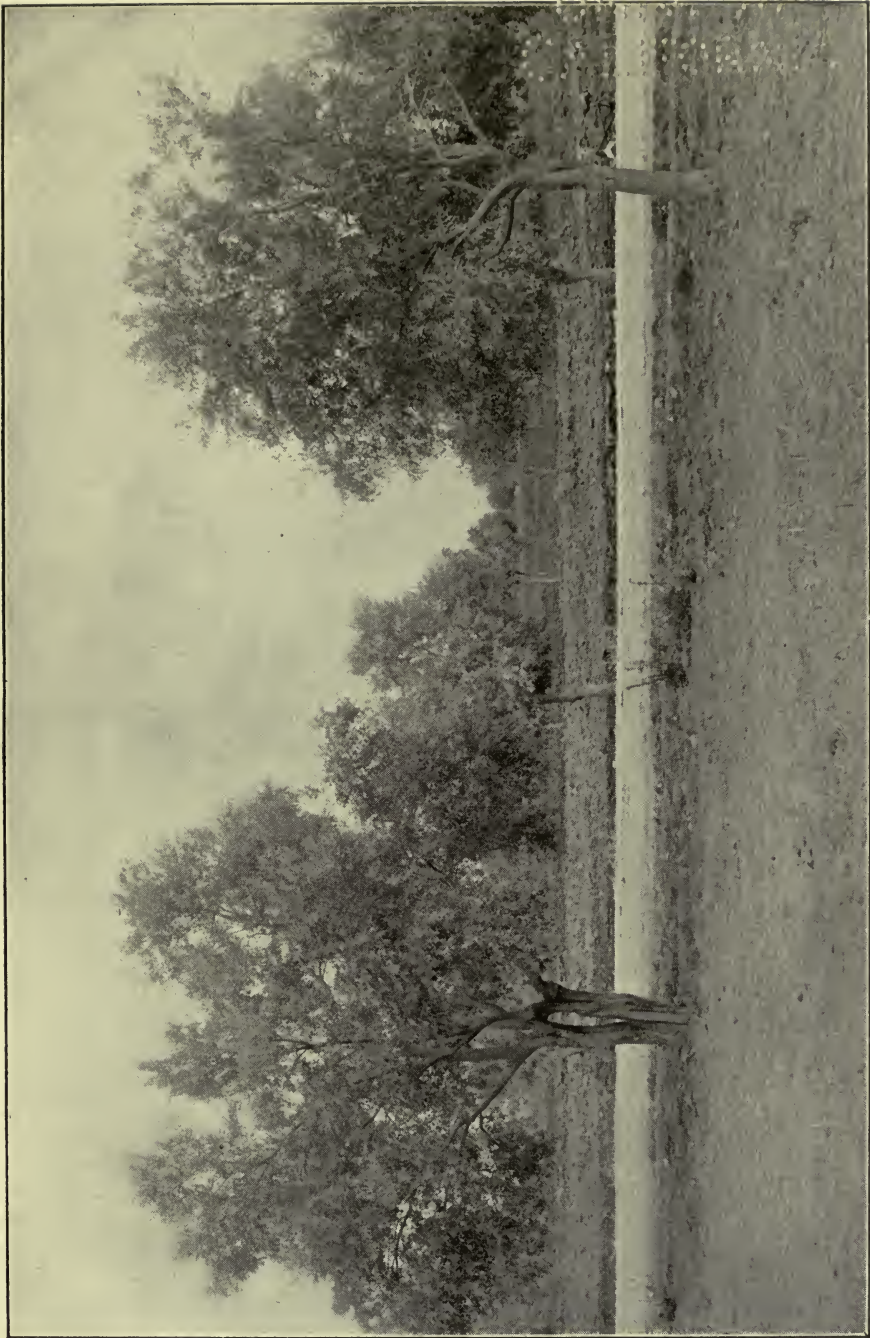
If the land were manured and ploughed the trees would, especially on the chalky soils, yield abundant fruit and oil of excellent quality. Unfortunately this is not done, and it has been found very difficult to induce the peasants to adopt any kind of cultivation. They plough the land only when they intend to sow corn or other crops between the trees, a procedure which tends to lessen the productiveness of the trees. The system of irrigation applied is also very defective. Irrigation, while improving the quality and quantity of edible olives, is not desirable in the case of press olives.

As to pruning, Cypriots would have none of it until within the last five years. By dint of patient and constant persuasion, some few of the larger owners were induced to let their trees be pruned by a staff of pruners under the direction of the Agricultural Department (see Plate VI). Much ridicule—and at times threats—was hurled at both the pruners and the tree owners, who were assured by the villagers that for their folly they would undoubtedly lose their trees. The results belied all these fears, and now within the space of some four to five years the practice of pruning has become fairly general, and a good number of villagers have qualified themselves as expert pruners and are kept regularly employed by private persons. As a consequence of this a great amelioration is noticeable in the olive trees in many parts and the yield and quality of olives have been improved.

The method of gathering olives by beating, however, continues. The fruit so knocked to the ground becomes dirty and bruised, and quickly ferments, when stored, to the detriment of the oil. This mode of gathering by beating damages the young twigs and branches, whose bearing capacity the following year is thus impaired.

Little care is taken in selecting the olives for oil. Not only are they dirty and bruised, but unripe or diseased fruit, as well as overripe fruit that has fallen from the tree, is collected together indiscriminately.

The usual practice is to spread out the olives as received,



Pruned Olive-trees at Metochi of Kykos.

NO. 1000
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and unsalted, on the mud roofs of houses in order to give off a part of their water before grinding.

The procedure is then as follows :

They are first of all taken to the crusher or grinding mill. This consists not of two stones, as in Greece, but of one stone, drawn by pony, mule or donkey.

For the first quality of oil the olive stones should not be broken, but generally speaking, insufficient care is paid to this and the stones are, for the most part, crushed. The crushed olives (zimari, paste) are then removed to the press, which is worked by hand, with one exception of an hydraulic press at Akanthou. At this village, where the best olive oil is produced, the olives are brought direct from the trees to the mill, whereas elsewhere the practice is to leave them in a heap to ferment and they often become foul and covered with dust and dirt.

In pressing with wooden presses, the zimari or crushed olives are placed in round bags made of plaited rushes. Seven to ten of these are placed one on top of another in the press and the oil obtained is virgin oil (huile vierge).

The bags are then removed and squeezed so as to change the position of the contents. They are then replaced in the press and hot water is poured into each bag. The oil obtained is of second quality. A third pressing is sometimes given.

The yield is calculated at the rate of 1 oke of oil to 4 okes of olives.

In the Paphos district is produced a black oil with a very distinct flavour. This is due to the custom of boiling the olives before grinding. The demand for this inferior oil is confined to that district.

In former days it was usual for the mills and presses to be worked in the open. This is now rarely the case, but may still be occasionally seen in parts of the Paphos district and elsewhere.

Whether outdoors or indoors these mills and presses are soon allowed to become very unclean, and the rancid flavour which clings to the wood is quickly imparted to the oil, which possesses, for any but Cypriots, a strong and unpleasant smell and flavour. There is a considerable

residue or waste, which, if it could be utilised, would go far to meet the deficiency in the requirements for local consumption.

There are a few good iron presses now in use. Their superiority is generally recognised and, no doubt, now that the war is over, they will be imported in greater numbers.

Small inexpensive, cottage filters have been designed by the Agricultural Department and these are being adopted, though very gradually. The oil so filtered is greatly superior, but having acquired a more delicate flavour, it is not so much appreciated by the native consumers.

Large numbers of young wild olive trees are issued on permit from the State forests for private cultivation and many thousands of two- and three-year-old plants raised in the Government Nurseries are also distributed every year. With the gradual improvement in cultivation and in the preparation of the oil, the production should increase enormously.

The local production of olive oil is insufficient for the requirements of the Island, but there is no reason why, in the course of time, when the large number of trees newly planted and annually on the increase, come into bearing, a valuable export trade should not result. The figures of production, given in the table below, are strikingly fluctuating, and indicate the irregularity of the annual yield and the marked variation in price :

Year.	Quantity. Cwts.	Value. £
1904	4,294	6,467
1905	5,291	8,504
1906	7,845	12,602
1907	8,981	16,922
1908	788	1,459
1909	3,851	8,864
1910	7,550	17,232
1911	608	1,415
1912	48	88
1913	911	2,052
1914	2,197	4,837
1915	6,003	15,146
1916	4,966	16,035
1917	290	1,225

Sesame Seed

The annual production in Cyprus of sesame seed (*Sesamum indicum*) is said to be about 195,000 okes. It is

one of the recognised summer crops in the plains, and is frequently sown together in the same field with cotton, maize, etc., and in the vine villages it is sown in the newly planted vineyards, where it does well. In such cases the preparation of the soil is done on the same lines as for cotton, maize, vines, etc.

The seed is used mainly for the extraction of the oil, which is largely employed in cooking, and it is also used in the preparation of sweetmeats; it is added sometimes as a condiment in bread-making. There is a small export, principally through Egypt.

The percentage of oil extracted varies according to the locality where the seed has been produced. Of the local product, that from Paphos gives the highest yield, viz. 30 to 35 per cent.; but this is inferior to the Egyptian product, which is to some extent imported and yields 40 to 45 per cent. of oil, this being probably due to the thinner skin. The crop is uncertain. The plant is readily affected by the hot west wind (*λίβας*) which not infrequently blows during its period of growth. The development of the seed is thereby checked and it remains thin and small (*ψάλλιος*), and naturally the oil yield is diminished.

Ground Nut, Peanut or Monkey Nut (Arachis hypogæa)

This nut is fairly popular among all classes and is imported through Egypt in moderate quantities. There is no reason why in certain localities this plant should not be grown successfully, more especially in the light sandy soils around Varosha and at Syrianochori. Efforts have been made to induce cultivators to grow this crop, but so far it has not commended itself. It calls for something a little out of the ordinary in the way of cultivation, as the plants mature their fruits under the soil; the profit to be derived from the crop is uncertain, and is thought, though without sufficient proof, to compare unfavourably with rival crops. Growers have been somewhat deterred by the ease with which the fruit can be stolen. As this is hidden under the soil, a theft is not at once detected. These drawbacks probably explain its restricted cultivation.

Should oil-extracting machinery be introduced, these nuts might well be grown for their oil, both for culinary

purposes and for use in soap-making. The residuum, after extraction of the oil, and the haulm are nutritious cattle foods.

The importation of these nuts was recently prohibited except in a roasted condition, owing to the risk of their introducing plant pests when in the raw, earth-encrusted condition. This has tended to check importation, and may perhaps give an impetus to local production. Ground nuts can be grown, of course, only where irrigation is possible.

The quantity of ground nuts imported in 1917 was 1,532 cwts., valued at £2,448. Previous to that year they were not separately enumerated.

Castor-oil Seed

The castor-oil plant (*Ricinus communis*) is only grown to a small extent, but the tree usually thrives well and its cultivation might be extended with advantage. According to Gennadius, Dioscorides claimed that it used to be called Seseli of Cyprus, from which the inference may be drawn that the plant has long been among the flora of the Island, where it is now known as a perennial. It grows very freely from seed and rapidly attains a height of 15 or 16 ft.; but it quickly dies back after a slight frost, though it recovers again the following year. It appears to do well in most soils, but thrives best in light loam with moderate moisture.

Owing to the demand for the oil, one or two plantations have lately been made by the Agricultural Department.

The varieties locally grown include plants producing large, medium and small-sized seed. Trial cultivations are being made to ascertain their relative values. It is found that a heavier yield of better quality is usually obtained where the plant is treated as an annual and not as a perennial. Four samples of castor seed examined at the Imperial Institute were found to contain normal amounts of oil, and similar seed would be readily saleable in the United Kingdom if offered in commercial quantities (see BULLETIN OF THE IMPERIAL INSTITUTE, vol. xvii. 1919, p. 492).

FIBRES

Cotton

During the time of the Venetian occupation (1489-1570) Cyprus exported annually from seven to fifteen million pounds of raw cotton. In the seventeenth and eighteenth centuries the English Levant Company sent large quantities from Cyprus to England. When the scarcity of cotton occasioned by the American Civil War gave a stimulus to its growth Cyprus took part in meeting the demand, and in 1866 over 2,000,000 lb. were exported. Since then the production has declined. In former times, then, the production of Cyprus cotton must have been very large, as cotton manufactures in the Island were, as in most cotton-producing countries in the East at that period, both considerable and of choice quality. Cyprus was always distinguished for its cotton spinning. Gennadius suggests that the Karpas, which is one of the centres of the Cyprus cotton manufacture, derived its name from the ancient "karpasos," a fine cotton cloth which came from India. There is an old Hebrew word "karpas" found in the Old Testament, and derived from the Sanscrit "karpasa," cotton, or "karpasum," cotton cloth.

During the Turkish Administration cotton cultivation declined, owing to the destruction of aqueducts, Venetian wells, etc., and to the practice of taxing the cotton crop in the field before it was picked—a cause of considerable delay and detriment to the crop. Careless cultivation and consequent deterioration of the fibre as well as the general fall in value contributed to the decay of the industry. Taxing the crop in the field was abandoned in 1890, and a tithe was levied on exported cotton only (*Handbook of Cyprus*).

The species of cotton principally cultivated in the Island is *Gossypium herbaceum*. American "New Orleans" seed was introduced some twenty years or so ago, and this has now largely displaced the original native kind; in fact the native kind has almost entirely disappeared, and what little is grown is mostly used for stuffing the native bed-quilt or "paploma."

Cotton grown without irrigation is known as "dry"

cotton. It is grown chiefly in the Messaorian plain and in the Karpas ; it is harsh to the touch and short in staple, but of satisfactory colour. "Wet" cotton is grown on irrigated land ; it is usually of larger staple and of finer quality than the "dry" cotton and commands a higher price. This is grown mainly round about Kythrea, Nisou, Dali, Lapithos and in the Solea valley. Native cotton is always grown "dry" ; the ordinary American variety is grown both "wet" and "dry."

The Karpas cotton, which is "dry" grown, is inferior not only on account of its shorter staple, but on account of the method of picking. In some places of Messaoria, at Dali, Nisou, etc., the "dry" and sometimes the "wet" cotton is picked in the morning before the dew has quite evaporated, and it is picked direct from the growing plant. But the most general practice is for the villagers to cut the bolls early in the morning before the dew is evaporated (*πορνή*), transport them to the houses and then remove the lint at their leisure. In this way the bolls are more or less crushed and the lint when removed contains a mixture of husk, leaves, etc.

In the case of native and other varieties the lint of which adheres to the boll, the husks, leaves, etc., are removed from the bolls in the following way : The bolls are spread out on mats to dry in the sun ; when sufficiently dry the bolls are put in a rotary sieve made of reeds and sticks, similar in make to the ordinary reed baskets of the country. Each end of the sieve is closed, but it has an opening in the middle, about 1 by $1\frac{1}{2}$ to 2 ft., which is closed by a small reed mat. The sieve is about 5 to 6 ft. long and 2 to $2\frac{1}{2}$ ft. in diameter. The bolls are dropped into the sieve through the opening and it is then revolved by hand by means of an axle which passes through it longitudinally. By this means most of the crushed husks and leaves fall through the interstices of the sieve.

The native seed is usually grown on dry lands as it withstands drought. The "wet" cotton is mostly of the American variety.

Professor Wyndham Dunstan, F.R.S., in his *Report on the Agricultural Resources of Cyprus* (1905), referred to the successful trials made with "Sea Island," "Peter-

kin," "Truitt's Big Boll," "Culpepper Big Boll," and "Allen's Long Staple." Since then other varieties have been tried by the Agricultural Department, and while "Allen's" and "Truitt's" have continued to do well, good results have been obtained from "Triumph" and "Durango," both of which are early kinds and are therefore very suitable to the Island. A report by the Imperial Institute on samples of "Allen's Improved," "Mebane's Early Triumph" and "Sakellaridis" cottons grown experimentally in Cyprus in 1915 will be found in the BULLETIN OF THE IMPERIAL INSTITUTE (vol. xv. 1917, p. 298).

Owing to fear of locusts, late sowing (about May-June) became rather general. This is a dangerous practice as the bolls ripen late and much cotton is spoilt by the early autumn rains. It is mostly sown broadcast or in trenches; on irrigated land it is mostly sown in the ridges, but the older practice of sowing broadcast still, unfortunately, continues.

"Dry" cotton is usually sown either on land which can be irrigated by a river when in flood, or in "livadhia" or low-lying lands which retain their moisture a long time. In the former case the seed is sown about March-April, while the soil is still damp from rain water or from river overflow. It is generally expected that when the young plants are fairly established a second irrigation from flood-water may occur. In the "livadhia" the seed is sown later. "Wet" cotton is watered about every fortnight.

The crop begins to be collected in mid-September and continues up till the end of October. "Dry" cotton is rarely manured; "wet" cotton occasionally. The use of chemical manures is coming into practice. There are several ginning machines in the Island, but baling by hydraulic presses is done almost exclusively at Larnaca.

In the Island the cotton seed is used for sowing and for feeding cattle. The exports of cotton seed have been :

Year.	Quantity.	Value.
	<i>Cwts.</i>	£
1909	2,708	769
1910	3,066	970
1911	3,245	830
1912	15,874	4,535
1913	13,933	3,750

The exports represent about three-fourths of the total production.

There should be a good opening for machinery for extracting the oil.

The cotton is locally graded into (1) best, (2) medium, and (3) poor, all being American varieties. The first quality is the "wet" or irrigated cotton. The second quality is grown mostly in the Messaoria plain and at Dali, Nisou, Potamia, Kythrea, where it is partly irrigated by river floods. The third quality is "dry" and comes principally from the Karpas. On the Marseilles market the second quality has a value 3 to 4 per cent., and the third quality 8 to 10 per cent. less than the first quality. The first quality ranks in price at Marseilles on about a level with American cotton.

For some ten years Greece has taken the leading place as an importer. Before the war, Cyprus cotton went chiefly to Marseilles and Greece, some also to Trieste. Only a very insignificant quantity goes to England. The freight to Marseilles was about 25s. per ton, to Trieste about 15s. per ton, while to England it averaged 50s. per ton. The market prices at Marseilles and Trieste were approximately the same, but at Marseilles they were subject to a discount of $1\frac{1}{2}$ per cent., whereas at Trieste a discount of 3 to 4 per cent. was made. The Trieste market, being small, was subject to sudden fluctuations and was therefore risky and less favoured by Cypriot exporters.

For several reasons the Liverpool market has not been so attractive as that of Marseilles. At Liverpool and Manchester quantities of not less than, say, 100 bales are preferred, whereas Marseilles would take smaller consignments of 20 or 40 bales. Uniformity of type is required by Manchester spinners, whereas the French factories are more ready to handle different types, including the shorter staples. Cyprus merchants make no distinction as regards the varieties of cotton, whether "Orleans," "Sea Island" or other kinds, and indeed they are scarcely competent to do so, as this requires special knowledge and experience. They buy in small quantities from many peasant growers and mix the produce in order to make up a fair consignment.

In normal times there was always the further difficulty of obtaining direct transport to England, whereas to Marseilles, Trieste and also to Greece the opportunities were more frequent.

Since the war Greece has become much the largest buyer. Owing to shortage of cotton on the Greek market this commodity was purchased from Cyprus rather than from Liverpool, as the freight was lower and war risks much less; apart from the almost impossibility of obtaining tonnage. It was the practice before the war for Cypriot merchants to sell c.i.f. Piræus, but they could not continue this under recent conditions and now sell f.o.b. Cyprus, and this practice is likely to continue. This f.o.b. Cyprus price has lately been about the same as would ordinarily be obtained for c.i.f. Liverpool. Greece has many small filatures willing to take consignments of even 10 bales, and the shipment direct or via Alexandria is easier.

A Cyprus bale weighs about 150 okes.

The following figures, showing average annual exports of raw cotton at various pre-war periods, indicate the course of the cultivation:

Period.	Average Quantity. Cwts.	Average Value. £
1880-89 . . .	68,410	147,683
1890-99 . . .	57,291	91,812
1900-09 . . .	41,121	92,939
1910-17 . . .	68,384	213,275

Prices have varied, as is shown by the values of the following record years:

	Quantity. Cwts.	Value. £	Average price. £
1885 (highest export on record)	14,276	29,567	2 1 5
1886 (2nd ditto) . . .	13,887	26,535	1 16 11
1912 (3rd ditto) . . .	13,808	40,085	2 18 0
1913 (4th ditto) . . .	13,444	40,693	3 0 6
1884 (5th ditto) . . .	12,227	26,874	2 3 1

In 1917 there were 13,685 donums under cotton cultivation.

It is usual in some parts of the Island, especially in the Kyrenia district, to leave the crop in the ground for two or three years. This method of cropping is locally known

as "palia" or old. It is found profitable to leave the cotton plants two or three years on irrigated land. The second-year crop usually gives the heaviest yield.

The average yield of unginned cotton on irrigated land is about 120 okes (3 cwts.) per scala; but as much as 250 okes can be obtained. "Wet" cotton, best quality, yields 1 oke of lint from 3 okes of unginned cotton, and "dry" cotton yields about 1 oke of lint from $3\frac{1}{2}$ okes of unginned cotton.

There is much land well suited to cotton which for lack of water cannot be utilised. If artesian water could be found, there would be a very considerable extension of this cultivation.

There is a well-equipped little cotton factory at Famagusta, and excellent cotton fabrics are made, especially in Nicosia neighbourhood, Lapithos and Karavas, Lefkoniko and Gypsos and in the Karpas. These are known under the names of "alaja" and "dimita." They are mostly of good patterns, the material is strong and wears well, and is being largely used, not only by the peasantry, but also for making men's suits and ladies' skirts and cloths.

An interesting article on the Cyprus Cotton Industry is to be found in the BULLETIN OF THE IMPERIAL INSTITUTE, vol. iii. 1905, pp. 327-334.

Flax and Linseed

The cultivation of flax (*Linum usitatissimum*), which began to develop some twenty years ago, has declined during the last ten years or so. The reasons for this are that it is considered to exhaust the soil, the later handling of the crop for fibre is troublesome and the market is liable to rather violent fluctuations. It grows well in the Messaoria plain, and when chemical manures are more generally used it may come more into favour. Attempts have been made to improve the quality by the introduction of Riga flax seed, but so far without success. There is a small export of linseed, but owing to the primitive methods of winnowing and cleaning it does not fetch the best price. The quality of the cleaned seed is excellent. Knowledge and care are needed in picking the crop at

exactly the right time. The imperfect methods of general cultivation prevent the uniform ripening of the seed, and this means an uneven and unsatisfactory sample. Defective screening accounts for the presence in excess of foreign substances, weed seeds, etc. These difficulties are capable of remedy, and it may reasonably be hoped that when once overcome the cultivation will be extended.

In Cyprus the cultivation is the same whether intended for seed or fibre, and consequently the latter is of an inferior quality, as is indicated in a report on Cyprus flax published in the BULLETIN OF THE IMPERIAL INSTITUTE (vol. vi. 1908, p. 4). Seed is sown in November–December at the rate of 17 to 22 okes per donum. Retting is done by steeping in the large stone irrigation tanks which are a feature on most farms. In the Messaoria, about Ano and Kato Zodia, where flax is commonly grown, the plant is retted in the river Ovgos, which retains sufficient water usually until August. The yield per donum varies from 100 to 300 okes of seed, 80 to 100 okes of fibre and 50 to 70 okes of tow.

Wool

The exports of wool for the three last pre-war years were as follows :

Year.	Quantity.	Value.
	<i>Cwts.</i>	<i>£</i>
1911	5,535	13,452
1912	4,627	11,362
1913	4,707	12,181

This went chiefly to France, and next, though in much smaller quantities, to Italy.

The wool is of moderate quality ; this is partly due to the breed of sheep and partly to the conditions under which they are kept. Attempts have been made by the Agricultural Department to impress on the native breeders the necessity of keeping the sheep well fed, and experiments have been carried out at the Athalassa Experimental Farm for the purpose of demonstrating the advantages of careful rearing.

Two fleeces from the Athalassa Farm were sent to the Imperial Institute in May 1912, for examination and commercial valuation. One was the fleece of a yearling ram. This was clean, fairly soft and almost white. The other was the fleece of a yearling ewe. This was clean, slightly harsh and almost white, but was slightly coarser than that of the ram.

These fleeces were considered by a firm of London brokers as an excellent class of carpet wool and likely to meet always with a ready sale in the London market (see BULLETIN OF THE IMPERIAL INSTITUTE, vol. x. 1912, p. 537). A similar opinion was expressed immediately before the war (July 1914) by a London firm to whom two bales of Cyprus wool had been sent, of which a part had been purchased in the bazaar and washed and trimmed by the Department and part came from the Athalassa (Government) flock. It was considered as "an ideal wool for carpet making or for blankets, but deficient in lustre for braids."

The actual yield per sheep, viz. 3 to 3½ lb., compares unfavourably with that of Lincolns, which they most closely resemble. This is due partly to breed, but largely also to the conditions under which the sheep are kept (see p. 17).

Hemp

The cultivation of hemp (*Cannabis sativa*) is practically confined to the southern part of the Paphos district, and there only in places where the water-supply is ample. The plant is grown only for fibre, which is exclusively used for rope-making, which is carried out by hand by the villagers round about Ktima. It would be of advantage to have a rope-making machine at work at a spot centrally situated in the area of production. A simple hand-worked machine is now being experimentally used and will, it is believed, turn out a better class of rope.

The plant grows well on fertile and irrigated lands. Farmyard manure, and specially sheep manure, are generally applied, and chemical fertilisers are now also coming into use.

Harvesting takes place when the plants begin to turn pale. The plants are uprooted, not cut, and are made up into sheaves tied together at the butt end only. The bundles are not more than $2\frac{1}{2}$ spans round, and of equal size. When first uprooted the sheaves are placed flat on the field in rows to dry and in such zig-zag fashion that the top end of one sheaf is always made to rest on the butt end of another, and thus does not come into contact with the ground: this ensures the circulation of air and hastens the drying process. The sheaves are taken later to the threshing-floors, where they are stood upright until they are dry. The seed is separated by beating. The sheaves are exposed to the sun until the leaves are shed, and when the stems are entirely dry the bundles are tied up at both ends and are taken to the retting-place, which is usually the common stone tank or cistern of the country. There they are steeped in water for six to nine days. The bundles are generally covered by about one foot of water. On the sixth day the fibre is tested. If it separates easily the bundles are removed, if not they remain for another two or three days. This requires much care and experience, as the quality depends largely upon effective retting. Then they are taken out of the water and sun-dried, being piled up into pointed shocks, left hollow in the centre.

The fibre is separated by means of a wooden implement locally called "melidjia." This consists of a wooden trough placed on two legs which are fixed in the ground. A wedge-shaped piece of wood which is hinged to the trough at one end is used as the beater. The hemp stalks, after the butts are cut off, are placed in the trough and the beater worked up and down so as to split the stalks and lay bare the fibre.

The average production of fibre per scala is 60 to 80 okes, but where conditions are all favourable it may reach 160 to 200 okes and the seed yield may be anything from 80 to 200 okes per scala.

Silk

The silkworm (*Bombyx mori*) finds in Cyprus a climate exceptionally favourable to its development, and Cyprus

silks have been famous for their quality throughout the middle ages and as far back as the sixth century A.D., when Greek monks first introduced silkworms from China.

In the fateful year 1845, when the disease pebrine nearly destroyed the silk industry of Europe, the anxious search for healthy silkworm eggs that then ensued led Arabs from Syria to visit Cyprus and buy large quantities of silk cocoons from which they raised and exported the eggs. At that time, therefore, it is evident that Cypriot moths were well thought of. Pebrine soon reached Cyprus and almost brought the Island breed to an end. Thanks, however, to the Pasteur system, whereby pebrine and other silkworm diseases have been brought under complete control, the industry both here and elsewhere was not only saved but has been considerably developed.

Writing in 1896 Mr. P. Gennadius, late Director of Agriculture, Cyprus, stated that the local production of silkworm eggs was so small that it could not be taken into consideration, and from the figures then given the total average annual production at that time is estimated to have been 35,000 okes of dry cocoons. This represented an average yield of only $3\frac{1}{2}$ okes of dry cocoons, equal to $15\frac{1}{2}$ kilograms of fresh cocoons, per ounce of silkworm eggs. This compared very unfavourably with the average annual production of fresh cocoons in France and Italy at that time, which was 35 kilograms and 30 kilograms respectively per ounce of silkworm eggs. Moreover, this ratio had been, up to that period, on a descending scale.

In a report published in 1897 Mr. Gennadius attributed this unsatisfactory state of things to the following causes :

1. The importation of cheap silkworm eggs of inferior quality ; the average price paid by merchants was 2 to $2\frac{1}{2}$ francs per ounce, while the price in France ranged from 9 to 12 francs.

2. The action of merchants who imported larger quantities of eggs than they could properly dispose of.

3. The ignorance and folly of rearers who undertook to rear far more worms than they could properly " educate," having regard to space, leaves and labour.

In 1908 the Department of Agriculture set to work, with

some success, to improve the methods of rearing up to that time in vogue, and during the six years ending 1913 (inclusive) the average annual quantity of eggs hatched out was 12,319 oz., the average annual export of "dry" cocoons was 45,551 okes, and the average annual estimated local consumption 4,449 okes, making a total annual production of 50,000 okes, as against 35,000 okes in 1896. The former total represents an average yield of about 4 okes of "dry" cocoons, equal to about 18 kilograms of fresh cocoons per ounce of seed, and marks a slight improvement upon the ratio of eighteen years previously.

Since 1914 this branch of work has received a larger share of attention from the Department. Five sericultural stations have been established, regulations have been issued, inspections by qualified persons have been systematically made, practical advice has been given to rearers in the matter of cleanliness, disinfection and so forth, the granting of licences to egg-raisers has been put on a better footing and the whole industry has been brought more under observation and control.

Numerous suggestions have been made from time to time for insuring that only a good quality of egg shall be imported. As an effective—perhaps the most effective—means to this end, the Department of Agriculture has set itself to improve the production of local eggs and thus indirectly discourage their importation: holders of licences to raise eggs are required to pass periodical examinations; several have in consequence had their licences cancelled, new licensees have been added, and many unlicensed persons have been prosecuted and convicted for illegally raising eggs.

The common method of hatching practised by villagers, by placing the eggs tied in cloth with a little cotton-wool in their beds or by carrying them on their persons, still prevails, but it is gradually yielding to a better system of incubation. The Department has designed a simple, inexpensive hatching-box, and these are now being used with good results.

Until about three years ago probably 25 per cent. of the local rearers were producing their own seed without any microscopical examination at all. Bad feeding, bad ven-

tilation, ill-adapted premises were general. As a consequence pebrine and flacherie played such havoc that many people were beginning to abandon silkworm rearing and uproot their mulberry trees. The expansion and increased resources of the Agricultural Department happily came just in time to check this backward move.

Silk reeling is unfortunately done in the most primitive manner with wooden appliances and hot water by village hand labour. The locally reeled silk is used only for Island consumption and the great bulk of cocoons is exported in the raw state, mostly to Lyons and Milan. The burden of freight on this bulky cargo is naturally a heavy handicap and the local silkworm rearers have consequently to be content with very low and inadequate prices for their cocoons. During the reeling process 20 to 25 per cent. of the silk is lost, and a further loss is incurred during weaving owing to the numerous knots having to be cut away and the silk threads rejoined.

A considerable loss is said to take place in selling cocoons in the European markets. The cocoons on arrival at Marseilles are subjected to official tests and sold according to the reports made by the official testers. It is of advantage to the buyers that the report should be made as unfavourable as possible as the price is lowered proportionately, and it is felt that the cocoons exported are thus placed too much at the mercy of the testing officials.

These Cyprus cocoons are reeled in France and Italy and the silk is largely sold to England. It would be to the mutual benefit of England and Cyprus if a direct demand for Cyprus reeled silk could be created and modern reeling plant introduced into the Island. A large sum of money, now annually paid for freight, would thus be saved to the Cypriot producers, which would stimulate the local industry and tend to increase greatly the annual production and improve the local weaving of silk stuffs, an industry which has already gained considerable fame and at which the Cypriot women are adepts.

As the following table shows, the amount of raw silk exported is a negligible quantity, but a fairly large quantity is locally reeled and is used in making the silk stuffs which are so much sought after in the local bazaars :

Export of cocoons.			Export of cocoons waste.		Export of raw silk.	
Year.	Oks.	Country.	Oks.	Country.	Oks.	Country.
1909	41,013	France	2,120	France	6	Turkey
1910	44,550	"	1,105	"	259	"
1911	57,422	"	2,704	"	157	Egypt
1912	43,196	"	2,571	"	246	Turkey
1913	48,884	"	70	Turkey	70	Egypt
			2,502	France	90	Turkey
					3	Greece
					118	Turkey

Efforts have been made by the Agricultural Department to improve the Cypriot race of silkworms. Two races of white colour, the Japanese and the Baghdad, have been separately crossed with the yellow race of Baghdad. These crossings began in 1912-13 and have been continued up to the present. The objects aimed at are to establish a new Cypriot race (*a*) giving good cocoons of a fine structure and larger in size than the French variety and yielding a maximum quantity of silk; (*b*) producing cocoons of a uniform colour and in demand in the European market and (*c*) with these characteristics constant.

The results obtained so far are promising, but uniformity of colour has not yet been attained, though it is hoped that, by careful selection, this will become more fixed every year. It may here be mentioned that the famous French cream-coloured race took seventy-five years to become fully established owing to the widespread damage caused by pebrine and, to a lesser extent, by flacherie.

It has been observed that silkworm eggs locally produced by qualified licensees are decidedly more immune to disease and less affected by adverse atmospheric conditions than imported seed.

The local conditions of sericulture in Cyprus have undergone a change of late years. Formerly Nicosia and Famagusta were the districts where this industry was chiefly carried on; but latterly whole mulberry groves have been uprooted and replaced by fruit trees which are considered to be more profitable. This was the inevitable result of the ignorant methods under which the silkworm-rearing industry was conducted and the use of bad seed permitted, whereby disease was spread and annual loss

incurred. It is hoped that the industry is now again on the upward grade. One indication of this is that whereas a few years ago 1,000 to 1,800 cocoons went to an oke, now the figure may be put at 500 to 1,000. Again, the waste due to excess of floss is much less than formerly, and if only reeling by machinery can be introduced a very much better return will result to the cocoon producer.

In the Karpas and in and around Nicosia a bi-voltine race is reared. The results are poor, but the two rearings are made because in these localities there is an ample supply of leaves. From this race are produced small cocoons locally called "Confetti." They are only used for local silk manufacture.

An inferior silk called "Koukoularika" is made from the cocoons of the ordinary or univoltine race, both those which have been stoved and those which have been badly stained when the moths emerged.

These cocoons, which, during the process of boiling in lye, have been bleached, are turned inside-out and the excrement of the larva removed. The silk is then spun by hand with the "atrachtos." These cocoons are mostly from laggard worms and of inferior quality.

The silk industry has suffered greatly from unscrupulous dealing on the part of the dealers in eggs. It is a common custom for these persons to sell imported seed at 2s. and even less per ounce, although the law requires all such seed to be accompanied by a Consular certificate and affidavit showing that the price paid was not less than 4s. per ounce, exclusive of freight, carriage or insurance. Secret discounts, presumably, render this practice possible. The dealer does not ask for payment in cash, but requires it in kind at the rate of 1 oke in every 4 okes of cocoons raised. If 28 okes of cocoons are obtained from 1 ounce of seed the dealer would get 7 okes, valued at say 2s. 6d. per oke = 17s. 6d. for each ounce of seed. The dealer mostly gives a cash advance of 10s. or £1 with the seed, stipulating that the crop is to be sold exclusively to him, the price being left open. The unfortunate producer is therefore in his toils.

The establishment of small Sericultural Societies would

do much, both to encourage and cheapen the cost of growing mulberry trees and assist the industry. A few such societies have lately been formed.

Mulberry

This tree (*Morus alba*) is grown extensively for silkworm feeding and is mostly found in those parts of the Island in which the silk industry is centred, viz. in the Marathassa valley and in the Karpas, fairly generally in and around Nicosia, Kyrenia and in the southern parts of the Paphos district.

Little care is given to its cultivation. For the most part, in all the older plantations, the trees are set too close together. This is less noticeable in the newer plantations. Pruning, where given, is defective and so is the method of gathering the leaves.

The usual method is to cut off, every year, the shoots with the leaves on them, from about one foot above the main branches. Two reasons are given for this by villagers. (1) It is quicker and easier to cut off these shoots than to pick off the leaves while still on the tree. The shoots are brought into the "magnanerie" and there placed upright in water and the leaves can then be removed more conveniently and at leisure. In this way the leaves remain fresh two days. (2) By cutting these shoots in the spring, *i.e.* during the silkworm-rearing season, which begins in early April, fresh shoots are formed which bear leaves in late summer and autumn. The latter afford very welcome green food for cattle and sheep. These leaves are stripped direct from the growing tree. The effect of this second gathering is prejudicial to the tree, which is thereby exhausted. The leaves produced the following spring are fleshy and watery and in the uncertain weather of spring are apt to induce flacherie.

Agaves and Aloes

Agave americana, *A. rigida* var. *sisalana*, *Furcraea gigantea*, *Aloe ciliata* and *A. frutescens* all grow well and, if properly cultivated and handled, might be worth more attention than they at present receive.

In 1913 a Cypriot from German East Africa who had been engaged in the production of Sisal hemp there was struck by the few excellent plants he found growing in Cyprus, and, had sufficient suitable land been then obtainable, with transport facilities, was desirous of undertaking cultivation on a commercial basis.

Samples of fibre prepared from the leaves of the above-mentioned plants were reported on by the Imperial Institute in 1912, but as the leaves had been retted, and not scraped or scutched, their value was depreciated, and this was estimated at from £14 to £18 per ton with best Mexican Sisal hemp at £25 per ton.

The outlay for fencing against wandering flocks of goats and for decorticating machinery and other expenses would deter the ordinary cultivator from planting, and this could only be profitably undertaken if ample capital were forthcoming.

Broom Corn

Until the end of last century all brooms of European type were imported. Seed of broom corn (*Sorghum vulgare*), known locally as "tchihri" or "skoupa," was then introduced, and gradually the cultivation has extended and a good number of brooms of very fair quality are now locally made. The process of broom-making is very simple and the high price of the imported article during the war has led to a marked extension of the industry. The plant grows well, especially on irrigated land. The seed provides a good food for chickens and the stalks and leaves can be used as fodder. It is a profitable crop, especially when the cultivator makes and sells the brooms himself, and is principally grown in the Karpas and at Athienou.

TOBACCO

In Turkish times tobacco was grown in several parts of the Island, though not to any large extent.

"For centuries it was produced in many districts of the Island, and particularly in the Karpas, near Kilani, Omodhos and Paphos, but from the time it became an article of monopoly its production was subjected to rigorous

restrictions, and its cultivation has been entirely abandoned" (Reports, pt. ii. (1896), P. Gennadius).

The quantity grown before the occupation appears to have been very fluctuating and to have averaged about 56,000 lb. annually, and the Government revenue, according to British Consular reports, would not have been more than £300 to £400 per annum. The Régie was introduced in 1874, but owing to the hampering restrictions the industry had been pretty well crushed out by the time of British occupation in 1878. Meanwhile the revenue from tobacco, imported mainly from Volo and Salonica, increased greatly.

The monopoly ceased at the British occupation, but the regulations and imposts remained. Those responsible for controlling the industry, collecting dues, and checking illicit consumption had a troublesome task, while on the other hand the cultivator became averse to engaging in a cultivation which was hedged round with so many restrictions and formalities.

These exist at the present time and may here be quoted :

The grower has to notify the Customs authorities of his intention to sow, giving the locality and area. Before picking he must again notify the Customs, so that a Customs officer may be present at the picking and weigh the freshly picked leaves. After storing, but before delivering the tobacco to the factory, the Customs officer must again weigh the now dry leaves.

The excise duties leviable are : Tobacco leaf, $4\frac{1}{2}cp.$ per oke, payable on transfer of leaf from grower to wholesale dealer. Tobacco manufactured in Cyprus, whether made into cigarettes or otherwise, in addition to the import duty or transport duty, pays a banderolle duty of 3s. $6\frac{1}{2}cp.$ per oke.

These regulations are a relic of the Turkish times, as in those days the State received a definite due called " City Toll " by charging the tobacco cutters and tobacco sellers with a trade tax. They appear to have been administered with more laxity in Turkish than in post-occupation times, and it is said that the abandonment of tobacco cultivation was mainly due to the severity with which

these rather vexatious and irritating regulations were enforced.

For many years the tobacco imported by local cigarette manufacturers came almost entirely from Macedonia. This tobacco was of very superior quality and cheap, and locally grown tobacco could not compete with it. Of late years the price of Macedonian tobacco has risen considerably and the manufacturers have therefore been induced to import Thessalian tobacco instead, which is not of so fine a flavour and approximates more closely to Cyprus produce. Cypriot smokers have thus had their palates prepared for the flavour of the locally grown tobacco.

About the year 1912, when Houry's Cyprus Tobacco Association, Ltd., was formed, a revival in the industry set in. This has since received considerable impetus from the war, which, temporarily, has thrust Macedonian tobacco out of the market. The primary object of the Association was to manufacture tobacco and cigarettes from Cyprus-grown tobacco, although foreign tobacco could also be used. Tobacco then began to be regularly grown by the Association at a Chiftlik near Limassol and elsewhere, and cigarettes made therefrom have had a fair local sale. The arrival of well-to-do refugees from Latakia and other parts of Syria, skilled in tobacco cultivation, led to great extension of this crop. A large part of the produce was at first converted into Latakia tobacco. Owing possibly to the lack of care and skill on the part of native labour, partly perhaps to the unsuitability of the herbs and brushwood used in the fuming, the market was not found sufficiently encouraging and the Latakia, for which at best there is a very restricted market, has almost ceased to be produced. Tobacco for cigarettes, however, continues to be grown on a fairly large scale, but in order that land suitable for corn and other foodstuffs should not be sacrificed to tobacco, the cultivation of the latter is permitted only by special licence. In 1916 and 1917 the industry fell almost entirely into the hands of the richer refugees, who were expert growers, and they contracted with the small farmers and peasants. A number of speculative growers, professional men, merchants, etc., were tempted

by the prevailing high prices to embark in the industry, but the licensing system has tended to throw it more into the hands of the *bona-fide* farmers, who are allowed only to cultivate small areas which can be looked after mainly by their own families. In 1916 the total production was 89,065 okes, and the estimated yield for 1917 is 487,674 okes.

The Agricultural Department has for some five years carried out experimental growings in various districts, and samples of tobacco so grown have been submitted to the Imperial Institute (see BULLETIN OF THE IMPERIAL INSTITUTE, vol. xiii. 1915, pp. 547-550). The two best samples reported on were grown in the Nicosia plain. They were said to conform with the Turkish tobacco as regards size of leaf, but contained too much moisture for the English market. The tobacco was found to smoke rather hot and was only mildly aromatic, but it was believed that these defects would probably disappear with more experience in the curing. The samples referred to were incompletely cured, having been submitted quickly in order to roughly ascertain their quality. The report on the whole was moderately encouraging, and it is hoped that later samples which have been better cured will be found superior.

The tobacco grown in Cyprus is mostly of the Samsoun, Trebizond, Kavalla and Hassan Keff varieties.

The normal importation of tobacco into Cyprus is about 180,000 okes, which produces an import duty of £4,500 a year, at the rate of $4\frac{1}{2}cp.$ per oke.

The average amount paid for banderolles on tobacco when issued from factories for consumption is about £30,000 a year, which at the rate of 3s. $6\frac{1}{2}cp.$ per oke equals a banderolle duty on 161,000 okes; the difference of about 20,000 okes would be cigarettes exported on which no banderolle duty is paid.

If, then, no tobacco were grown and none imported the Government would lose £35,000 revenue annually. It would appear to be immaterial from a revenue point of view whether tobacco were imported or grown in the Island, since the imposts are the same, viz. on imports $4\frac{1}{2}cp.$ per oke import duty and 3s. $6\frac{1}{2}cp.$ per oke banderolle

duty ; on locally grown tobacco $4\frac{1}{2}cp.$ per oke transport duty and $3s. 6\frac{1}{2}cp.$ per oke banderolle duty. There is, however, this difference, that the money leaves the Island when the tobacco is imported and remains and fructifies when it is locally grown.

Tobacco cultivation is in many ways well suited to this Island, as a great part of its cultivation as well as the gathering may be done by women and children. It need not therefore make any serious demand upon man labour, which is already insufficient, and much of the work can be performed by those who are unfit for heavy field work. It is a summer crop, which is greatly in its favour, the quality when grown "dry" being much finer than when irrigated. Its introduction broadens the basis of cultivation, provides a revenue from land that would otherwise lie fallow and is a useful element in any system of rotation. As it calls for careful preparation and thorough cultivation of the soil it has a great educative influence on a people prone to slovenly, primitive husbandry, and corn crops following tobacco have frequently given a larger, more uniform yield.

At the same time it is an open question whether the crop can be grown and the leaf cured by the Cypriot farmer to produce a tobacco which, under normal conditions, will successfully compete in quality and price with the Macedonian tobacco.

TANNING MATERIALS AND DYE-STUFFS

Tanneries are fairly numerous and large quantities of skins are tanned and sold to native boot-makers. Before the war, goat- and sheep-skins and ox-hides were practically the only kinds handled, the two former being mainly used for the uppers of boots. The top-boots worn by villagers are nearly all made from goat-skin, locally called "totmaria." Since the war pig-skins and dog-skins have been also used. Camel-skins are often employed for making soles.

Pine bark and sumach are the native tanning substances chiefly used in the local tanneries. The pine is one of the commonest forest trees of the Island. Shinia leaves (*Pistacia Lentiscus*) are also used (see p. 51).

Sumach

The Sicilian, elm-leaved or tanner's sumach (*Rhus Coriaria*) is a shrub which grows wild throughout a large part of the Island, being principally found among the vineyards on the slopes of the southern range of hills. The leaves are largely used in the leather tanning industry, and a considerable export might have been established to the United Kingdom had it not been for dissatisfaction caused by the excessive presence of impurities, such as lentisc leaves and dust, which were usually found in the consignments sent.

One sample was sent by the Agricultural Department to the Imperial Institute in 1909. This was found to consist wholly of sumach and no lentisc or other leaves, and gave on examination the following results: Moisture, 10.1; ash, 9.8; tannin (by hide-power method), 26.9; extractive matter (non-tannin), 16.7 per cent. The report showed that the leaves produced a good leather, similar in texture and colour to that obtained with Sicilian sumach, and was considered likely to fetch about the same price as a medium quality of Sicilian sumach, which contains from 25 to 30 per cent. of tannin (see BULLETIN OF THE IMPERIAL INSTITUTE, vol. x. 1912, p. 45).

Two further samples were sent in 1916. The first sample "consisted of a finely-ground yellowish-green powder, containing a quantity of sand, small stones and iron dust." The second sample consisted of a "coarsely-ground, yellowish-green powder, containing a quantity of pinkish unground twigs, sand and small stones, together with some iron dust."

The results of examination were as follows:

	No. 1. Per cent.	No. 2. Per cent.
Moisture	9.3	9.2
Insoluble matters	53.6	57.8
Extractive matters (non-tannin).	14.6	13.0
Tannin	22.5	20.0
Ash	8.5	12.3
<hr/>		
Tintometer readings—Red.	0.7	1.2
Yellow	2.1	2.5

Both samples were low in tannin, compared with the Sicilian percentage of 25 to 30.

Sample No. 1 was valued at £13, and No. 2 at £12, per ton, with Sicilian sumach at £15 per ton; the lower value being due to the lower tannin contents, owing to the presence of sand, dirt, etc. It may be assumed that if more care in preparing clean samples were taken, Cyprus sumach would greatly improve its market value.

Valonea

There are a few well-grown specimens of valonea oak (*Quercus Ægilops*) to be seen, but being a slow grower and as it takes many years to reach the stage when it yields a profit, it does not commend itself to the Cypriot tree planter. It prefers deep soil and requires artificial irrigation or a greater rainfall than we have in Cyprus.

It has been tried at Salamis and failed, and also at Machaera with the same result. It has been grown also on Troödos, but after six years' growth attained a height of only 1 foot.

Only an insignificant quantity of Valonea cups are locally produced. These come from the Paphos district and are said to be rather poor in tannin. The bulk comes from Anatolia. The pre-war price for the latter was 5s. per cantar of 44 okes, that for the locally grown was 20 paras per oke on the spot, transport charges bringing up the price to about 1 copper piastre per oke delivered.

Acacia Barks

Acacia pycnantha has been grown in Cyprus, but does not acclimatise well, and neither the soil nor climate seems favourable. *A. mollissima* also has not shown any very successful growth. *A. cyanophylla* and *A. longifolia*, on the other hand, thrive excellently. They are great drought-resisters and grow on almost any soil. They have been very extensively grown by the Forest Department in every district for fuel and along the coast upon sand dunes. They have not been utilised so far for the extraction of tanning, except experimentally. Samples of the barks of the two last-named species were found on examination at the Imperial Institute to be too poor in tannin to be worth exporting, but they should be quite suitable for use

in Cyprus (see BULLETIN OF THE IMPERIAL INSTITUTE, vol. xi. 1913, pp. 412-414).

Madder

In former years, and within the period of the British occupation, the cultivation of madder (*Rubia tinctorum*) was fairly flourishing in Cyprus. The old madder grounds can still be distinguished, and are mostly to be seen near Morphou, Ayia Irini, Sotira, Ayios Serghios, Famagusta and Larnaca. These madder grounds were excavations made in order to expose the soil lying beneath 10 to 30 ft. of drift-sand; and they form, as it were, a series of tanks along the shore. The red dye obtained from the dried and ground madder roots constituted at one time one of the most valued of dye-stuffs, and was in special demand for military uniforms; but this has been entirely superseded by artificial coal-tar derivatives and, as Gennadius says: "The happy days of the cultivation of this plant are past, never to return."

It is propagated mostly by root cuttings. The leaf begins to dry at about the sixth month. There is no further growth above ground, but the roots continue to increase and shoot downwards till moisture affects them. "When they get too wet, they become black or rot. In Cyprus this rotting would often begin after about eighteen months, while in superior soils the roots would continue to improve during thirty-six months, and they would be known in the trade as eighteen months and thirty-six months roots. In Famagusta district they remain mostly eighteen months, while at Morphou they would continue fully thirty-six months, during the whole of which time the surface ground should be kept free of weeds."

After the root is lifted it is generally dried; if packed before quite dry, it ferments and deteriorates.

Two and a half tons of dried roots would be produced from an acre of good ground, and the madder grounds used to fetch a very high price.

DRUGS AND OTHER PRODUCTS

Liquorice Root

The liquorice plant (*Glycyrrhiza glabra*, Linn.) grows mainly in the Famagusta and Kyrenia districts, and the

roots are collected and exported from time to time. Two samples were reported upon in 1917 by the Imperial Institute (see BULLETIN OF THE IMPERIAL INSTITUTE, vol. xv, 1917, p. 312) and the following opinions of two London firms of brokers were elicited.

(a) One firm described the Lapithos (Kyrenia district) roots as medium to bold unpeeled roots of good flavour, fairly well cleaned and very well dried; and valued them at from 50s. to 55s. per cwt. ex wharf, London (February 1917). The firm described the Famagusta roots as thinner than the Lapithos sample and not so well freed from smooth valueless pieces, but mentioned that they had apparently been washed. They valued these roots at 50s. per cwt. ex wharf, London (February 1917). The firm added that both samples were exceptionally dry, and that it seemed doubtful if the material in the bulk would be as dry.

(b) A second firm considered the roots to be rather mixed, inferior quality, and worth at that time about 45s. per cwt. in London (February 1917).

Pyrethrum

Pyrethrum (Chrysanthemum) cinerariæfolium grows well from seed and is an attractive garden plant with pretty, marguerite-like flowers. These yield the pyrethrum of commerce so largely used as an insecticide, and which is said to form the chief ingredients in various flea powders. These flowers, when dried and ground to dust, are employed for this purpose by the natives. The original pyrethrum powder came from plants growing in Dalmatia.

The plant was introduced into the Cyprus Government Gardens some twenty years ago and has since spread more or less throughout the Island. It is perennial and drought-resistant, and will also stand several degrees of frost and seems indifferent to soil, provided it is not too damp. The seed is sown in September and the seedlings are transplanted in April or May, but it multiplies itself readily by suckers. The flowers, which are about three times the size of the Chamomile (*Matricaria Chamomilla*), which they closely resemble, are gathered as soon as they are fully open, and are then dried in a well-ventilated

room. They are usually sold in bales of 50 to 100 kilogrammes. One donum may produce about 100 okes of flowers annually.

Squill

Bulbs of the local squill were submitted in 1917 to Kew and provisionally identified as *Urginea Scilla*. Like the asphodel, this root is found everywhere. If sliced and placed about the house they are said to drive away mice. It was intended by the Agricultural Department to make an attempt to find a market for these roots, in the hope that if they could obtain a small payment for them farmers might be induced to collect them off their lands, but the project had to be abandoned for the time owing to the war. There is a small demand for these roots, if sliced and dried, in Europe for medicinal purposes.

Squill bulbs from Cyprus were examined at the Imperial Institute in 1916 (see BULLETIN OF THE IMPERIAL INSTITUTE, vol. xv. 1917, p. 311). The samples, which were submitted to a firm of drug manufacturers, were objected to on account of their dark colour, and were valued at about 6d. per lb. as against a pre-war value of 3d. per lb.

According to the report by the Imperial Institute there are two varieties of *Urginea Scilla*, white and red, the scales of the former being yellowish-white and those of the latter having a reddish tint, and there are also many intermediate forms. Though the red and the white varieties have been stated to possess equal medicinal value, the white variety is preferred in England.

In making stone irrigation channels which are lined with a coating of lime and sand or earth, local masons sometimes rub over this lining with a sliced squill which has been dipped in oil. It is found that this tends to harden and glaze the lining and prevent it from cracking.

Colocynth or Bitter Apple

The colocynth (*Citrullus Colocynthis*), locally called "pikrankoura" or "petrankoura," grows wild in some parts of the plains. The round yellowish-green fruit, about the size of an orange or small melon, ripens in July

to September and, after being gathered, is skinned and dried in the sun. It is used by druggists as a purgative. Until about ten years ago it was cultivated on a small scale and an annual export of about £400 in value took place, chiefly to England and Austria. It was then in demand, it is said, as an adulterant of quinine. The fruit is locally thought to be a remedy for rheumatism. For this purpose the fruits are picked and put in a saucepan and covered with olive oil. After cooking for six hours the pulp or ointment is rubbed into the affected part. The European demand having ceased, the plant is now only found in a wild state.

Asphodel

The asphodel (*Asphodelus ramosus*), locally known as "spourdellos" or "spourtoulla," is a troublesome and abundant weed in many parts of the Island, up to an altitude of about 4,000 ft. The peasant farmer rarely attempts to remove it, though it occupies a large proportion of his land to the detriment of the crops. In the hills the villagers dry the bulbs and feed them to their sheep, cattle and donkeys. A paste is also made from the roots which is used by boot-makers to stick the leathers together. To make this paste the roots are dried in the oven and ground, and then mixed with ground vetches or maize and made into the gum or paste locally known as "tsirichi."

VI. MINOR AGRICULTURAL INDUSTRIES

Bee-keeping

Although Cyprus bees are world-famed, bee-keeping in the Island is still in its infancy.

The native hive is generally an earthenware cylinder or pipe about 2 ft. 6 in. long and 9 in. in diameter (see Plate VII, fig. 1). Hives are also made of a mixture of earth and chopped straw, similar to native mud-bricks. These hives are also cylindrical, about 18 in. long and 10 to 12 in. in diameter with a 3-in. thickness of wall. These are cooler in summer and warmer in winter, and produce stronger colonies than the earthenware ones.

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Fig. 1.—Cypriot Earthenware Beehives.



Fig. 2.—Shipping Fruit at Larnaca.

Of late years the Agricultural Department has introduced modern hives with movable frames, and had it not been for the high cost of timber since the war, the number of these would have increased rapidly. The difficulty is to get the local carpenters to construct them properly and with finish. Practical hive construction is taught at the Agricultural School.

Cyprian bees are, par excellence, the yellow race of the world. They are of uniform colour, size and character, slightly smaller than the Italians and the blacks. They have great power of flight, are very prolific and vigorous and good honey-gatherers. They are by many considered vicious and ill-tempered. This is possibly due to the constant war they have to wage against hornets, which in this country are a real plague and frequently exterminate whole colonies and sometimes whole apiaries. Various devices are employed for the protection of bees in or near the hives.

A good number of Cyprian queen bees have been imported into Europe and America, and are very highly regarded wherever they have been established. In the eighties Cyprian queens were sold in the United States of America at £2 each. This high price checked the importation and the crossing of Cyprians with Italians and blacks took place, the hybrid offspring being sold by dealers as Cyprians. These, however, did not possess the best characteristics of Cyprians, and for a time they brought about a reaction in favour of other breeds.

Cyprus possesses excellent honey-producing plants in the eucalyptus trees, orange groves, "throumbia" or wild thyme, and other aromatic plants.

In the neighbourhood of orange groves a competent bee-keeper can obtain an average of 50 lb. of honey per colony; although unfortunately the ordinary village bee-keeper gets little more than 6 to 10 lb.

Locally produced beeswax is of fine quality with delicious aroma and of a bright yellow colour, said to be superior to that imported from Asia Minor and Egypt.

The industry is susceptible of considerable development and, when brought under more complete control, should be capable of establishing a good export trade of honey and possibly of beeswax.

Basket-making

Basket-making is a considerable industry, as all fruit and much other produce is transported in baskets mostly designed for the backs of donkeys or mules. The export trade of fruit and vegetables creates a constant demand (see Plate VII, fig. 2). The bulk of these baskets are made of reeds (*Arundo*) which grow luxuriantly by the side of water channels or wherever moist soil is found. This material is not an ideal one for the purpose, as the baskets are easily crushed and lose shape, to the detriment of the contents. The reeds are therefore often stiffened by the introduction of an occasional breadth of some other material, *e.g.* shinia (*Pistacia Lentiscus*), tremithia or myrtle. All these are much used in basket-making, though the latter is heavy. There is a native willow (*Salix alba*) and also the weeping willow (*S. babylonica*). These have not been used until recently when, by the efforts of the Agricultural Department, a number of these trees have been pollarded and the new shoots have been found quite satisfactory for the purpose.

Six years ago a number of osier cuttings were imported from England, but unfortunately they have not succeeded so far owing to a succession of dry years. The surviving plants were this autumn removed to a more suitable site, but after suffering from drought they have now been almost destroyed by heavy floods.

In order to encourage the manufacture of better baskets for the fruit trade between Cyprus and Egypt the Agricultural Department provides practical instruction in basket-making, and a qualified teacher pays occasional visits to basket-making villages and demonstrates the work and teaches improved patterns to the villagers and school boys.

Fruit and Vegetable Preserving

There is little doubt that the establishment of small factories for canning or bottling fruits and vegetables would be a profitable undertaking. Owing to the suddenness with which, in the heat of summer, the fruits ripen in Cyprus, and the consequent glut that often ensues, market

prices fall to a point at which it does not pay to pick and handle. Transport difficulties also make it precarious, in the case of soft fruits, to attempt a sale outside the immediate place of production. Increased cultivation is thus discouraged.

In growing fruits or vegetables for canning or bottling a man is independent of market fluctuations, whereas at present both producers and consumers are in the hands of the local shopkeepers, who have the former entirely at their mercy.

The Egyptian fruit and vegetable trade is very well worth cultivating, but until better measures can be enforced in the matter of transport by sea as well as land, shippers run the risk of heavy losses, which, no doubt, recoil upon the unlucky producers.

Specimens of most of the products referred to in these notes may be seen in the Cyprus Court in the Public Exhibition Galleries of the Imperial Institute.

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