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THE CHANGING ECONOMY OF NORTHERN GREECE SINCE WORLD WAR II

ΕΤΑΙΡΕΙΑ ΜΑΚΕΔΟΝΙΚΩΝ ΣΠΟΥΔΩΝ
57 ΙΔΡΥΜΑ ΜΕΛΕΤΩΝ ΧΕΡΣΟΝΗΣΟΥ ΤΟΥ ΑΙΜΟΥ 57

THE CHANGING ECONOMY OF NORTHERN GREECE SINCE WORLD WAR II

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ΘΕΣΣΑΛΟΝΙΚΗ
1962

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Printed in Greece by N. Nicolaides, Thessaloniki.

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INTRODUCTION

The objective of my research was to investigate the post World War II changes in the economy of Northern Greece.

The field research for this study was supported by the Foreign Field Research Program conducted by the Division of Earth Sciences, National Academy of Sciences – National Research Council and financed by the Geography Branch, Office of Naval Research, under contract with the National Academy of Sciences. I arrived in Greece late in June 1959 and remained until early August 1960. During my stay, I visited all the Prefectures (See Figure 1) and devoted nine months to geographical field work. Field work was essential in order to observe and record the changes that have taken place in the region's economy. Also, I consulted government officials, private business men, and professional men to obtain statistical data for my report. They all showed a keen interest in my work and gave freely of their time and effort to help me in many ways. Insofar as possible Greek sources of the most recent date were used.

This book is divided into 11 chapters: physical and human aspects, agriculture, livestock, fishing, forestry, mining, industry and handicrafts, electricity, transportation, ports and trade, tourism and conclusion.

ACKNOWLEDGMENTS

I wish to express my deep obligation and sincere thanks to the many officials of the Greek government who furnished the data that I used in this study. All errors of commission or omission are solely my responsibility.

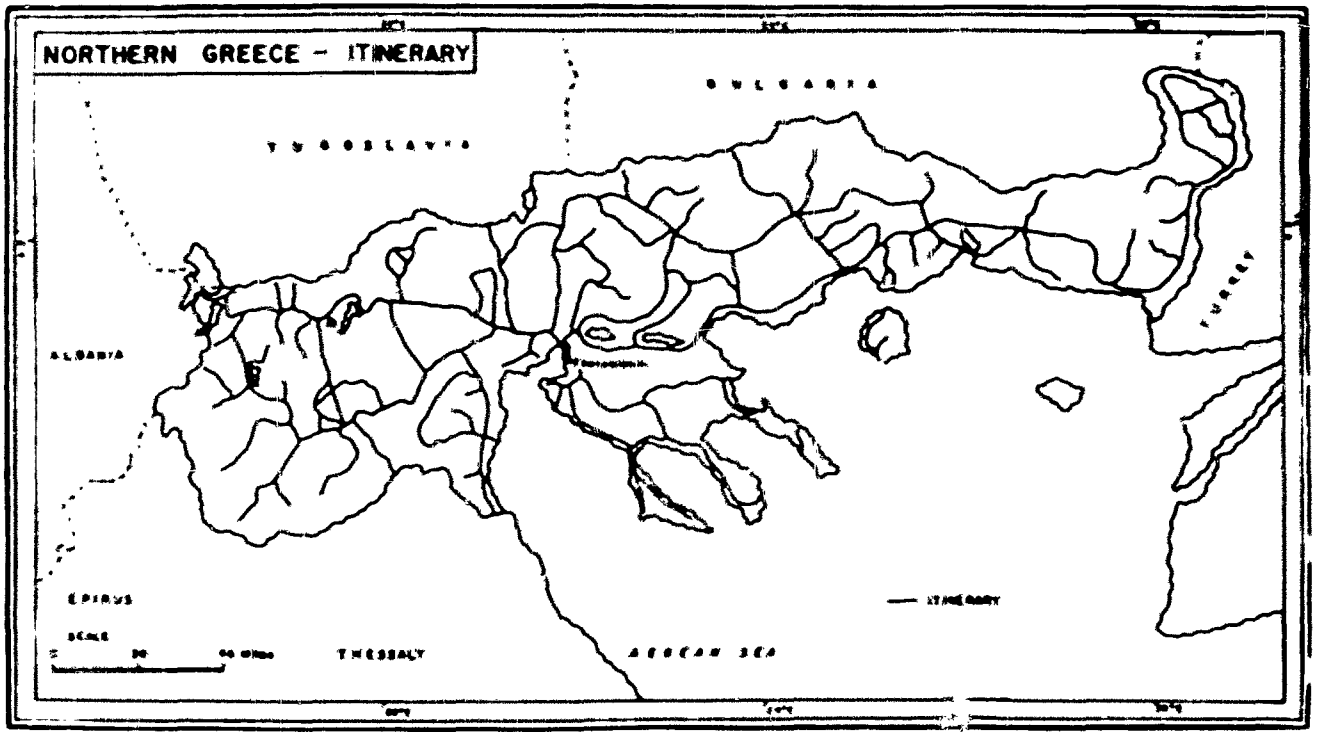
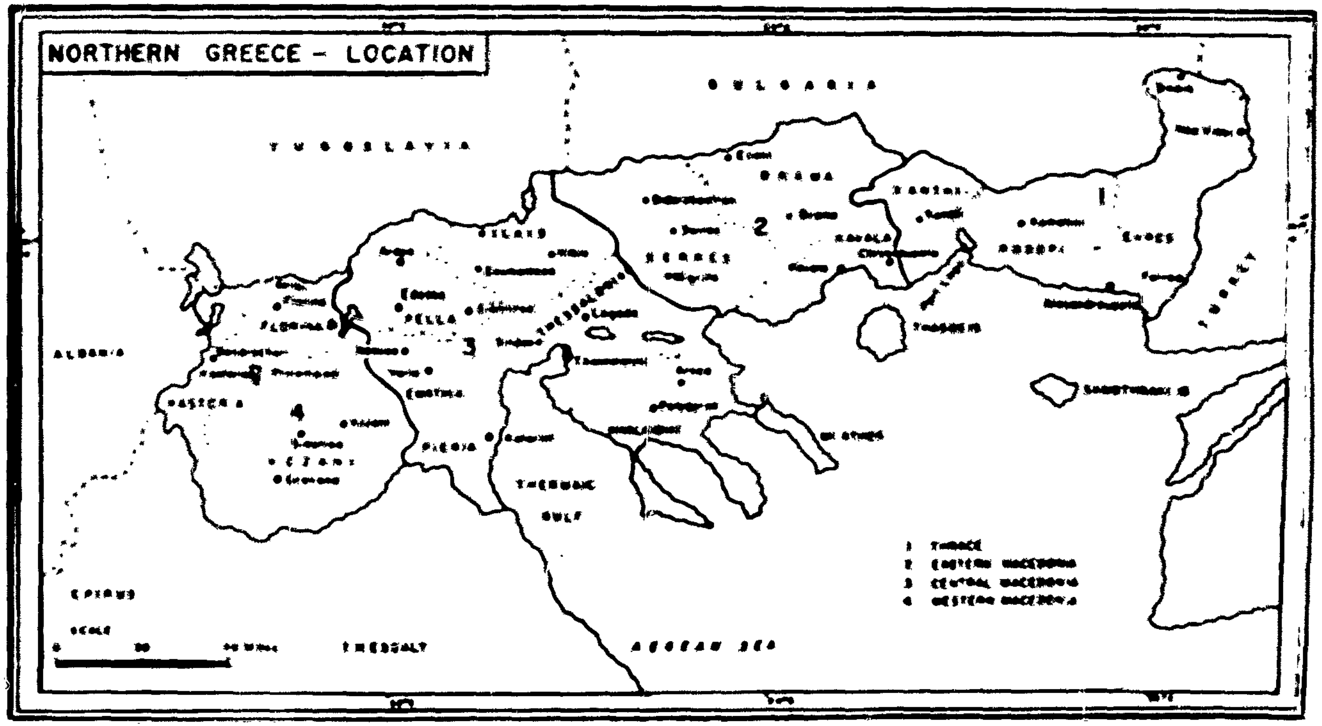

NORTHERN GREECE - ITINERARY
YUGOSLAVIA
BULGARIA
TURKEY
ALBANIA
EPIRUS
THESSALY
AEGEAN SEA
ITINERARY

Figure 1.


NORTHERN GREECE – LOCATION
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YUGOSLAVIA
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DRAMA
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KASTORIA
KOZANI
PIERIA
THASOS
1 THRACE
2 EASTERN MACEDONIA
3 CENTRAL MACEDONIA
4 WESTERN MACEDONIA
SCALE

Figure 2

CHAPTER I

PHYSICAL AND HUMAN ASPECTS

Location

Northern Greece covers 42.942 square kilometers[1], an area about the size of Denmark, is bounded on the north by Bulgaria, on the northwest by Yugoslavia, on the west by Albania, on the east by Turkey, and on the south by the geographical regions of Thessaly and Epirus and by the Aegean Sea (see Figure 2). The economic, political, and military importance of the region stems from its geographical location. It lies astride the important routes connecting the Aegean Sea with the interior of the Balkan Peninsula. Table 1 shows the prefectures which comprise the two major geographical-political divisions of the region—Macedonia and Thrace.

Physical Base

Table 2 and Figure 3 show that in Northern Greece approximately 75 per cent of the surface area is hilly and mountainous. The western part of the region, which is more mountainous than the rest, is transversed by north-south trending mountain ranges which are a continuation of the Dinaric Alps chain into Greece. The Rodopi Massiff and the Balkan mountains extend along the northern boundary of the region. The extension of the Thessaloniki plain into Southern Yugoslavia breaks up the mountain continuity along the border between Yugoslavia and Bulgaria. The presence of mountain passes here and there provides routes into the region's northern neighbors. Much of the high plateau of Northern Greece lies above 800 meters[2]. Many summits are over 1.500 meters, reaching 2.911 meters above sea level in Mountain Olympus. Among the principal mountains are Grammos, 2.520 meters; Vernon (Vitsi), 2.128 meters; Vermion, 2.052 meters; Kaimaktsalan (Varnous), 2.524 meters; Askion, 2.111 meters; Kerkini (Beles), 2.031 meters; Orvilos, 2.212 meters; and Falakron, 2.111 meters.

1. One square kilometer is equivalent to 0.3861 sq. mi.
2. One meter is equivalent to 3.28 feet.

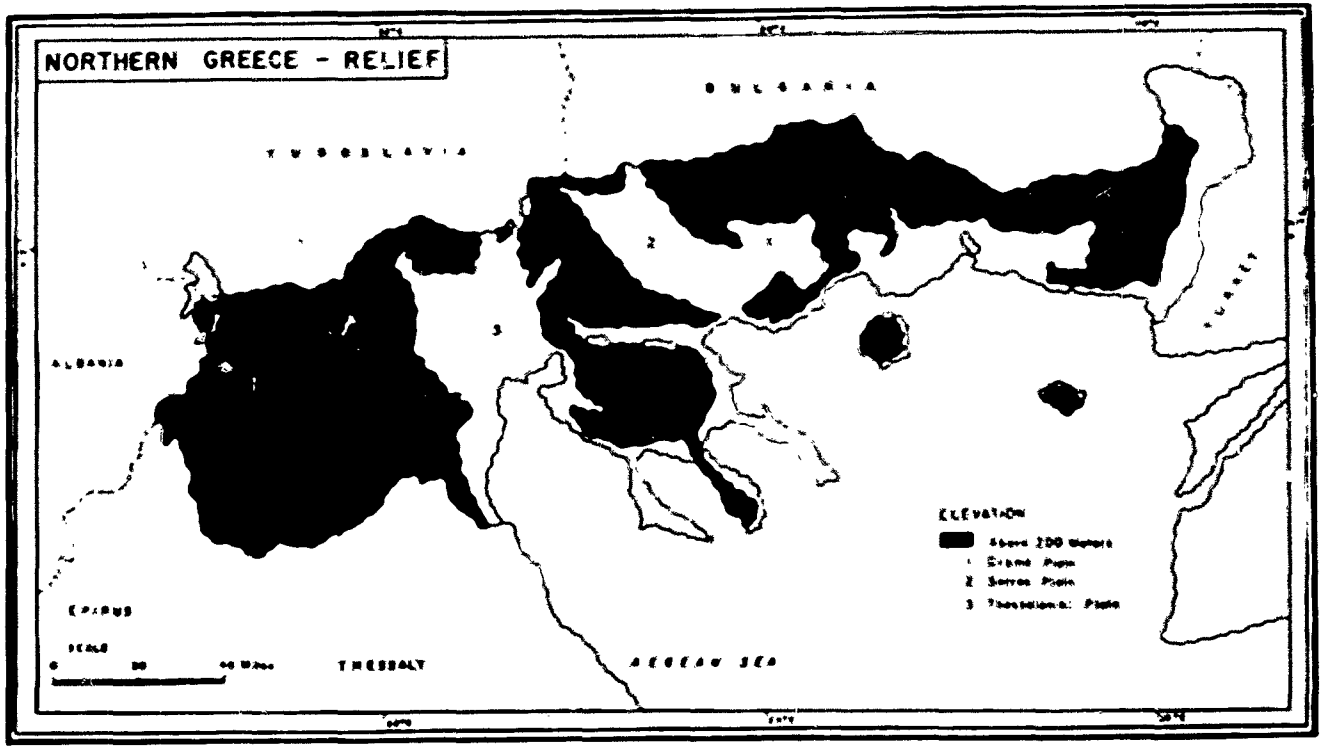
NORTHERN GREECE - RELIEF
YUGOSLAVIA
BULGARIA
ALBANIA
GREECE
EPIRUS
THESSALY
AEGEAN SEA
ELEVATION
1 Central Plain
2 Serres Plain
3 Thessalonika Plain

Figure 3.

The highlands of the region are characterized by great physical diversity - rugged, bold mountains, steep ridges, sharp peaks, and rounded cupolas interspersed with little valleys and plains. Since this diversity influences the climate and the soil of Northern Greece, it is certainly of great importance for its agricultural and pastoral production.

Most of the mountain ranges have been fragmented by tectonic forces and deeply dissected by pronounced erosion. Where they rise abruptly, soil cultivation is restricted to lower elevations. Although only a small

Fig. 4. Northern Greece is a region of mountains, hills, and narrow lowlands and valleys.

portion of the highlands is suitable for the growth of forests, they contain deposits of both ferrous and non-ferrous minerals, whose exploitation would not only create new jobs for the region's unemployed workers, but would also provide it with much needed foreign exchange.

Mountains and hills are in sight from every spot in Northern Greece, and not one prefecture is composed predominantly of level land. The prefectures in which more than 80 per cent of the surface area is hilly and mountainous are Khalkidiki, Drama, Florina, Kastoria, Kavala, and Xanthi (see Table 2). A considerable part of their agricultural land consists of steep hillsides, mountain slopes, and plateaus subject to serious erosion unless terraced.

The fact that the major rock formation is limestone accounts for the frequent appearance of spring and underground water supplies, which

are of primary importance to the people, especially to the fruit growers of Naousa and Veria. Small springs, artesian wells, and dug wells supply water for domestic consumption. In the non-limestone areas, water is scarce and the people have a difficult time obtaining enough water to meet their immediate needs. Despite the presence of perennial streams, the region's water resources are not ample. Hence, no matter what plan is introduced to increase the agricultural production, its success will depend on how efficiently the available water resources are utilized. Without a doubt, water is more important than any other natural resource in Northern Greece.

There are a few small coastal and interior alluvial plains (areas below 200 meters of elevation), the largest being the plain of Giannitsa (see Table 3). The 21 per cent of the land surface is in plains, representing approximately 41 per cent of the plains area in Greece. The plains form a discontinuous coastal strip from 40 to 60 kilometers wide hemmed between the Aegean Sea and the mountain ranges which mark the frontiers with Yugoslavia and Bulgaria. They are fertile, but are periodically inundated due to inadequate natural drainage of water. In the western section of the region the available land is confined to a few small mountain basins such as Florina and Kozani-Kailaria.

The plains in the central and eastern parts of Northern Greece are not only drained, but also irrigated by the rivers Aliakmon, Axios (Vardar), Strymon (Struma), Nestos (Mesta), and Evros (Maritsa). The sources of

Fig. 5. Plains are few.

Axios, Strymon, Nestos, and Evros are in the neighboring countries of Bulgaria and Yugoslavia (see Figure 7). The crest of the east-west mountain range which lies astride the northern boundary of Greece is to the north of it. Only joint action by the involved countries can give a permanent and satisfactory solution to the problems concerning the development of these river basins. Water for irrigation and other purposes is provided by such lakes as Little Prespa, Big Prespa, Vigoritis, Doirani, Kerkini, Lagada, Volvi, and Vistonida (see Figure 7).

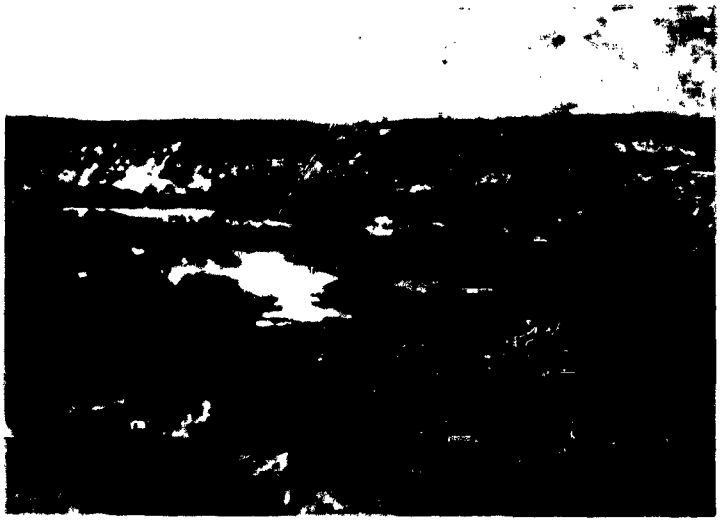

Fig. 6. The Aliakmon is one of the few permanent rivers which provide the farmers with water for irrigation.

The rugged terrain of much of Northern Greece, except the river plains and valleys, is unsuitable for permanent settlement and scarcely capable of exploitation for any agricultural and livestock activity. This has resulted not only in fragmented landholdings, but also in over-population of the fertile and well-watered plains and valleys.

Climate

The climate of Northern Greece, with the exception of southern Khalkidiki and the coastal plain of Pieria prefecture, is modified Mediterranean; i.e., the winters are more rigorous and the summers are hot and dry, but not as dry as those of Southern Greece. The continental influences are more pronounced than those of the Mediterranean climate.

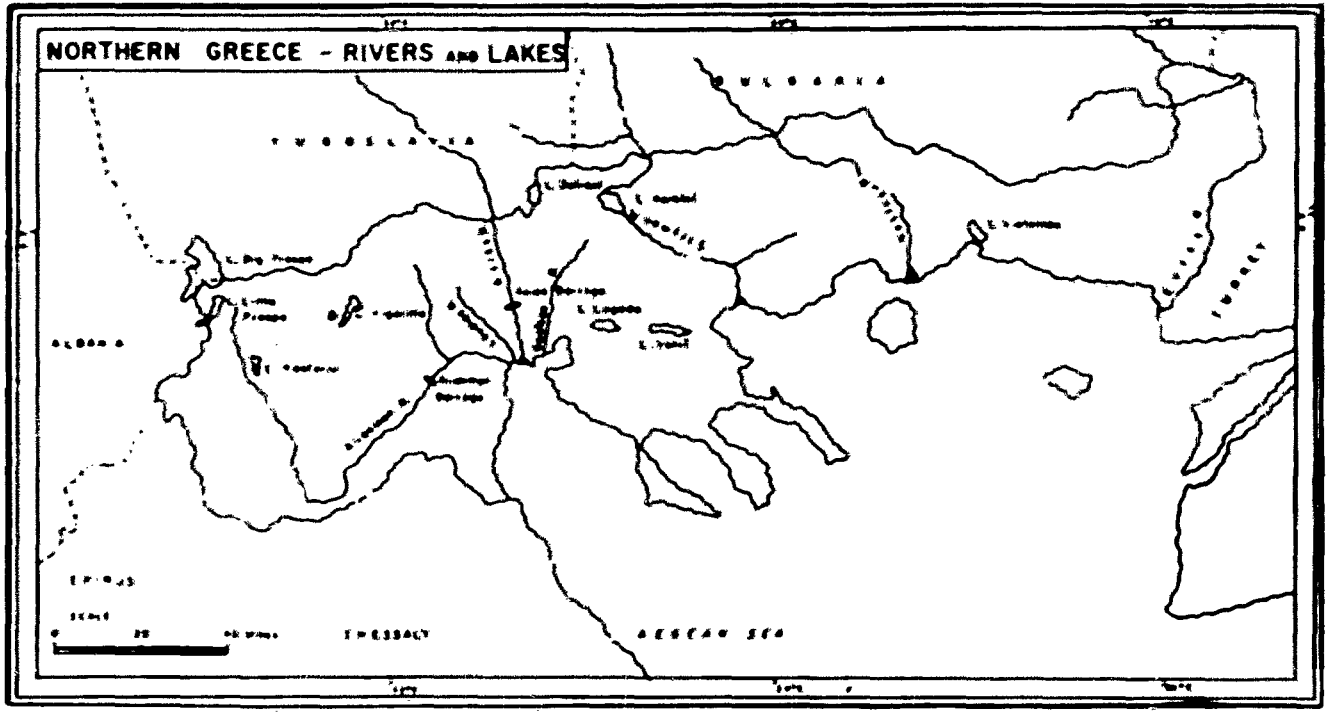

Figure 7.

The region's temperature is varied. On the plains of Thessaloniki, Drama, and Serres the highest temperatures in the summer range from 70° to 90° Fahrenheit and the lowest from 25° to 46° Fahrenheit (see Table 4). In the mountain sections, depending on altitude, the summer and winter temperatures are lower than those of the plains and seacoast areas. Although the Rodopi range prevents the penetration, on a large scale, of the continental climate of central Europe, the corridors of the Axios, Strymon, and Nestos rivers bring cold temperatures from the north in the winter. Freezing

Fig. 8. The streams become completely dry in the summer. In the winter they become raging torrents, which cause much damage to property.

temperatures occur both on the plains and in the mountains. On the plain of Thessaloniki the temperature may drop to 25° F. In the lowland areas temperatures below 32° Fahrenheit may last for more than two days. Killing frosts may occur at any time between mid-October and May 1. The number of frost-free days ranges from 160 in Florina to 260 in Kavala. The mean temperature for the period from April to September is approximately 70° F., and from October to March approximately 46° F.

The amount of rainfall received by the region ranges from 20 inches along the seacoast to about 30 inches in the mountain ranges along the Bulgarian and Yugoslav border. In the Grammos-Pindus mountain area the annual precipitation amounts to about 50 inches, for the mountains block the inflow of the moisture-bearing winds in the winter. Rains occur suddenly, and less frequently, and are of shorter duration than those in

central Europe. Although the amount of rainfall is sufficient for the cultivation of rain-fed crops, it is unevenly distributed, and is usually concentrated in the three winter months (see Table 5). This precipitation regime is unfavorable in two ways. First, it produces frequent floods and rampant erosion in the denuded areas. Second, its variability is a hazard to the region's agricultural activities. Owing to this uncertainty, irrigation is practiced wherever a permanent water supply is available. Unlike the pronounced summer drought of Southern Greece, here it is milder. Conventional showers during the summers are not infrequent. In the spring, thunderstorms can do much damage if they coincide with the blossoming of the trees.

Soil

A great variety of soils is found in Northern Greece, the main types of which are podzols, brown forest, rendzina, alluvial, and saline soils. The mature alluvial soils are high in fertility. In general, the fertility of the soils is low, owing to over-cropping and limited application of green manure and commercial fertilizers. In the mountains and hills the soils are very shallow; being more predisposed to drought than deeper soils, they are hazardous as an agricultural base.

To improve the fertility of the soil, extensive use of fertilizers is desirable. This is called for by the present emphasis on intensive cultiva-

Fig. 8. The alluvial soils are planted in wheat, cotton, and corn.

Fig. 10. In the mountainous and hilly areas the soil is gravelly and low in fertility.

Fig. 11. Kronon still plagues Northern Greece.

tion. Both nitrogen and superphosphate fertilizers are used. The completion of the nitrogen fertilizer plant in Ptolemais will increase the available supply of fertilizers.

Although the soils of the region are low in nitrogen, some agronomists feel that the lack of nitrogen could be easily remedied by rotation with legume, fallowing, cover-cropping, and the use of green manure. However, their suggestion could not be carried out because the people are dependent on a limited amount of the land for living. Hence, the only way for them to maintain the soil is through the application of non-organic fertilizers. More than seventy-five per cent of the better soils occur in the plains of Thessaloniki, Serres, and Evros. Their superior soil fertility is clearly evident in the variety of agricultural crops grown here.

The excellent studies and surveys conducted by the Soils Laboratory branch in Thessaloniki during the last few years have not been sufficiently intensive or extensive to be used in the compilation of a detailed soils map. The availability of such a soils map will be of inestimable value in ensuring a sound, rational basis for agricultural planning and development.

Forests, Sea, Minerals

Northern Greece's forest resources are limited. They have dwindled during the course of the centuries because of such malpractices as excessive cutting and burning. Although scrub gowth is found in many parts of the region, the only existing forests of commercial importance are in Khalkidiki and Western Macedonia. Even these forests have been threatened with indiscriminate exploitation by both the farmers and nomads. In 1956, the forested areas covered approximately 778.000 hectares (see Table 15).

The adjoining sea is not very productive. A narrow continental shelf, strong currents, deep off-shore waters, relatively high water temperatures, and an inadequate supply of plankton are not conducive to good fish production and fishing.

The region contains a wide variety of minerals. Many of the deposits are too small to be of economic importance. The commercially-significant deposits of lignite, manganese, chromium, and iron pyrites are being mined. The presence of strategic minerals - manganese, chrome, and asbestos - provides an opportunity for further expansion in mining. Granites and limestones are used as building stone. The latter is also used in the production of quicklime. Suitable clay deposits for the production of pottery and tile are scattered throughout the region.

Land and water are Northern Greece's most valuable resources. If properly developed they would not only support more than adequately its

present population of approximately 2.244.250 people, but would also provide the rest of the nation with agricultural and pastoral products for domestic consumption and export. Land is the principal source of nearly all food elements, and it promises to remain so for an indefinite period in the future.

Population

Although the population of Northern Greece declined from 2.112.012 to 2.037.789 inhabitants in the period between 1940 and 1950, it has been rising since then. In 1961 it was 2.244.250 people[3]. In that year, population density ranged from 28.18 per square kilometer in Kastoria prefecture to 158.04 in Thessaloniki prefecture. The regional population density of 52.26 is less than the national average of 63.05 per square kilometer (see Table 6). Although the density figure is low, it does not mean that Northern Greece is underpopulated. As a matter of fact, the high percentage of farming population (see Table 7) and the early stage of industrialization indicate that pressure of population upon the region's resources is great. In 1961 there was one hectare[4] of arable land per 1.9 inhabitants (see Table 8). The prefectures with an acute population pressure problem are Drama, Kavala, Xanthi, Serres, and Thessaloniki.

Table 9 shows the sources of employment in Northern Greece. It should be noted that close to 60 per cent of the economically active population is engaged in forestry, fishing, livestock, and agriculture. However, most of the workers are farmers. Agriculture is still saddled with the task of supporting more people than do other occupations.

Since 1950, there has been a constant flow of people from the rural area to the larger towns and cities because of such factors as lack of employment opportunities in the villages and the attraction of the big city. This trend is reflected by the population growth of the city of Thessaloniki, which increased from 297,164 inhabitants in 1951 to 377,026 in 1961. Despite the gradual urbanization of the region, approximately 50 per cent of the people still live in villages of less than 1,000 inhabitants.

Economic deprivation has motivated many young men to migrate to other more productive nations such as the United States and Australia. The desire to migrate now dominates the thinking of the young mountain

3. In 1951 there were in Northern Greece 67.099 Turks, 26.592 Pomaks, 5.116 Gypsies, 32 Circassians.

4. One hectare is equivalent to 2.471 acres.

peoples, but the government hopes to minimize it by impoving the economy of the mountain sections. Since entire families migrate, the monetary remittances sent back home have been declining. They would have been much higher if the family of the immigrant had stayed behind. Although the government does not favor emigration, some way—other than migration—must be found to reduce the population pressure in Northern Greece.

TABLE 1.
tiographical - Political division and prefectures of Northern Greece.

Division	Prefectures
Thrace	Evros
	Rodopi
	Xanthi
Macedonia	
Eastern	Drama
	Kavala
	Serres
Central	Thessaloniki
	Kilkis
	Khalkidiki *
	Pella
	Pieria
	Emathia
Western	Kozani
	Florina
	Kastoria

Source: National Statistical Service of Greece, Athens, 1960.

* Agion Oros (Mount Athos) in Khalkidiki has an autonomous political administration. It is not a prefecture.

TABLE 2.

Land area classification into three classes: Hilly and Mountainous, Productive land, and Forests, by prefecture, Northern Greece 1956.

(area in square kilometers) *

Prefecture	Area in sq km and per cent		Hilly and mountainous area and per cent of land surface		Productive land and per cent of land surface		Forest and per cent of land surface	
Drama	3,502	8.16	2,975	84.95	587	16.76	350	9.99
Emathia	1,688	3.93	1,215	71.57	597	35.36	450	26.65
Evros	4,249	9.89	3,300	77.65	1,293	30.43	750	17.65
Kavala	2,169	5.05	1,850	85.29	490	22.57	300	13.83
Kastoria	1,680	3.19	1,375	81.84	274	16.30	285	16.96
Khalkidiki	2,988	6.96	2,500	84.00	657	21.99	900	30.12
Kilkis	2,614	6.09	1,385	52.98	1,116	42.69	150	5.73
Kozani	5,868	13.66	4,520	77.02	1,201	20.46	590	10.05
Florina	1,871	4.36	1,535	82.04	468	25.01	400	21.37
Pella	2,606	6.07	1,900	72.90	736	28.24	530	20.33
Pieria	1,544	3.60	975	63.14	494	31.99	500	32.38
Rodopi	2,586	6.02	1,730	66.89	630	24.36	580	22.43
Serres	4,052	9.44	2,950	72.80	1,019	25.15	470	11.59
Thessaloniki	3,435	7.99	2,164	62.99	1,602	46.63	700	20.37
Xanthi	1,751	4.08	1,435	81.95	399	22.78	320	18.27
Agion Oros **	339	.79	300	88.49	17	5.01	100	29.49
Northern Greece: Total	42,942	32.39	32,100	74.77	11,579	26.96	7,375	17.17
Greece Total	132,562		103,174	77.83	36,055	27.19	18,263	13.77

Source: Demetrios Hinopoulos, *The Mountain Economy of Greece* (published in Greek), Athens, 1959, Table 7 b, p. 50.

* One square kilometer equals 0.3861 square mile.

** It is also known as Mount Athos.

TABLE 3.

Area of the main plains in Northern Greece

Plains	Area in square kilometers
Giannitsa	1,780
Thessaloniki	2,184
Serres	770
Komotini	510
Drama	432
Xanthi	440
Kozani – Kailaria	430
Nea Orestiada	367
Katerini	352
Chryssoupolis	240
Florina	184
Servia	64
Total	7,743

Source: E. Skandalis, *The Position of Tobacco in the Economy of Northern Greece* (published in Greek), Athens, 1960, p. 15.

TABLE 4.

Average [Mean] Monthly Temperature, three stations, in degrees Fahrenheit.

	City of Thessaloniki	City of Florina	City of Xanthi
January	41.5	34.3	41.5
February	44.6	34.5	44.9
March	50.3	44.7	48.6
April	57.4	52.0	57.0
May	66.8	60.5	67.4
June	74.7	68.3	74.5
July	79.9	71.3	78.2
August	78.6	71.5	79.4
September	71.5	64.0	71.4
October	61.7	55.5	62.5
November	52.5	46.2	52.9
December	46.0	37.2	47.6

Source: National Meteorological Service, Athens, 1960. The length of record is from 1945 to 1959.

TABLE 5.

Monthly Precipitation, three stations, in inches.

	City of Thessaloniki	City of Florina	City of Xanthi
January	1.4	2.0	2.7
February	1.5	1.3	3.6
March	1.7	2.5	2.5
April	1.9	3.7	1.9
May	2.4	2.6	2.0
June	1.7	2.4	1.6
July	0.9	1.6	0.8
August	1.2	1.3	2.1
September	1.5	2.2	1.4
October	2.0	3.4	0.9
November	2.8	3.7	2.8
December	2.3	3.8	3.2

Source: National Meteorological Service, Athens, 1959. The length of record is from 1945 to 1959.

TABLE 6.

Census of population and population density, by prefecture, Northern Greece, 1940, 1951, 1961.

Prefecture	Area * (sq. km.)	Population in			Increase or decrease over		Density per sq. km.		
		1940	1951	1961*	1940	1951	1940	1951	1961*
Drama	3,502	145,653	120,492	120,946	−25,161	454	41.59	34.41	34.54
Emathia	1,688	96,998	96,439	114,150	−559	17,771	57.48	57.13	67.62
Evros	4,243	154,945	141,340	157,901	−13,605	16,561	36.47	33.30	37.19
Florina	1,871	88,995	69,991	67,838	−19,004	− 2,153	47.58	37.41	36.26
Khalkidiki	2,988	74,433	75,745	79,858	1,312	4,113	24.91	25.35	26.72
Kastoria	1,640	64,275	46,497	47,341	−17,778	937	39.20	27.62	28.87
Kavala	2,168	138,133	136,337	140,445	− 1,796	4,108	63.70	62.86	64.75
Kilkis	2,614	101,820	89,475	102,847	−12,345	13,372	38.95	34.23	39.34
Kozani	5,958	191,741	177,858	190,997	−13,883	12,761	32.68	30.31	32.48
Pella	2,696	120,550	116,669	133,128	− 3,881	16,459	46.37	44.98	51.08
Pieria	1,541	77,032	85,161	96,505	8,129	11,344	49.99	55.91	63.15
Rodopi	2,596	106,402	105,721	109,192	− 681	3,471	41.15	40.88	42.22
Serres	4,052	231,941	222,549	248,085	− 9,111	25,436	57.17	54.92	61.21
Thessaloniki	3,435	425,855	430,926	512,980	34,101	82,921	123.98	125.50	158.08
Xanthi	1,751	98,575	89,991	89,613	− 8,584	− 278	56.30	51.34	51.17
Agion Oros	339	4,746	4,096	2,687	− 1,650	− 309	14.00	9.10	7.93
Northern Greece: Total	42,962	2,112,014	2,017,798	2,244,258	−71,225	206,469	49.18	47.38	52.26
Greece: Total	132,562	7,344,860	7,632,861	8,157,586	116,461	724,725	56.55	57.58	63.06

Source: *Statistical Yearbook of Greece*, National Statistical Service of Greece, Athens, 1957, p. 11.

* National Statistical Service of Greece, Athens, 1961.

TABLE 7.

Economically active and non-active population, Agricultural population, Greece, Northern Greece, 1951.

	Active Population	Per cent of total	Non-active Population	Per cent of total	Agricultural Population	Per cent of total	Total Population	Per cent of total
Northern Greece	728,149	33.17	1,339,640	61.83	1,233,131	56.93	2,167,789	28.70
Greece	2,839,481	37.29	4,793,320	62.90	3,761,661	49.32	7,632,801	73.70

Source: *Statistical Yearbook of Greece*, National Statistical Service of Greece, Athens, 1957, p. 18.

TABLE 8

Density of Population per Hectare of Arable Land, by Prefecture, Northern Greece, 1951 and 1961.

Prefecture	Arable land in Hectares*	Population		Density of Population per Hectare of Arable Land	
		1951	1961	1951	1961
Drama	58,700	120,492	120,936	2.1	2.6
Emathia	59,700	96,439	114,150	1.6	1.9
Evros	129,300	141,340	157,901	1.1	1.2
Florina	46,900	69,719	67,238	1.5	1.4
Khalkidiki	65,700	75,735	79,818	1.2	1.2
Kastoria	27,400	46,407	47,544	1.7	1.7
Kavala	48,000	139,317	140,445	2.9	2.9
Kilkis	116,000	99,475	102,847	0.8	0.9
Korani	120,100	177,838	190,807	1.5	1.6
Pella	73,000	116,969	133,128	1.6	1.8
Pieria	49,400	96,161	97,545	1.7	1.9
Rodopi	63,000	105,721	109,194	1.7	1.7
Serres	101,900	222,569	248,043	2.2	2.4
Thessaloniki	160,200	450,956	542,900	2.9	3.4
Xanthi	70,900	99,991	99,613	2.3	2.2
Agion Oros**	1,700	3,186	2,687	1.8	1.6
Northern Greece: Total	1,157,900	2,037,789	2,244,258	1.7	1.9
Greece: Total	3,665,500	7,632,801	8,357,526	2.1	2.3

Source: Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960.
Statistical Yearbook of Greece, National Statistical Service of Greece, Athens, 1957, p. 18.
National Statistical Service of Greece, 1961.

* An hectare is equivalent to 2.471 acres.

** Agion Oros (Mount Athos) is an autonomous political administrative unit.

TABLE 6.

Sources of Employment, Northern Greece, Greece, 1951

Occupation Group	GREECE		NORTHERN GREECE	
	Number (000's)	Per cent of total	Number (000's)	Per cent of total
Agriculture, forestry fishing, livestock	1,567,271	48.16	478,149	59.97
Mining and quarrying	17,621	0.48	3,416	0.43
Industry and handicrafts	450,424	15.96	102,082	12.79
Building and construction	74,950	2.64	16,802	2.11
Public utilities	11,212	0.40	2,020	0.25
Commerce	219,303	7.74	47,698	5.98
Transport and communication	138,025	4.86	28,716	3.60
Domestic and personal services	387,622	13.65	74,152	9.29
Other occupations	176,442	6.21	44,569	5.58
Total	2,839,481	100.00	798,149	100.00

Source: *Statistical Yearbook of Greece*, National Statistical Service of Greece, Athens, 1957, p. 20.

CHAPTER II

AGRICULTURE

The economic and physical rehabilitation of the region's basic economic activity—agriculture—commenced as soon as the war ended. However, progress was very slow at the beginning because of the Guerrilla War which took place between 1947 and 1949. During this period, hundreds of farmers abandoned their homes and farms and flocked into towns and cities which had been chosen as security centers.

Since the majority of the farmer-refugees were destitute, the government shouldered the main burdens of resettlement after the defeat of the Guerrillas. It provided them with agricultural tools, seeds, fertilizers, goats, sheep, and draft animals. The totally destroyed villages were rebuilt. Potable water was brought into the villages. New roads were constructed to connect the once isolated rural villages with the larger towns and cities in the region. Some of the resettled farmers were provided with houses and other community services.

Border Areas Settlement Program

To improve the economic conditions of the people in the border areas and to repopulate the deserted villages, a special recovery program, known as the Border Areas Settlement Program, was initiated in 1953. Priority was given to the inhabitants of the mountainous areas of the prefectures of Kozani, Kastoria, and Florina, because they had suffered the greatest damage during the Guerrilla War. As of 1959, approximately 180.000.000 drachmas had been expanded on the program.[1]

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1. Some of the non-Greek agencies which contributed to the region's agricultural recovery were the International Children's Emergency, the United Nations Welfare Mission, the World Health Organization, the ECA Mission Welfare D vision, CARE (Cooperative for American Remittances to Europe), the Rockefeller Foundation, Y.M.C.A., Y.W.C.A., the British Friendship to Greece Society, and UNRRA.

To arouse in the people a consciousness of their own condition and to develop in them a desire for self-help, the United Nations and the Greek government selected Chrysoupolis, a town of about 7.000 inhabitants, situated on the northern edge of the Nestos river plain in Kavala Prefecture. This Chrysoupolis Commu-

Fig. 12. The border line villages suffered heavily during the Guerrilla War.

Fig. 13. The villages usually occupy the unproductive land.

Fig. 14. Land fragmentation is typical of Northern Greece.

Fig. 15. The tiny fields shown here are owned by five peasant families.

In 1959, the appropriations were primarily used for the resettlement and economic rehabilitation of the Mountain Derion region in Evros Prefecture. The region was depopulated during the Second World War and the ensuing Guerrilla War. Before the war, it was an important livestock center. Today it is only a minor producer of animal products, for its livestock was decimated during the war and its recovery was retarded not by lack of grazing land, but by lack of shepherds. Many of them fled to security centers during the Guerrilla War, but did not return to it after the

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nity Development project would serve as a model for the countries of Turkey and Yugoslavia as well. The majority of the people engage in agriculture, their main crops being wheat, corn, tobacco, rice and beans. Government and private capital was used in the expansion of the irrigation and drainage network, the expansion of rice fields, and in the construction of stables, warehouses, a veterinary clinic, and a high school. The Technical Institute was built by NOVIB (Dutch Organization for International Assistance) on land donated by the community. Also, loans were granted to manufacturers to improve their plant facilities. Special committees were appointed to help the director of the Community Development in the formulation and execution of the program. The experiment was launched in October, 1956. Mr. C. Van der Pies was the U.N. expert and also the first director of the program.

The Community Development Program in Chrysoupolis did not bring forth the anticipated results for several important reasons: 1) The people of Chrysoupolis misinterpreted the fundamental concept of the Community Development Program—awakening and stimulating a feeling of unity and responsibility for each other and the whole, and of desire for self-help. They thought that the United Nations would invest capital in the development of the town and its environs. Apparently, they forgot that the United Nations gives only technical aid and guidance. The monies must come either from the people themselves or from the government. 2) There is conflict between the objectives of the Greek farm extension program and the Community Development program. Both have vowed to raise the standard of living of the people. But the farm extension program does not restrict itself only to agricultural matters. It also engages in social matters. At times the approaches of the farm extension agronomists to the declared goals run contrary to those expounded by the director of the Community Development program. It appears, then, that the sponsors of the program have forgotten that farm extension is a part of community development. 3) There is little cooperation among the Greeks and also between themselves and the U.N. and Greek Government officials. 4) The sponsors, apparently, have failed to explain to the people of the town the objectives of the program. 5) There is little capital to carry out the recommended projects. 6) Instead of serving as a coordinator, the Community Development group now deals with problems which are in the realm of other agencies, institutions, and organizations. It is interesting to note that foreign and native consultants want to solve the problems of a region by themselves instead of training local leaders to solve them. 7) Chrysoupolis was the wrong town for this experiment because it was already in the process of being developed.

end of the war. The Mechanical Cultivation Service has been engaged to terrace the hill sides of the villages which will be occupied by the new settlers, especially from the over-populated sections of the prefecture of Kavala. Preference will be given to the landless peasants. Since the settlers will be asked to become part-farmers and part-shepherds, the government is seeking to find people who can meet these qualifications. The government is interested in seeing this region settled with permanent occupants, and not nomads.

The available agricultural land will be used to produce rye, wheat, barley, potatoes, and tobacco. The latter will provide the farmers with a cash crop. Some of them could also increase their farm income by engaging in bee-keeping. Table 10 shows the cost of settling successfully a five-member family in the Mountain Derion region.

Since Northern Greece is a region of villages, it raises two important questions. How have the villages fared under the impact of the Border Areas Settlement and other village aid programs since 1945? What measures have been undertaken by the government to help them improve their living conditions? Partial answers to these questions may be had by studying what has taken place in the villages of Dendrochori, Exohi, and Dikaia.

The village of Dendrochori, (see Figure 2), near the Albanian border, was abandoned by its inhabitants during the Italian invasion and was partly destroyed by the guerrillas. Since many of its inhabitants decided not to return to it after the termination of hostilities, the government has been obliged to bring in settlers from other parts of Greece. The end of the Guerrilla War created a vacuum in this section of Kastoria prefecture, a vacuum which had to be occupied by people from other parts of the country.

Before coming to Dendrochori, the settlers were migratory nomads. They did not possess homes or property; their home was the wattle hut. Now the government hopes that they will become permanent settlers and practice grazing and farming.

The main problem of Dendrochori is over-population. Since the father wants to prove his virility by begetting as many children as he can, each family has about six children. Boys are preferred to girls, for the latter are an economic burden. Birth control is not being practiced for various reasons—religious opposition, ignorance, and desire for children.

Despite the presence of a hostile environment — poor soil, isolation, shortage of capital, limited livestock, lack of electricity, and denuded mountain slopes — its inhabitants are very enthusiastic and hopeful about their future. As a matter of fact, the entire village population is satisfied with the present level of living. Two years ago they did not have a house of their own. Now they do.

The government is pushing the resettlement and rehabilitation of this village for economic, political, ethnic, and military reasons.

The village of Exohi (see Figure 2), is about 2.5 kilometers from the Bulgarian border. Its 500 inhabitants are Asia Minor refugees who now engage in the production of tobacco and potatoes. The soil of the region is suitable for tuber crops.

The Queen's Fund ("Vasiliki Pronoia") has taken great interest in the economic and social development of Exohi. The burned church was repaired, the water wells were improved, and other forms of aid were granted to the destitute peasants. During the Guerrilla War several houses were burned, and the government built new houses for the afflicted villagers. The construction of a new children's home would provide the people with employment. The present house is too small to accommodate the ever-growing number of youngsters who want to learn new ways of doing things. The Fund also contemplates the construction of a new bridge across the torrent which traverses the village. Vasiliki Pronoia has done a very good job in helping to ameliorate the living conditions in the destitute villages under her care. It represents the "Ethnos" in the often neglected Greek mountain villages. When the peasants see the Queen's Fund jeep heading toward their villages, they get the feeling that someone in far-away Athens is really interested in their grave (but to some, trivial) problems.

The village of Dikaia, (see Figure 2), situated midway along the portion of the river Evros, which forms the boundary between Greece and Bulgaria, is courageously trying to fulfill its role as the shop window of Greek democracy and freedom, despite the existence of irritating deterrents to its economic and social program.

The main livelihood of Dikaia is agriculture. her main crops are wheat, corn, and beans. The average size of land holdings is about 50 stremata (12,5 acres), though some peasants own more than 150. The newly constructed wheat storage plant should enable the producers to keep the wheat until prices rise to a respectable level. However, lack of capital is retarding the growth of Dikaia, and capital is desperately needed to meet its needs: a modern, potable water system, the surfacing of streets, the completion of the church, the control of the torrent which runs through the village, and the installation of a large electric generator.

The Bulgarian land across from Dikaia is under cultivation. The Bulgarians have invested much capital and equipment in the improvement of the land, and their well-cultivated farms can be seen from Dikaia. They have also brought electricity to their own border villages. Obviously, the communists of Bulgaria are trying to demonstrate to the inhabitants of the Greek border villages that communism has the interests of the people at heart. The drive of the communists to influence the border villages has forced the Greek government to try to do something about improving their

economic situation. However, lack of capital prevents the government from carrying out a major economic improvement program. The insistence of the communist countries to turn their border areas into a showcase for communism compels Greece to invest money in the improvement of its relatively non-productive border areas when that money is admittedly so desperately needed for the rational development of its productive regions.

Some progress has been registered in the plains villages of Northern Greece in the sectors of agriculture, livestock, education, culture, and hygiene. The use of pesticides for large scale spraying operations has conquered endemic malaria. The provision of good quality water piping has made clean water available to the villagers. In the near future such scenes as women carrying the jerry-cans of water, filled at the spring a kilometer or two from their homes, and the lines of donkeys with water drums strapped on their backs will be a romantic memory. They will vanish from rural Northern Greece. Today, clean and safe steel piping carries water from the spring or well straight into the village or into the homes of the villagers. This form of assistance from the government represents much health and happiness to the people of Greece.

However, progress has not reached the mountain villages of Northern Greece. Here life continues to be grim and severe. Men and women work incessantly to eke out a bare existence from the bare rocks. Some of them attempt to grow barley and wheat on the shallow soil on mountain sides with an inclination of 30 to 40 degrees. Plants also wage an unceasing struggle to wring some nutriment from poor soil. The main support of the villagers comes from the animals (sheep and goats) grazing among peaks, precipices, and plateaus. The mountain regions of Northern Greece test the endurance of plants, animals, and men as they extract a stark sustenance out of valueless and fruitless land.

Since the majority of the mountain areas have strategical significance, I feel that the nation should subsidize the economy of their inhabitants. Teachers, priests, and other officials should receive higher wages than their counterparts in the city or in a larger town; there should be some compensation for physical and cultural isolation. If the areas become depopulated, a zone of political vacuum, varying in width from 10 to 40 kilometers, will be created along the border of Northern Greece. The "Greekness" of this zone must be maintained even though the cost may be high. The political advantages will far outweigh the economic hardships. I feel that what happens in the mountain villages of Northern Greece will determine the future history of Greece[2]. If the nation

2. The feeling of the Greek people towards the mountain villagers was nobly expressed by Spyridon, Archbishop of Athens, at the 5th regional economic conference which was held on June 28, 1950 at Larisa. He said that "it is our duty

wishes to perpetuate its dream of political and economic stability, it must quickly remove the triad of poverty, ignorance, and conservatism which is responsible for the political and economic retardation of the Greek mountain villages[3].

Land Holdings

The average land holdings range from one to four hectares per family. In the Agios Germanos village, north of Florina, the land holdings are as low as one-half hectare. Even the small holdings are usually broken up into three to twelve different plots, widely scattered among the lands of the village. In the plains the typical Northern Greek farmer has only 4 to 7 hectares. In contrast, the average wheat farmer in the Great Plains of the United States has between 140 and 280 hectares.

The prevalence of small farms has made it impossible for the majority of the farmers to specialize in the production of crops for the market. Hence, the majority of the farm households are primarily subsistence units and not agricultural-business enterprises. Even the commercialized farms are in their character subsistence farms, especially the farms in the tobacco growing areas.

The farmers specialize in the production of tobacco because it is the best way of providing their families with their wants. The farmers have also discovered that tobacco production is more satisfactory than other production alternatives despite its fluctuating price structure. Since the farmers primarily produce for their own use, there is no need for them either to reduce production costs or to improve their products.

Although there has been marked increase in per capita production thanks to improved farming techniques and other means, the wants of the farmers have been increasing steadily since 1950. The inability of the farmers to meet their wants out of their own production has forced them to look for jobs outside the sector of agriculture. However, jobs are very scarce in the region[4]. As a result, the farmers feel economically insecure, and many of them have lost their hope in the future. Frustration, discon-

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to care for the people of mountain districts like the apple of our eyes; they have always been the guardian of our national existence throughout the centuries". See *Battle for Survival*, No. 95, Ministry of Coordination, Athens, June 28, 1950, p. 29.

3. Paul P. Vouras, "Northern Greece in Our Times", *Balkan Studies*, Volume I, Thessaloniki, 1960, pp. 35-39.

4. A small number of unemployed farmers have migrated to other more economically active countries such as the United States, Belgium, West Germany, and Australia.

tent, and tension keep mounting in the farming areas, especially in the tobacco growing areas. The solution of the problems of the farmers becomes daily more difficult. To partly alleviate this situation, the government is encouraging the establishment of industries and the expansion of cultivated land in Northern Greece.

Improvement of Production[5]

The means to increase agricultural production included bringing new land under irrigation, increasing the arable areas, and widely adopting practically all known methods of increasing crop and livestock production. However, hopes for attaining and then surpassing the production targets are largely concentrated and dependent upon the irrigation and reclamation programs[6].

The land reclamation program was started in 1926; its main objective was to provide the landless Asia Minor refugees with land. The early work was carried out by the American companies Monks Ulen and the Foundation Company. Prior to 1939, the river of Axios (Vardar) and the Strymon (Struma) had been contained by flood levees. EYYEM, Maintenance and Improvement of Hydraulic Works in Macedonia, is responsible for the control of the rivers in Macedonia and for the main canals and structures. YPEM (Productive Works Service of Macedonia) is responsible for the "valorization" of the land. In the period between 1926 and 1958, 1.130.000 stremmata[7] were protected from floods, and 861.000 stremmata were irrigated. In the same period approximately 4.535.000.000 drachmas had been expended on land reclamation and related programs by EYYEM and its predecessors. Figures 18 and 19 show the area reclaimed by both

5. The agricultural development recommendations drawn up by the American and Greek agronomists were based on the following characteristics of Northern Greek agriculture:

1) The agriculture is primarily dependent on rainfall which is seasonal, variable, and at times inadequate.

2) The possibility of further expansion is limited without irrigation.

3) The land is predominantly tilled in small holdings by subsistence farmers.

4) Agricultural yields are low.

5) Raising livestock is not practiced as an integral part of agriculture and is on a low standard.

6) The organization and marketing methods are inadequate.

6. Data was obtained from the EYYEM and YPEM Offices in Thessaloniki, 1959.

7. One stremma is equivalent to 0.02427 hectares.

EYYEM and the Ministry of Public Works, and the areas irrigated by both EYYEM and YPEM. Most of the work was carried out in the plains of Thessaloniki, Serres, and Philippi - Drama. The most important land reclamation projects since 1950 were the completion of the Axios and Aliakmon rivers diversion dams and the antiflood works in the Evros river valley, (see Figure 18)*. The former projects were completed in 1958 and have been designed to irrigate 950.000 stremmata in the lower section of the Thessaloniki plain. The main irrigation canals have been constructed,

Fig. 16. A small torrent-control dam.

and work has started on the feeder lines. The canals are lined with cement to reduce the rate of water loss through evaporation, transpiration, and seepage. The irrigation network will be completed by the end of the First Five Year Economic Program. The diversion dams would serve not only as reservoirs but also as water regulators.

Work on the Nestos (Mesta) river diversion dam started early in 1960. It will make possible the irrigation of 45.000 acres of land. The total cost has been estimated at 640.000.000 drachmas.

8. The Axios diversion dam is near the village of Gefira and about 28 kilometers north of the mouth of the river. The study was undertaken by KNAPPEN - TIPPETTS - ABBETT Engineering Company. The Aliakmon River diversion dam is about four kilometers west of Veria city. The cost of construction for dams has been estimated at 210.000.000 in current drachmas.

The need for the control of the Evros river has long been apparent to Greece, but action was not taken until early in 1950. In that year the governments of Greece and Turkey reached an agreement concerning the joint development of the Greek and Turkish portion of the Evros River basin[9]. The area was subject to periodic flooding, which precluded the full agricultural development of the fertile sections of the valley. The survey was undertaken by the Harza Engineering Company of Chicago. The firm was requested by the governments of Greece and Turkey (Sep-

Fig. 17. The construction of flood control works has reduced the threat from floods.

tember 21, 1951) to prepare a master plan to develop the land and water resources of the Turkish and Greek portions of the Meric - Evros (Maritsa) Basin. The plan has been formulated around the basic idea that increased agricultural production is the key to the future development of the basin. Both agronomical and water control improvements had to be

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9. The Meric - Evros river basin is contained on the north by the Danube, on the east and south by the coastal drainage to the Black, Marmara, and Aegean Seas, and on the west by the Nestos. The river has its source in the mountains of Bulgaria to the east of Sofia, and flows east and southeast to the city of Edirne, Turkey. Here the river changes course and flows generally southward for a distance of some 200 kilometers and empties into the Aegean sea near Enez, Turkey. The Meric - Evros Permanent Committee, *Master Plan, Flood Control, Drainage, Irrigation, and Agricultural Management*, Harza Engineering Company, June 15, 1953, Chicago.

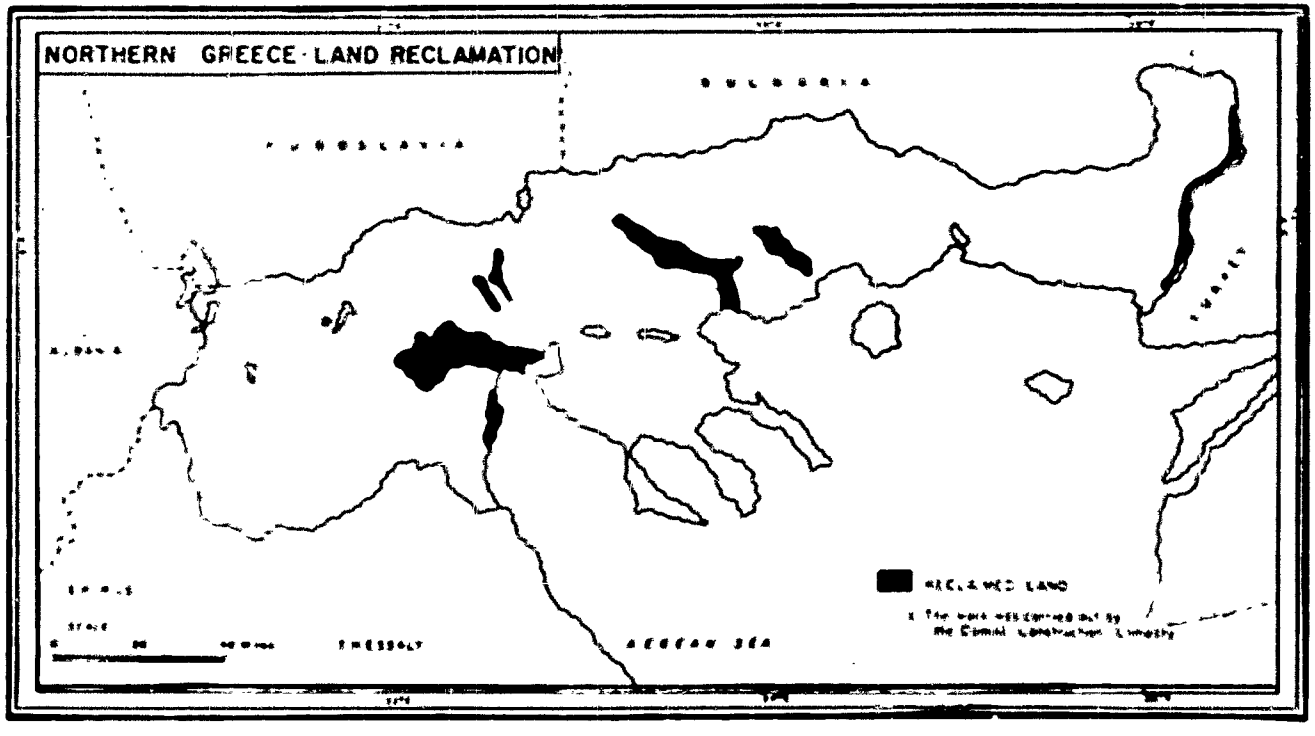

Figure 18.

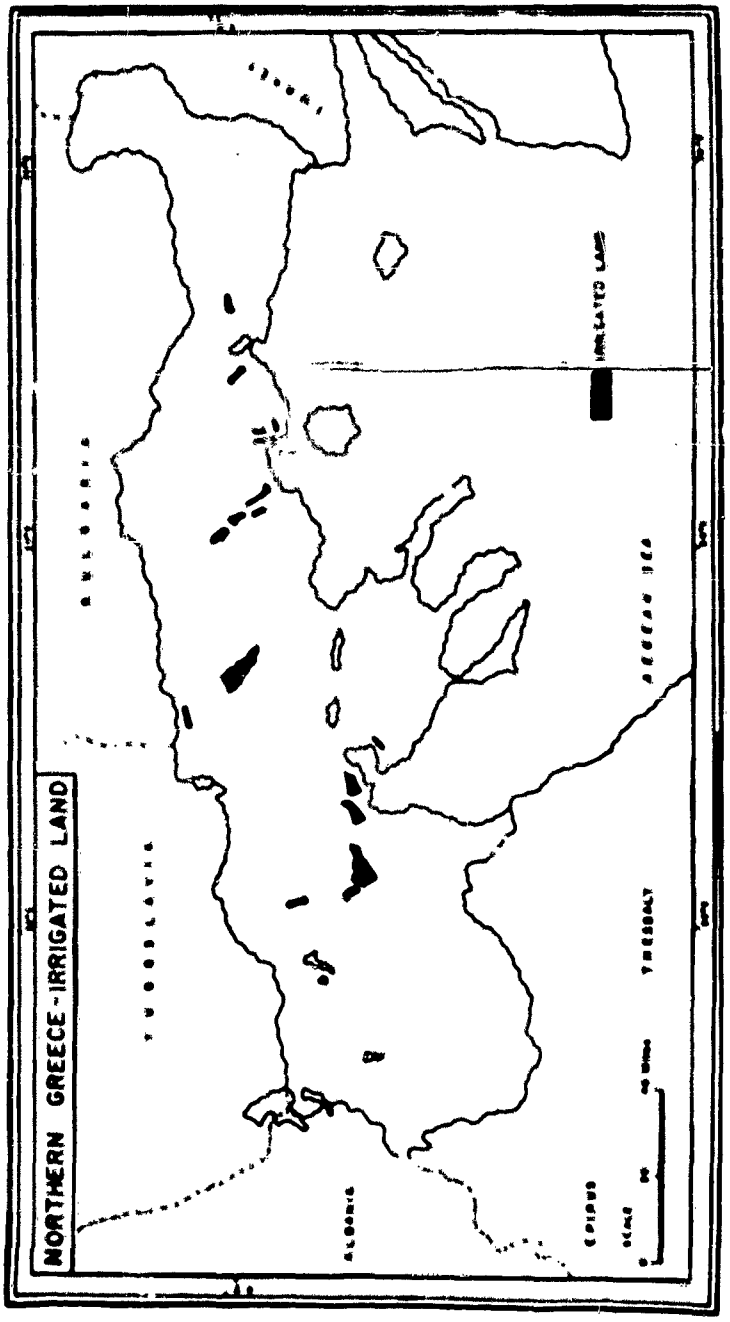

Figure 19.

considered as interrelated measures essential to future development. The construction of the flood levees was assigned to the Domiki Construction Company (A.T.E. Domiki). The agreement called for the completion of the flood protection measures by both countries by 1959. The anti-flood works on the Greek side were completed by 1959, except for a small portion near the town of Ferre. Turkey, however, reluctantly launched the construction of anti-flood works on her side as late as early in 1960, partly perhaps because Turkey is not confronted with a population pres-

Fig. 20. The Aliakmon river diversion barrage.

sure problem. Greece must now wait until Turkey constructs the pilot channel cut-off to the south of Ferre area. The works have more meaning for Greece, for she lacks arable land to feed more than adequately her people. As of 1960, 140,000 stremmata have been reclaimed through drainage and protection from local flooding. The next step is the construction of irrigation canals.

When the project was started, the farmers of the region could not believe that it was possible to tame the river. However, by 1957 they became aware of the importance of the works to their economic welfare. The tangible economic evidence of the project is revealed by tables 11 and 12.

Minor Irrigation Projects

Since natural conditions are somewhat unfavorable to major irrigation projects, emphasis has been placed on minor irrigation projects. Pre-

valent in the mountainous and hill sections of the region, these minor irrigation works have several advantages:

1. will stabilize the income of the farmer, especially in the dry and unfertile areas
2. will provide the farmers with more work-days
3. will make evident the economic value of water
4. will produce a higher yield per hectare, through availability of water and improved cultivation methods.

Fig. 21. The canal brings water to the farms near the city of Serres.

The economic importance of these projects has been recognized by all. Both the Agricultural Bank and the Ministry of Agriculture are giving their moral and economic support to the farmers to carry out small irrigation works individually or collectively.

Irrigation is needed because it is the principal means not only for expanding the cultivated area, but also for increasing and stabilizing yields. The amount of irrigated land increased from 335,065 to 941,124 stremmata in the period between 1929 and 1957. Table 13 shows the per cent of irrigated land by prefectures in Northern Greece. Prefectures in which more then 15 per cent of the cultivated land is under irrigation are Emathia, Pella, Serres, and Florina. In 1959 more then 80 per cent of the irrigated land was planted in annual crops such as cotton, corn, beans, melons, and vegetables [10].

10. Ministry of Agriculture, Athens, 1960.

Gravity flow, pumping, and sprinkling irrigation techniques are used. In 1957 661,791 stremmata were irrigated by means of gravity flow, 208,637 by water-pumps, and 70,696 by sprinklers. Approximately 70 per cent of the water used for irrigation comes from rivers and springs[11]. The rest is obtained from wells, artesian wells, and man-made ponds.

Adequate provisions for maintenance of irrigation schemes are still lacking. There are a few signs of neglect today: regulators have fallen into disrepair, canals have become silted and have developed leaks. Also, false economies have made the task of maintaining them more difficult.

Since water is limited, measures must be taken to ensure its use to maximal advantage. Much water is being wasted because of inadequate knowledge of irrigation techniques and of the water requirements of various crops in the different crops of the region. A worthwhile water-conservation measure has already been undertaken by the Ministry of Agriculture. Experimental plots to determine the appropriate irrigation techniques have been established in areas which are already irrigated. It has been demonstrated that improved levelling of land would produce a much more economical distribution of water.

The construction of new diversion dams and the extension of the present irrigation network make it imperative for Greece to reach an agreement with Yugoslavia and Bulgaria regarding the control of the rivers. With the exception of the Aliakmon, the other large rivers with a substantial flow during the summer dry season originate in the Communist bloc and Communist Yugoslavia, (see Figure 8). The watersheds of the Strymon, Nestos, and Evros are in Bulgaria, and that of the Axios is in Yugoslavia. Only a small segment of their drainage basins is situated in Northern Greece; e.g., only 6 per cent (ca 3,180 sq. kilometers) of the Evros river basin is in Greece. Hence, any attempt by Yugoslavia and Bulgaria to extract more water for their use or to build diversion dams would undermine the efforts of Greece to develop the Greek portions of the river basins. The agreement should involve these areas: reforestation, gully-erosion control, watershed protection, flood control, and irrigation[12].

11. Ministry of Agriculture, Athens, 1960.

12. The absence of a river-development agreement between Bulgaria and Greece has been called to the attention of the government by the critics of its land reclamation projects in Northern Greece. A conference was held between Greek and Yugoslav officials early in 1960 to work out an agreement concerning the use of the water of the Axios river and Lake Doirani, and the cultivation of Yugoslav-owned land inside Greece and vice-versa.

Soil Erosion

Prevention of soil erosion is one of the important agricultural problems Northern Greece has to face today. Millions of cubic feet of fertile soil are carried to the sea by the torrents and rivers. Since 1950, intensive measures have been undertaken to check soil erosion: reforestation of the barren slopes, the construction of terraces on steep slopes of watersheds, the construction of small dry stone and cement dams to regulate the flow of the torrents and streams, hurdle and fascine works to prevent the formation of gullies, and the construction of dikes and terracing. The first experiment at terracing was carried out in the area of the Vathylakos water shed (near Thessaloniki) in 1948. Today the terraces are fully suited to local farming conditions. Terracing is recommended in the hilly areas as a means not only of reducing soil erosion, but also of increasing the moisture content of the soil, so essential for the growth of crops. Since steep slopes reduce the retention of moisture during the summer, the yield is therefore poor if not negligible. The farmers of the region are now cognizant of the great advantages to be derived from soil conservation on hillside slopes and are asking that the work be further extended. The tractors and other equipment needed for brush-clearing, terracing, breaking up of new land, deep ploughing, and small drainage and irrigation works are provided by the Mechanical Cultivation Service. It also helps cooperatives and farmers to utilize effectively existing agricultural equipment, trains technical personnel in the handling of agricultural machinery, makes agricultural machinery available to the farmers for a slight fee, and instructs farmers on mechanical cultivation methods. However, its participation in land ploughing has declined since the farmers started purchasing their own tractors. The projects undertaken either by individual farmers or agricultural cooperatives are financed by the Agricultural Bank on two to five year loans.

Land Consolidation

The high cost of production, which characterizes the agriculture of Northern Greece, could conceivably be reduced by encouraging the farmers to consolidate their agricultural holdings. Such factors as long established cultivation, shortage of land, unrestricted rights of transfer, and pressure of population have encouraged over-fragmentation of land.

In spite of the advantages of land consolidation—more intensive cultivation, greater use of machinery, low production cost, higher net income per peasant family, rational crop-cultivation—the process of consoli-

dation has been very slow. As of 1955, four villages had consolidated their land holdings (see Table 14)[13]. The physical and technical aspects of consolidation are less difficult to overcome than the difficulties arising from the fact that the farmers are human beings with normal emotion and reactions. It seems, then, that much demonstration and persuasion is needed to convince the farmers of the benefits to be obtained.

Mechanical Cultivation

There has been a rapid increase in farm mechanization since 1944, but further expansion of production through power farming may be retarded by the small-size farm prots and by other factors. The employment

Fig. 22. The animal-drawn plow will continue to be used by the farmers in the mountainous areas of Northern Greece.

13. Since 1955, the villages of Platí, Panorama, Dragaia, Saravanes, Neochorouda, and Prinos have applied to the Ministry of Agriculture for permission to consolidate their agricultural holdings. Before consolidation takes plake, the majo-

Fig. 29. Mechanized farming is gradually expanding in the plains.

of tractors in the plains has produced tangible results because of the presence of fertile soil, level to rolling land, and larger sizes of farm plots. In the mountainous areas, however, where most of the land is rocky and broken into small plots, draught-plowing will continue to be of major importance. Despite the greater use of machinery, the use of traditional plowing and other cultivation methods is still dominant [15].

The number of tractors owned individually and collectively increased from 251 to 6,121 in the period between 1944 and 1957 [14]. In 1957 about 43 per cent of all tractors in Greece were in Northern Greece. The most popular makes of tractors are Fordson, Hanomag, Zetor, and Utos. Much of the mechanical farming equipment is from Great Britain, West Germany, and Czechoslovakia. The share of the Communist bloc has been increasing steadily since 1955. In 1958 it was approximately 32 per cent of the total agricultural machinery imports of Greece [16]. To operate, maintain, and repair the machinery, the Ministry of Agriculture, together with the American Farm School, is offering instruction to qualified farmers.

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rity of the farmers must vote for it, and also must possess more than one-half of the land to be consolidated.

14. In 1939 there was one tractor per 1,635 stremmata.

15. The tractor has now replaced the horse as a symbol of prestige in the rural areas.

16. Ministry of Agriculture, Athens, 1960.

Since mechanized farming is something new for the farmers of the region, it is still confronted with some handicaps: the high cost of fuel, inadequate repair facilities, expensive spare parts, and insufficient knowledge of the suitability and capability of different types of farm equipment.

Fertilizers, Insecticides, Pesticides

The application of fertilizers, insecticides, and pesticides has led to an increase in agricultural production. However, if the use of fertilizers is to be promoted, the cost should be reduced. At present fertilizers are largely imported. The completion of the nitrogen-fixation plant at Ptolemais would not only reduce the cost of fertilizer, but would also produce savings in foreign exchange. It must also be remembered that a rapid increase in the utilization of fertilizers may encourage indiscriminate use, which may do more harm than good. Since extensive use of DDT has eradicated malaria, the land in the plains is more intensively cultivated than before the war[17]. The loss of work days due to malaria attacks is now insignificant.

Although the government has been encouraging the farmers to diversify their agricultural production in order to lessen their dependence on one or two crops for their means of livelihood, the possibilities appear to be limited. Greater diversification calls for an increase in the supply of fertilizers, better seeds, and machinery, for with all the progress which has been made, only one-third of the total cultivated areas receives adequate fertilizer treatment.

Land Use

Table 15 represents the best estimates derived from consulting available sources of statistical material and from conversations with Ministry of Agriculture officials. A serious error in the compilation of land use data was the lack of estimates of double-cropped and interplanted areas.

In 1959, approximately 25.21 per cent of the total land area was in cultivated crops; 6.85 per cent was in tree and vine crops, grazing, and meadows. The land in farms was 32.06 per cent of the total land area. The rather low percentage of land in farms is largely due to its scarcity rather than to socio-economic factors which may keep potentially arable land out of cultivation. Another revealing characteristic of the pattern of over-all utilization is the low proportion of arable land devoted to

17. Before the war, Greece was a major importer of quinine.

forage crops. The remainder 67.94 per cent is classified as follows: 32.47 per cent mountains, and nomadic grazing, 18.27 per cent forests, and 17.20 per cent torrents, roads, and other uses.

Value of Crops

In 1956, the most important crops in terms of value were cereals, industrial crops, truck crops, and vine and tree crops (see Table 16). The estimated value of agricultural production was 6,609,263,355 drachmas in 1956, a figure wich represented 32 per cent of the total value of the national farm production. Table 17 shows the per capita and gross value of agricultural production by prefectures in 1956. The prefectures with a per capita value of farm production of more than 200 dollars were Pella, Pieria, Khalkidiki, Thessaloniki and Emathia. Those with the lowest per capita value of farm production were Xanthi and Evros.

Agricultural Crops

Wheat

Wheat, barley, corn, pulses, sesame, tobacco, and (more recently) cotton, rice, and fruits are the principal crops. However, wheat is by far the most important single cereal crop grown in the winter-rain-fed areas of Northern Greece. In 1959 the region's contribution to the total national wheat production was estimated at 45 per cent (see Table 18), and constituted 40 per cent of the gross value of all cultivated rotation, tree and vine crops in the region[18]. Wheat is grown throughout the region, but the cultivation is concentrated in the prefectures of Kilkis, Serres, Kozani, Evros, and Thessaloniki (see Table 19), where there are extensive plains and hills suitable for this culture. The wheat fields range in size from 2 to 9 hectares. The total arable land devoted to the production of wheat increased from 320,000 hectares in 1950 to 512,000 hectares in 1959 (see Table 20). In that year it represented 44 per cent of the total wheat area in Greece and 48.5 per cent of the total rotation crops land in Northern Greece (see Table 21). In some prefectures the land used for wheat more than doubled since 1950; i. e., in Kilkis it increased from 39,000 hectares in 1950 to 77,000 hectares in 1959. Also, the average yield per hectare of wheat witnessed a similar increase: it jumped from 1,188 kilograms per hectare in 1950 to 1,535 kilograms in 1959. Similar increases were shown by the other crops too (see Table 22). The wheat production in 1959 was approximately 795,000 metric tons, representing an 103.84 per cent increase

18. Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960.

over 1938 (see Tables 23 and 24). Despite this increase in production, approximately 3,600 metric tons of wheat were imported into the region in 1959. The imported wheat was of the hard variety and was mainly used in the manufacturing of alimentary pastes. The imports of wheat in 1938 amounted to 67,000 tons [19].

The general improvement in the wheat culture was brought about by the use of early maturing varieties [20], greater use of fertilizers, improved plowing techniques, the destruction of pests and diseases by extensive use of insecticides and fungicides, and a favorable governmental attitude [21]. Also, the employment of threshing machines and combines reduced the loss of wheat due to abnormal weather conditions during the threshing season. Before the extensive use of threshing machines, most of the wheat was threshed out by hand or with burden animals and was winnowed by hand. This was a prolonged operation; at times the harvested wheat lay on the threshing floor for more than one month, exposed to sudden and destructive storms. In 1957, 85 per cent of the wheat was threshed by the region's 1,172 threshing machines and 144 combines [22]. The operators of the machines received rent for their services either in money or in kind, mostly in kind.

To increase the production of wheat, to provide the farmers with high wheat prices, and to relieve the wheat surplus problem in some districts, the government expanded the price-support program for wheat early in 1950. The government pre-determines the price and collects through the Agricultural Cooperatives a substantial portion of the crop. The price level ranges from 2.5 to 3.5 drachmas per kilogram and is higher than the world market price. As a result, the price differential is met by the government budget. The annual wheat subsidy was about 400,000,000 drachmas in 1958 [23]. However, no attempt has been made by the government to pass it on to the consumer. If it had not been for the price-support program, the wheat prices received by the farmers would have been lower than the world market prices.

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19. Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960.

20. The experiments were conducted by the Plant Improvement Station in Thessaloniki. The station was established in 1925.

21. Credit has been extended to the wheat farmers and Agricultural Cooperatives by the Agricultural Bank of Greece to construct grain warehouses and to purchase imported seeds and other items needed in the cultivation of wheat. Also, the government has constructed large wheat storage plants in the wheat growing areas.

22. Ministry of Agriculture, Athens, 1959.

23. *Ibid.*

In 1960 the wheat price was set at 3.5 drachmas per kilogram for the small farmers (under 3 hectares) and 2.7 drachmas per kilogram for large farms up to 9 hectares. The open market price of approximately 3 drachmas per kilogram was supported by the government by requiring the flour mills to process exclusively wheat purchased in open market, and to support this price through open market purchases by Agricultural Cooperatives[24]. The annual wheat collection by the government in the 1956-1959 period amounted to 178,000 metric tons[25]. Most of the wheat was collected in the prefectures of Thessaloniki, Serres, Kilkis, and Evros. Approximately one-fourth of the region's annual wheat production was being collected by the government until 1960.

Since the wheat farmers knew that the government would absorb their wheat surplus, they devoted land that was not suitable for wheat cultivation. The marginal land that was brought under cultivation is better suited for barley than wheat. Also, the undue emphasis on wheat production has slowed down the diversification of agriculture and has led to high domestic wheat prices.

Now that the objective of the government has been reached—namely, to achieve near self-sufficiency in wheat production by concentrating on land suited for it—there is no economic case for an artificial high price for wheat. This has been realized by the government: in 1959 it decided to reduce each year the State allocation for the support of wheat prices in a bid to turn the farmers to more profitable crops and also labor-intensive crops such as cotton and sugar beets. The returns from an hectare planted in cotton are approximately double that of wheat—about 10,000 drachmas. To stimulate the diversification of agriculture program, the government is subsidizing the farmers who wish to engage in it. It appears, then, that the production of agricultural crops in Northern Greece, where cultural and physical conditions are favorable for their development, can be increased through a price-support program. The Greek farmer is willing to increase the production of old and new crops provided that his efforts are being subsidized by the government. He is too poor to take risk for himself.

Corn

Unlike wheat, cotton, and rice, the land devoted to corn started to decline after 1953. In that year it amounted to 135,000 hectares (see

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24. Ministry of Agriculture, Athens, 1959.
25. *Ibid.*

Table 20), a figure which represented 51 per cent of the total corn land in Greece. Despite the decrease in area, the production of corn rose from 95,000 metric tons in 1950 to 160,000 tons in 1959 (see Table 23). The region's share of the total national corn production was estimated at 57.6 per cent in 1959 (see Table 18). The increase reflects not only the use of better corn varieties and improved cultivation methods, but also the expansion of irrigated corn. The low-yielding rain-fed corn fields (*ca* 900 kilograms per hectare) are gradually being replaced by irrigated fields which are more productive. The average yield of an irrigated hectare of corn, provided that the weather conditions are favorable, is more than 2,000 kilograms. Approximately 22 per cent of the corn land was under irrigation in 1959. The leading producers of non-irrigated corn are the prefectures of Thessaloniki, Kozani, Serres, and Evros[26]. That of irrigated corn is Pella. As far as gross value is concerned, corn is the fifth important crop after wheat, tobacco, cotton, and fruits. In 1959 the gross value of corn was estimated at 3,625 drachmas per hectare[27].

Rice

To improve the diet of the people, to improve the food situation, and to bring new land under cultivation, it was decided early in the 1950's to reclaim the saline soils in the river plains and deltas of Axios, Strymon, and Nestos[28]. An important factor which made possible the utilization of the saline and waterclogged portions of these plains was the use of DDT in eradicating malaria.

The cultivation of rice in the reclaimed mudflats was supported by the United States Mission to Greece, because it was felt that the then unused saline soils could be made productive. Also, rice is a highy labor-intensive crop, requires little initial capital except that needed for the land, and is high yielding. Table 25 shows the area and producing centers of rice in Northern Greece in 1958. In that year the cultivation of rice was confined to the Prefectures of Serres, Drama, Kavala, and Thessaloniki (see Figure 24).

The increase in area and production has been almost phenomenal since 1950. The area planted in rice increased from almost nothing in 1950

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26. It is anticipated that the completion of the irrigation networks in the Evros plain will further diminish the rain-fed corn area. The irrigated corn area increased from 16,285 hectares in 1956 to 17,100 hectares in 1958.

27. Ministry of Agriculture, Athens, 1959.

28. The reclamation work was carried out in Northern Greece by YPEM.

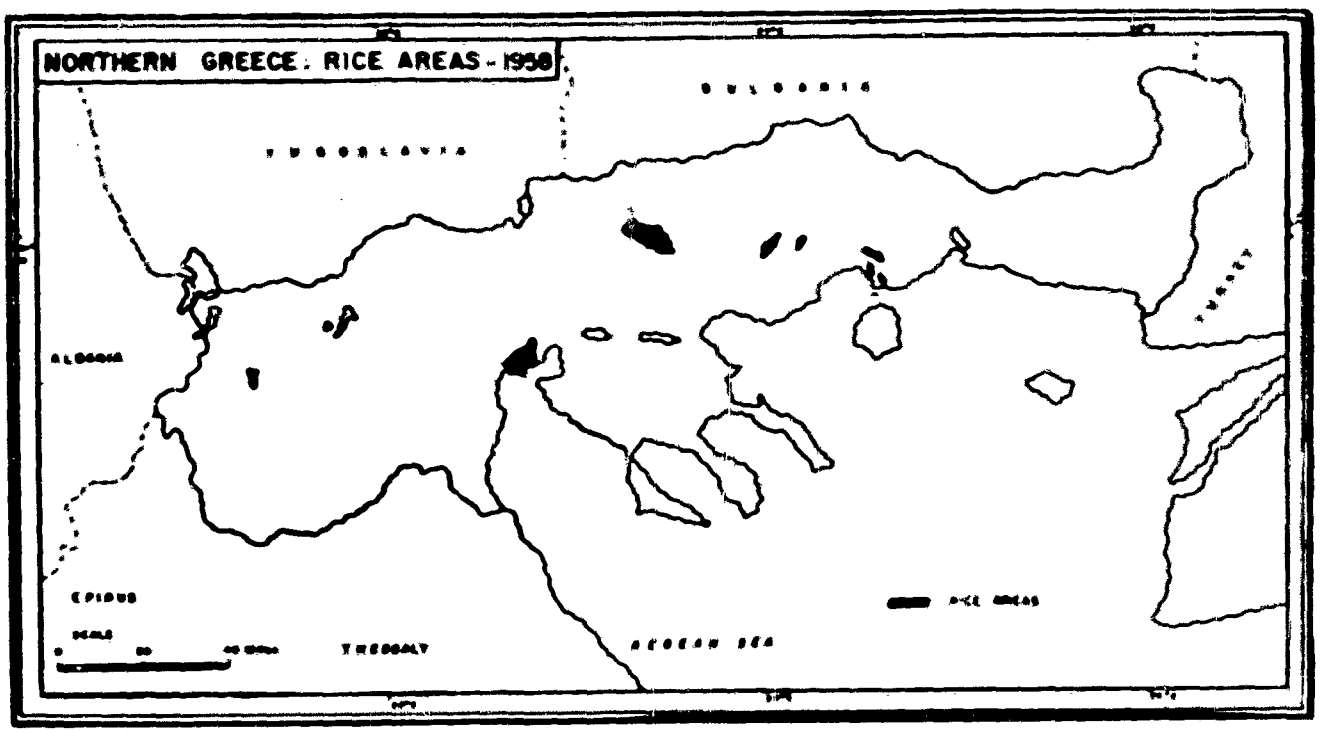
NORTHERN GREECE: RICE AREAS - 1958
YUGOSLAVIA
BULGARIA
TURKEY
ALBANIA
EPIRUS
THESSALY
AEGEAN SEA
RICE AREAS

Figure 24.

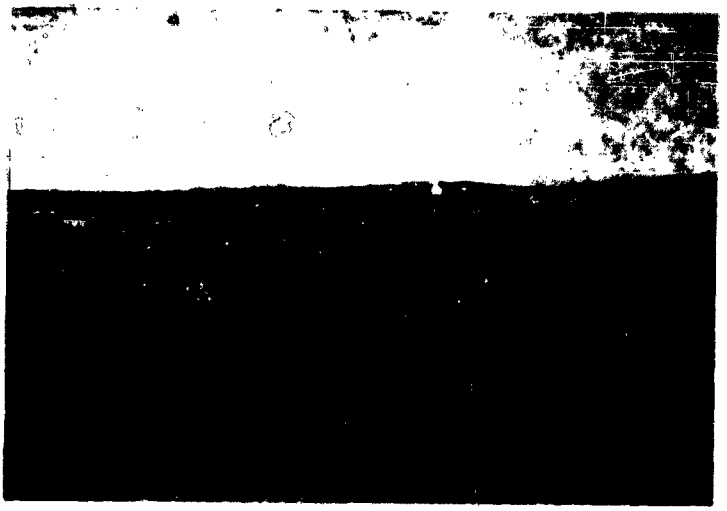

Fig. 25. A wheat field near Thessaloniki.

Fig. 26. A rice paddy near Halastra, Thessaloniki.

Fig. 27. Storage plants have been erected for the farmers by the Agricultural Bank and the Agricultural Cooperatives.

Fig. 28. Threshing machines are now a common sight in Northern Greece.

to 10,000 hectares in 1959, and represented 55.55 per cent of the total rice land in Greece. Production has steadily risen from 3,000 metric tons in 1950 to 41,000 tons in 1959. In that year it represented 56.16 per cent of the total national rice production. Also, the introduction of improved cultivation practices, the use of fertilizers, improved seeds, and better seed beds increased the yield per hectare from 2,727 kilograms in 1950 to 4,100 kilograms in 1959 (see Table 26). The rice paddies are rather small. The average size holding per rice grower is less than 3 stremmata [29]. The rice is hulled and cleaned in the local mills. There are a few large mills in the city of Thessaloniki.

Despite an increase in the production of rice, the region is still a net importer of rice. However, the amount of imported rice dropped from 5,287 metric tons in 1938 to 342 tons in 1959 (see Table 27). The region was a net exporter of rice in the years 1953 and 1957.

It is anticipated that after the reclamation works in the rice-growing areas are completed, more land will be devoted to this culture. Since the quantity of water is limited, it is important that the irrigated fields be devoted to the cultivation of high yielding crops. After the soil in the rice is desalinized, it will be used to produce truck crops and cotton. Expansion of rice production appears to offer great possibilities. To increase the consumption of locally-produced rice, the government had reduced the imports of rice from abroad.

Truck Crops

The production of edible pulses [30] is steadily improving despite a slight drop in area after 1957 (see Table 20). In 1959 the area under pulses amounted to 26,800 hectares, an area representing approximately 41 per cent of the total pulses land in Greece. The cultivation of legumes is encouraged by the government for two reasons: 1) to meet the domestic requirements in pulses, and 2) to improve the system of crop rotation. However, the production does not cover the local need for beans. As a result, beans are imported from abroad into the region. In 1959 approximately 1,400 metric tons of beans were imported to close the gap between production and consumption [31]. The area under legumes cultivation, production, yield, and the important producing prefectures are shown in Table 28.

29. A stremma is equivalent to 1/10 of an hectare.
30. Pulse is a general name for the leguminous plants or their seeds.
31. Ministry of Agriculture, Athens, 1960.

The cultivation of vegetables (beans, cabbage, peas, okra, cucumber, tomatoes, leeks, artichokes, etc.) and melons is concentrated near the large cities and towns where they are in good supply during the season. However, the large urban centers can augment their supply of vegetables by importing them from the other agricultural areas of the region. This has been made possible by the improvement of the highway network since 1950; e.g., melons are shipped to Thessaloniki by truck from Evros, and strawberries from Florina and Kozani. The area planted in vegetables was estimated at 39,800 hectares in 1959 and the production at 462,000 metric tons[32]. The leading producer of vegetable crops is the prefecture of Thessaloniki, largely because of such factors as the availability of fertile, level to rolling agricultural land, water for irrigation, adequate transportation and marketing facilities, and the presence of the large urban market of Thessaloniki. Most of the vegetables are grown in small vegetable gardens; however, there are a few large truck farms near Thessaloniki. The production in many instances is affected substantially by weather condition, especially in the spring. The area under cultivation is influenced by such factors as demand and existence of surpluses; e.g., in 1959 there was a surplus of potatoes and the following year there was a considerable drop in the area planted in potatoes.

Tomatoes and potatoes are the most important vegetable crops; their combined annual production averaged 160,000 tons in the period 1956 - 1959[33]. The production of potatoes was encouraged by the government by launching an educational campaign and by furnishing the necessary seed to farmers through the Agricultural Bank of Greece in 1958. Research underway emphasizes the improvement of quantity and quality of tomatoes for foreign and domestic consumption.

Although the per capita per year consumption of vegetables was approximately 52 kilograms in 1959, it was less than that in the rural areas of the region and especially in the mountain villages[34]. Three reasons may be cited to explain the presence of an imbalanced diet in the majority of the villages: 1) there is little land for the cultivation of vegetables; 2) the majority of the farmers do not know the value of a balanced diet; and 3) the cultivation of vegetables is held in low esteem by some villagers.

In order to increase the consumption of vegetables in the rural areas and to increase the exports of truck crops to Western Europe, the govern-

32. Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960.
33. *Ibid.*
34. Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960.

ment has undertaken several remedial steps. Agronomists were sent to the United States to receive specialized training in the production and marketing of vegetables. Techical instruction is now given to the interested farmers, and the Agricultural Bank of Geeece has made loans to them to purchase improved seeds, chemical fertilizers, and insecticides and to improve the irrigation facilities. The home economics workers are seeking the cooperation of the farmers not only to improve vegetable-gardening practices but also to produce more vegetables for their own use and necessarily for sale. Several improved practices are being recommended: 1) better seed beds, 2) improved vegetable seeds, 3) greater use of organic and non-organic fertilizers, and 4) the expansion of non-irrigated gardens where water for irrigation is scarce. The young girls of the villages are receiving instruction on the preservation of vegetables and fruits[35]. Also the Ministry of Education is encouraging the teachers in the rural villages to establish school gardens.

Although the cultivation of strawberries began in 1927, it really started to expand after 1950. In 1956 the region's 40 hectares yielded 2,090 metric tons of strawberries. Most of the production is concentrated in the Prefecture of Florina. Table 29 shows the area and producing centers of strawberries in Florina. The yield of strawberries per stremma ranges from 640 to 1,280 kilograms. Although the production of strawberries amounted to 1,600 metric tons, it can be increased provided that the producers receive satisfactory prices for their crop. Land suitable both for irrigation and for cultivation of strawberries is found everywhere in the Prefecture, especially in the hilly areas. The area under cultivation could be increased to 5,000 stremmata with minimum difficulty.

The first successful shipment of fresh strawberries to West Germany and Austria was made in 1956 under the direction of AGREX, export organization of the Agricultural Bank of Greece. The token shipment (*ca* 13 tons) was well received by the consumers, and since then a substantial portion of the region's production has been exported to Western Europe. In 1958 the exports of fresh strawberries to Western Europe amounted to 26.4 metric tons and those of preserved strawberries to 53.3 tons[36]. The rest is consumed by the domestic market, especially by the Athens and Thessaloniki markets. An obstacle to greater exports of strawberries to West Germany is the special tariff placed on imported straw-

35. Now in the winter a peasant family can enjoy not only a casserole of lamb with string beans but also preserved fruits.

36. Prefecture of Florina, Section of Agriculture, Florina, 1959.

berries after June 10 or 15 of each year. This measure was enacted by West Germany to protect its own strawberries industry. Also, the region has to compete with Bulgaria, Italy, and Yugoslavia for the same market. The latter two have an added advantage: they are closer to the market than is Northern Greece.

To increase the exports and to reduce the cost of production of strawberries, efforts are now geared toward improving cutting, packing, loading, and transport and marketing of the product in the foreign and domestic markets. Provided that the quantity and quality of strawberries improve, there will be a great demand for them in the market of Western Europe. The same holds true for the other agricultural products.

The local vegetables canning industry can double its output by reducing the cost of production and by encouraging the consumers to eat more canned vegetables. The Greek consumer prefers to eat fresh vegetables rather than canned. Also, tinned goods are very expensive. With the exception of locally-produced raw materials, the others (tin cans, paper, etc.) have to be imported. This industry should be supported by the government not only because it would provide the populace with year-round consumption of vegetables, but also because it would create jobs in the labor-surplus agricultural districts. However, it should be remembered that the successful operation of a vegetable canning industry depends primarily on the availability of good surpluses and not merely on the residue from market shipment.

Broom-Corn (Sorghum Saccharatum)

Almost all of the broom-corn (sorghum) is cultivated in the flood plain of the Evros river in the Orestiada province of the Prefecture of Evros. Broom-corn is the main summer crop of the villages along the edge of the plain, and there is a ready market for it. The most important producer is the village of Nea Vissa [37]. Harvesting, threshing, and winnowing of sorghum occupies the entire family during the month of August. Feeble attempts at mechanization have been made.

Before the completion of the flood-control works, the area was susceptible to floods during the winter, and the cultivation of the land was usually restricted to such summer crops as broom-corn, maize, sunflower, and melons. In some years, however, floods occured during the summer growing season with grave economic consequences. It is anticipated that

37. Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1959.

Fig. 29. Peasant women tilling the soil.

Fig. 30. The rough and deeply furrowed hands of the peasants reflect that their life is a harsh one.

the completion of the drainage and irrigation projects would lead to the diversification of agriculture; i.e., less land would be planted in sorghum and more in such crops as vegetables, corn, and sugar beets.

In 1958 the production on 3,000 hectares was estimated at 5,955 metric tons of panicles and seeds (see Table 30). A small portion of the production is exported abroad, especially to Italy. The sorghum seeds are shipped to the local oilseeds processing-plants.

Other Crops

Sesame is grown in all prefectures except in Florina and Kastoria. Because of low yields and a limited market, the amount of land devoted to its production has been declining since 1955 (see Table 20). In 1958 the production on 20,600 hectares was estimated at 5,000 metric tons of sesame (see Table 30). The important producers of this crop are the prefectures of Serres, Evros, Rodopi, and Khalkidiki. A small portion is exported to foreign and domestic markets. The production of the other crops—sunflower, flax, and paprika is insignificant.

Arboriculture

The edaphic and climatic conditions of the regions favor the cultivation of deciduous fruit trees such as apples, peaches, apricots, cherries, and pears[38]. However, the systematic cultivation of trees is a recent development and gained momentum after 1950. Prior to the war, the fruit-growing industry was underdeveloped. Tree fruits are grown in all prefectures, but the most important producers of fruits are the prefectures of Pella and Emathia (see Table 31). The production of both fresh and dried fruits on approximately 31,890 hectares amounted to 96,000 metric tons in 1956. This represented approximately 37 per cent of the total Greek production of fruits. In 1956 the gross value was estimated at 327,000.000 drachmas and this was 29.6 per cent of the total value of Greek fruit production. Its relative contribution to the total value of agricultural production in Northern Greece was 4.9 per cent in 1956[39].

The most important fruits are apples and peaches. The leading producer is the Vermion area (Edessa - Skydra - Naousa - Veria) in the prefectures of Emathia and Pella (see Figure 31). Many factors are responsible for the expansion of apple and peach cultivation: 1) availability of water for

38. The climate is unsuitable for the cultivation of citrus-fruits.
39. Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960.

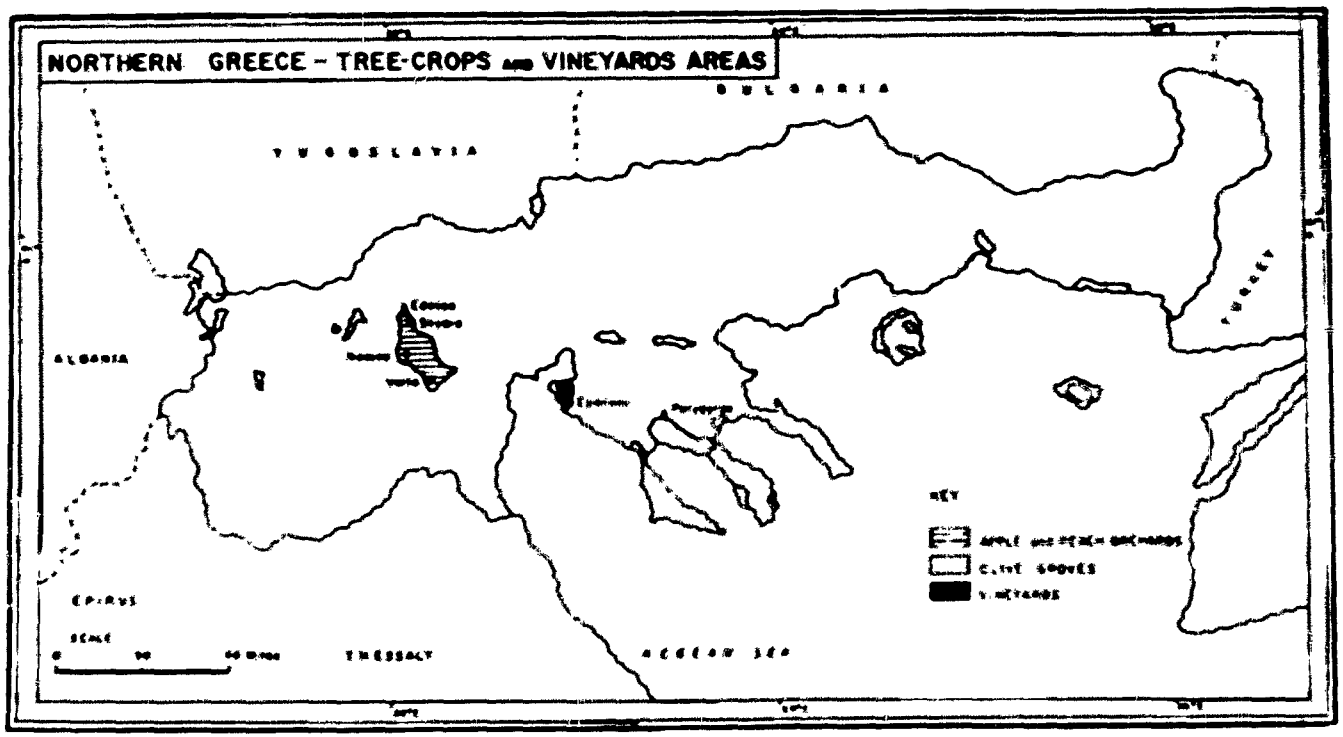
NORTHERN GREECE - TREE-CROPS and VINEYARDS AREAS
YUGOSLAVIA
BULGARIA
ALBANIA
EPIRUS
THESSALY
AEGEAN SEA
KEY

Figure 31.

irrigation, 2) absence of very cold winds in the winter and hot winds in the summer, 3) clear and dry air in the summer, 4) abundant sunshine, 5) fertile and deep soil, 6) an early start, 7) presence of an energetic and progressive rural population, 8) accessibility to the market, 9) more than adequate transportation, and 10) government support and assistance. When the peasants early in 1950 discovered that fruit-growing was more lucrative than wheat-growing, they shifted to the production of fruits[40]. Thousands of apple and peach trees were planted, the majority of which are not more than ten years old.

The orchards are mostly small (less than four stremmata) and numerous. The average number of apple trees per stremma is thirty-two[41]. Almost all of the orchards are irrigated every 15 or 20 days. There are systematic orchards in all the prefectures. The important varieties of apple trees grown are Belfort and Starking-Delicious. Those of peach trees are Alberta and Condoni. Since 1956, the Belfort apple trees have been yielding ground to other varieties such as Starking-Delicious[42]. The peach orchardists are now planting early maturing varieties. The majority of the peach trees are of the late-maturing species. Since the crop is picked in the middle of August, the region cannot successfuly compete with Yugoslavia for the market of West Germany and Austria. The peach-crop of Yugoslavia matures about the same period and she is closer to the market.

The average farmer in the Vermion fruit-growing area usually devotes thirty per cent of his land to fruit production. The possibility is that he would devote more land to it as soon as the exports of fresh fruit increase. Table 32 shows the amount of land which a small farmer assigned to the production of different agricultural crops before and after the war.

The production of fruits has been increasing steadily due mainly to two factors: 1) new trees reaching fruit-bearing state, and 2) the increa-

40. Some of the farmers became orchardists quite by accident. There is a story about a wheat farmer who planted a few apple trees on his land because he wanted to eat his own apples. During the Guerrilla War he was forced to leave the area. After the lapse of three years, he returned to his farm. By now the trees had reached their fruit-bearing stage, and he made more money from the sale of fruit to the market than he did in all the previous 15 years from the sale of wheat. The news of his success spread to all "corners" of the area. As a result, the wheat farmers became fruit growers.

41. Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960.

42. In the Naousa area 55% of the planted apple trees were Belfort; 30%, Starking-Delicious; and 15% of the planted trees were Jonathan, Du Commerce, Carlet and Black Davis. Sixty per cent of the peach trees planted were Alberta; 10%, Red Bird Cling; and 10%, Hale.

Fig. 52. A blossoming peach orchard near Vermion.

sing yields per tree. The growers have gladly accepted the recommendations of the agronomists concerning pruning, fertilization, irrigation, disease control, and picking and packing of fruits. Despite the progress registered thus far in the over-all improvement of arboriculture, there is still room for further improvement. The pickers still need instruction in and supervision of picking and packing of fruits. The quality of fruit can be improved by shifting the grading, sizing, and packing of fruits from field to centralized packing centers. Greater use should be made of mechanical sizers and rollers for grading.

The cost of apple and peach production is still rather high when compared with that of California in the United States. Although the cost of production per hectare is higher in California than in Vermion, the cost of production per kilo is less than in Vermion. Efforts are now geared toward increasing the output per tree. Despite the high cost of production, in 1958 the gross profit from an hectare of apples was estimated at 11,000 drachmas [43].

The ever-increasing production of fruits (see Table 33) is presenting many problems both to the government and to the growers because of the fluctuating demand for fruits by the European market and the lack of sorting, grading, and packing equipment; ice-making plants; cold storage

43. Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960.

Fig. 33. Fruit-growers are examining the seedlings before buying them.

plants; and refrigerated cars or trucks for transporting the fruit to the domestic and foreign markets[44]. A limited fruit canning and preserving industry to absorb surplus fruit is also needed.

The expansion of the existing fruit canning and preserving industry is limited by the low purchasing power and conservative habits of the consumers. The habit of buying factory preserved and canned fruits is not widespread in Northern Greece. The preservation of fruits in the rural areas is limited by the relatively high cost of sugar (ca 11 drachmas per kilogram in 1959) and scarcity of glass jars. The majority of the consumers eat fresh fruit only when prices are prohibitively low (dumping prices). Although they usually rely on staples, there is a discerning demand for fresh and canned fruits the year round by the consuming public in the urban centers of the region. It is anticipated that they may devote a part of their increased income to this purpose.

The government considers the development of the fruit industry of paramount importance and various measures have been taken to facilitate internal distribution and exports. Under the Five Year Economic Development Program, cold storage plants and other facilities would be built in the fruit-growing areas[45]. More refrigerated cars would be purchased to

44. These problems are due to lack of long - range planning when the decision was made to encourage the development of arboriculture.

45. In the apple and peach growing areas, economies are possible in the joint

lessen the dependence of the growers on INTERFRIGO, an international company which rents refrigerated cars to different countries for their use. It is anticipated that the completion of these facilities will prevent the repetition of the "apple crisis" of 1956 when prices fell so low that many growers refused to pick their apples. Lack of cold storage and transportation facilities in 1959 forced the farmers to dump their bumper peach crop into the market with the result that the selling price of a kilo of peaches was less than the cost of production [46]. It was possible to purchase one kilo of peaches for about 1.5 drachmas (*ca* 3 cents) in the market of Thessaloniki. Agronomists have been sent to the United States, Italy, France, and Israel to study the production and marketing of fruits. The Agricultural Bank of Greece is granting loans to the growers to carry out their orchard-improvement program. The agronomists at the Arboriculture Station of Naousa are experimenting with new varieties of fruits trees [47]. In the hilly and mountainous areas the government encourages the farmers to plant the marginal land in walnut, hazelnut, and almond trees to meet the local and foreign demand for these fruits. The decision permitting the cooperatives to market the fruits directly without being required to go through middlemen has almost eliminated the latter. However, it is too difficult to tell how much of the saved turned-over charges, if any, will benefit the consumer, or the grower, or the remaining middlemen. Also, assistance was extended to the farmers by private organizations. In 1956 the Greek Productivity Center in Athens granted a loan of 250,000 drachmas to the orchardists of Naousa for the establishment of a produ-

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use of facilities since no overlapping of shipping seasons occurs. However, there is overlapping of the grape and peach picking periods.

46. Prior to 1954 there was no problem of fruit disposal and the prices received by the growers were very good. The prices started to decline after 1956 because of over-production of fruits. As a result, the farmers are dissatisfied. The majority of them still want to sell their entire production as they did before 1956. The best way for them to increase their income with smaller sales is to concentrate on the production of high quality fruit. Since the number of producers has increased, the individual orchardist should be more than satisfied if he disposes of only two-thirds of his fruit production.

47. The Arboriculture Station of Nausa, which covers about 19 hectares, was established in 1954. Its main objective is to improve the tree-fruits culture of Greece. For this purpose, improved varieties of fruit trees have been imported from Italy, France, and the United States. More trees have been imported from Italy, for she possesses ecological conditions similar to those of Greece. One-hundred and ninety-two varieties of trees have been planted in the Station.

Fig. 54. A cold storage plant near Skydra.

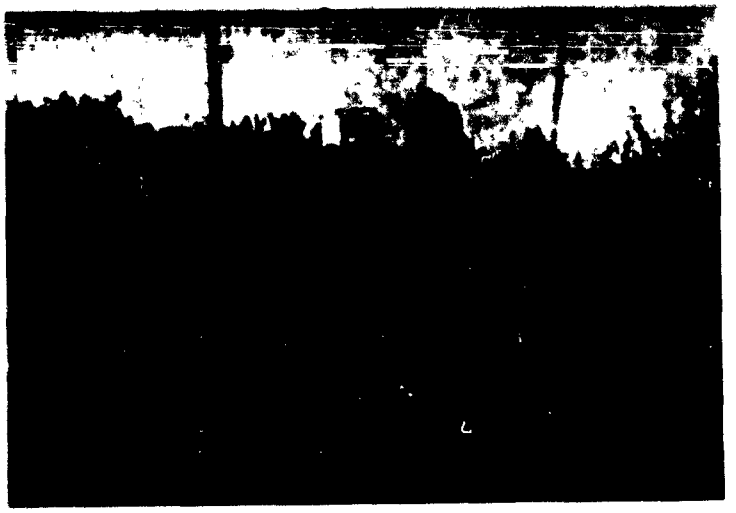

Fig. 55. Refrigerator trucks are used by the fruit growers to ship their crop to the market.

ctivity center consisting of two plants – one for sorting and packing fruit and the other for refrigeration and preparation for export [48].

The exports of fruits to Western Europe have been increasing steadily since 1956 (See Table 34). In 1957 peaches were exported to the United Kingdom for the first time. Also, peaches were shipped to West Germany by refrigerated trucks. The use of trucks has somewhat lessened the dependence of the growers and exporters on refrigerated cars.

It is anticipated that more fresh fruits will be exported to Western Europe now that Greece is a member of the European Common Market. However, it should be remembered that the consuming public will not purchase Greek products if they are below those of other countries in quality. In the Europe Common Market Greece will have to compete with countries that are far more advanced in marketing practices than she [49]. It is pleasant, however, to note that the fruit-growers of Northern Greece are gradually appreciating the importance of quality, grading, exact sizing, firm packing, and uniform attractive shipping containers for the export market [50]. The quality of exportable fruits has improved tremendously since 1956. Government agronomists are now directing and supervising the sorting and packing of fruits. It is almost impossible for an exporter to "get by" with poor quality of fruits.

Besides the shortage of refrigerated cars and trucks, the exports of fruits to Europe are affected by such factors as the condition of the fruit industry there, and competition from Italy. In 1957 there was a very poor apple crop in West Germany, and the exports of apples to it amounted to 19,000 metric tons. In the following year the exports of apples were smaller because of a good apple crop in West Germany. Italy is the region's formidable competitor in the market of Western Europe because of her close proximity to it [51]. The distance from Naousa to Munich, West Germany, is approximately 1,400 kilometers, but it is only 400 kilometers from Italy's fruit-growing areas in the Po river valley. Also, the Greek fruits have to pass through Communist Yugoslavia on their way to the market.

48. Greek Productivity Center, Athens, 1960.

49. A Greek marketing specialist has been attached to the Consulate in Munich not only to find new markets for Greek products but also to direct and supervise their disposal in West Germany.

50. The production and marketing of fruits is a new experience for them.

51. The government and the growers are convinced that Greek fruits are of superior quality and because of their superiority will be able to compete successfully with Italian fruits. I personally ate both Greek and Italian peaches and found the Greek peaches more tasty.

It is conceivable that Yugoslavia can exact economic and political concessions from Greece by interrupting the flow of Greek goods, especially perishable agricultural crops, to the European market. For example, inadequate servicing of the Greek refrigerated cars enroute to Western Europe may result in some spoilage of the cargo. There is no doubt that the fresh fruits industry of Northern Greece, especially peaches, largely depends on the continuation of friendly economic and political relations with Yugoslavia. This also holds true for the other exportable products of the region.

The farmers of Northern Greece are confident that tree-cultivation will become one of the most lucrative types of land use once the techniques and problems of fruit production and marketing are mastered.

Viticulture

The cultivation of both table and wine grapes occupies less than 3 per cent of the total land in Northern Greece (see Table 15). In 1959 it represented approximately 13.5 per cent of the total vineyards in Greece. The production on 30,800 hectares amounted to 92,150 metric tons in 1959. The production of raisins is insignificant[52].

There are vineyards throughout the region, but the most important concentrations are in the prefectures of Thessaloniki, Kilkis, Kozani, and Serres (see Table 35). Most of the table-grapes are grown in Thessaloniki, Kozani, and Rodopi, but Thessaloniki contributes more than one-third to the region's total table-grapes production, which on 7,860 hectares amounted to 44,500 metric tons in 1959. In Thessaloniki the table-grapes are grown in the Peraia-Triada-Epanomi agricultural triangle directly south of the city of Thessaloniki. Rozaki, one of the most popular grapes locally and abroad, is cultivated extensively. This variety is also grown on trellises. It has been found that trellising usually doubles production of high quality grapes. The production of "must" is concentrated in the prefectures of Kozani, Serres, Khaikidiki, Kilkis, and Thessaloniki. More than one third of the annual production of wine-grapes comes from the prefectures of Kozani and Serres. In 1959 the vines on 23,240 hectares yielded 47,650 metric tons of grapes[53].

The average production of grapes per hectare is less than the national average[54], largely because of improper selection of phylloxera-resistant

52. Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960.
53. *Ibid.*
54. The national average production of grapes per hectares was 3,000 kilograms in 1958.

American vines, unfavorable weather conditions (hail, frost), and lack of experience on the part of the grape-growers in the production of grapes and wine.

Steps have been taken to improve both the quantity and quality of grapes. The agronomists are instructing the growers on irrigation, fertilization, dusting, spraying, ringing, and thinning of vines. Research continues in the vineyard nurseries of Thessaloniki, Naousa, and Komotini to improve the native stock by grafting it with better varieties and to study the adaptation of French and American phylloxera-resistant vines to different types of soil. Phylloxera has been in the region since 1908. The Agricultural Bank of Greece is granting loans to the growers to replace their phylloxera infested vines with phylloxera-resistant stock.

The viticulture-improvement program under the Five-Year Economic Development Program has these four objectives: 1) the improvement of wine-making, 2) the introduction of early-maturing varieties of vines[55], 3) the establishment of cooperative wineries[56], and 4) the establishment of more grape-vine nurseries.

The export of table-grapes to Western Europe and especially to West Germany has been steadily rising since 1950 (see Table 34). The agricultural cooperatives are exerting greater efforts to increase the export of grapes to the Scandinavian countries. However, the shipment of increased quantities of grapes to the Western European market would depend on the availability of cold cars during the harvesting season. There is usually a scarcity of refrigerated cars or trucks because of the overlapping of the peach and grape picking seasons. There is no doubt that when the vineyards improvement program is completed, grapes will become an important cash crop.

Olive Culture

The olive groves, like the vineyards, occupy less than 2 per cent of the total land in Northern Greece (see Table 15). The cultivation of olive trees is restricted to the areas where the edaphic and climatic conditions permit their growth (see Figure 31). The important producer of edible olives and olive oil is the prefecture of Khalkidiki. Here the olive groves are situated in the narrow plain and in the peninsulas of Cassandra and

55. However, this may prove to be a difficult task, since Northern Greece has a climate that is more suitable for the cultivation of late-ripening vines.

56. Four wineries are contemplated for the region—Amynteon, Thessaloniki, Nigrita or Serres and Soufli.

Sithonia south of mountain Holomon, which protects them from the cold winds in the winter. Also, the sea breezes ameliorate the high summer temperatures which characterize the interior plains. Another producer is the island of Thassos, south of Kavala. A small proportion of the olive trees is grown in terraced hillsides. In the prefectures of Rodopi and Evros the olive groves are west of the city of Alexandroupolis and along the seaward slopes of mountain Ismaros. Table 36 shows the number of trees and producing centers in the region in the year 1958.

On the plains, especially in Khalkidiki, the practice of intercropping the olive groves with cereals is certainly responsible for the low production during rather dry years. Cereals also extract nitrogen from an already nitrogen deficient soil. It has been recommended that replacing wheat with leguminous hay more benefits would accrue to the grower. It would not only replenish the fertility of the soil, but would also provide him with a nutritious forage crop. In 1956 the olive trees on 19,100 hectares yielded 4,500 metric tons of olive oil and 2,926 tons of edible olives[57]. However, since the production does not meet the regional demand for oil, oils and fats are imported into the region.

The olive groves have been neglected in the past; only recently have the growers been attempting to use the tree-improvement cultivation methods which the growers of fresh fruits (apples and peaches) have used successfully. Research continues on the problem of the Daccuss fly. In some years this fly is responsible for losses as high as 15 per cent of the total crop. Also, an effort is being made to consolidate the scattered olive-tree holdings of farmers[58].

57. In 1959 the number of olive trees was estimated at 2,335,000.

58. In the island of Thassos the consolidation of the olive-tree holdings has already started. The first villagers to consolidate their tree-holdings were those of Prinos. Prior to consolidation, the individual tree-holdings were scattered in all directions from the village, and the farmer had to walk great distances to take care of them. The olive trees were improperly cared for and cultivated. Now the grower devotes more time to his large or small olive grove, and the yield of olives per tree has increased.

The concept of land ownership was lost some time far back in the history of the island, and its place was taken by that of tree-holdings or tree-ownership. In other words, the farmer was thinking in terms of number of trees rather than in terms of number of stremmata. This concept was perpetuated by the proverb that "the vineyards should be in one place and the olive trees everywhere". The farmer felt that if his olive trees were not in one place, the possibility of losing his entire olive-crop because of abnormal weather conditions was almost impossible.

The villagers of Kallihari, Agios Georgios, and Soter have asked the Ministry of Agriculture to help them consolidate their respective olive-tree holdings.

Cotton

The presence of fertile soil and favorable climatic conditions offers greater potentialities in cotton production as more irrigated land becomes available. The cultivation of cotton has also been aided by the government and private individuals. The area planted in cotton was 65,450 hectares in 1959 as compared with 23,956 in 1939 and 33,898 in 1950 (see Table 37). This represented 5 per cent of the total land in cultivation in Northern Greece and 50 per cent of the total cotton land in Greece. Production has also been increasing steadily except in 1958 when lack of rainfall almost ruined the crop. In 1956 prolonged rainfall in the fall prevented the picking of large quantities of cotton. The production of cotton increased from 13,000 metric tons in 1938 to 94,000 tons in 1959 (see Table 23). Next to rice, the gross value per hectare is higher than that of any other industrial crop. It usually averages about 14,000 drachmas[59].

The chief cotton growing areas are the prefectures of Thessaloniki, Pella, Emathia, and Serres (see Figure 36). In 1958 their share of the total cotton production of the region was approximately 81 per cent[60]. The leading cultivation centers are Alexandria, Veria, Epanomi, and Gianitsa (see Table 39). Although one half of the cotton is planted in rain-fed land, the area in irrigated cotton is increasing steadily, and more land would be devoted to it following the completion of the irrigated networks. There was an increase from 27,225 stremmata to 352,300 stremmata between 1938 and 1959. This represented an increase of 1,194 per cent over 1938. That of non-irrigated cotton was only 50.84 per cent.

To assist the farmers in their efforts to improve both the quantity and quality of cotton, the government has been providing them with grants-in-aid. In the year 1960-61 every cotton cultivator was granted 80 drachmas per irrigated and 50 drachmas per non-irrigated stremma under cultivation. The subsidy, however, was limited to 15 stremmata or 1.5 hectares per farmer. This measure is one of many intended to encourage the farmers to diversify their agricultutal production, i.e., to cultivate more lucrative crops in place of the traditional wheat cultivation. Approximately 60,000,000 out of 100,000,000 drachmas that were allocated for this purpose in 1960 were spent in Northern Greece, and this outlay clearly demonstrates the considerable importance attached by the government to cotton culture[61].The government also encourages the cultivation of cotton because it

59. Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960.
60 *Ibid.*
61. Ministry of Agriculture, Athens, 1960.

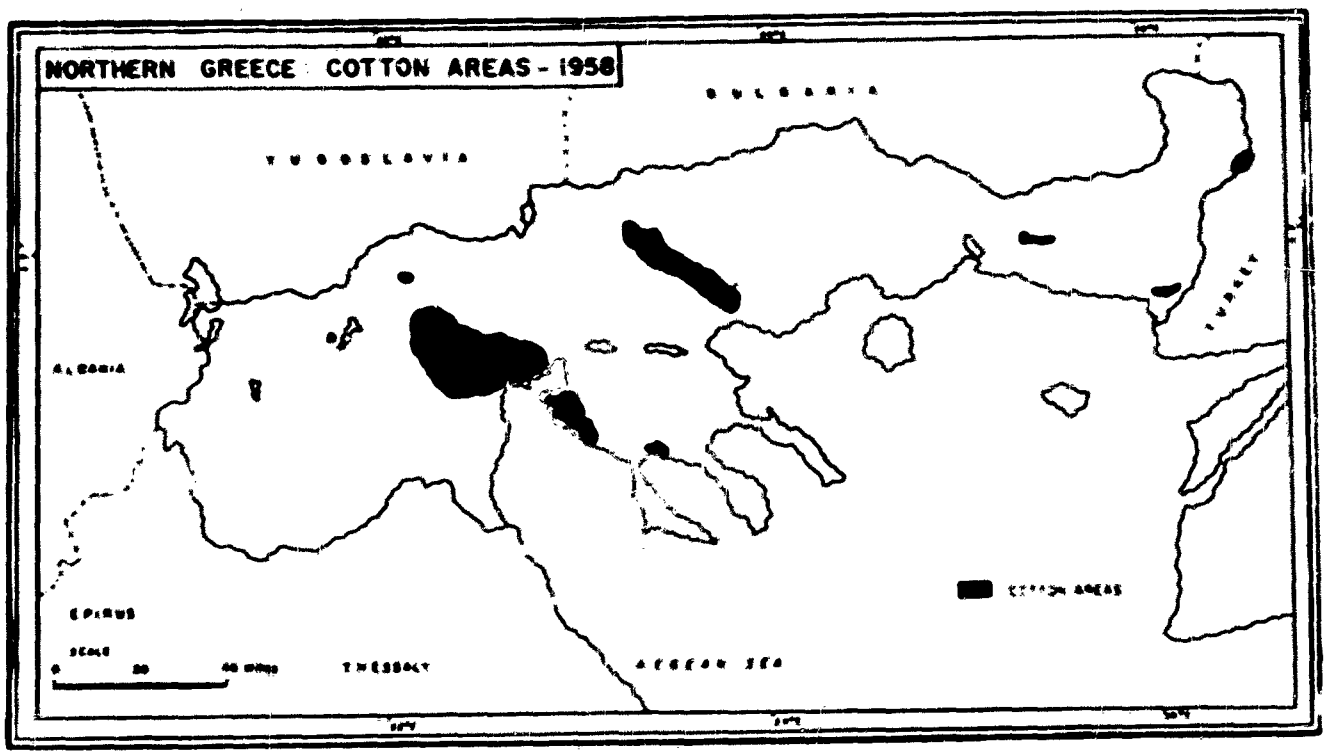
NORTHERN GREECE COTTON AREAS - 1958
YUGOSLAVIA
BULGARIA
TURKEY
ALBANIA
EPIRUS
THESSALY
AEGEAN SEA
COTTON AREAS

Figure 36.

is a labor-fiber crop and, next to tobacco, an important earner of income. This is important in an area where the average size of landholdings is less than 2.5 hectares and where there is a chronic unemployment and underemployment problem. In other words, cotton cultivation would enable the farmer to employ fully the members of his family. Table 40 compares the number of workdays required to cultivate and harvest a stremma of wheat and cotton and the gross value of each crop per stremma. A close perusal of the table reveals that, under the present agricultural economic conditions, the cultivation of cotton is more advantageous than that of wheat. There is no doubt that any increase in the amount of land planted in cotton would not only increase the number of work days, but would also provide the farmers with more income than would a similar increase in wheat area.

The Hellenic Cotton Organization and the Hellenic Cotton Research Institute played a major role in the growth of the cotton industry. The former was established in 1931 to improve the production and marketing of cotton. The Organization, which consists of 12 representatives from the government, farmers, and manufacturers, is a quasi-governmental agency under the jurisdiction of the Ministry of Agriculture. The Institute was founded in the same year to undertake research on cotton production. Its main experimental farm is at Sindos, about 15 kilometers northwest of Thessaloniki. There are also two small demonstration farms—one in Veria and the other in Serres. Research has been carried on in seed propagation,

Fig. 37. The farm of the Cotton Institute at Sindos.

Fig. 38. A cotton field near Sindos.

Fig. 39. A cotton ginning mill in Thessaloniki.

Fig. 40. Ginned cotton bales ready for export.

selection of foreign and domestic strains best adapted to the region, cotton breeding, insect control, weed control and control of plant diseases. It has also studied methods of soil cultivation, planting, hoeing, thinning, hilling, fertilization, rotation, and irrigation[62]. The research findings of the Institute have been successfully translated into readily understandable terms for the farmers by the extension agronomist. The staff, though undermanned, has been able to direct and operate an effective, up-to-date experimental station.

Although the region has been exporting ginned cotton since 1952, its position as an important cotton-growing area will depend on the conditions and processes in the foreign market. For example, in 1956 the exports of cotton to France and Italy increased because of the abnormal

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62. The 2G and 10E cotton varieties were developed by the Cotton Institute of Greece. Acala 4-42 and Coker 100 Wilt, upland type, were imported from the United States.

Attention is given to the development of an early maturing strain of cotton. This would enable the farmer to practice double-cropping; i.e., he would sow a winter hay crop immediately after the cotton is picked.

The majority of the farmers are now using planters to sow the crop. Although experiments at the farm of the Hellenic Cotton Institute in Sindos have shown that rotation has not led to an increase in yield as compared with continuous cotton-growing, rotation is recommended in order to lessen the farmer's dependence on a single crop.

political situation in the Middle East, particularly in Egypt. However, lack of arable land and capital may prevent the region from becoming a residue producer of cotton. Table 44 shows the exports of ginned cotton from Northern Greece to its customers in the years 1956 and 1957. It appears that the most important outlet for its cotton crop continues to be Western Europe. The leading customers are France and Italy. Among the communist countries, Bulgaria, Yugoslavia, and Hungary are the leading importers. In 1956, 26.7 per cent of the cotton exports were shipped to the Communist bloc. In 1957 it was 41.4 per cent of the total cotton exports. The region's share of the total Greek cotton exports was estimated at 60 per cent in 1958.

The government already has a praiseworthy program for the improvement and expansion of cotton cultivation. The possibility is that cotton may well become an even more valuable asset and contribute more to Northern Greece's income than any other cultivated crop.

Tobacco

The cultivation and production of tobacco continues to be the main agricultural activity in many sections of the region, especially in the foothills of the prefectures of Kavala, Xanthi[63], Drama, Serres, Kozani and Pieria. Tobacco is not only the region's major economic crop, but also Greece's major earner of foreign exchange. As a matter of fact, Northern Greece is the major producer of tobacco in Greece (see Table 42). Despite the lessening demand for classical tobacco, the number of villages engaged in tobacco culture, the number of tobacco growers, area under cultivation, and production of tobacco have increased since 1939. Figure 42 shows the principal varieties of tobacco leaf grown in Northern Greece[64]. They are:

1. BASMA (Although this variety is grown throughout the region, the cultivation is concentrated in Thrace, Eastern and Western Macedonia. The best quality of Basma is grown in the vicinity of

63. The prefecture of Xanthi produces the best classical tobacco in the world. The tobacco leaves of Proto Yiakas, Souyialesi, and Tsompelia have won world fame for the prefecture.

In 1957 the government extended the privilege of growing tobacco to farmers in the villages within a zone of 30 kilometers from the frontier. This was done to provide them with a cash crop. The allotment was four stremmata.

64. The varieties have acquired their names from their color, shape of plant and leaves, the name of the region or village where they were originally cultivated, or from the specifics which they present in smoking.

Xanthi, Komotini, Chrysoupolis, Machala, Kyrghia, Nigrita, and Pravi. The leaves are thin, soft, golden-yellow, and have a fine and refreshing taste).

2. SAMSOUN (The main producer of Samsoun or Katerini is the prefecture of Pieria in Western Macedonia. This tobacco variety was introduced into the region in 1922 by the refugees from the Samsoun district in Turkey. The leaves are soft and have a delicate aroma and pleasant taste).

3. BACHI BAGLI (The cultivation of this variety is not as extensive as that of Basma. It is mainly grown in the Prosotsani

Fig. 41. General view of the tobacco land near Toxotes, Xanthi.

district of Drama. The leaves are of thick texture, porous, and have high cigarette yield. For these reasons it makes an ideal filler).

4. SMYRNA (This variety was also introduced into the region from Turkey by the refugees and is grown in Western Macedonia, especially in Kozani prefecture. The leaves have mild taste and are low in nicotine)[65].

5. KABA KOULAK (This variety is grown mainly in the Sintiki and Almopia province of Serres and Pella respectively. The leaves are thin, light in color, mild in flavor, and have a high sigarette yield. Like Bachi Bagli, it is a good filler).

6. TREBEZONDE (This variety is mainly grown in the Peonia province of Kilkis. It is low grade tobacco. The leaves are long and have no aroma and taste).

65. This variety is also known as the Myrodata type Smyrne.

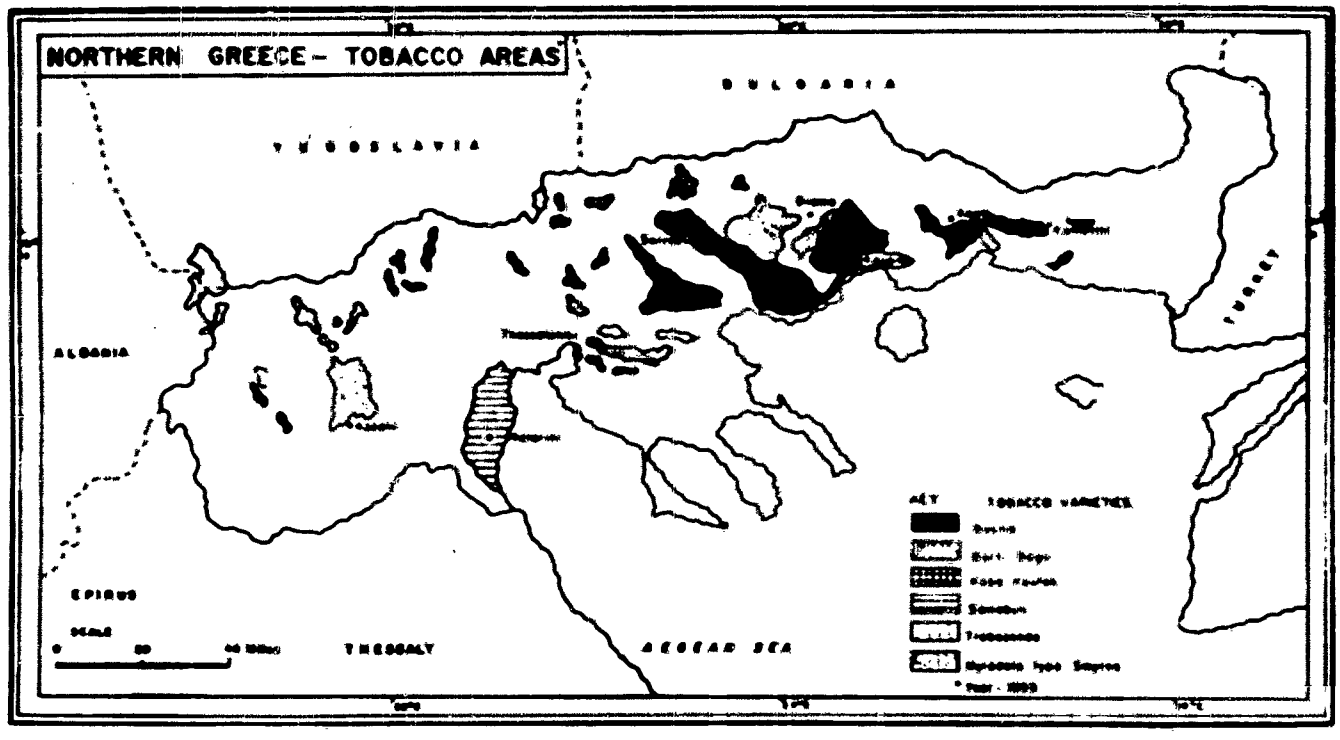
NORTHERN GREECE - TOBACCO AREAS
BULGARIA
YUGOSLAVIA
ALBANIA
EPIRUS
THESSALY
AEGEAN SEA
TURKEY

Figure 42.

Table 43 shows the share of each variety in the total tobacco production in Northern Greece.

Tobacco is more labor-intensive than any other agricultural crop grown in the region and engages the entire family. The relative contribution of work in the total cost of production per stremma was 62 per cent in 1956. That of cotton, another labor-intensive crop, was 42 per cent (see Table 44). All hands, except young children, take part in bed seed preparation, sowing, transplanting, harvesting, and manipulation. Manipulation includes drying, sorting, fermenting, and baling. The blending is done at the tobacco manipulation plants. The average plot of land is less than 6 stremmata and is usually over-fragmented. The tobacco farms are small because when the land was allocated to the Asia Minor refugees in 1922, the income from a five-stremma tobacco farm was sufficient to support rather comfortably a five-member peasant family. However, today the same farm cannot support the family because of declining tobacco prices and limited exports[66]. As a result of this trend, the economic productivity of the villages in the classical tobacco growing areas has been steadily declining.

Many tobacco villages are now islands of economic stagnation. The soil in the tobacco growing areas, especially in the foothills, is thin, sandy-clay, and low in fertility; but if this soil is to be planted in any crop, certainly the most profitable one is tobacco. An hectare will return to the grower approximately 15,000 drachmas if planted in tobacco but only 2,500 drachmas if planted in wheat. Since the prices paid for both superior and inferior quality of tobacco do not differ very much, the tobacco growers are now planting tobacco in the more productive farms for higher yields; consequently many of the less productive tobacco farms have been abandoned.

Table 45 shows the amount of land planted in tobacco, and other data, by prefectures and districts in the year 1959. Prefectures with more

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66. "...It now takes more okas (1 oka 2,831 lbs.) to purchase the items that it was possible to buy with one oka in 1939. In 1939, one tobacco grower could have bought the following items with 1 oka of tobacco or 200 drachmas; 1 oka of sugar, 1 oka of olive oil, 1 oka of coffee, 1 oka of rice, and 1 oka of soap—or one pair of shoes. Today with 1 oka of tobacco or 50 drachmas he could buy the following items: 1 oka of meat, 1 oka of olive oil, and 1 oka of apples. If he wishes to buy a good suit, he needs the price equivalent of 35 okas of tobacco. In 1939, it was only 6 okas. Although the prices used to determine what the growers could have purchased back in 1939 may not be precisely accurate, the point remains clear that the tobacco grower was better off before the war than he is now. He is going through the ill consequences of monoculture". See Vouras, *op. cit.*, pp. 39-40.

Fig. 43. The tobacco fields are tiny.

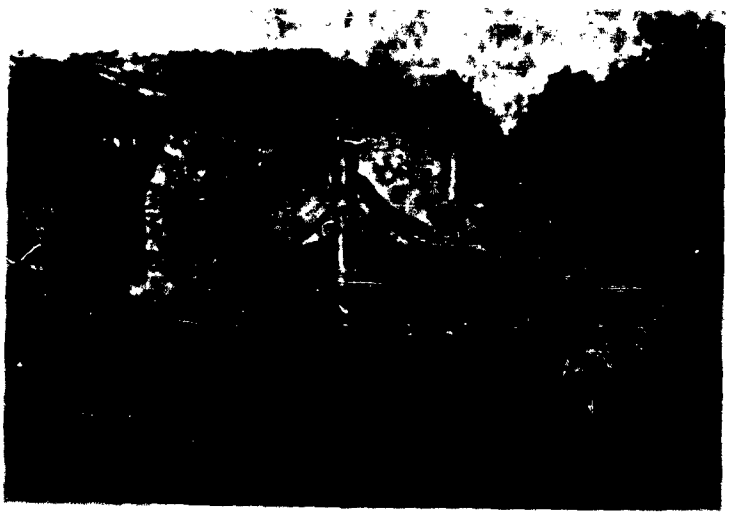

Fig. 44. Tobacco curing.

than 60,000 stremmata in tobacco were Xanthi, Kavala, Drama, Serres, and Pieria. The number of villages engaged in tobacco culture ranged from 14 in Emathia to 155 in Kozani. In the mountain and foothill sections of the region, especially in Eastern Macedonia and Thrace, the cultivation of tobacco is the most important economic activity, for the land is more suitable to the production of tobacco than any other economic crop. More than fifty per cent of the total tobacco growers, tobacco villages, tobacco area, and tobacco production were in the districts of Eastern Macedonia and Thrace. The settlement of the Asia Minor refugees in these districts is one of the reasons for the heavy reliance on tobacco as the main source of income.

Table 46 shows the contribution of tobacco to the total gross value of agricultural production by prefectures in Northern Greece in the year 1956. In that year the value of tobacco production was more than forty per cent of the total agricultural production in the prefectures of Kavala, Serres, Xanthi, Drama, and Pieria. In the other prefectures dependence on tobacco as a major source of income is less because of either agricultural diversification or low production of tobacco imposed by climatic conditions or by political considerations.

Since 1939 a noticeable change has taken place both in the cultivation and production of tobacco. The area planted in tobacco in Central and Western Macedonia has increased by 107.5 per cent since 1939. In Eastern Macedonia and in Thrace the increase was only 11.8 per cent (see Table 47). The regional production of tobacco also increased, but the increase was greater in Western and Eastern Macedonia. This is largely the result of a lessening demand for Basma and Bachi Bagli and an increasing demand for the other varieties. For example, the production of Samsoun increased from 3,142 to 9,901 metric tons between 1938/39 and 1958 (see Table 48).

Besides that done on the tobacco farm, further manipulation takes place in the manipulation plants. It involves sorting, blending, fermenting, and baling of tobacco. There are manipulation plants in the cities of Kavala, Xanthi, Komotini, Serres, and Thessaloniki. Before the war, Kavala was not only the region's but the country's leading manipulation and export tobacco port. Today it ranks second after Thessaloniki. Kavala is the natural outlet for the classical tobacco of Eastern Macedonia and Thrace, and Thessaloniki of Western and Central Macedonia. Approximately 35,000 workers are engaged in tobacco manipulation. The tobacco exports of Thessaloniki increased from 16,200 metric tons in 1954 to

about 28,600 in 1960[67]. It usually handles one-third of the export of tobacco tonnage.

The average yield per stremma in kilograms is not uniform throughout the tobacco-growing areas. It ranges from 44.2 kilograms in Evros to 109.3 kilograms in Pieria. This is largely dependent upon such factors as soil fertility; angle of slope; favorable and unfavorable weather conditions; disease, pest, and insect attacks; and variety of tobacco grown. For example, the Samsoun plant yields more leaf than the Basma plant. Higher yields

Fig. 43. This palatial home in Rodolibos, Serres, was built before the war when the returns from tobacco were higher than they are today.

are common in Western Macedonia and Central Macedonia (see Table 48). The regional average yield per stremma increased from 69.6 kilograms in 1939 to 72.6 kilograms in 1959. Also, the per capita production varies from prefecture to prefecture depending on the number of tobacco growers and yield. In 1959 it ranged from 128.7 kilograms in Evros to 699.8 kilograms in Pieria. The regional per capita production dropped from 423.0 kilograms to 387.5 kilograms between 1939 and 1959. The decline was not due to a drop in production but to an increase in the number of tobacco growers (see Table 49).

Since 1950 there has been a shifting of tobacco manipulation eastward to Thessaloniki. Two reasons may be cited to explain this trend: 1)

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67. National Tobacco Board, Athens, 1960.

the increasing production of tobacco leaf in Eastern and Central Macedonia, and 2) the introduction of automation in the manipulation plants[68]. Mechanical manipulation was necessary to reduce the cost of production, for the biggest item of expense is hand manipulation. Although it has led to the production of a more standardized product, which is also free of dust and sand, mechanical manipulation created an unemployment problem. In 1960 there were 5,000 unemployed tobacco manipulation workers in the city of Thessaloniki.

The Tobacco Institute at Drama, which was established in 1930, is responsible for undertaking research on such topics as fertilizers, pest disease control, improvement of export tobacco varieties, reduction of nicotine content in tobacco leaf, and improvement of cultivation and manipulation techniques. The Institute is assisted by the two sub-station which are located in Xanthi and Katerini respectively. The work of the Institute was interrupted during the Second World War and was resumed after 1945. American economic aid was used in the rehabilitation of its war-damaged facilities. It consists of three departments—agricultural, phytopathological, and chemical and tobacco manipulation methods. The Institute is under jurisdiction of the National Tobacco Board of Greece.

Improved tobacco seeds are now distributed free to the tobacco growers by the Institute. Several improved varieties have been developed, which are adapted to the different soil and microclimatic conditions of the region[69]. Some are low in nicotine[70] and have a strong and fine aroma. Others are resistant to plant diseases such as mildew, phythophthora, thielavia, and mossaic.

The Institute has experimented with the cultivation of Virginia tobacco[71]. It is possible for Northern Greece to grow Virginia tobacco in the irrigated areas, but the consensus of opinion among the tobacco agronomists is that the replacing of Oriental tobacco with Virginia tobacco would not help the region's tobacco surplus problem. Virginia tobacco is best adapted to humid conditions. Northern Greece has deficient rain fall in

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68. The number of automatic packaging machines increased from 8 in 1959 to 30 in 1960 in the manipulation plants of Thessaloniki.

69. The quality of the different varieties of tobacco is protected by restricting their cultivation to the best suited areas. The free cultivation or replacement of a variety with another is prohibited by law. Special authorization must be secured from the Ministries of Agriculture and Commerce.

70. The nicotine content ranges from 0.25 per cent to 1.50 per cent, with an average of 1 per cent.

71. Experiments have been carried out at the Katerini sub-station.

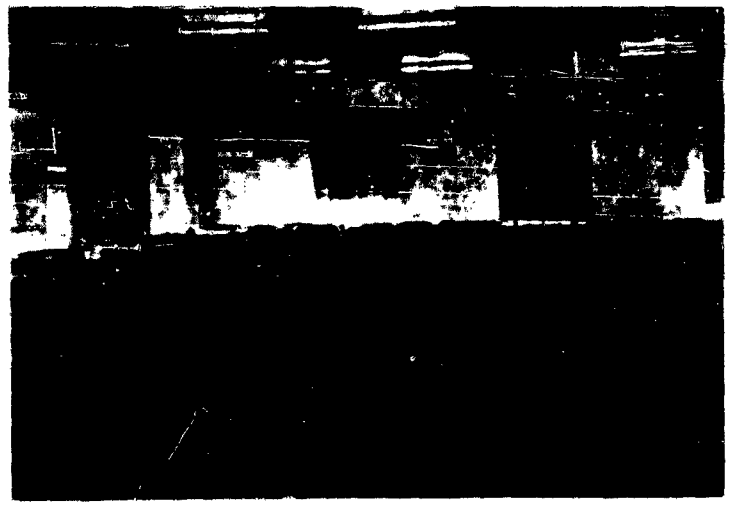

Fig. 46. The interior of a tobacco manipulation plant in Xanthi.

the summer, and irrigated land, which is limited, cannot be devoted to the production of a crop with an unreliable market. They feel that the irrigated land should be planted in such crops as cotton and sugar beets for which there is a growing demand. Even if Northern Greece were to become a substantial producer of Virginia tobacco, she will not be able to compete with the American tobacco grower for the market of Western Europe. They also feel that the most pressing problem is related to marketing and not to cultivation and production problems. Until more land is brought under irrigation, Northern Greece will continue the cultivation of classical tobacco on the less productive land. Evidence has shown that tobacco grown on rain-fed soil is finer and more aromatic than that grown on irrigated soil.

Although the growers are interested in increasing the leaf output per plant through the application of fertilizers, the tobacco manufacturers and merchants claim that this would impair the quality, color, and aroma of the leaf. Evidence has shown that even the application of animal manure makes the leaves dark and strong. They also claim that the only way for Greece to increase her tobacco exports is to concentrate on quality rather than quantity of production. Since the tobacco prices drastically declined after the Second World War (see Table 50), the growers believe that the production should increase, even though quality may suffer, in order for them to earn at least two-thirds of the income which they did earn before the war. The only way for them to achieve this is through bigger sales of tobacco. If the government wants the growers to continue

the production of high quality tobacco[72], it must compensate them one way or another. Why should they pay the penalty? The majority of them are still overly-dependent on the sale of tobacco for their means of livelihood. The Tobacco Institute may help them out by developing high yielding varieties of tobacco without reducing quality.

To advise the government on tobacco matters, the National Tobacco Board of Greece was established in 1957. The functions of the former Autonomous Office for Hellenic Tobacco were transferred to the Board.

It consists of representatives from the Ministries of Agriculture, Coordination, Commerce, and Finance, three representatives of the tobacco workers, a representative of the Federation of Greek Tobacco Exporters, and two tobacco specialists:

The over-all objectives of the Board are:

1) to allocate the amount of land for tobacco cultivation
2) to increase the production of uniform quality tobacco
3) to encourage the cultivation of improved tobacco varieties
4) to protect tobacco plants againts insects, pests, and diseases
5) to improve technical education of growers
6) to control production of tobacco
7) to expand tobacco export
8) to observe the economic conditions in the world tobacco market
9) to provide the growers with limited agricultural credit.

The main task of the Board now is to increase further the Greek share of world tobacco leaf trade. For this purpose, the Board has been participating regularly at the International Trade Fairs. This is a very good method of publicizing the outstanding qualities of Greek classical tobacco.

To help improve the economic position of the growers, the government in 1960 forbade the purchase and sale of tobacco below 8 drachmas per kilogram[73]. Existing stocks were purchased by the National Tobacco Board and were stockpiled. Special care was given to the tobacco growers of the "classical varieties" grown in Eastern Macedonia and Thrace. It was decided that a sum of 335,000 drachmas be set aside to be used in connection with a Five-Year Plan aimed at the diversification of the economic base. This is necessary in order to reduce political tension in the region. Credit already has been granted to the tobacco growers to undertake the production of other crops or to engage in raising stable-fed live

72. Rigid control has been imposed on the cultivation and packaging of tobacco to ensure higher quality. Also, the government is now adapting production to the demand of foreign markets.

73. National Tobacco Board, Athens, 1960.

stock. Also, money was allocated for the construction of tobacco drying sheds, for the purchase of insecticides and spraying machines, for the resettlement of isolated villages, for the construction of terraces and drainage works, and for reforestation[74]. Credit was also granted to the tobacco merchants to purchase greater quantities of tobacco.

Although the region is gradually recapturing its pre-war tobacco markets, its share of the world oriental tobacco market has not been as great as the increase in tobacco consumption. The tobacco exports in the

Fig. 47. A well constructed tobacco shed.

1956 - 1959 period averaged 46,952 metric tons, representing 78 per cent of the total Greek tobacco exports (see Table 51). The declining demand for oriental tobacco may be attributed to such factors as the habit of smoking blended cigarettes in West Germany after the war[75]; U. S. com-

74. "A secondary benefit resulting from EOK's (National Tobacco Board) construction of tobacco warehouses in the tobacco growing areas is the encouragement that was given to others in the region to build new buildings. This was what the capital investors needed to renew their confidence in the future of the area. The element of psychological fear has been pushed into the background temporarily—I hope, permanently". See Vouras, *op. cit.*, p. 40.

75. The presence of American troops in Western Europe is largely responsible for the increasing consumption of blended cigarettes. According to Skandalis, the consumption of straight cigarettes in West Germany dropped from 25 per cent before the war to 9 per cent in 1959. That of blended cigarettes increased to 51 per cent. See Skandalis, *op. cit.*, p. 51.

petition [76]; the Guerrilla War, which delayed the rehabilitation of the tobacco industry; competition by Bulgaria, Turkey, and Yugoslavia [77]; cancer scare; and the use of filters [78]. I feel that the latter is the most important one for the slow increase of Northern Greek tobacco exports. The trend all over the world is to filter cigarettes, and almost anything can be disguised behind the filter—hence, the low demand for Greek classical tobacco.

Table 52 indicates that West Germany and the United States have once again become the region's most important customers. In 1958 their share of Northern Greek tobacco export was 69.98 per cent. Tobacco trade with the Soviet bloc has also been increasing since 1956. SEKE, a Union of Agricultural Cooperatives, has been very successful in expanding tobacco exports to the Soviet bloc. This was largely achieved through barter agreements [79]. Since the quality of consumer and industrial goods offered by the countries of Eastern Europe has improved, the consummation of barter trade agreements would be easier than it was before 1955. The share of the Soviet bloc was 4.42 per cent in 1956 and 12.91 per cent in 1958 [80].

76. U.S. Public Law 480 enabled West Germany and other countries to import Virginia tobacco from the United States.

77. The content of Greek oriental tobacco in the American cigarettes decreased sharply during the war. The inability of the Greek producers to supply the American cigarette companies with tobacco immediately after the war forced them to turn to Turkey and other oriental tobacco producers. The first shipment of Greek tobacco reached the United States early in 1946. Some of the American cigarette companies which purchase Greek oriental tobacco are Reynolds, A.T.C., Ligget and Myers, Lorillard, Philip Morris, Brown and Williamson. Reemtsma is the leading German cigarette company importing Greek tobacco.

78. Since a small quantity of oriental tobacco is used in blending, whether the tobacco was purchased from Turkey, Greece, Yugoslavia or Bulgaria is unimportant. The important thing in determining from which country to buy the tobacco is price. The average export price for Yugoslavian tobacco per kilogram was $ 1.18 in 1958 - 59. That of Greek tobacco was $ 1.28. Since the region's competitors are selling oriental tobacco at lower prices, an effort should be made to reduce the cost of production. It is possible that greater use of machinery in cultivating and picking tobacco, and less refined hand work in farm and factory manipulation, may produce a product equally valuable for manufacturing with considerably less labor per kilogram.

79. The organization has been engaged in the exportation of tobacco since 1947. It operates its own warehouses and tobacco manipulation plants at Kavala, Xanthi, Komotini, Drama, and Thessaloniki. The Federation of Greek Tobacco Exporters, which was organized in 1925, provides prospective buyers with material on cultivation, production, and export of Greek tobacco leaf.

80. The exports of Turkish oriental tobacco to the Soviet bloc increased

The question of finding new markets in order to ease the region's tobacco "crisis" is a never-ending problem. Something has to be done to dispose of the unsold stocks of tobacco. The government is making a serious effort to increase the exports of tobacco to new countries. The participation of Greece in the European Common Market offers great possibilities for further increases of tobacco to it. The government is also under pressure to promote commercial relations with the Soviet bloc, which has indicated that it is now in a position to buy Greek farm products.

The adoption of protective measures by the government is becoming more imperative for economic, political, and social considerations[81]. The region must not lose its foreign markets. The government, tobacco growers, and the agricultural cooperatives should enact a long-range tobacco improvement program and strictly adhere ro it. This would ensure the proper marketing of the region's tobacco in the interest of the national economy. Despite the reduction in area planted in tobacco since 1957, the government will not discourage the cultivation of tobacco because it is an important income earner, utilizes the poorer lands, can withstand drought, is labor-intensive, and provides work for non-tobacco workers.

To a large degree, the remarkable improvement in Northern Greek agriculture is the result of the combined efforts of the peasants, agronomists, agricultural cooperatives and Agricultural Bank, American Farm School, and United States technical and economic aid.

> The Greek peasant is gradually learning the meaning of progressive agriculture. He has come to know that, unlike traditional agriculture, progressive agriculture involves making choices: he has to decide for himself whether to cultivate today or tomorrow, what crops to grow, what source of draft power to use, or which fertilizers are best for his purpose. He knows that, in a progressive agriculture, crops are produced mainly for sale, and he realizes that such farming involves a degree of agricultural decisions from other considerations.
>
> Today, money has become the interagent in the process of making many choices. The peasant receives money for his products and

from 3,000 metric tons in 1953 to 24,500 tons in 1957. Those of Greece increased from 3,300 metric tons to 6 531 tons in the same period. In 1960 Turkey disposed of its tobacco crop by devaluing the pound.

81. The consensus of opinion among the tobacco growers and other interested parties is that the solution to the tobacco problem lies in the establishment of a State Tobacco Monopoly. The creation of such a monopoly would eliminate not only the middle man but also such obstacles as dispersion of responsibility, and apathy. It would also enable the government to exploit all the opportunities in the market.

then must mete it out in exchange for various goods and services. This is a new skill for one accustomed to living largely by tradition; it is a skill not learned without mistakes. He has moved toward a more productive agriculture because he is now more willing to take the responsibility for his own decisions.

The rate at which the peasant can increase production is affected by his own attitude: by his belief that an increase in production on his farm is really possible, by the extent of his confidence in extension workers and the dependability of research, by his willingness to try new methods, and by the strength of his conviction that his family can achieve a higher standard of living through their own efforts. His ability to progress also depends partly upon what he thinks of government, that is, if he looks upon it as an exploitative or as a creative organ.

The attitude of the government toward him is very favorable. It believes that he can expand livestock production. It believes that he can cultivate new exportable agricultural items. It has confidence in him as a progressive farmer. It has become cognizant of the importance of the varied requirement for his agricultural and industrial growth. It believes that he has the capacity to manage his own affairs.

The rising confidence of the peasant is now the best resource of Northern Greece. Unlike the economic resources of land, labor, and capital this psychological resource need not– perhaps should not be economized. The discovery that he can increase production on his small plot of land without waiting for more land not only builds confidence in him to try another change but also communicates to his neighbors.

The agronomists worked untiringly and unselfishly to bring to fruition the dream of not only the region but also of the nation, agricultural self-sufficiency, and an improved standard of living for a large segment of the rural people. Several methods have been used to acquaint the farmers with modern agriculture: result–demonstration plots and farms, traveling schools, out-of-school agricultural courses, meeting of farmers, educational rural clubs, and rural libraries. The Farm Extension Service has done a commendable job and its work becomes even more significant when one recalls that this work has been accomplished in a region that had experienced ten years of war.

Much more would be accomplished by the State agriculturalists if they had private means of transportation. Since at present they must travel by bus or train, or walk, they are limited in their movements and are unable to serve as many farmers as they should. Let me illustrate: When I was in Drama, the local agriculturalist invited me to accompany him on a trip to the nearby village to see how he was handling the agricultural problems of the villagers. The village was about 20 kilometers away from the city. Lacking private means of transportation, we required four hours to complete an assign-

ment which would have taken only two hours if we had a car. After completing the job, we squandered two valuable hours in waiting for a bus to take us back to Drama".

The agriculturalists have made many contributions to the agricultural economy and community development of Northern Greece, the following two being the most important: 1) the introduction of the "Let's try it" philosophy, and 2) the removal of the element of distrust between themselves and the farmers.

The agricultural cooperatives are taking on growing significance in the economy of Northern Greece. Their main function is to increase the borrowing capacity of farm communities for joint development and extension projects. The cooperatives are also stimulating the development of a democratic community spirit and a sense of self-reliance among farmers who feel helpless and overly-dependent on the landlord, merchant, and money-lender. By engaging in the marketing of agricultural products, they have succeeded in getting better prices for the farmers. The importance of cooperatives to the welfare of the farmers has been recognized by the government, which now encourages, nurtures, guides, and supervises them. However, it must be remembered that the agricultural cooperatives are still weak because of lack of capital and coordination and cooperation.

The American Farm School, which was founded in 1904 by Dr. John Henry House, is situated 5 kilometers northeast of Thessaloniki. The land which he selected for the location of the school was very poor. The reasons for selecting it was to prove his premise that "anyone can farm good land. Let's teach the people to farm on land that looks hopeless". In this he was very successful. The area encompassed by the school increased from 123.5 hectares to 898.5 hectares. The objectives of the farm school are

1. to train leadership in the Greek village (a 4-year course is offered to village boys from all parts of Greece. The entrance requirements are stiff. The candidates must either be sons or grandsons of farmers, over 14 years of age, and must have demonstrated a capacity for learning as well as an aptitude for farming in their elementary schools. The program of instruction involves the following areas: farm crops, livestock, poultry, gardening, vineyards, orchards, irrigation, hygiene, farm machinery repairs, soil and plant diseases, religion, Greek and English instruction).
2. to provide condensed courses (six weeks to three months) to those who are interested in becoming involved or who are already involved in a farm occupation (Some of the courses offered are

82. Vouras, *op. cit.*, pp. 33 - 35.

conserving water and soil fertility, food preservation, maintenance of farm machinery, home improvement methods, and improved farming techniques. The courses are offered in conjunction with the Ministry of Agriculture. Approximately 1,000 farmers attend these courses each year).

3. to follow-up the work of the graduates (The majority of them are engaged in the following activities and also provide leadership in the village. They serve as technicians in agricultural services, introduce farm mechanization, use improved animals and feeding practices, grow products for export, practice intensive farming, cooperate with the farm extension agronomists, and participate in civic affairs. The presence of these graduates in the villages of the region made possible the rapid expansion of modern farming techniques. Since they could speak English, they were able to communicate with the American agronomists who were sent to the region by USOM after 1949).

4. to promote Community Development programs (This involves the bringing together of the village leaders and the political leaders of the region and the government officials to discuss the problems that confront the general development of the village).

Much has been done by the farm school to improve the standard of living in the villages of Northern Greece, but the director of the school, Bruce Lansdale, feels that the following problems may retard the economic growth of the Greek villages:

1. lack of coordinated approach to the solution of the village problems
2. lack of confidence in his (peasant) ability to solve his own problems
3. lack of a long-range development plan understood by the village community
4. shortage of needed materials for the development of modern agriculture, livestock, and industry
5. chronic unemployment and under-employment
6. weak cooperatives
7. need for better marketing programs.

The Agricultural Bank of Greece, which operates branches in the region, is attempting to maintain the income-producing ability of the farmers and agricultural cooperatives by providing them with seasonal or short-term productive loans and medium-term loans for land reclamation and development. The short-term loans, up to 12 months, are for seeds, tools, fertilizers, and working capital[83]. In 1959 the Thessaloniki branch

83. The Agricultural Bank is now offering loans equivalent to 1,500 drachmas

of the Bank granted seasonal loans valued at 97,530,000 drachmas[84]. Most of the loans were issued to grain and cotton producers. Credit is also extended to the farmers during unforeseen floods, poor harvests, attacks of insects, and similar emergencies. The Bank also engages in extra-banking services such as purchasing and selling seeds, insecticides, and fertilizers, and through its agronomists, helping the small farmers to improve their farm practices.

The agronomists feel that the Bank could be of greater service to the farmers by shifting its emphasis on formal security to the economic purpose of loans. Emphasis on formal security militates against the small farmers, who are interested in improving their productivity but cannot provide an adequate security. Supervision of loans by the Bank would enable the farmer to improve his economic position and credit ability by devoting the loan to the purposes for which it was granted. Since agriculture is the region's most important economic activity, further improvement for agricultural credit is a matter of great urgency.

The accomplishments of Northern Greek agriculture since 1950 are

1. Increased production (The region is now producing most of its food requirements and has an exportable surplus. New export crops such as cotton, apples, peaches, and strawberries have been added to the pre-war list of exportable farm items).
2. Increased consumption of agricultural and animal products, especially fresh fruits and cheese.
3. Increased farm income (The income of the farmers, especially in the plains, increased from $ 146 per capita in 1938 to $ 202 in 1959. However, it was below the national figure of $ 291 per capita in 1959).
4. Technological advances (The widespread application of advanced cultivation methods, increased mechanization, greater use of fertilizers, better seeds, improved breeds of animals and other measures to increase and improve both the quantity and quality of farm and animal products).

Despite the registered progress, the region's agriculture is confronted with two fundamental problems: the shortage of land, and the unsalable surplus of tobacco.

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to help farmers buy animals and start vegetable gardens. The loans are designed for small farmers who raise only one crop—wheat, tobacco, or currants—and neither have livestock or gardens to grow vegetables for their own consumption. The loans are repayable in five years at 2 per cent interest.

84. Agricultural Bank of Greece, Thessaloniki Branch, Thessaloniki, 1960.

The creation of land through reclamation, flood control, and clearing may ameliorate the former, but the latter may be too difficult to solve. The existence of surplus reveals that the increase in agricultural productivity has not been accompanied by a general increase in national prosperity. The increase in agricultural production is a delusion, as the hard-working Greek farmer has learned. The Greek farmer pays about 4 per cent more for his purchases of agricultural and industrial products than he is able to get through the sale of his own products.

The disposal of Northern Greek agricultural products will become more difficult in the forseeable future because her present buyers are trying to become self-sufficient in agriculture. If the region wishes to export agricultural items, she must concentrate on the production of high quality and reasonably priced commodities. She must also produce what the customer wants, not what the producers think the customer should have. In the market, the customer is always right. An increase in national prosperity through industrialization will create a market for increased consumption; however, the transition from a purely agricultural to an industrial and agricultural one certainly takes time [85].

TABLE 10.

Cost of Settling a 5-member family in Mountain Iberian region, 1959.

	Cost in current drachmas
Shelter, Furnishings, etc.	18,000
Improvement of 20 stremmata of land	7,000
One or two draft animals	5,000
Animals for breeding purposes	7,000
Farm tools, seeds, etc.	5,000
Subsidization of the family for nine months (until the harvest season)	6,000
Total	48,000

Source: Ministry of Northern Greece, Section of Border Area Resettlement, Thessaloniki, 1960.

85. Vouras, *op. cit.*, p. 43.

TABLE 11.

Area, production of wheat, Nea Vrasa, Evros 1954/1955 - 1958/1959.

Year	Area in stremmata *	Production in metric tons
1954 - 1955	7,900	1,000
1955 - 1956	6,500	475
1956 - 1957	7,400	900
1957 - 1958	8,350	1,210
1958 - 1959	13,000	2,500

Source: Domiki Construction Corporation, Athens, 1960.
* One stremma is equivalent to 0.247 acre.

TABLE 12.

Area, production of Agricultural crops in the flood protected Zone of the Village of Tycheron, Evros, 1959.

Crops	1954	1955	1956	1957	1958
Wheat					
Area in stremmata	0	0	0	1,000	2,500
Production in metric tons	0	0	0	500	6,100
Corn					
Area in stremmata	9,000	8,000	9,000	10,000	9,000
Production in metric tons	1,900	1,000	1,150	1,900	1,900
Melons					
Area in stremmata	3,000	3,500	3,900	3,500	3,900
Production in metric tons	4,850	5,500	5,700	5,000	11,000
Clover					
Area in stremmata	0	0	0	1,500	1,500
Production in metric tons	0	0	0	5,500	7,500

Source: Domiki Construction Company, Athens, 1960.

TABLE 13.

Per cent of irrigated land: Northern Greece, by prefecture, Greece, 1955.

Prefecture	Cultivated land in stremmata	Irrigated land in stremmata	Per cent of irrigated land
Emathia	612,000	198,648	31.0
Pella	824,000	189,192	23.0
Serres	1,200,000	201,597	16.0
Florina	375,000	59,550	15.5
Thessaloniki	1,420,000	121,548	8.5
Kastoria	295,000	25,961	8.0
Kozani	720,000	35,016	5.0
Kavala	500,000	23,250	4.5
Pieria	470,000	17,197	3.5
Khalkidiki	720,000	23,961	3.5
Drama	535,000	14,997	2.5
Kilkis	975,000	16,114	1.5
Evros	1,105,000	15,392	1.5
Xanthi	395,000	6,117	1.5
Rodopi	775,000	3,787	0.5
Northern Greece	11,291,000	941,124	7.4
Greece	35,770,000	3,954,275	11.0

Source: Ministry of Agriculture, Athens, 1960.

TABLE 14.

Land consolidation data, Villages of Zervochori, Nevrokopi, Konstantinato, Northern Greece, 1955.

Village	Total area to be consolidated	Number of farm plots			Number of plots granted to farmers		
		Number of owners	Prior to consolidation	After consolidation	1	2	3
Zervohori, Emathia	5,000	262	980	420	95	140	27
Konstantinato, Serres	3,484	91	259	137	51	34	5
Nevrokopi, Drama	9,500	558	7,150	1,211	150	40	368

Source: Ministry of Agriculture, Athens, 1960.

TABLE 15.

Land use in Northern Greece, 1959.

Land Use	In 000 hectares	Per cent of total land in farms	Per cent of total land not in farms	Per cent of total land
Land in Farms				
Cereals	727,3	53.25		17.07
Pulses	26,8	1.96		.63
Truck crops	39,8	2.91		.94
Industrial crops (tobacco, etc.)	162,4	11.89		3.81
Forage crops	76,6	5.60		1.79
Other annual crops	41,5	3.03		.97
Total Rotation, crops	1,074,4	78.64		25.21
Vineyards	30,8	2.25		.73
Olive trees	19,1	1.39		.44
Fruit trees	31,9	2.33		.75
Total Rotation, Tree and Vine crops	1,156,2	84.63		27.13
Grazing and Meadow	210	15.37		4.93
Total Land in Farms	1,366,2			32.06
Land not in Farms				
Mountains, nomadic grazing	1,383,5		47.80	32.47
Forests	778		26.88	18.27
Total land in some productive use	3,527,7			82.80
Unused land (roads, torrents, etc.)	732,6		25.32	17.20
Total Land	4,260,3	100.00	100.00	100.00

Source: Ministry of Agriculture, Athens, Greece.
Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960.

TABLE 16.

Income from agricultural crops and per cent of total, Northern Greece, Greece, 1956.
(in current drachmas)

Agricultural crops	Northern Greece	Greece	Per cent of total: Northern Greece
Cereal	2,527,926,680	5,660,918,930	44.65
Pulses	227,955,840	534,014,795	42.69
Truck crops	684,531,614	3,038,925,600	22.30
Industrial crops	2,105,199,440	3,259,697,052	64.94
Forage crops	416,370,865	2,148,719,770	19.38
Vine crops	215,589,100	2,088,652,170	10.38
Olive tree crops	101,121,770	2,897,301,950	3.49
Citrus fruits	10,966	461,157,500	0.24
Deciduous fruits	332,677,270	733,324,280	45.36
Total	6,600,383,355	20,923,581,997	31.71

Source: Ministry of Agriculture, Athens, 1960.

TABLE 17.

Per capita and gross value of agricultural production by prefectures in Northern Greece, 1956.

Prefectures	Gross value of farm production	Per capita value of farm production	
		Drachmas	U S dollars *
Emathia	442,000,000	6,570	219.0
Thessaloniki	855,191,000	6,290	209.0
Khalkidiki	296,357,000	6,190	206.3
Pieria	385,377,000	6,070	202.3
Pella	570,716,000	6,000	200.0
Serres	1,014,172,000	5,780	196.0
Kavala	440,816,000	5,680	189.6
Kilkis	415,343,000	5,430	181.0
Drama	442,911,000	4,950	165.0
Kastoria	196,616,000	4,420	147.3
Florina	304,785,000	4,150	136.6
Rodopi	313,363,000	3,890	129.6
Kozani	502,967,000	5,790	193.3
Xanthi	247,825,000	5,730	124.3
Evros	394,698,000	3,710	123.6

Source: E. Skandalis, *The Position of Tobacco in the Economy of Northern Greece* (published in Greek), Athens, Greece, 1960, p. 37.

* The exchange rate for Greek currency was 30 drachmas to a dollar.

TABLE 18.

Production of agricultural crops in Greece, Northern Greece, 1950 and 1959.
(in 000 metric tons)

Kind of crop	1950			1959		
	Greece	Northern Greece	Per cent of total Northern Greece	Greece	Northern Greece	Per cent of total Northern Greece
Wheat	865	380	44.44	1,775	785	44.78
Barley	305	78	38.04	220	91	68.81
Oats	125	40	32.10	140	30	21.42
Rye	45	40	88.88	27	20	74.07
Corn	198	85	47.97	278	160	57.55
Pulses *	52	25	48.07	82	31	37.80
Cotton	79	40	50.63	174	94	54.02
Tobacco	58	47	81.05	79	54	68.35
Sesame	12	7	58.33	11	7	63.63
Rice	32	3	9.37	73	41	56.16

Source: Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960.

* It does not include the production of pulses grown with other crops.

TABLE 19.

Area in Cereals by Prefectures in Northern Greece, 1958
(in hectares)

Prefecture	Wheat	Barley	Oats	Rye	Corn	Rice
Drama	19,400	3,100	740	205	5,490	925
Emathia	24,370	1,900	855	140	3,400	—
Florina	14,610	2,790	—	3,150	5,595	—
Kastoria	12,300	550	295	1,780	4 520	—
Kavala	13,630	2,330	295	730	6,970	1,115
Khalkidiki	28,650	1,970	11,395	425	1,790	—
Kilkis	53,990	6,990	5,690	1,250	5,335	90
Kozani	46,760	5,790	—	5,340	1,650	—
Pella	29,100	2,730	1,700	110	1,540	—
Pieria	12,990	1,570	395	1,340	9,250	—
Serres	48,920	7,550	2,395	2,340	8,595	3,825
Thessaloniki	58,870	11,290	10,490	2,650	7,890	2,995
Evros	62,490	6,350	390	5,940	18,590	—
Rodopi	36,940	7,540	990	4,650	6,390	—
Xanthi	12,350	2,490	195	2,150	3,895	50
	474,500	65,000	35,800	31,500	91,000	9,000

Source: Ministry of Northern Greece, Section of Agriculture Thessaloniki, 1959.

TABLE 20.

Area of agricultural crops in Northern Greece, 1938, 1950 - 1959.
(in 000 hectares)

Kind of Crop	1938	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959
Wheat	364	330	361,5	376	412	418,5	400	438,5	432	474,5	512
Barley	81	62	71	73,5	71,8	76,4	66	72,2	66,8	65	60
Oats	42,5	31,5	35,4	37,3	37,5	36	33,6	36,8	36,6	35,8	31,5
Rye	56	41,5	49	52,5	54,5	50	42	41,4	35	31,5	22,5
Corn	116	121,5	123	121	135,4	130,5	110,5	102,4	106,5	91	91,2
Pulses *	14,5	26	22,5	23	17	26,2	27,5	36,5	36,5	25,9	26,8
Cotton	21	34	43,5	36	40	56	56	76,1	67	70	65,4
Tobacco	54,7	67,5	63,9	51,5	60,1	73,5	69	80,5	86,3	78,6	73,1
Sesame	24	19	21	22,5	26	21,5	19,5	20,4	19,3	20,6	21,2
Rice	—	1,1	2	4	6	6,8	7,1	5,3	6,5	9	10

Source: *Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960.*

* It does not include the area of pulses interplanted with other crops.

TABLE 21.

Area of agricultural crops in Greece, Northern Greece, 1950 and 1959
(in 000 hectares)

Kind of crop	1950			1959		
	Greece	Northern Greece	Per cent of total Northern Greece	Greece	Northern Greece	Per cent of total Northern Greece
Wheat	967,3	330	34.08	1.163,4	512	44.00
Barley	306.5	62	20.02	194,8	80	32.46
Oats	147.5	31,5	21.35	139,8	34,3	24.45
Rye	55	41.5	75.45	32,8	22,5	68.59
Corn	968,5	121,5	48.90	165.3	91,2	55.17
Pulses *	64,8	26	40.12	64,6	26,8	41.48
Cotton	77,2	34	44.04	131,6	65,4	49.69
Tobacco	103,27	67,5	65.36	134,1	73,1	65.02
Sesame	53,5	19	35.52	30	21,2	70.66
Rice	9,7	1,1	11.34	18	10	55.55

Source: Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960.

* It does not include the area of pulses grown with other crops.

TABLE 22.

Average yield per hectare in Northern Greece: Wheat, Barley, Oats, Rye, Corn, Sesame, Rice, Pulses, 1938, 1950, 1958, 1959
*(in kilograms)**

ITEM	1938	1950	1958	1959
Wheat	1,071	1,198	1,782	1,585 **
Barley	1,049	1,444	1,800	1,350 **
Oats	706	1,270	1,424	952 **
Rye	805	984	984	888 **
Corn	1,080	781	1,197	1,754
Rice	---	2,727	3,888	4,100
Sesame	291	369	242	330
Pulses ***	690	980	1,081	1,156

Source: Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960.

* One kilogram equals 2.28 lbs.

** The decrease in the yield per hectare is largely due to the unfavorable weather conditions that prevailed in the region during the growing season.

*** Excluding of pulses grown with other crops.

TABLE 23.

Production of agricultural crops in Northern Greece, 1938, 1950 - 1959
(in 000 metric tons)

Kind of crop	1938	1950	1951	1952	1953	1954	1955	1956 *	1957	1958	1959
Wheat	390	590	400	475	640	498	563	575	765	846	795
Barley	85	78	98	81	117	91	84	116	105	104	81
Oats	50	40	40	27	50	40	43	44	49	51	50
Rye	45	40	45	48	57	43	46	43	55	51	50
Corn	125	95	120	119	167	143	167	128	144	108 **	160
Pulses *	10	25	26	25	23	38	35	35	30	28	31
Cotton	13	40	50	32	48	77	99	71	95	84	94
Tobacco	37	47	43	27	42	47	73	58	79	50	53
Sesame	7	7	8	5	12	9	10	8	7	5	7
Rice	—	5	7	14	18	28	25	19	27	55	41

Source: Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960.

* It does not include the production of pulses interplanted with other crops.

** The production was low due to lack of rainfall in late spring and summer. The low yields recorded in 1956 illustrate the hazards to which Northern Greek agriculture is subject.

TABLE 25.

Area, Production of agricultural crops in Northern Greece, 1938 and 1959, and per cent increase or decrease over 1938.

Kind of crop	Area in 000 hectares		Per cent increase or decrease over 1938	Production in 000 metric tons		Production increase or decrease over 1938
	1938	1959		1938	1959	
Wheat	364	512	+ 40.66	390	795	+ 108.84
Barley	81	60	— 25.92	85	81	— 4.70
Oats	42.5	31.5	— 25.88	30	30	
Rye	56	22.5	— 59.82	45	20	— 55.55
Corn	116	91.2	— 21.38	123	110	— 10.56
Pulses *	14.5	26.8	+ 84.83	10	31	+ 210.00
Cotton	24	65.4	+ 172.50	13	94	+ 623.07
Tobacco	54.7	73.1	+ 33.63	37	53	+ 43.24
Sesame	24	21.2	— 11.66	7	7	
Rice	—	10		—	41	

Source: Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960.

* Excluding pulses growth with other crops.

TABLE 25.

Area, Production Centers of Rice in Northern Greece, 1958.

Production Center	Area in Stremmata
Drama Prefecture	
Doxato	1,750
Koudounio	1,500
Kalos Agros	2,550
Fotolivos	1,420
Kavala Prefecture	
Chrysoupolis	3,150
Keramoie	2,750
Doukalion	1,250
Parne	1,100
Serres Prefecture	
Kato Kamela	3,255
Ano Kamela	1,500
Metrousion	2,100
Adelfikon	2,250
Kouvouklion	1,350
Koumaria	2,500
Anagennesis	3,500
Vamvakia	3,710
Karperi	3,710
Kala Dendra	1,980
Provatas	5,730
Skotousa	4,335
Thessaloniki Prefecture	
Nea Malgara	5,200
Kalohorion	4,000
Halastra	1,200
Sindos	1,500
Anatolikon	1,300

Source: Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1959.

TABLE 26.

Area, Production, Yield of Rice in Greece and Northern Greece, 1938, 1950 - 1959.

Year	Area in 000 hectares			Production in 000 metric tons			Yield per hectare in kilograms	
	Greece	Northern Greece	Per cent of total Northern Greece	Greece	Northern Greece	Per cent of total Northern Greece	Greece	Northern Greece
1938	2,1	0,0	—	4,0	0,0	—	1,905	—
1950	9,9	1,1	10 10	32,5	3,0	9.23	3,298	2,727
1951	19,8	2,0	10 10	56,6	7,0	12.36	2,752	3,500
1952	21,3	4,0	18 77	75,3	14,0	18.59	3,535	3,666
1953	17,5	6,0	34 28	66,0	18,0	27 27	3,771	3,000
1954	22,0	6,8	30.90	89,5	28,0	31 28	4,068	4,117
1955	18,7	7,1	38.50	61,0	25,0	40.98	3,262	3,521
1956	12,1	5,3	43 80	45,7	19,0	43.45	3,611	3,587
1957	14,2	6,5	46 47	59,8	27,0	45.45	4,211	4,154
1958	17,1	9,0	52 63	70,0	35,0	50 00	4,093	3,900
1959	18,1	10,0	55 55	73,0	41,0	56 16	4,033	4,100

Source: Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960. Ministry of Agriculture, Athens, 1960.

TABLE 27.

Exports and Imports of Rice: 1938, 1950 - 1959.

Year	Exports in metric tons	Imports in metric tons	Net exports in metric tons	Net imports in metric tons
1938	—	5,287	—	5,287
1950	—	2,810	—	2,810
1951	—	1,510	—	1,510
1952	183	1,495	—	1,322
1953	2,540	630	1,910	—
1954	78	620	—	542
1955	155	358	—	203
1956	360	440	—	80
1957	310	—	310	—
1958	218	995	—	777
1959	67	491	—	324

Source: Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960. Chamber of Commerce and Industry, Thessaloniki, 1960.

TABLE 28.

Area, Production, Yield of Truck crops by prefectures in Northern Greece, 1956.

Kind of truck crop	Area in 000 hectares	Production in 000 metric tons	Yield per hectare in kilograms *	Prefecture (only the important producers are listed)
Watermelons	8,5	111,6	13,129	Thessaloniki, Serres, Kavala, Xanthi
Melons	3,3	33,92	10,278	Thessaloniki, Evros, Pella, Kozani
Strawberries	0,4	2,08	5,216	Florina, Pella, Kozani
Potatoes	9,4	98,24	10,238	Drama, Kozani, Thessaloniki, Florina
Tomatoes	3,5	61,55	17,583	Thessaloniki, Serres, Kavala, Pella
Onions	2,9	27,65	9,534	Thessaloniki, Kozani, Florina, Serres
Garlic	1,1	4,83	4,390	Evros, Thessaloniki, Serres, Xanthi
Fresh Beans	1,5	8,58	5,720	Kavala, Thessaloniki, Kozani, Serres
Fresh Broad Beans	0,9	4,32	4,800	Thessaloniki, Serres, Emathia, Kilkis
Peas	0,3	0,845	2,816	Thessaloniki, Serres, Emathia, Drama
Eggplants	0,72	10,11	14,041	Thessaloniki, Serres, Kozani, Evros
Okra	0,34	1,55	4,558	Thessaloniki, Xanthi, Kozani, Pella

TABLE 28.

Continued

Kind of truck crop	Area in 000 hectares	Production in 000 metric tons	Yield per hectare in kilograms	Prefecture (only the important producers are listed)
Dandelions and Endives	0,07	0,693	8,614	Thessaloniki, Florina, Emathia, Kastoria
Artichokes	0,02	0,108	5,400	Thessaloniki, Rodopi, Kavala, Khalkidiki
Beets	0,23	3,5	15,217	Thessaloniki, Serres, Rodopi, Kavala
Cabbage	1,4	30,36	21,578	Thessaloniki, Serres, Kozani, Drama
Cauliflower	0,14	1,85	13,220	Thessaloniki, Serres, Khalkidiki, Xanthi
Spinach	0,8	7,8	9,500	Thessaloniki, Kozani Serres, Pella
Squash	0,85	10,82	12,729	Thessaloniki, Kavala, Kozani, Pella
Cucumbers	0,45	6,71	14,914	Thessaloniki, Kavala, Serres, Kozani
Lettuce	0,34	4,6	13,529	Thessaloniki, Kavala, Pella, Serres
Green Peppers	0,8	7,92	9,900	Thessaloniki, Pella, Evros, Florina
Leeks	0,82	17,0	20,731	Thessaloniki, Kozani, Kavala, Kastoria
Celery	0,05	0,605	12,000	Thessaloniki, Evros, Florina, Cavala
Kidney Beans	13,7	17,0	1,240	Evros, Cavala, Pella, Xanthi

TABLE 28.

Continued.

Kind of truck crop	Area in 000 hectares	Production in 000 metric tons	Yield per hectare in kilograms	Prefecture (only the important producers are listed)
Broad Beans	9,3	8,2	881	Pella, Thessaloniki, Khalkidiki, Cavala
Beans Grown with Maize	11,5	6,7	577	Evros, Kastoria, Pella, Rodopi
Chick Peas	4,8	3,5	729	Khalkidiki, Drama, Thessaloniki, Rodopi
Lentil	8,7	6,3	724	Komni, Thessaloniki, Kastoria, Florina

Source: Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1959. Ministry of Agriculture, Athens, 1959.

* One kilogram equals 2.28 lbs.

TABLE 29.

Area, Production Centers of Strawberries, Florina, 1959.

Producing Center	Area in Stremmata
Florina	700
Polipotamos	600
Alona	300
Skopia	200
Tropaeouchos	80
Perasma	100
Meseonini	50
Atrapos	40
Triantaphyllia	30
Total	2,000

Source: Prefecture of Florina, Section of Agriculture, Florina, 1959.

TABLE 30.

Area, Production, Yield of Industrial crops in Northern Greece, 1958.

Kind of crop	Area in hectares	Production in metric tons	Yield per hectare in kilograms	Prefecture (only the important producers are listed)
Cotton	70,000	84,000	1,200	Imathia, Thessaloniki, Serres
Tobacco	78,800	59,000	750.6	Serres, Pieria, Drama, Kavala
Anise	330	110	333.3	Kozani, Serres, Thessaloniki
Paprika	360	848	2,355.5	Pella
Flax	900	380	421.2	Kilkis, Thessaloniki
Broom - corn	3,000	5,955 *	1,985	Evros, Rodopi
Peanuts	630	763	1,230.6	Serres, Kilkis, Thessaloniki
Sesame	20,000	5,000	242.7	Evros, Serres, Khalkidiki
Sunflower	2,700	1,630	608.7	Evros, Rodopi, Xanthi

Source: Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1959.

* It includes both the production of seed and panicles.

TABLE 31.

Area devoted to Orchards by prefectures in Northern Greece, 1959.

Prefecture	Area in hectares
Thessaloniki	1,010
Emathia	6,050
Pieria	1,080
Kilkis	950
Pella	6,190
Khalkidiki	5,010
Kozani	1,155
Florina	810
Kastoria	1,340
Serres	1,550
Drama	630
Kavala	1,040
Xanthi	75
Rodopi	2,590
Evros	3,010
Total	31,980

Source: Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960.

TABLE 32.

Land use in a typical farm, Prefecture of Emathia, 1958, 1959.

Kind of crop	Area in stremmata		Per cent of total	
	1958	1959	1958	1959
Apple orchards	0.2	7.0	0.5	18.4
Peach orchards	—	4.0	—	10.5
Vineyards	5.0	3.0	13.2	7.9
Wheat	20.8	15.0	54.7	39.5
Corn	12.0	9.0	31.6	23.7
Total	38.0	38.0	100.0	100.0

Source: Prefecture of Emathia, Section of Agriculture, Veria, 1960.

TABLE 33.

Production of Fruits in Northern Greece, 1955 - 1958
(in metric tons)

Kind of fruit	1955	1956	1957	1958
Apples	21,930	45,440	70,502	66,215
Peaches	2,875	19,457	30,715	36,086
Apricots	696	3,328	3,536	2,095
Cherries	1,452	4,632	4,640	5,040
Pears	1,910	6,656	7,508	6,810

Source: Ministry of Agriculture, Athens, 1960.

TABLE 34.

Exports of Fruits and Grapes, Northern Greece, 1938, 1950 - 1959.
(in metric tons)

Year	Apples	Peaches	Grapes
1938			190
1950			
1951			735
1952			310
1953			1,295
1954			3,058
1955			2,630
1956		3,850	3,163
1957	19,090	7,600	4,194
1958	7,548	13,568	4,928
1959	4,554	25,415	4,301

Source: Ministry of Agriculture, Athens, 1960.

TABLE 35.
Area cultivated in Grape-vines and Olives by Prefectures in Northern Greece, 1959.
(in hectares)

Prefectures	Vineyards	Olive-groves
Thessaloniki	5,500	50
Imathia	1,300	
Pieria	800	80
Kilkis	1,900	
Pella	1,370	
Khalkidiki	2,150	11,300
Kozani	4,640	
Florina	1,700	
Kastoria	500	
Serres	4,100	50
Drama	1,150	
Kavala	1,500	4,000
Xanthi	450	
Rodopi	1,210	000
Evros	2,500	2,500
Total	30,900	19,100

Source: Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960.

TABLE 36.
Number of Olive trees and main producers in Northern Greece, 1958

Production Center	Number of Olive trees
Evros Prefecture	
Makri	6,100
Samothraki Island	250,000
Rodopi Prefecture	
Maronea	30,000
Serres Prefecture	
Eleon	5,500
Kavala Prefecture	
Elevhori	12,000
Paleo	6,000
Miriofito	10,000
Thasos Island	877,000
Khalkidiki Prefecture	
Poligiros	300,000
Ormilia	100,000
Sarti (Efesia)	51,000
Paliouria	65,000
Agios Dimitrios	45,000
Nea Moudania	35,000
Nea Marmaras	35,000

Source: Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1959.

TABLE 37

Area of Cotton cultivation in Northern Greece, Greece, 1938, 1950, 1959.
(in hectares)

	Northern Greece			Greece			Northern Greece - Per cent increase over 1938	Greece - Per cent increase over 1938
	1938	1950	1959	1938	1950	1959		
Irrigated cotton	2,722	3,752	35,230	26,261	25,086	85,510	1,194.3	225.6
Non-irrigated cotton	21,234	30,146	30,230	48,466	52,188	46,000	42.3	— 5.1
Total	23,956	33,898	65,450	74,726	77,274	131,510	173.2	76.0

Source: Hellenic Cotton Organization, Athens, 1960.

TABLE 38.

Area, Production, Yield per hectare of Cotton in Northern Greece, Greece, 1959.

	Area in 000 hectares	Per cent of total Northern Greece	Production in metric tons	Per cent of total Northern Greece	Yield per hectare in kilograms
Northern Greece					
Irrigated cotton	35,230	53.83	71,710	76.10	2,035.4
Non-irrigated cotton	30,220	46.17	22,522	23.90	745.2
Total	65,450	100.00	94,232	100.00	
Greece					
Irrigated cotton	85,510	64.98	141,904	81.48	1,658.8
Non-irrigated cotton	46,000	35.02	32,222	18.52	696.9
Total	131,910	100.00	174,026	100.00	

Source: Hellenic Cotton Organization, Athens, 1960.

TABLE 39.

Area planted in Cotton and cultivation centers in the Prefectures of Northern Greece, 1957 - 1958.

Cotton cultivation center	Area in stremmata (it includes both irrigated and non-irrigated cotton)
Serres	
Karperi	3,900
Eraklia	3,700
Skotousa	3,600
Psyhikon	3,500
Koimesis	3,500
Ammandia	3,440
Ahinos	3,000
Kavas	
Anthia	1,542
Samothraki	1,500
Rodopi	
Kalamokastron	1,850
Komotini	1,500
Khalkidiki	
Agios Pavlos	4,900
Nea Kallikratia	4,500
Emathia	
Alexandria	20,700
Veria	17,500
Makrohori	9,270
Stavros	7,900
Xehasmeni	7,550
Nisi	7,300
Korifi	5,490
Daskion	5,400
Kilkis	
Polikastron	18,580
Vofcohori	5,240
Drama	
Potolivos	3,700

TABLE 39.

Continued.

Cotton cultivation center	Area in stremmata (it includes both irrigated and non-irrigated cotton)
Thessaloniki	
Epanomi	20,000
Sindos	11,926
Koufalia	11,527
N. Monasteri	10,500
Halastra (Pirgos)	9,000
Kimina	9,000
Adendron	8,445
Nea Malgara	7,000
Vasilika	6,500
Trilofos	6,300
Pella	
Gianitsa	39,063
Kria Vrisi	13,300
Palea Pella	6,000
Arevessas	5,500
Nea Pella	4,485
Axos	4,300
Kariotissa	3,950
Pieria	
Agrinion	4,470
Korinos	1,900
Xanthi	
Genessa	1,850

Source: Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1959.

TABLE 40.

Wheat and Cotton, a comparison of work days required.

Kind of crop	Number of work days required to cultivate and harvest one stremma	Size of land-holding in stremmata	Size of family (4 workers) and number of work days	Gross value per stremma in current drachmas
Cotton	12 - 15	25	310 - 375	800 - 900
Wheat	2 - 3	25	50 - 60	420 - 450

Source: Ministry of Agriculture, Athens, 1960.

TABLE 41.

Exports of ginned Cotton from Northern Greece, Greece, 1956, 1957.
(in metric tons)

Country of destination	1956		1957	
	Northern Greece	Greece	Northern Greece	Greece
France	10,742	21,549	5,808	7,398
Italy	5,490	9,782	595	578
Yugoslavia	3,653	3,780	1,696	2,596
Hungary	1,439	1,738	116	116
U.S.S.R.	800	596	—	—
Bulgaria	506	486	1,547	1,611
Czechoslovakia	397	393	173	172
West Germany	330	487	75	121
Belgium	253	313	190	190
Rumania	192	755	550	550
Japan	100	131	530	1,513
Union of South Africa	55	59	—	—
Great Britain	10	10	88	388
Spain	—	—	700	1,378
Holland	—	—	50	85
Poland	—	196	—	—
Ethiopia	—	39	—	—
Finland	—	496	—	196
Hong Kong	—	—	—	170
Total	23,154	40,708	9,898	17,367
Per cent of total	56.88 %	43.12 %	56.99 %	43.01 %

Source: Hellenic Cotton Organization, Athens, 1960.

TABLE 42.

Tobacco culture data, Northern Greece, Greece, 1939, 1959.

Item	1939			1959		
	Greece *	Northern Greece	Per cent of total Northern Greece	Greece	Northern Greece	Per cent of total Northern Greece
Number of villages	1,382	835	65.13	1,756	1,191	67.82
Number of tobacco growers	142,200	99,302	69.83	192,648	140,213	72.78
Area in stremmata	806,192	601,134	69.63	1,081,718	730,695	71.51
Production in kilograms	56,921,390	42,014,355	73.95	78,799,907	51,109,507	67.39
Average yield per stremma in kilograms	65.6	69.6		77.1	72.6	
Per capita area in stremmata	6.09	6.07		5.9	5.2	
Per capita production in kilograms	399.6	423.0		408.0	378.7	

Source: National Tobacco Board, Athens, 1960.

* Excluding the Dodecanese Islands.

TABLE 43.

Relative contribution of Each Tobacco Variety to the total Tobacco production in Northern Greece, 1938/39 and 1958.

Variety of tobacco	1938/39	1958	Increase or decrease over 1938/39
Basma	73.41	54.08	— 19.33
Bachi Bagli	10.44	10.24	— .20
Kaba Koulak	4.08	7.30	+ 3.22
Samsoun	4.43	16.79	+ 12.36
Trebisonde	.26	.98	+ .72
Myrodata type Smyrne	3.40	10.63	+ 7.23
Total	100.00	100.00	

Source: National Tobacco Board, Athens, 1960.

TABLE 44.

Relative contribution of work to the total cost of production per stremma in Northern Greece: Tobacco, Truck-crops, Cotton, Wheat, 1958.

Kind of crop	Cost of production per stremma in drachmas	Value of work in drachmas	Per cent of total
Tobacco	1,767	1,087	62
Truck - crops	1,580	660	42
Cotton	937	343	37
Wheat	477	131	27

1. E. Skandalis, *The Position of Tobacco in the Economy of Northern Greece* (published in Greek), Athens, Greece, 1960, p. 67.

TABLE 45.

Tobacco culture data by Prefectures and Districts in Northern Greece, 1950.

Prefecture	Number of villages	Number of growers	Area in stremmata	Production in kilograms	Average yield per stremma in kilograms	Per capita area per grower in kilograms	Per capita production per grower in kilograms
Evros	48	1,746	5,090	220,700	44.2	2.8	126.7
Rodopi	91	7,286	26,970	2,021,106	70.4	3.4	277.0
Xanthi	142	11,892	61,970	2,612,961	42.1	5.2	219.9
Thrace	281	20,924	93,534	4,858,856	62.6	4.4	280.0
Kavala	91	12,729	75,147	4,842,906	64.4	5.9	380.0
Drama	125	16,847	111,761	7,247,315	64.8	6.6	430.1
Serres	136	28,479	190,999	11,969,353	62.6	6.7	416.7
Eastern Macedonia	342	58,055	377,907	23,959,874	63.4	6.5	412.6
Total: Eastern Macedonia and Thrace	623	78,979	471,441	28,817,730	63.2	5.9	347.5

TABLE 43.

Continued

Prefecture	Number of villages	Number of growers	Area in stremmata	Production in kilograms	Average yield per stremma in kilograms	Per capita area per grower in kilograms	Per capita production per grower in kilograms
Pella	49	5,321	17,452	1,973,697	113.0	3.1	357.3
Emathia	14	619	1,735	139,906	80.2	2.8	224.8
Thessaloniki	96	11,178	42,636	4,092,192	96.0	3.7	356.5
Kilkis	110	10,317	36,318	2,648,568	71.2	3.5	255.9
Pieria	59	13,221	84,365	9,251,627	109.3	6.3	699.8
Central Macedonia	328	40,191	182,726	18,108,289	99.1	4.5	450.5
Florina	46	3,691	13,857	1,029,561	74.3	3.7	294.8
Kastoria	39	2,028	7,907	332,515	42.0	3.9	163.9
Kozani	155	15,324	54,784	3,922,412	68.7	3.5	349.4
Western Macedonia	240	21,043	76,528	5,193,498	67.8	3.6	246.3
Central and Western Macedonia	568	61,234	259,254	23,291,777	89.8	4.2	380.3

Source: National Tobacco Board, Athens, 1960.

TABLE 46.

Relative Contribution of Tobacco to the Gross Value of Agricultural Production in Northern Greece, 1956.
(in 000 000 current drachmas)

Prefecture	Total value	Value of tobacco	Per cent of total
Pieria	385	214	56
Drama	445	215	48
Xanthi	248	103	42
Serres	1,014	429	42
Kavala	441	174	40
Kozani	505	111	22
Rodopi	313	59	19
Kilkis	415	52	12
Thessaloniki	855	87	10
Kastoria	127	9	8
Florina	205	16	8
Pella	571	37	6
Emathia	442	7	2
Evros	385	6	2
Halkidiki	298	—	—

1. E. Skandalis, The Position of Tobacco in the Economy of Northern Greece (published in Greek), Athens, Greece, 1960, p. 65.

TABLE 47.

Area, Number of Tobacco Growers in Northern Greece by Districts, 1938, 1939, 1946 - 1959.

Year	Area in stremmata		Number of growers	
	Eastern Macedonia and Thrace	Central and W. Macedonia	Eastern Macedonia and Thrace	Central and W. Macedonia
1938	421,495	124,935	67,964	29,758
1939	470,308	112,836	68,722	30,590
1946	368,587	113,196	52,716	22,967
1947	412,817	138,154	50,334	24,390
1948	392,391	101,798	51,729	18,616
1949	427,026	125,243	56,668	23,037
1950	483,790	191,998	63,671	31,412
1951	464,006	173,098	63,971	31,479
1952	394,664	130,440	56,345	23,629
1953	425,178	175,313	59,990	31,368
1954	492,552	212,384	67,669	41,615
1955	548,556	340,708	74,479	56,989
1956	512,845	292,796	74,120	53,833
1957	534,927	327,621	80,878	62,561
1958	491,140	285,324	80,222	61,231
1959	471,411	250,254	78,979	61,234
Decrease over 1938	49,940	134,319	10,995	31,476
Per cent increase over 1939	11.8	107.5	16.0	106.7

Source: National Tobacco Board, Athens, 1960.

TABLE 48.

Production of Tobacco in Northern Greece by Districts, 1938/39, 1958.
(in metric tons)

Variety of Tobacco	1938/39		1958		Total for the region - 1938/39	Total for the region - 1958	Per cent increase over 1938/39
	Eastern Macedonia and Thrace	Central and Western Macedonia	Eastern Macedonia and Thrace	Central and Western Macedonia			
Basma	24,050	3,304	28,349	3,543	27,363	31,892	16.55
Bachi Bagli	3,736	145	3,985	2,156	3,881	6,041	55.65
Kaba Koulak	1,080	454	1,016	3,277	1,514	4,293	183.55
Samsoun	—	3,142	—	9,901	3,142	9,901	215.11
Trebizonde	—	99	—	579	99	579	484.84
Myrodota type Smyrne	—	1,272	—	6,266	1,272	6,266	392.61
Total	28,855	8,416	33,250	25,722	37,271	58,972	58,972

Source: National Tobacco Board, Athens, 1960.

TABLE 49.

Tobacco Culture Data, Northern Greece, 1939, 1946, 1950, 1954, 1959.

Item	1939	1946	1950	1954	1959
Number of villages	836	816	811	1,073	1,191
Number of tobacco growers	99,302	75,893	95,093	109,394	140,219
Area in stremmata	606,134	481,783	675,397	734,779	730,985
Production in kilograms	42,014,355	19,990,273	46,641,111	48,302,821	53,109,307
Average yield per stremma in kilograms	69.6	41.2	70.9	65.7	72.6
Per capita area in stremmata	6.07	6.3	6.9	6.7	5.2
Per capita production in kilograms	423.0	262.6	490.5	441.5	378.7

Source: National Tobacco Board, Athens, 1960.

TABLE 50.
Average Prices of Tobacco Received by the Growers in Northern Greece, 1938/39, 1955, 1958.
(in current drachmas per kilogram)

Variety of tobacco	1938/39	1953	1955	1958	Per cent decrease over 1938/39
Basma	63.0	26.8	26.4	25.0	60.31
Bachi Bagli	45.0	19.8	17.6	18.5	62.22
Kaba Koulak	55.0	15.9	13.1	17.5	50.00
Samsoun	51.0	19.5	17.0	21.2	58.43
Trebizonde	33.8	19.2	14.0	14.7	56.50
Myrodata type Smyrne	26.4	14.8	12.2	15.1	72.34

Source: National Tobacco Board, Athens, 1960.

TABLE 51.
Tobacco Exports of Northern Greece and Share of total Greek Tobacco Exports, 1956, 1957, 1958
(in metric tons).

Country of destination	1956	1957	1958	Per cent of exports 1956	Per cent of exports 1958
West Germany	13,567	19,791	16,921	35.00	34.53
U.S.A.	8,452	12,154	12,473	21.83	25.45
Austria	3,625	3,100	1,916	9.36	3.91
Italy	2,551	4,431	3,155	6.59	6.44
France	2,186	2,827	2,434	5.64	4.97
Finland	1,719	924	933	4.44	1.90
Belgium	1,504	1,642	1,181	3.88	2.41
Switzerland	1,075	655	1,015	2.78	2.07
U.S.S.R.	601	2,138	3,402	1.55	6.94
Czechoslovakia	572	761	1,265	1.47	2.58
East Germany	435	525	251	1.12	.51
Egypt	408	963	583	1.05	1.19
Sweden	371	652	217	.96	.44
Holland	247	415	536	.62	1.09
Great Britain	229	554	9	.59	.02
Japan	148	61	102	.38	.21
Israel	136	263	221	.35	.45
Portugal	119	142	171	.30	.35
Hungary	78	941	427	.20	.87
Poland	30	173	983	.08	2.01
Others	738	631	815	1.91	1.66
Total exports of Northern Greece	38,721	53,131	49,103		
Total exports of Greece	50,101	67,550	61,910		
Per cent of total exports: Northern Greece	77.29	78.56	79.15		

Source: National Tobacco Board, Athens, 1960.

CHAPTER III

LIVESTOCK

The livestock industry of Northern Greece, which contributes approximately 25 per cent to the regional income, has almost reached its pre-war levels[86]. However, the pre-World War II level of the goat population will not be reached because of the program to reduce the goat population. Table 52 shows the rehabilitation of livestock in the prefecture of Evros since 1947. Similar recovery was made by livestock in the other prefectures. The contribution of livestock could be increased because the possibilities for improvement in all branches of the industry are vast, and the demand for livestock products by the population, which has now become more animal proteins conscious, has increased. The per capita consumption of animal proteins in 1958 was about 75 kilograms[87]. The consumption of eggs, fresh milk and cheese is greater than that of meat. Cheese it the main source of cheap protein for the low income group of the population.

The existing livestock other than fowl consists of sheep, goats, buffaloes, cattle (milk and work cows) and swine. There are also draft animals such as mules, horses, and donkeys. More than fifty per cent of the nation's cattle and buffalo population is concentrated here (see Table 53). Table 54 reveals that the prefectures with a large sheep population (over 200.000 head) are Rodopi, Kozani, Evros, Kilkis, and Thessaloniki. Those with a large goat population (over 100.000 head) are Thessaloniki, Kastoria, Kozani, and Rodopi. The goat and sheep density per square kilometer in the prefectures is shown in Table 55. The prefecture with a high goat density is Kastoria. Those with a high sheep density are Rodopi and Kilkis. The goat density for the region is 27.4 and that for sheep 59.1.

Livestock is concentrated in the aforementioned prefectures largely because of the pastures in the river plains of Axios, Strymon, and Evros and in their respective mountain sections.

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86. Sheep were imported from Yugoslavia to augment the depleted Greek flocks.

87. Figures were obtained from the Division of Livestock, Department of Agriculture, Athens, 1960.

The majority of the sheep and goats are nomadic and semi-nomadic. The size of the flocks and herds ranges from 10 to more than 400 head. Some of the large livestock owners possess more than 2.000 sheep and goats. The goats are grazed in the high-mountain zone and the sheep in the lower mountain slopes and in the plains where there is more grass for them. Table 56 shows the Zonal distribution of livestock in the prefectures of Emathia. The nomadic herds and flocks are owned by shepherds, who possess no agricultural land and who practice transhumance: in the summer

Fig. 48. Sheep enclosures in the mountains of Western Macedonia.

they carry their animals to the pseudo-alpine pastures in mountain Olympus, Pindos, Kaimachalan, Grammos, and Rodopi, and to the lowlands in the winter. The Vlachs[88] carry their flocks and herds as far south as the plain of Larissa to be fed and wintered. The semi-nomadic herds and flocks belong to families, which are part-agricultural and part-pastoral; they live in the villages of the lower mountain zone and on the edge of

88. The Vlachs are nomadic people whose origin is obscure. They have been shepherds for many centuries. Although they continue to speak their own language, they are like all the other Greeks. Since 1945 many of them have turned to other occupations with some success. They, like the peasants, have been exposed to the 'Revolution of Rising Expectations'. Now the women, children, and the aged are transported by truck from their settlements in the plains to the mountain villages and vice versa. In the past they rode on mules. Samarina village in Kozani is the summer capital of the Vlachs.

the plains. In the plains each farm family usually possesses one or two goats, one or two sheep, and one cow. In the mountain villages each family possesses one or two goats, three or more sheep, and, if it can afford one, a cow. In some villages the sheep and goats of the farmers are grazed by one or two herders, who take them out to the pasture in the morning and bring them back to the village in the evening for milking. Otherwise, each farmer is responsible for grazing his own animals. The animals of the nomadic and semi-nomadic shepherds are sheltered in wattle enclosures.

Most of the sheep and goats are multi-purpose animals, raised for milk, meat, wool, hair, and hides. The output of wool and hair, which is largely used by the local weaving industries, is very small both in quantity and value. In 1958 the production of wool amounted to approximately 2,500 metric tons; that of hair, 510 metric tons. The value of both items has been estimated at $ 2,145,000[89]. The major use of cattle is still for draft-plowing and drawing carts. Cows are a secondary source of milk, except near the urban centers where they are used primarily for milk production. Some cattle are now raised for beef production.

Milk and Cheese production

The production of milk in 1958 amounted to approximately 120,000 metric tons[90]. Out of this, 48 per cent was derived from sheep, 30 per cent from goats, 20 per cent from cows, and less than 2 per cent from buffaloes. More than 75 per cent of the sheep and goats milk, and six per cent of the cows milk, is used in the making of cheese, the remainder, including buffalo milk, is consumed in a liquid form. Some milk is used to make butter and yogurt.

The absence of milk condensation plants is largely responsible for the annual importation of approximately 350 tons of condensed milk[91] and for the low prices obtained by the farmers for their milk. As a result, the expansion of livestock is not as fast as it would have been were there a large milk market. Because of this lack, in the period of maximum milk production the milk prices are usually lower than the cost of production.

The production of milk per animal depends upon what breeding animal classification it belongs to-native, improved (through cross-breeding), or imported (refined animals). The imported animals are superior and high

89. Ministry of Northern Greece, Section of Livestock, Thessaloniki, 1959.
90. *Ibid.*
91. *Ibid.*

producers of milk. Table 57 shows the average annual milk production of native, improved, and imported refined animals.

The region produces both hard and soft cheese, but the production is below the regional requirement for it. In 1958, the production amounted to about 20,000 metric tons, and approximately 365 tons of cheese were imported to close the gap between local production and consumption [92]. Soft cheese is made in small village cheesemaking shops and is packed in a saline whey in old petroleum cans (which can be sold closed), wooden barrels, and skins. Hard cheese is made from a sliced semi-dry curd which is taken to cheese making plants for further processing, involving heat treatment. The production of these types of cheese, the cheese-making methods, and the location of cheese production are all designed to fit the local physical and cultural environment; e.g., the heavy salting and excessive heat treatment of the cheese makes it possible for the cheese makers to use non-refrigerated rooms in spite of the high summer heat following the period of maximum milk production (April and May). With the expansion of cold storage space in the plains, more canned soft and hard cheese is now stored in refrigerated rooms. However, in the mountain villages cheese is still kept in non-refrigerated rooms in the basement of the houses.

Meat Production

In 1958 the production of meat amounted to approximately 45,000 metric tons, and 2,700 tons of meat (live animals, fresh, dried, and frozen) were imported into the region to meet the demand for meat products by the populace [93]. The importation of foreign improved animals for cross-breeding, improved feeding, and the construction of watering troughs in the water-deficit pastures all have led to an increase in carcass weight of the animals. That cross-breeding can improve the livestock industry of the region is shown in the Table 58. In the same year the combined production of both wool and hair (goats) was estimated at 3,100 metric tons. About 235 tons of wool and hair were imported, for the woolen textiles and home industries [94].

92. Ministry of Agriculture, Division of Livestock, Athens, 1960.

93. Figures were obtained from the Division of Livestock, Ministry of Agriculture, Athens, 1960. Spring is the period of maximum slaughtering. Most slaughtering is of young lambs for the Easter trade. It is hoped that by fattening a small portion of the lamb population, the market will be provided with high quality meat in the summer.

94. Ministry of Northern Greece, Section of Livestock, Thessaloniki, 1959.

Poultry

With the exception of a small number of improved foreign strains (Rhode Island and Leghorn), the production of eggs and poultry meat comes from native hens which are gleaners of the fields, the barn yard and the kitchen. Some effort is made by the farmers to provide them with nutritious grains, but grains are expensive to buy. Since these hens are mostly scavangers, any production of poultry products by the farmer under this method of raising is clear profit. The hens are generally of nondescript

Fig. 40. In many villages the hens are gleaners of the fields, the streets, the barn yard and the kitchen.

breeds and not heavy layers. The annual production of eggs per hen is about 60. Better breeds of chicken which produce larger eggs over a longer period of time than the native types have been introduced to the region's farmers. Impregnated eggs of improved hens are provided for the farmers who are really interested in improving their fowl at a small charge, or sometimes free, by the American Farm School at Thessaloniki and the livestock and agricultural experimental stations. The control of poultry diseases is hindered by the raising method, which permits the chickens to search for their own food in the village streets and elsewhere. In 1958 the production of eggs was estimated at 9,000,000 units. That the production of eggs has increased since 1952 is reflected by the drop in egg imports. The imports of eggs decreased from 523 tons in 1952 to 8 tons in 1959 [95].

95. Ministry of Northern Greece, Section of Livestock, Thessaloniki, 1959.

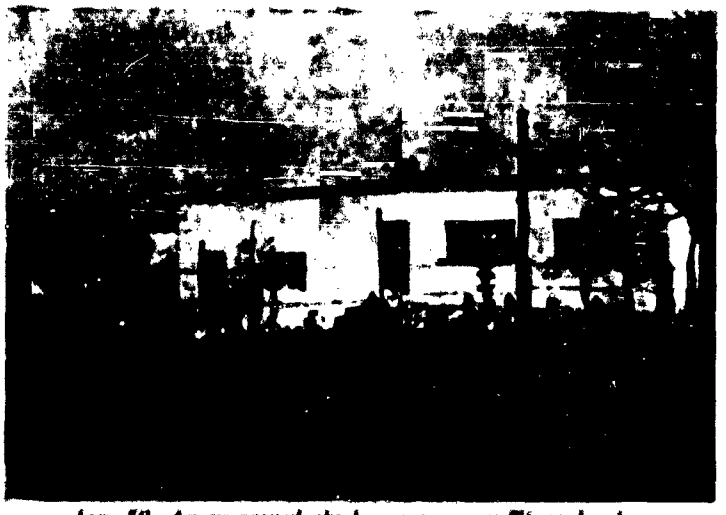

Fig. 50 An improved chicken coop near Thessaloniki.

The growing demand for poultry products is stimulating poultry-raising close to the urban centers. Government financial assistance is granted to the farmers who want to construct improved chicken coops and to those who have undertaken the commercial production of broilers and eggs. The American Farm School encourages its graduates to go into the production of poultry meat and eggs. As a result of these measures, the quality of poultry has been improved. Well-fleshed, moderately-sized, and young poultry is replacing the poorly-fleshed, undersized, and frequently old native breeds in the market place.

Draft Animals

The use of tractors, particularly in the plains, is gradually replacing horses, mules, donkeys, and cows as draft animals. However, these animals are employed intensively in the mountain regions because steep slopes and small fragmented land holdings make the use of tractors both physically and economically impractical. Horses and mules are preferred over other animals for plowing (see Table 59). The declining use of animals as beasts of burden has created an animal under-employment. In 1958, 10,000 out of 35,000 draft animals in Halkidiki prefecture were either idle or partly employed.

Pastures

Northern Greece does not have important natural grasslands such as occur in the United States and other regions. It is difficult to determine

the areal extent of pastures because sections classified as forests are grazed. Also, the fallow land in the plains and mountains serves as pasture. The ungrazed forest is in areas where there is no water available for the animals. Since the annual grasses are low in nutritional value, shrubs and trees are used as fodder for the livestock. The animals graze on maquis (scrub evergreen oak); stubbles; meadows; vineyards (after the gathering of grapes); orchards (the inter-row land); and grass, woodland, and brush pastures. In the high mountains there is a pseudo-alpine zone. In the winter the pastures in the lower mountain zone, the hills, and the edge of the plains are over-grazed because they carry twice as many animals as they are capable of supporting on a sustained basis. Sometimes the problem of feeding them is made difficult by a failure of winter grazing, a failure caused by inadequate winter precipitation, paucity of growth because of low temperature, or destruction of grass by frost.

The encroachment of the plough on the pastures and range lands has led to harmful concentration of animals on them. Arable land was needed to provide the landless peasants in the plain and mountain villages with farmland. The Government is carrying out a land development program in the Mount Derion region in Evros prefecture. As a result, the pastures are over-grazed and soil erosion is acute. Under these conditions, it is impossible to place the existing limited pastures on rotational basis.

The development and improvement of natural pastures through the control or restriction of grazing is hindered by the character of ownership

Fig. 51. Sheep grazing on a natural pasture in Halkidiki.

pasture. The mountain pastures belong to the permanent mountain villagers and partly to the nomads who practice transhumance. The latter pay rent for the use of the pastures to the mountain villages, and some of them prolong the grazing season to the detriment of the pastures. They do this because they want to increase their supplemental income from renting the pasture. However, they are still not cognizant of the fact that when the pastures become degraded they will not be rented by the nomads. Even the publicly-owned grazing lands are over-grazed. Any attempt by the government to restrict grazing will be opposed by the farmers, who own a limited number of animals, and the large shepherds, who are entirely dependent on the pastures for their living.

At times the execution of the program is hindered by political interference. Despite opposition from many quarters, the best method to protect the mountain pastures from over-grazing is to reduce the number of animals. This is *sine qua non* to any well-conceived, well-integrated, and well-executed program for improved land use. It appears, then, that the mountain zone should be devoted to forestry and, to a limited extent, raising of livestock. However, if the government wishes to bring about the complete de-stocking of the mountain zone, the dispossessed shepherds should be provided either with pastoral or agricultural land in the reclaimed sections in the plains and foothills. The construction of watering troughs, cisterns, and reservoirs for the animals is not only bringing about an even utilization of pastures, but also is opening up for grazing the unutilized pastures in the limestone water-deficit areas. The foresters and the agronomists have made a considerable effort to provide the nomadic and semi-nomadic shepherds with new sources of water. It has been estimated that the watering places, which have been constructed since 1950, now serve close to 100,000 hectares of pasture[96]. As a result of this measure, the livestock has increased in some areas. Also, there has been a noticeable increase in the carcass weight of the animals, fleece, and milk. The water reservoir in Mt. Olympus, which was completed in 1951, has enabled the shepherds to use the unutilized pastures. Before 1950, water was available for about 500 animals. Now water is available for more than 50,000 large and small animals. However, an effort should be made not to allow the increasing numbers in livestock to exert more pressure on the already over-grazed pasture lands. This could be alleviated by increasing the non-natural pasturage acreage.

Since the expansion of crop land has progressively limited the area

96. Ministry of Agriculture, Division of Livestock, Athens, 1960.

of natural grazing land, and the available water for animals has increased their numbers in the pasture areas. it is up to the irrigated and non-irrigated cultivated areas to support more livestock. There is some land which is unsuitable for agriculture but well-suited for the development of non-natural pasturage in the plains of the Axios, Strymon, and Evros rivers. Also, the farmers are being persuaded to grow feed for livestock either by intercropping forage crops with cereals, or by devoting some land solely to the production of them. In 1956 approximately 51,316 hectares were devoted

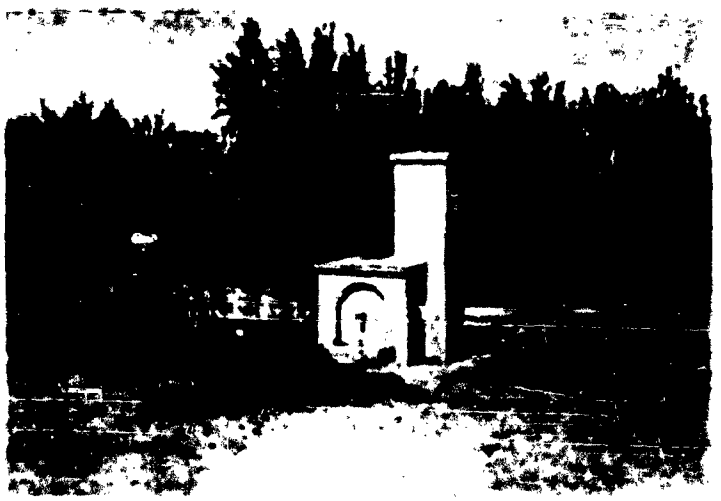

Fig. 58. A watering trough for the animals.

to the production of forage crops such as alfafa, legumes, oats, and permanent grass. The production totaled about 28,870,252 metric tons. Most of the land in permanent grass pastures are in the prefectures of Xanthi, Rodopi, and Evros [97].

The physical and economic feasability of growing forage crops is being demonstrated throughout the region by the farm extension agronomists, and the resistance on the part of the farmers, who adhere tenaciously to traditional practices, is gradually waning. The farmers who are willing to try the establishment of pastures of the production of fodder crops are given technical and financial assistance by the government. It is now possible to devote some of the cultivated land to the production of

97. Ministry of Agriculture, "Production de la Grèce 1955 et 1956", *Bulletin Agricole*, Athens, 1958, pp. 122-124.

fodder crops since less land is needed to produce grains for human consumption. The use of fertilizers, insecticides and better varieties of seeds have led to an increase in the production of cereals. It is hoped that the availability of hay and alfafa, which could be used to feed the animals in the high mountain zone, would lessen the pressure on the lower mountain pastures in the winter. The leguminous plants under cultivation were selected by the Bureau of Soil Conservation at Thessaloniki from many varieties, which were imported from countries all over the world.

Despite the noticeable improvement in pasture management—limited rotational grazing, limited hay production, limited fertilizing of fields, limited seeding of pastures—further improvement in pasture may be retarded by lack of capital. The majority of the shepherds are very poor. They meet only their meager wants. Even if they possessed capital, they would have invested it not in the improvement of the livestock industry, but in the purchase of real property in the urban centers, e.g., the purchase of an apartment in a cooperative apartment building in Thessaloniki. Also, they do not show the same tendency to make use of modern technical aids to production which is displayed by many farmers.

Livestock Improvement

Veterinary services are now offered to the shepherds and farmers to enable them to control animal diseases by the Rural Veterinary Clinics. Considerable progress has been made in the control of such diseases as distomiasis, foot rot, foot and mouth disease, anthrax, blackleg, sheep pox, fowl cholera, Newcastle disease, and hog cholera. However, there is still a great need for systematic remedial and prophylactic treatment to reduce parasitic infections by such means as flock treatment against internal worms, and cattle and sheep dipping against external parasites. The effectiveness of the disease control program is hindered by the relative immobility of the veterinarians. Since they do not have at their immediate disposal a car or jeep, they have to rely on local bus services or the hiring of pack animals and cannot cover as much territory as they could cover otherwise.

Besides providing the shepherds and farmers with veterinary assistance, the government furnished the farmers with improved sires, purebreds, and semen from purebreds to improve their livestock. Improvement in both quality and quantity of livestock is imperative, if the region wishes to meet the ever increasing demand for animal products. Also, the anticipated increase in public developments under the Five-Year Economic Program will create an expanding and more discriminating market for meat

products. The hoped-for increase in production can be attained only through improved livestock and not through the native undernourished and low-production animals.

A program of artificial insemination has been underway since 1950, and it has shown progress by organization and implementation of the methods recommended by the veterinarians. The Animal Husbandry Institute at Thessaloniki supplies the semen to the artificial inseminators at the prefectures. Purebred bulls (Brown Swiss, American Swiss, Jersey) have

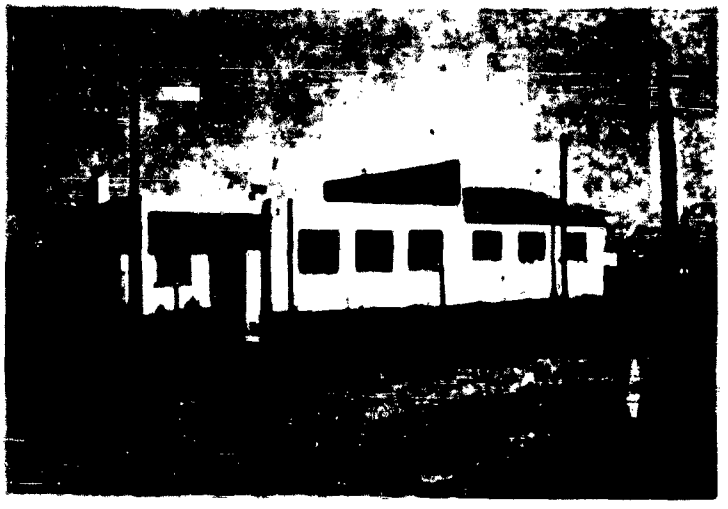

Fig. 53 A veterinary clinic in Lagada, Thessaloniki.

been imported for this purpose. The inseminator makes an effort to reach every village-community in his area during the period in which the cows are in heat. The animals that are to be inseminated are kept apart from the rest. To expedite the work of the technician, the animal is tethered to a post either in the public square or in the house, or to a tree if the farm is near the road. The charge per successful insemination is about 30 drachmas ($ 1.00) and the farmer gladly pays this, because he knows that the progeny will bring to him more money than the native breed. The farmers and shepherds who cannot be reached by the inseminator are provided with improved bulls. An effort should be made not to allow the improved cattle to breed to native bulls[98]. If this is not done, their superior inheritance is absorbed into the indigenous cattle population.

Besides the government, the Near East Foundation, and the Ame-

98. In the prefecture of Pella 300 native bulls were castrated in 1956.

rican Farm School, assistance given to the region by other nations and organizations (such as the Mennonites), is improving livestock farming. However, this assistance has frequently taken the form of importation of purebred animals, which are distributed to different farm villages [99].

The government, through the Agricultural Bank, is aiding the farmers who have shown an interest in becoming producers of milk or in fattening calves and lambs. Since the natural grazing lands are gradually decreasing, an increase in the production of milk and meat can be had with a very small number of improved stall-fed or tethered goats, sheep, and cows where conditions are adequate for them.

99. In 1956 the Mennonites shipped 20 American Swiss Milk Cows to the village of Panayitsa, Pella. They were purchased in Wisconsin by the Lancaster County Mennonite Aid Committee for $4,200. The United States Overseas Mission paid the ocean freight to Thessaloniki and the L.C.M.A.C. paid the trucking from there to the village. The feed was furnished by L.C.M.A.C. and Eastern States Cooperative of Lancaster, Pennsylvania. The dairy cows were given as a gift by the Mennonites to the progressive peasants. A contract was signed between the Mennonites (the group is officially known in Greece as PAX), and the farmers to feed the animals according to a plan drawn up by the local team. The farmer was obligated to turn over to PAX the first heifer. The young heifers were to be given to other peasants. PAX was also involved in the marketing of milk. After various combinations of approaches (making cheese, butter) had been tried out, the team worked out a door-to-door milk delivery route in Edessa, the capital of the prefecture.

A common dairy barn was built to teach the peasants proper feeding, care, and handling of cows and also to demonstrate milking procedures and sanitary handling and marketing of milk.

The establishment of a dairy industry in Panayitsa did not prove as successful as its sponsors had anticipated, for several reasons: 1) the long distance to the market of Edessa (20 kilometers), 2) shortage of nutritious fodder, 3) lack of experience and organization on the part of the peasants, 4) limited market, and 5) the disillusionment of PAX workers. It is interesting to note that the local agronomists were against the creation of a dairy industry in Panayitsa because of its unfavorable edaphic and climatic environment. The project started to disintegrate when PAX turned over to the farmers the responsibility of marketing the milk.

The main complaints of PAX against the villagers of Panayitsa are that 1) they have little insight into their problems, 2) they are too conservative, and 3) they are dishonest. Those of the villagers against PAX are that 1) they expect quick results from us, 2) some projects are altruistic for them but not for us, and 3) they know very little of our history and culture.

Despite the failure of the Panayitsa project, the Mennonites are now aiding the village of Tsakones in the Ardea basin to improve its economic position. This village is strategically situated to serve a larger, more productive, more populous, and more progressive hinterland than Panayitsa. Here a small agricultural and livestock farm, similar to the American Farm School in Thessaloniki, will be built and maintained by the Mennonites.

Fig 54. An improved goat.

American and European milk cows were imported for this purpose. There is contradictory evidence as to whether or not the Brown Swiss or the American Swiss is better suited to the physical and cultural environment of the region. Both seem to have made significant contributions to the improvement of livestock. However, because of high importation costs of American Swiss, the Government is emphasizing the expansion and propagation of Brown Swiss [100].

Since the government is interested in the destocking of goats, one possible way of not only maintaining but also increasing the production of milk and meat is through the keeping of stall-fed or tethered goats, particularly in the plains. For this purpose, highly productive goats (Zaanen and Toggenburg) have been imported from Germany and Switzerland. These goats will be used for both breeding and cross-breeding with the native goats. The farmers who keep tethered goats feed them improved fodder. A portion of their agricultural land is devoted to the cultivation of forage crops.

Despite the high hopes of the goverment, the destocking of goats program can only succeed if the farmers and shepherds who would be losing their herds are provided with land on the newly irrigated areas in

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100. S. J. Browne, *Observations, Findings and Recommendations on Programs to improve the Livestock Situation in Greece*, USOM (United States Overseas Mission), Athens, 1955, pp. 57-60.

the plains either to engage in agriculture or in stell-fed livestoch. If, for any reason, land cannot be made available to them, they should be permitted to continue the keeping of untethered goats. In the mountain areas the inhabitants depend solely on the goat for their animal proteins. The goat is the only animal capable of converting the coarse herbage into animal products. Also, the soil conservation and afforestation programs would be aided indirectly by the reduction of the goat population. However, it must be remembered that the goat is not always responsible for over-grazing. Some areas have been badly overgrazed by other animals, and only the goat can subsist on the survived rough brush.

Since the government operated livestock breeding stations cannot meet the demand for improved aminals by the farmers, the government is encouraging the progressive farmers to concentrate solely on the raising of improved animals. It is hoped that these farmers would not only increase the number of available improved livestok, but would also encourage others to do the same. The Agricultural Bank is also aiding the farmers and shepherds who want either to construct permanent sheds or storage bins, or to fatten animals. That the government is interested in the improvement of livestock is evident by the decision to grant a 30 per cent subsidy to the mountain villagers on the purchased value of improved animals either for reproduction or fattening[101]. Also, a similar subsidy will be granted to those who have constructed chicken coops, animal sheds, and other facilities.

Since the Agricultural Bank makes loans to the farmers, it can play a greater role in the over-all improvement of the livestock than either the agronomist or veterinarian by insisting on better animal husbandry practices to back up the obligations of the loans to the farmers and shepherds.

The improvement and expansion of the native sheep flocks is encouraged by the government not only because it will increase the production of sheep products, but also because it fits well with its program to increase the number of working days for the farmers. Sheep raising is more labor-intensive than goat raising. The breeding program is aimed at improving fecundity, meat, milk, and wool. In connection with sheep breeding and cross-breeding, the Division of Livestock has decided to use the Chios and Mytilene sheep. For this purpose rams and sheep were imported from the islands of Chios and Mytilene. The Chios sheep is a good producer of

101. Calves have been imported from Yugoslavia for fattening.
102. Department of Agriculture Division of Livestock, Athens, 1960.

Fig. 55. Cattle-fattening has been undertaken by farmers in the plain of Thessaloniki.

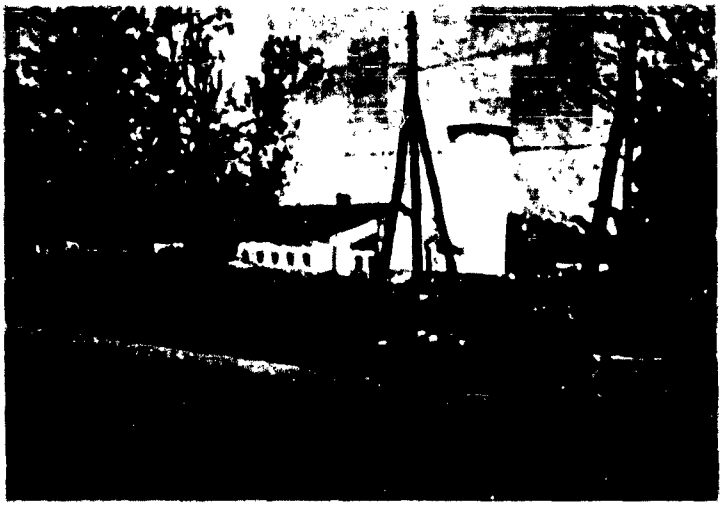

Fig. 56. A modern dairy barn near Thessaloniki.

milk — about 100 kilos per year. Unlike the stall-fed Chios sheep, the Mytilene can be grazed as a flock.

Swine are also being improved. Such breeds as Yorkshires, Large Black, and Edie Swine have been accepted by the farmers of the region. A similar attempt is being made to improve the draft animals such as horses and mules.

The existing livestock cooperatives are not very strong. They lack technical, financial, marketing, and managerial experience. Also, there is

Fig. 37. Chios sheep have been imported into the region to improve livestock.

little desire, if any, on the part of the shepherds to carry out the recommendations of the cooperative for the improvement of livestock. Some shepherds for egotistical reasons increase the size of their flocks and herds of sheep and goats even though they know that this would increase the pressure on the limited grazing lands. Others would rather sell their milk to independent buyers and not to the cooperative for the production of cheese. There is no doubt that the pastoralists must be made to realize that any advancement in their standard of living largely depends on their willingness to cooperate among themselves and also to support the livestock improvement program.

The improvement of the region's livestock industry began in earnest after 1950. Both the farmers and the shepherds are gradually recognizing

that the expansion and improvement of livestock, especially stall-fed animals, would provide the region with more food, and increase their meager income. It would also bring about more balance to production from the land than has existed in the past. The farmers in the plains now have increased the number of tethered goats that are fed on farm-produced fodder. However, further increases in the number of improved animals depend upon the continued willingness of the farmers to devote more arable land to fodder crops, an increase in milk consumption, and government technical and economic assistance. The efficiency of the industry has been improving through improved stock, better care, and more nutritious fodder. The livestock industry must surely grow and develop even more, because it is already an essential feature of the evolution of agriculture in Northern Greece.

TABLE 59.

Recovery of livestock between 1947 and 1957 in Evros prefecture.

Kind of Animals	1940	1947	1957
Horses	2,707	4,354	2,645
Mules	485	1,092	894
Donkeys	6,[illegible]	4,513	4,381
Cattle	80,227	n. a. *	59,[illegible]
Buffaloes	8,912	9,855	10,000
Sheep	229,514	190,[illegible]	214,105
Goats	92,420	52,[illegible]	83,237
Swine	11,050	15,852	13,439
Poultry	318,375	194,950	392,000

Source: Evros prefecture, Section of Agriculture, Alexandroupolis, 1959.

* Not available.

TABLE 53.

Number of animals in Greece, Northern Greece, and Northern Greece's 1958.

Type of Animal	Greece	Northern Greece	Per cent of total Northern Greece
Horses	336,000	95,515	28.42
Mules	222,000	45,461	20.48
Donkeys	515,000	143,133	27.79
Cattle	1,040,000	564,609	54.29
Buffaloes	77,000	69,807	90.35
Sheep	9,400,000	2,536,139	26.98
Goats	4,050,000	1,176,945	29.77
Swine	600,000	24,283	3.67
Poultry	14,300,000	4,061,373	28.40

Source: Ministry of Agriculture, Division of Livestock, Athens, 1960.

Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960.

TABLE 54.

Number of animals in Northern Greece by prefectures, 1958.

Prefecture	Horses	Mules	Donkeys	Bullocks	Cows	Sheep	Goats	Pigs
Drama	4,698	2,790	9,538	1,350	45,770	70,000	74,116	4,376
Emathia	7,500	2,500	4,500	4,900	30,000	110,000	48,000	13,800
Florina	3,765	1,340	6,525	1,643	25,763	151,315	19,819	7,973
Kastoria	1,900	2,250	5,700	270	15,800	106,120	109,975	2 906
Kavala	4,503	2,901	11,195	1,740	33,986	122,000	35,000	8 490
Halkidiki	6,348	3,706	6,294	53	12,573	50,350	90,392	9,000
Kilkis	6,440	1,910	6,790	6,480	44,530	251,250	47,700	10,980
Kozani	10,657	8,927	24,024	1 116	69,099	457,967	217,452	30,913
Pella	6,100	3,950	5,950	4,750	22,500	77,300	27,500	3,300
Pieria	7,007	5,216	4,992	475	17,925	82,770	60,420	9,315
Serres	10,416	4,358	25,444	18,208	73,970	252,784	79,394	17,713
Thessaloniki	19,599	3,042	12,475	5,852	54,111	360,330	106,273	12,962
Evros	2,846	965	4,797	11,124	58,624	216,085	91,001	18,585
Rodopi	1,646	501	8,375	6,483	36,528	216,970	116,756	2,948
Xanthi	1,633	1,145	6,644	5,085	25,700	132,000	53,105	670
Total	95,515	45,461	143,153	68,907	564,909	2,536,613	1,176,945	155,382

Source: Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1960.

TABLE 55.

Goat and Sheep in Northern Greece by Prefectures, 1959.

Prefecture	Goat Density per sq. km	Sheep Density per sq. km
Drama	21.1	19.9
Emathia	28.4	65.2
Florina	10.6	80.9
Kastoria	65.5	63.2
Kavala	16.1	50.2
Halkidiki	30.2	19.8
Kilkis	18.3	88.5
Kozani	37.1	78.2
Pella	10.5	29.6
Pieria	39.1	58.8
Serres	19.6	62.4
Thessaloniki	30.9	75.8
Evros	21.4	50.9
Rodopi	45.1	83.9
Xanthi	30.3	75.8
Northern Greece	27.4	59.1
Greece	37.3	70.8

TABLE 56.

Zonal Distribution of Animals in Emathia prefecture, 1955.

Kind of animals	Mountain zone	Hill zone	Plains zone	Total
Work Cows	700	1,300	6,100	8,000
Milk Cows	2,100	3,900	16,000	22,000
Buffaloes	—	70	4,130	4,200
Horses	500	1,000	5,950	7,500
Mules	1,200	300	1,000	2,500
Donkeys	750	1,450	2,300	4,500
Sheep	25,000	15,000	70,000	110,000
Goats	29,000	13,000	6,000	48,000
Swine	3,000	5,000	7,000	15,000
Poultry	25,000	60,000	115,000	200,000

Source: Pella prefecture, Section of Agriculture, Veria, 1960.

TABLE 57.

Average Annual Production of Milk per Sheep, Goat, and Cow in kilograms, 1959.

Kind of Animal	Native	Improved	Imported (Refined)
Cow	600	750	2,000
Sheep	30*	60	100
Goat	40*	150	400

Source: Ministry of Agriculture, Division of Livestock, Athens, 1959.

* The nomadic sheep and goats yield two or three kilograms less milk per head than the seminomadic.

TABLE 58.

Average carcass weight of native, improved, and imported cows in kilograms, 1958.

Races of Cows	Kilograms per Head
Native	450
Improved	900
Imported (refined cows)	2,000

Source: Ministry of Agriculture, Division of Livestock, Athens, 1960

TABLE 59.

Amount of Land plowed per draft animal and tractor per day.

Type of draft animal	Amount of land plowed in hectares
Horse	0.4
Mule	0.5
Donkey	0.2
Work-Cow	0.3
Milk-Cow	0.2
Buffalo	0.3
Tractor	2.5

Source: Ministry of Northern Greece, Section of Agriculture, Thessaloniki, 1959.

CHAPTER IV

FISHING

The importance of fish as an alternative source of protein has been recognized by UNNRA, FAO, AMAG, and other agencies providing financial and technical assistance to the region since the war. Since prospects for really large-scale livestock expansion in the region are somewhat limited, it was felt that the production of fish should increase in order to meet the ever-increasing demand for it by the people and also to narrow the gap between production and consumption. In 1945, the per capita consumption of fish was approximately 3.5 kilograms, and the per capita production was 7,000 tons[103]. There are several factors partly responsible for the low production and consumption of fish: a) lack of capital, limiting fishing to beach and inland lakes; b) a general lack of ice plants, and proper piers or even sheds for storing and sorting fish; c) lack of electric power, preventing the construction of cold storage plants; d) lack of proper transportation and marketing facilities, restricting the consumption of fish to the fishing ports and to a few inland cities; e) the low-earning capacity of the consumers; f) improper exploitation of fresh water fisheries; and g) the depletion of the nearby fishing grounds.

The fishing industry was completely ruined by the war and Axis occupation. The enemy not only requisitioned a small segment of the fishing fleet, but also burned many of the in-shore and lake fishing vessels. Almost all of the fishing gear was lost through destruction or non-replacement. As a result, the existing fish processing and preserving facilities became inoperative. Any fishing that was carried on during the war was done by small crafts near the short and in the inland lakes and fish-farms. The total value of damage sustained by Greek fisheries during the 1941-1945 period is estimated at 200.000 dollars.

Financial and technical assistance by UNNRA, AMAG, and the Greek Government was granted to the fishermen to construct new fishing vessels, manufacture new fishing gear, and improve the existing equipment. New vessels were constructed and the existing ones were improved under the fishing recovery program. The present fleet is composed of moderate-sized vessels; some are propelled by cars; some move under sail. The

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103. Ministry of Northern Greece, Section of Fishing, Thessaloniki, 1960.

number of trawlers and purse seiners increased from 120 in 1948 to 176 in 1959 [104]. The trawlers have become an enviable possession because they enable the fishermen to use their nets and traps several miles off shore. As a result of these efforts, the production of fish is 118 per cent higher than before the war, and in the fishing ports the prices are more or less within the reach of the average consumer. The production of fish increased from 13,288 metric tons in 1951 to 24,000 in 1959, and represented 30 per cent of the national fish catch (see Table 60). Income received from fishing also increased and in 1957 it amounted to approximetely 2.740.000 dollars. Despite the increase in production, the region still imports about 1,000 metric tons of fish products annually. Approximately 3,320 people engage in fishing, and today fishing is an important subsidiary economic activity in the region [105].

The fishermen of the region engage in farm, in-shore, off-shore, and lake fishing. For in-shore fishing small vessels (oar, sail, motor) outfitted with small equipment (nets, traps) exploit the nearby waters. Since their area of exploitation is limited, only the motor driven vessels venture beyond the 25 miles radius from the fishing ports. In-shore fishing is prevalent throughout the coastal area of the region and engages approximately 3,000 fishermen. Most of the fishing vessels are privately-owned and employ from 2 to 5 fishermen. The average annual production is 4,000 tons. The production is not very high because of the dearth of fish in the traditional fishing grounds and the narrow coastal shelf, which limits bottom fishing. The survival of this category of fishing is largely dependent upon the employment of low-paid fishermen. An effort is being made to remove some of the drawbacks that retard further expansion of in-shore fishings: shortage of modern fishing equipment; inadequate capital, storage and marketing facilities, and marketing facilities; and the limited number of motor-driven vessels.

For off-shore (deep sea) fishing, trawlers and purse seiners are used. These vessels are now in a position to tap the richer fishing grounds away from the shore, where approximately 30 per cent of the annual catch is made. Since the fishermen usually seek migratory fish, they are forced at times to violate Turkish water. The fishing vessels bring in a varied catch that includes sardines, horse mackerel, mullets, tuna, bonito, codfich, and red mullets. Sardines constitute nearly 40 per cent of the catch [106].

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104. Ministry of Northern Greece, Section of Fishing, Thessaloniki, 1960.
105. Ministry of Northern Greece, Section of Fishing, Thessaloniki, 1960.
106. Ministry of Northern Greece, Section of Fishing, Thessaloniki, 1960.

Northern Greece has several lakes—Lagada, Volvi, Doirani, Kastoria, Big Prespa, Little Prespa, Vigoritis, and Vistonida—where fishing is a minor activity. Since the majority of the lake fishing fishermen lack capital, they can only carry on small scale activities and their per capita production is very low. Fishing is carried on by small crafts made from local supplies. Nets and traps are used predominantly, but netting and fishing equipment is in poor condition and expensive to replace. The progressive fishermen use nylon nets because they found them to be more durable than the non-synthetic nets. Storage and preserving facilities are lacking, and even if the production were to increase, there would be some spoilage. The most important fish caught are carp, eels, and horse mackerel. A portion of the catch is consumed locally, and the rest is shipped to the coastal and inland cities of the region. The average income of a lake fisherman is approximately 60 drachmas ($ 2.00) per day. Some of the large fishermen may earn as much as 26,000 drachmas ($ 866.00) per year. Prices paid for fish range from 2 to 25 drachmas per oka (2.8 lbs.), depending on quality and quantity of fish. Feeble attempts have been made to improve the quality of fish. Fishermen's cooperatives have been formed to improve catching and marketing of fish, but they have been ineffective thus far[107].

Although the Thermaic Gulf has been neglected, it could be turned into a rich fish farm, for the perennial rivers of Axios and Aliakmon bring soluble salts to it. Also, the shallowness of the gulf make it easy for plankton to obtain mineral nutrients from organisms that have disintegrated on the bottom. The salinity is not very high. The western shores of the gulf are suitable for fish reproduction, but trawling fishing should be prohibited, and fishing should be restricted to in-shore fishing vessels.

There are about twenty-nine large and small fishing ports, but the most important are Thessaloniki, Kavala, and Alexandroupolis, Since 1957, Kavala has become the leading fishing port (see Table 61). The facilities for handling the catch are out-moded, and there is lack of fishing piers, suitable refrigerating facilities, and other facilities. Under the Five-Year Economic Program, attention will be given to the improvement of methods of moving fish from ports to interior towns and cities, and to the methods of financing cooperative and other operations to create the enlarged facilities. A new fishing receiving station in the Free Zone of the Port of Thessaloniki will be built by the government. This new installation would not only improve the handling of fish, but would also make fish available to the consumers in adequate quantities. The building of fishing vessels is

107. In 1959 there were 32 fishermen's cooperatives in Northern Greece.

concentrated in Kavala, Thessaloniki, and Samothrace. A smal plant manufactures fishing nets in Thessaloniki.

The majority of the canning and salting plants are in the ports of Kavala and Thessaloniki, where there are cheap labor and surplus fish. The plants are small, employing from five to twenty workers. The equipment is out-moded and needs to be improved. Some of the production is shipped to Bulgaria in exchange for livestock products. Since the presence of fish processing plants would lead to the entire utilization of the catch, this industry should be encouraged by the government to expand. However, the success of the expansion program would be determined by the availability of low-cost capital to the operators for the improvement of their plants and equipment, the availability of low-priced tin cans, and the success of a campaign to increase the consumption of tinned and processed fish products. The main salted fish are sardines, anchovies, mullets, and eels. Mullets and eels are smoked in Kavala and Alexandroupolis.

The optimum utilization of the border-line lakes—Big Prespa, Little Prespa, and Doirani—is hampered by their being in a frontier area. Big Prespa is shared by Yugoslavia, Greece, and Albania. Doirani is shared by Yugoslavia and Greece, and Little Prespa by Greece and Albania. Under the existing political conditions, each nation is restricted to its own section of the lakes.

The important fish farms are Drana, Porto Lago, Lake Vistonida, Keramoti, Vasova, Karasos, Koumbournou, Loudia, and Karies. The latter two are operated by the government as fish hatcheries. The small production of fish may be attributed to several factors: the shallowness of the lagoons, the continoous silting and narrowing of the channels, and inadequate flow of water. If the channels are dredged, regulated, and protected from silting, more fish would enter the lagoons. The rather successful fish farm of Porto Lago (Lake Vistonida), which is situated about 20 kilometers south of Xanthi City, indicates that the production of fish in fish farms could be greatly increased by the proper control of water flow and salinity. The lagoon has a surface area of approximately 44,000 stremmata and a depth ranging from 3 to 15 feet. Fishing is carried out by the Association of Lake Vistonida, which was formed in 1945. The objectives of the cooperative are to restore the lagoon to productivity, to reorganize fishing in the area, to increase the catch, and to improve the economic position of the fishermen without raising the cost of the fish to consumers. The fish catch includes mullets, eels, and other fish. Approximately 40 tons of eels are exported to Holland and Germany. Special ships equipped with water tanks carry the eels alive to the market. The

average annual production is *ca* 600 tons. Most of the catch is shipped to inland cities and towns and to the Athens Piraeus center[106].

I believe that if this sector gets the attention it deserves, it could supply the entire region with its fish needs. The fishing industry is at the level that agriculture had reached before the war. Production could increase tenfold, provided that the necessary measures are executed by the government and the fishermen. Since the consumption of meat proteins is expensive, the availability of large quantities of locally caught fish will be of benefit from both the economic and nutritional viewpoint.

106. Ministry of Northern Greece, Section of Fishing, Thessaloniki, 1960.

TABLE 60.

Fish Production: The Share of Northern Greece, 1938, 1950 - 1959.
(in metric tons).

Year	Greece	Northern Greece	Per cent of total: Northern Greece
1938	35,000	11,000	31.43
1950	50,000	n. a. *	n. a. *
1951	45,000	13,200	29.33
1952	43,750	16,362	37.40
1953	46,000	16,900	36.70
1954	60,000	16,320	27.20
1955	60,010	16,320	27.20
1956	65,000	22,100	34.10
1957	75,000	23,830	31.77
1958	80,340	22,975	28.60
1959	82,000	24,000	29.27

Source: Chamber of Commerce and Industry, Thessaloniki, 1960.
Ministry of Northern Greece, Section of Fishing, Thessaloniki, 1960.

* Not available.

TABLE 61.

Production of Fish by Regions, 1952 - 1959
(in metric tons).

Year	Thessaloniki	Kavala	Porto Lago	Alexandroupolis	Lakes and fish farms	Total
1952	6,218	5,622	701	756	3,065	16,362
1953	8,300	4,950	350	800	2,500	16,900
1954	8,000	4,700	470	650	2,500	16,320
1955	8,019	3,722	600	694	3,000	16,435
1956	7,912	8,528	1,054	1,606	3,000	22,168
1957	8,256	9,924	581	1,700	3,400	23,830
1958	7,795	10,022	491	1,167	3,500	22,975
1959	7,700	10,000	650	1,250	3,600	24,000

Source: Chamber of Commerce and Industry, Thessaloniki, 1960.
Ministry of Northern Greece, Section of Fishing, Thessaloniki, 1960.

CHAPTER V

FORESTRY

The exact size of the Northern Greek forest is very difficult to ascertain. As a matter of fact, the forest resources of this region have never been adequately surveyed. According to the Division of Forestry, 778,000 hectares (see Table 62) or 18 per cent of the land surface is forested. Of this 57 per cent is in oak, and the remainder in black pine, Aleppo pine, fir, and maquis. Approximately 67 per cent of the country's oak forest is located in Northern Greece, especially in Western Macedonia. Oak and other stands are available in Vermion, Vernon, Olympus, Holomon, and Laela mountains, but they are still not exploited. Working capital is needed to construct and maintain roads in the still inaccessible forest. However, the opening of the forest would create considerable work for local unskilled farmers and shepherds. The partly-forested areas (ca 478,000 hectares) carry mixed vegetation—mostly evergreen oak and associated shrub.

Approximately 73 per cent of the forest lands is owned by the public; 17 per cent by individuals; and the remainder by communities, cooperatives, and monasteries (see Table 63). Most of the monastery-owned forests are in Mount Athos. Since most of the forests are nationally-owned, the enforcement of laws governing forest exploitation of timber is easier than in the non-government-owned forest lands. As a result, the private forests are over-exploited. Much of the forest legislation pertains to the granting of concessions or leases for the exploitation of wood and other forest products.

The exploitation of the forests engaged about 12,000 workers in 1959 (see Table 64). In general, logging operations are carried out by the government and small operators. The latter employ a few workers and use little, if any, power machinery. Most of the production of the few sawmills is for local consumption. The principal uses are for fuel, wood, charcoal, fencing posts, tobacco dying sticks, railroad ties, vine props and stakes, and construction. The collection of valonia acorn cups is no longer important because of the use of substitutes by the leather industry. Greater use of lignite has steadily decreased the consumption of firewood by the quick-lime operators. The itinerant quick-lime makers are gradually disap-

Fig. 58. The mountain slopes in many sections of the region are denuded.

Fig. 59. Reforested slopes near Siderokastro, Serres.

pearing, and the production is now carried on by permanent quick-lime establishments. Despite increases in the use of lignite (briquettes) as a heating fuel by the urban people, the consumption of firewood is increasing. In 1959, the per capita consumption of fuelwood was approximately 5 cubic meters [109]. To reduce the demand for firewood until such time as the region's forests are more productive, use of lignite should be encouraged and made obligatory in certain types of housing units and undertakings. Imports of wood products have been averaging around 25,000 tons per annum. The scientific exploitation of the region's still untapped forests would not only improve the quality of lumber, but would also reduce imports of both construction lumber and pulp. Studies have been undertaken of the possible utilization of local woods for the wood pulp plant under consideration. However, Northern Greece will continue to import construction lumber and pulp because the local industry cannot meet the ever-increasing demand for wood products.

The wide extent of deforested areas, deep gullies, and other remnants of erosion is a cause of wonderment for the visitor. He cannot understand why the Greek peasant, shepherd, lumberman, and politician have permitted the destruction of an important source of income, the forest. He may also suspect that the "unhealthy" conditions of the region's forests is the result of an anemic exploitation policy.

Despite the presence of a large number of deterrents to the formulation and implementation of a dynamic forest policy—forest fires, overgrazing, destructive cutting, political opposition or favoritism, conservatism, and ignorance—one may observe the gradual emergence of a national forest exploitation program. There are many sings observed in the landscape which point toward the development of such a program:

1. the encouragement of the shepherds by the foresters to use the agricultural land which they possess for the production of forage crops such as alfafa, clover, and hay (the cultivation of these crops will serve two purposes: it will hold the soil in place and it will provide the animals with nutritious fodder, thus creating a semi-pastoral economy in the forest region).
2. the control of grazing (grazing is not permitted in the newly reforested and overgrazed areas).
3. the reforestation of the barren mountain slopes, gullies, and levees (the reforestation program is of considerable importance to the region because it will not only check erosion and help prevent floods, but will also supply it with much-needed wood products.

109. Ministry of Agriculture, Division of Forestry, Athens, 1959.

Reforestation had begun before the war and was resumed in 1945. Considerable work has been done by the Forestry Service of YPEM (Service of the Productive Works of Macedonia) at Siderokastro, Serres. The need for similar work has been observed throughout Northern Greece and especially in Kastoria. In the plains the planting of poplars is increasing through the combined action of both the Forest Division and the private owners. Poplars are planted along the banks of the rivers and streams to regularize and protect their river beds. The use of poplars as windbreaks is hindered by the fragmented land holdings. The yield of timber by a poplar plantation has been placed at 20 - 20 m^3 per hectare. Some may yield as high as 40 m^3 per hectare. A poplar woodlot usually furnishes timber in growing amounts in 15 to 20 years. Hence, the peasants are devoting some land to the poplar culture with the hope of not only increasing their income, but also providing their daughters with a substantial dowry. Poplar is much in demand in the villages as a building wood for small structures, or for tobacco dryers. The demand for large poplar logs will increase upon the completion of the wood pulp plant. The main opposition is seeing more of their grazing lands withdrawn from their use. Since there is no proper system of land use in the 800 to 1000 meters mountain zone, a conflict of interests betweeen the shepherds and the foresters has resulted).

4. the construction of new roads to tap the existing forests.
5. the application of the principle of "sustained yields" in the exploitation.
6. the establishment of tree nurseries (the government is making available to the villagers seedlings and nationally-owned land free of charge for the creation of new municipal forests. Approximately, 3,000 hectares have been available for this purpose. The only obligation of the village is to offer free labor for maintenance and the conservation of the new forests. More and larger nurseries should be established near the sections that are to be reforested).
7. the gradual realization by the people that the forest is their friend (A "Forest Week" has been instituted, which takes place in June of each year. Conferences in schools, radio broadcasts, and films are sponsored by the Forestry Division).

However, the foresters are not satisfied with the progress registered thus far. They believe the adoption of their program would not only strengthen the economic position of both the shepherd and the lumberman, but would also improve and enlarge the forests. Their program includes these essential points:

1. the conversion of poor agricultural land to forest.
2. the reduction of the goat population (Although the goat is re-

ferred to as a "Desert Maker" it is needed because it can survive under hard conditions where a sheep would die. The goat is a good producer of milk, meat, and hides when one considers the fact that its diet consists mainly of worthless brush).

3. the restriction of grazing to certain areas (It should be noted that the government recognizes that forested and reforested lands cannot be used as grazing reserves without defeating their objectives).

4. the expansion of stable-fed livestock.

5. the development of an economy consisting of limited agriculture, livestock arboriculture, and lumbering in the forested regions (the peasants are requested to plant apple, walnut, chestnut, and hazelnut trees in the mountain zone. In 1956, a 7-year plan for the development of forest economy was started).

6. the use of non-wood fuels by the urban and rural people.

7. the provision of private means of transportation to the foresters for the execution of their job.

8. the augmentation of the personnel of the regional divisions of forestry.

TABLE 62.

Forests: Northern Greece, 1959.
(in hectares).

Type of forest	Northern Greece	Greece	Per cent of total Northern Greece
Fir	5,400	270,000	0.29
Black Pine	35,200	80,550	1.94
Aleppo Pine	45,500	374,000	2.50
Beech	145,000	177,150	7.97
Chestnut	20,100	28,350	1.10
Oak	466,000	630,720	25.60
Mixed Broadleaf Evergreen	60,800	289,250	3.34
Total	778,000	1,820,000	42.74

Source: Ministry of Agriculture, Division of Forestry, Athens, 1960.

TABLE 63.

Forest Ownership by categories, Northern Greece, 1950.
(in hectares).

Type of Ownership	Northern Greece	Per cent of total - Northern Greece
Public	[illegible]	72.69
Community	[illegible]	3.69
Cooperative	23,000	2.96
Monasteries	26,740	3.44
Private	134,000	17.24
Total	778,000	100.00

Source: Ministry of Agriculture, Division of Forestry, Athens, 1960.

TABLE 64.

Workers Engaged in Forestry, by categories, Northern Greece, Greece, 1959.

Category	Northern Greece	Greece	Per cent of total - Northern Greece
Lumbermen	3,143	11,115	28.27
Resin collectors	192	10,227	17.79
Woodcutters	7,277	20,338	35.78
Quick-lime kiln operators	552	3,459	15.96
Valonia collectors	50	3,636	1.37
Total	11,304	48,775	23.96

Source: Ministry of Agriculture, Division of Forestry, Athens, 1960.

CHAPTER VI

MINING

The principal minerals known to be present in Northern Greece are lignite, chrome, iron, iron pyrites, manganese, lead and zinc, and magnesite. The proven reserves of lignite are believed to be 600 million tons; of chrome 600,000 tons; of lead and zinc, 500,000 tons; of iron ore 1.5 million tons; and of iron pyrites, 1 million tons. Other minerals present in varying amounts and being mined at present include asbestos, oil, and antimony. The probable reserves of asbestos are very large. The bauxite deposits of Katsikas near Thessaloniki are large and still unexplored for lack of demand. Even though some of the deposits are very small to be of economic importance, others, however, are important because they contain strategic minerals and may provide an opportunity for further increase in metals production in the future. The main mineralized areas are in Halkidiki and Kozani prefectures (see figure 60).

Almost all of the workable mines were severely damaged during the war ant the guerrilla war that followed. The enemy forces exploited the rich and accessible veins and demolished the mining installations when they were forced to retreat. The Guerrillas not only completely devastated the mines in the areas which they controlled but also increased the cost of re-equipping them. Since the Guerrillas prolonged the physical rehabilitation of the mines by both the government and private interest, Northern Greece was unable to meet the foreign demand for minerals after the war. This compelled its customers to look elsewhere or to develop their own mineral deposits.

The reconstruction of the war-damaged mines was largely achieved through the removal of trade restriction on the importation of mining equipment by the Greek government, the granting of credits by the Industrial Gredits Committee, and the provision of financial and technical assistance by the American Mission. American aid for this specific purpose amounted to approximately $ 13,000,000 [110], between 1948 and 1955,

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110. C. M. Watts, *Development in the Minerals Field - During the Period of American Aid to Greece 1948 - 1955*, United States Operations Mission to Greece, Athens, August 1955, pp. 37 - 38 (Appendix - Metal Mining Loans).

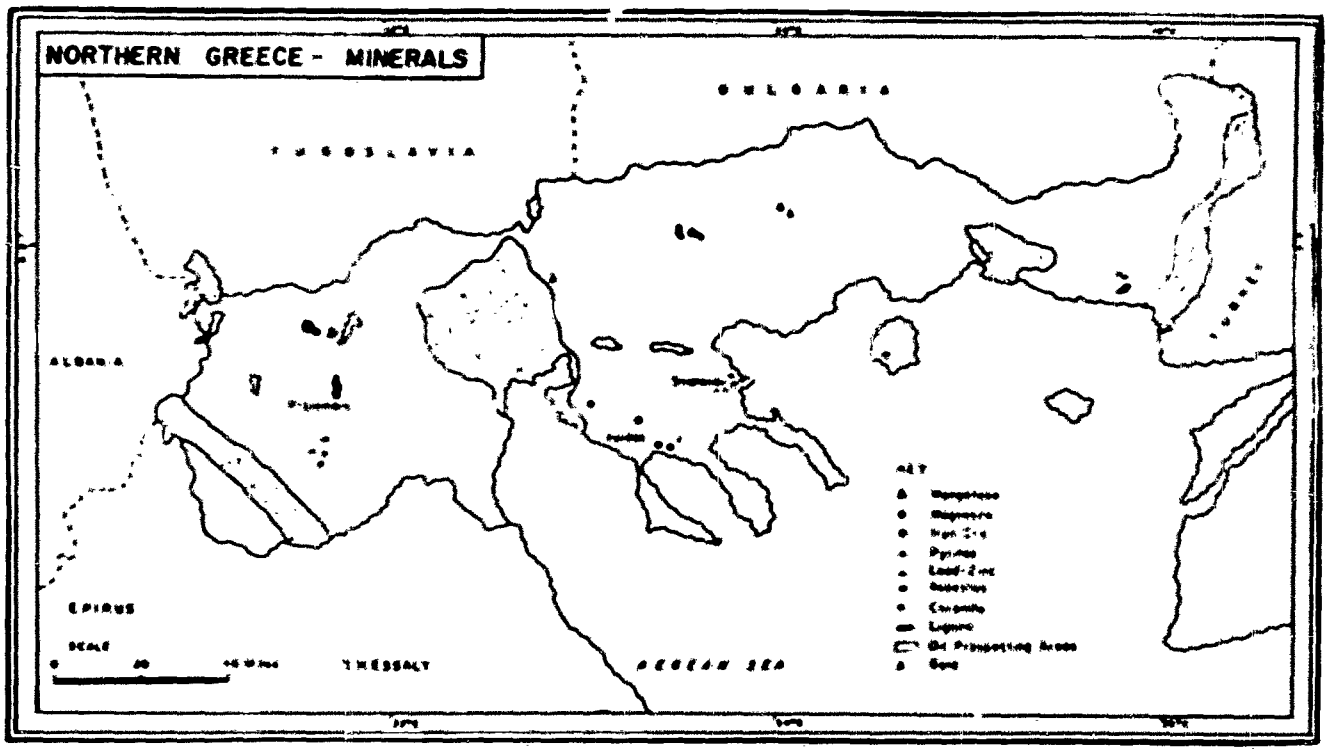
NORTHERN GREECE - MINERALS
YUGOSLAVIA
BULGARIA
ALBANIA
EPIRUS
THESSALY
AEGEAN SEA

Figure 60.

and was mainly used in the exploration, production, and export of the region's mineral deposits. The American Defense Material Procurement Administration (DMPA) gave special attention to the development of the strategic minerals mines. As a result of this concerted effort, the mines were completely rehabilitated by 1955 and now contribute to the economy of the region. In 1958 the production of minerals, excluding lignite, was 612,250 metric tons with an estimated value of $ 12,104,500 [111]. Future plans call for an increase of metals production to 1,077,000 tons with an estimated value of $ 36,114,000 [112]. The production of lignite in 1958 was close to 2.2 million metric tons [113]. Approximately 6,000 workers are engaged in the sector of mining. Table 65 shows the production of principal minerals in 1958.

Iron Ore [114]

The important deposits of hematite iron ore in Northern Greece are in the Cassandra-Stratoniki mineralized region, Halkidiki, and in the southern section of the island of Thassos.

The former is operated by the Hellenic Company of Chemical Products and Fertilizers Ltd. ECA reconstruction funds were used to rehabilitate the mine, but it has been inoperational since 1958. In 1953 the production of iron ore was 64,181 metric tons. The proven resources have been estimated at 100,000 metric tons.

The latter is operated by A. Hondrodimos Company. The workable ores are about 230 feet below the surface and usually are capped with marble and metamorphic rocks. The proven reserves have been estimated at 1,000,000 metric tons. Explorations for ore started in 1951 and full scale production did not get under way until 1954. Open-pit mining method is used to extract the ore. The screening of the ore is done by hand, and each worker can screen about one cubic meter of ore per hour. Labor is obtained from the nearby villages. When the mine is in full operation, it employs about 500 workers, the less demanding work being done by women. The production of iron ore ranges between 150,000 and 200,000 metric tons, depending on the ore prices in Europe. The ore is transported

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111. L. Polymeropoulos, *The Development of Northern Greece's Mineral Wealth* (published in Greek) Athens, 1960, p. 63.

112. *Ibid.*

113. The figure was obtained from Liptol, Athens, 1960.

114. Data was obtained from the Hellenic Company and Chemical Products Fertilizers Ltd., Athens, 1960.

by trucks to the port of Skala Maries for shipment. The bulk of it is shipped to the Kloeckner Company of Dusseldorf, Germany, a manufacturer of heavy industrial equipment. This firm is helping Hondrodimos Company to modernize and increase production. As a whole, the technical equipment and other mining installations are fairly satisfactory.

Besides Hondrodimos, the Krupp Corporation of Germany also mines iron ore. The small production is exported through the port of Limemaria.

Magnesite [115]

Magnesite ore deposits are scattered throughout the region, but the commercially-exploitable deposits are in the Vavdos-Ormilia-Gerakini mineralized region of Halkidiki, about 40 miles east of Thessaloniki. The ore is of pure white color and its content of Mg Co 3 ranges from 95 to 98 per cent. Since it is low in iron, the ore can be successfully processed into more refined products of high grade for the production of refractories. The proven reserves have been estimated at 1,000,000 metric tons. ECA construction loans were made to the mine operators to rehabilitate the war damaged mines.

The Vavdos and Gerakini mines are the most productive in the region. The former is situated near the village of Vavdos and is under exploitation by the "Oesterreich-Amerikanische Magnesite, A.G.", of Radenthein, Austria, through its Greek affiliate, the Magnomin Gompany. The mine was leased to the firm by the Greek Government in 1957 for a period of 30 years. The operator has completed the installation of new mining equipment, especially a 20,000 metric tons yearly capacity for the production of dead-burned magnesite. The production of dead-burned magnesite began in 1958 when 8,219 metric tons were produced. Of this, 5,175 metric tons were exported to the United States. The firm is now considering an increased output not only of dead-burned magnesite, but also of electrically fused magnesia. The underground works have been abandoned and replaced by open-pit extraction. The ore is picked up by hand sorting. The Gerakini mine is situated 9 miles south of Poligyros and is operated by the Anglo-American Magnesite Company. The exploitation is carried out by hand, and two furnaces process the ore into caustic calcined magnesite. The production of this mine is of irregular quality and is expensive. The

115. Data was obtained from the Magnomin Company and the Anglo-America Magnesite Company, Athens, 1960.

production of crude magnesite increased from 24,000 metric tons in 1935 to 76,000 tons in 1958. In both mines the mining facilities are satisfactory; together they employ about 1200 workers.

The other small mine operators produce insignificant quantities of caustic calcined magnesite. The degree of their activity, like that of the large operators, depends on world price for this product.

The magnesite mines of the region produced in 1958 76,000 metric tons of crude magnesite, 21,000 metric tons of caustic calcined magnesite, and 8,219 metric tons of dead-burned magnesite, with an estimated value of $ 2,000,000. The production amounts to more than 80 per cent of the total national magnesite output. Caustic calcined magnesite is exported to Holland, West Germany, and the United Kingdom. Dead-burned magnesite is exported to the United States and West Germany.

The exploitation of Northern Greece's magnesite mines could contribute more wealth to it if the mine operators were to increase the production of dead-burned magnesite, which is more readily marketable in the world market. The operators should merge into large corporations and establish facilities for the production of dead-burned magnesite.

Chromite [116]

Chromite deposits varying in content between 22 and 23 per cent Cr. 203 occur in many places of Northern Greece, but the main deposits are in the central section of Kozani and in the north-western section of Halkidiki. The proven reserves have been estimated at 600,000 metric tons.

The most important chromite mine is in Paleochori mining district of Kozani and is operated by the Hellenic Chrome Mines, Inc. The exploitation of the mine is fully mechanized and the technical equipment is modern. An 1800 meters long earial ropeway carries ore from the mine to the ore-enrichment plant in Skourmtsa, a few kilometers south of Kozani City. The production of chrome concentrate with 55 per cent Cr 203 increased from 362 metric tons in 1958 to 15,554 tons in 1960. The average monthly production of the enrichment plant was 1,238 metric tons in 1960. A loan from the American Defense Material Procurement Administration (ADMPA) was used to enlarge the plant after the war. About 195 workers are engaged in the mining and beneficiating of chromite ore. This mine has excellent possibilities of becoming a major producer of chrome concentrate. The ores in the other areas (Halkidiki, Naousa - Veria, Soufli) have been irregularly exploited.

116. Data was obtained from the Hellenic Chrome Mines Inc., Athens, 1960.

Any decision on the part of the government or private enterprise to construct ore-enrichment plants and to modernize the mines is dependent upon the success of both to increase the exports of chromite concentrates. Most of the chromite concentrates are exported to the United States, Norway, Sweden, Holland, Germany, and France where it is used in the production of chemicals and explosives and in the strengthening of steel.

Manganese[117]

The commercially-exploitable deposits of manganese ore are in the Prosotsani-Nevrokopi mining region, north of Drama. The thickness of the manganese ore-bearing beds ranges from 40 to 60 meters. The proven reserves have been estimated at 200,000 metric tons, and the potential reserves at 1,500,000 tons. The major producer of manganese ore is the Granitis mine, which is operated by D. Scallistiris Company. In 1957 the firm secured a loan of $ 320,000 from the Mercantile Metal Ore Company of New York for the expansion of the ore concentration facilities. Repayment of the loan in manganese ore concentrate shipments to the company started in 1958, and it is to extend over a five year period. Financial aid was also received from the American Defense Material Procurement Administration. As a result, the mine is fully equipped with modern ore-dressing installations for the concentration of the manganese

Fig. 61. Mine workers screening iron ore.

117. The data was obtained from the D. Scallistiris Company, Drama, 1959.

Fig. 68. The manganese ore processing plant at Sculatira mine near Drama.

ore. About 700 workers engage in the mining and dressing of the ore and underground mining is used. The ore-enriching plant is producing ore with 73.5 per cent of Mn. The annual production of concentrate manganese ore varies between 16,000 metric tons to 20,000 tons, depending on the manganese world price. Further increase in the production of ore may be retarded by the shortage of water during the summer season. Most of the ore, which is used in the production of batteries, is exported to the United States, France, the United Kingdom, and Italy. The shipment of ore to the port of Kavala for export is expedited by the use of the asphalt-surfaced highway which connects Nevrokopi with Kavala. The mine is near the road. With the exception of the Granitis Mine, no other serious efforts have been made to valorize the other existing poor deposits of manganese in Northern Greece.

Pyrites [118]

The richest deposits of pyrites are found at the "Madem Lakkos Mine" in Cassandra, Halkidiki. The mine is owned and operated by the Hellenic Company of Chemical Products and Fertilizers Ltd. The ore lies between crystaline schists and kaolonized granite and is mined by sub-

118. Data was obtained from the Hellenic Company of Chemical Products and Fertilizers Ltd., Athens, 1960.

level caving methods. There is a good water supply both for drinking and plant needs. Labor is plentiful, and the port of Stratoni is only a short distance from the mine. The proven reserves have been estimated at 1,000,000 metric tons. The Company, with American financial and technical assistance, rehabilitated and modernized the ore-dressing facilities after the war. A modern pyrite washing plant (60 tons/hour) has been in operation at Stratoniki since 1952. Also, a pyrites sands flotation mill (250 tons per day) has been erected to utilize the pyrite sands which had accumulated along the shore from the losses of the old pyrites washing plant. A four kilometers long, 100 tons per hour, aerial tramway carries the ore from the mine to the washing point and from there to the docking facilities for shipment. The pre-war level of production was reached in 1955 when 217,103 metric tons of pyrite concentrate were produced. In 1945 the production was 1,100 metric tons. The production started to decline after 1955, and in 1960 it was 126,495 metric tons. The bulk of the production is exported to West Germany, Austria, Italy, Egypt, France, and Holland. The rest is shipped to the Company's fertilizer plant in Piraeus, where it is reduced to sulphuric acid for the production of superphosphate fertilizer. The increasing demand for fertilizer in Northern Greece has encouraged the Company to make a bid to the goverment for the construction of a fertilizer plant in the Cassandra Mines area. The other important deposits of pyrites in Northern Greece (Naousa, Paggaion, Mountain Region, Almopia) have not been developed.

Lead and Zinc[119]

"The lead and zinc deposits in the Cassandra Mines, Halkidiki, are owned and operated by the Hellenic Company of Chemical Products and Fertilizers Ltd. The proven reserves of ore, assaying 3.5% Pb, 5-8% Zn, 28-30% S, have been estimated at 200,000 metric tons. An ECA reconstruction loan (*ca* $ 163,000) in 1949 enabled the company to complete the installation of a complex sulphides flotation mill (500 tons per day). An aerial tramway carries the ore from the Madem Lakkos mine to the flotation mill at Stratoni. Ore is also extracted at the Mavres Petres mine. The production of lead concentrates increased from 1,698 metric tons in 1953 to 11,111 tons in 1960. That of zinc concentrates increased from 3,914 metric tons in 1953 to 16,912 tons in 1960. The bulk of the production is exported to France and West Germany.

119. Data was obtained from the Hellenic Company of Chemical Products and Fertilizers Ltd., Athens, 1960.

The Kirki lead-zinc mine in Evros prefecture, a few miles northwest of Alexandroupolis, has been inoperative since 1952 when the Mediterranean Mines Company abandoned it. The Germans extracted ore during the war, installed an aerial ropeway to transport the ore, but the flotation plant that was started by them was not completed. The rich deposits of zinc ore in Thassos Island have been exploited, and it is doubtful if the existing lowgrade zinc ore could be extracted and beneficiated economically.

Asbestos [120]

The expoitation and development of the asbestos deposits in Servia, Kozani, has been undertaken by the Kennecott Copper Company in 1956. In that year a concession was signed with the Greek government. By the terms of this agreement, the Company will invest about $ 8.5 million in the extraction and processing of asbestos and in the manufacturing of asbestos products. The company continues exploratory drillings, which were initiated in 1956. The possible reserves of asbestos have been estimated at 100,000,000 metric tons by the Institute for Geology and Subsurface Research. The Kennecott project is cited by Greece as a type of foreign investment Greece urgently needs.

Oil [121]

Extensive exploration for oil in the region started before the war and was resumed again in 1949 with the financial assistance of OEEC. The potential oil bearings areas are the Katerini-Thessaloniki plain, the Evros River Basin, the coastal section of Thrace, and the Grevena-Kastoria graben. In 1957 the Greek Helios Company, together with the German concern Deimann Bergbau, struck oil, of a limited commercial value, near the village of Ardani, Evros. The present oil prospecting program of the company is technically aided by RAP (Regie Autonome du Petrole), a French Company. Oil prospecting and geological and geo-physical research in the Katerini-Thessaloniki plain has been undertaken by W. H. Hunt Oil Co., an American firm, and in the Grevena region by Rumanian oil experts. The new petroleum law, which was enacted in 1959, is expediting oil research.

120. Data was obtained from the Division of Mining, Ministry of Industry and Commerce, Athens, 1959.

121. *Ibid.*

Gold [122]

The auriferous alluvial deposits in the Galikos river north of Thessaloniki and 11 kilometers south of Kilkis have been exploited by the Northern Greece Goldfields Ltd. since 1937. The connected bucket floating dredge and the sluice boxes were severely damaged during the war. ECA recommended a loan of $235.650 to the company for the rehabilitation of the dredging operation. The new dredge was installed by the «Yuba Construction Company» of San Francisco. Operation was stopped during the war and was resumed in 1953. The production of gold increased from 70,624 gr. in 1953 to 160,976 gr. in 1959. About 70 workers are engaged in the production of gold. Recovery is made at the company's office in the town of Kilkis. The recovered gold is sold to the National Bank of Greece. The research of the company is now directed toward the discovery of new alluvial gold. The gold bearing alluvial deposits of Axios, Nestos, and Strymon rivers have been estimated at 20 million metric tons with 0.25 - 0.30 g/m³g.

The government is anxious to increase gold production and has requested the Northern Greece Goldfields Ltd., the original concessionaire, to limit its activities to the already explored areas and release the rest of the concession to it for exploration. New companies will be invited to explore and develop the auriferous sands of the released areas.

Lignite [123]

Lignite deposits are found throughout Northern Greece. They are found in the basins of Kozani, Ptolemais, Proselio - Trigoniko, Lavas, Sarantaporos, Eiasson, Vevi, Amynteon, Alexandroupolis, and in the Serres - Paggaion region. Approximately 65 per cent of Greece's lignite deposits are in Western Macedonia, and the lignite production of Northern Greece constitutes 45 per cent of the national output. The calorific value of the lignite ranges from 1990 k. cal./kg. in Ptolemais to 4900 k. cal./kg. in Alexandroupolis. The heat value can be readily increased by converting the lignite into briquettes and semi - coke.

The most notable development in the sector of mining has been the rational exploitation of the Ptolemais lignite deposits in Kozani prefecture (see Figure 60). The existence of these deposits had been known for a long time, but no systematic exploration work to determine the depth and ex-

122. Data was obtained from the Northern Greece Goldfields Ltd. Athens, 1960.
123. Data was obtained from the Greek Public Power Corporation, Athens, 1960.

tent of them had been undertaken until 1935. In that year the Government turned over the mine to the Greek Railways for development. In 1937 the German Professor Kegel completed his survey of the basin and the first contract for the exploitation of the lignites was signed in 1939. The work was ceased during the war and was resumed in 1951 when a new concession was signed between the Greek government and the Hellenic-American General Lignite Products Company. This concession was voided in 1955 because the company was unable to meet the terms of the agreement. On June 1955 the government signed a $ 20,000,000 contract with the Hellenic Chemical Products and Fertilizers Ltd. for the development of the lignite area. By the terms of the agreement, the company agreed to mine about 1.8 million tons of lignite annually for the operation of a 70,000 thermo-electric plant, as well as for the production of 200,000 tons of briquettes for the Greek State Railways, and 100,000 tons of semi-coke for the Larymana iron-nickel plant. A company under the name of LIPTOL, with a capital stock of $ 3.0 million, was assigned all the rights and obligations of the original concessionaire. U.S. aid funds ($ 13.5 million) and German credits ($ 3.5 million) were also used to finance the project. In 1959 the Hellenic Chemicals Products and Fertilizers Ltd., the principal stockholder of LIPTOL (Ptolemais Lignite Corporation), turned over nine-tenths of its stock to the Public Power Corporation, because LIPTOL was unable to raise the additional funds needed to double the mine's production.

Upon the strength of Kegel's report and these of other Greek and American geologists, the Greek government, through ECA Technical Assistance, engaged the British firm of Powell-Duffryn Technical Ltd. to make an engineering survey on the technical and economic aspects of developing Ptolemais as an open-pit mining operation and to study the possibilities of briquetting the lignite. The report of the firm recommended the use of the open-cast mining method, and the processing of the lignite into briquettes and metallurgical semi-coke. The construction of the briquettes plant was considered by many as one of exceptional economic importance to Northern Greece; i.e., it will serve as a nucleus for the development of a whole series of industries in the Ptolemais basin.

Geological research has indicated workable deposits of 3,000,000 metric tons, and with an estimated output of 4 million tons annually, those deposits will last for about seventy-five years. Although the lignite is not of the highest quality (60 per cent moisture content), the seams are accessible, horizontal, and economical to extract. The lignite seams are up to 150 feet thick and at a depth varying from 30 to 60 feet below the surface. The high quality lignite is processed into briquettes and semi-coke,

and the low-quality lignite is used to fire the thermo-electric plants. The estimated reserves have been placed at 600,000,000 metric tons.

Up to date mining equipment for the extraction of lignite is used in the mine. The lignite is taken by rail from the mine to the processing plants and thermo-electric plant. The mine is also connected by a railway with the cities of Thessaloniki and Kozani. The average annual production is 1,000,000 metric tons most of which is used by the Public Power Corporation, the operator of the thermo-electric plant. The Krupp company of West Germany served as an engineering consultant and also supplied the mining equipment. Approximately 800 workers are engaged in the mining of lignite.

The various sections of the Ptolemais lignite project were completed in late 1958 and are now in full operation. The 70,000 kw thermo-electric plant was completed in October, 1959. The construction of the second 125,000 kw plant was assigned to the French firm ALSTHOM and will be completed by 1962. The nitrogen-fixation plant is under construction. This plant war recommended by the Koppers company of West Germany and will provide the farmers of the region with much-needed fertilizer. The government is also contemplating the construction of chemical plants to process such by-products as gas. An investment of approximately $ 110.0 million is being contemplated for the economic development of the region. Of this, $ 40.0 million already has been expended in the development of the mine, and the construction of the briquettes, semi-coke, and thermo-electric plant.

The development of this mine has lessened the region's need for liquid fuel, and has improved the employment picture. An adequate supply of labor, adequate credit, interested government, and a ready market for the product promise a bright future for the Ptolemais area. Some have called it the "Ruhr" of Greece.

The other lignite deposits in Northern Greece are partly exploited despite the availability of high quality raw lignite. The lignite of the Vevi basin is used locally by the quick-lime kiln operators. Some of it is shipped to the urban centers of Edessa and Thessaloniki. The calorific value of the lignite varies from 300 to 6000 k. cal./kg. Since it is woody, it need not be briquetted to facilitate transportation and marketing as is in the case of Ptolemais.

The Serres-Paggaion region has several lignite mines, but the most important is the Perdicaris Company Mine near the city of Serres. Since seams are easily accessible, the inclined shaft-mining method is used. The width of the lignite beds varies from 6 to 15 feet and the deepest mineable

seam is about 579 feet. The annual production is approximately 60,000 tons, most of which is exported to the thermo-electric plant of the Public Power Corporation in Pireaus. The lignite is shipped by rail to the port of Thessaloniki for transhipment. Because of its relatively high calorific value (*ca* 4,000 k.cal./kg.) it can withstand high freight charges. The mine is ideally situated with respect to existing transportation facilities. It is one kilometer away from the asphalt-surfaced highway connecting Serres with Thessaloniki and four kilometers from the railroad. Approximately 500 workers engage in the mining of lignite; the daily payroll is about 30,000 drachmas ($ 1,000). Lack of capital, lack of credit, lack of market, inadequate and outdated haulage equipment, and constant flooding are the main problems of the mine.

Despite the existence of the compulsory lignite utilization law, which compels certain categories of industries and institutions to use Greek lignite to cover 50-100 per cent of their fuel requirements, the consumption of lignite has been very small. The only major user of lignite is the Public Power Corporation in Ptolemais. Lax enforcement of this law and the reluctance of the potential consumers to use lignite stem from the relatively high cost of converting from oil to lignite and briquettes, and from the inability of the non-Ptolemais lignite producers to offer a uniform quality of product, ensure an uninterrupted supply, and quote reasonable prices in comparison with other fuels. Any effort on the part of the government to help the small operators improve the means of production and marketing of lignite should be based on the essential steps listed below:

a. ascertain the volume of lignite deposits in the case of each mine and also the cost of production

b. abandon the marginal mines

c. have regular inspection and supervision of the mines by government geologists and mineralogists to assist the operators with their problems and also to see that the suggested mining-improvement methods are employed by the operators

e. provide the operators with low interest long-term loans to mechanize and modernize the mines

f. enforce the compulsory lignite utilization law.

The necessity for developing the mining industry not only in Northern Greece but also in other sections of the country has been recognized by the government, and every effort is being made to expedite it. The mining law has been largely revised to correct such defects as an inadequate technical program, a non-systematic minerals exploration program, an ineffective and incomplete government supervision of the industry, a lack

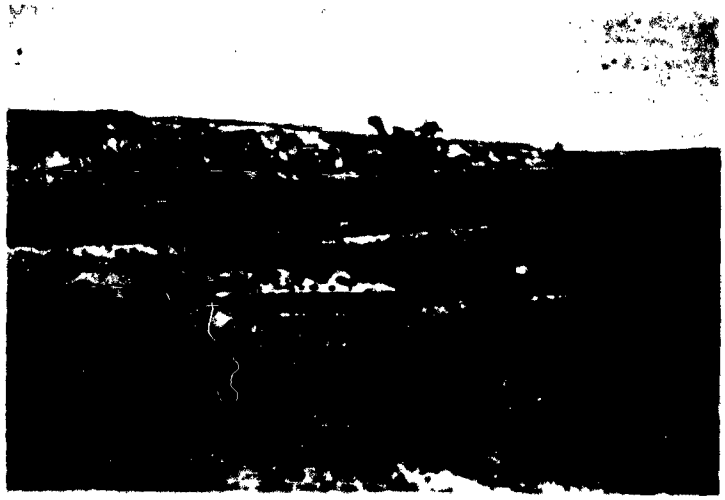

Fig. 63. The Ptolemais lignite basin in Kozani.

Fig. 64. A small lignite mine near the city of Serres.

of coordination among the various government agencies and bureaus involved in mining, poorly enforced mining legislation, the lack of faith in the possibilities of the country, and a vague government policy concerning mining concessions. The outstanding and revolutionary provision of the revised law deals with the insurance and retention of mining permits. To ensure that the concessionaire will carry out his intentions, the law compels him to deposit a guarantee and also to carry out the necessary exploration and other technical work within three months from the date of the application. Also the law obligates him to spend at least 20,000 drs. ($ 666) annually on mining projects. Extensions of time limits are abolished, and prospecting has been limited to two years. Under the expropriation provisions of the law, the government may nationalize closed or idle mines for the purpose of turning them over to mine operators who offered guarantees either to increase and make exploitation profitable or to establish ore-processing plants, provided that the original concessionaires did not execute the provisions of the lease. The objective of the government behind the strengthening of the "idle mines" provision of the law is to revitalize the industry by removing from it the incapable and indifferent mine operators with limited financial means and without mineral knowledge. It is also hoped that the new law may encourage further foreign and domestic capital investment not only in the mining operations of Northern Greece but also in the rest of the country. Coupled with the passage of this law, the government has initiated a comprehensive mineral exploration to determine the extent of mineral resources. The Geological Institute has been assigned the tasks of prospecting for iron ore in the island of Thassos, zinc and lead ores in western Thrace, and lignite at Amynteon and Vevi, Florina. An external factor, the stockpiling of strategic minerals by the industrial nations, may encourage the mine operators of these minerals to increase production. An increase in exports will give employment to hundreds more of specialized and non-specialized workers.

Although appreciable progress has been made in mining since 1945, further expansion in mineral production may be retarded by the factors listed below:

a. a chronic shortage of low-cost capital not only for the replacement of obsolete equipment but also for the construction of dressing-ore plants on the operators

b. a shortage of mining engineers and skilled mined workers which still hinders the formulation and implementation of a dynamic exploitation program

c. a still inadequate minerals research program

d. the unfavorable location of some mines with respect to existing main highways and ports.

In order for Northern Greece to lessen her dependence on the export of one or two agricultural items for a large share of its regional income, it must expand the sector of mining. The present mining development program calls for the increase of semi-processed minerals such as chromite and deadburned magnesite.

TABLE 65.

Production of Principal Minerals in Northern Greece, 1958.

Minerals	In Metric tons
Magnesite	76,000
Caustic Magnesia	21,000
Dead-burned magnesite	8,000
Chromite	47,000
Chromite concentrate	10,000
Iron Pyrites	146,150
Iron ore	300,000
Manganese	19,000
Lead	10,250
Zinc	14,000
Gold	200 kilograms
Lignite	2,100,000

Source: Ministry of Industry and Commerce, Division of Mining, Athens, 1959.

CHAPTER VII

INDUSTRY AND HANDICRAFT

The industry of Northern Greece emerged from the war and occupation almost ruined. Further physical damage was caused by the Guerrilla War between 1947 and 1949. The communist-led Guerrillas not only burned all the textile plants in Naousa, except one, but also retarded and impeded the industrial rehabilitation and development of the larger border-line villages and towns. Another consequence of the civil war was the flight of provincial capital and management to the "safety" centers such as Athens to the detriment of the provincial industries.

Limited UNRRA and ECA economic aid was extended to the region to rehabilitate its industry. Approximately 11 per cent of the capital that was allocated by government to the development of the country's industry between 1949 and 1952 was invested in Northern Greece (see Table 66). The loans were used to rebuild the guerrilla-destroyed plants in Naousa, to replace outmoded machinery, to construct new plants, to procure raw materials from abroad, to improve the skills of the workers and management, and to improve marketing and distribution of manufactured goods. As a result of this assistance, the index of production was 166 in 1959 (on the base of 1939 - 100). However, the index of industrial output would have been higher if the industrial recovery of the region had not been impeded by such factors as

the flight of capital and enterpreneurial leadership to Athens during the Guerrilla War period,

the concentration of political and economic resources in Athens,

the uneven distribution of credit and public investments,

the low income of the bulk of population ($ 202 per capita income in 1959),

the presence of monopolies and attendant high prices, and the emphasis on limited production with high profits per unit rather than mass production with lower unit profits.

Despite the economic aid and other forms of assistance given to the industry of Northern Greece, it has not been able to maintain the rate (ca 7 per cent per annum) of growth of the national industry. Since 1939 the

industrial output of Greece increased by 136 per cent, that of Northern Greece by 66 per cent (see Table 67). In 1925 the industrial production of the region was 23 per cent of the national output.

The relative contribution of the various branches of industry to the total industrial output of Northern Greece for a few selected years is shown in Table 68. In 1959 the textile and food processing industries contributed more than 60 per cent to the regional industrial production. With the exception of textile, leather, and paper industries, the contributions of the others have been steadily increasing since 1938, especially that of the food-processing industry. That of textile industry has decreased from 51 per cent in 1938 to 30 per cent in 1959.

In general, manufacturing plants are small. They utilize small amounts of power and have few employees. About 75 per cent of the plants that registered with the Chamber of Commerce and Industry of Thessaloniki employed 14 or fewer workers and the other quarter 200 - 205 workers (see Table 69). The largest employers of workers are the textile plants in Naousa and Thessaloniki. In 1955 there were 3 plants employing 3000 or more workers. In 1951 manufacturing and handicraft industries employed only 12.8 per cent of the economically active population as compared with 60 per cent in agriculture, forestry, fishing, and livestock (see Table 9).

In 1959, the manufacturing plants employed about 10.101 workers (see Table 70) and produced goods valued at $ 55,765,000, representing an increase of $ 7.955.000 since 1955. Of the total value of output 33.5 per cent was represented by food processing, 29.6 per cent by textiles production, 6.9 per cent by machine shop industries production, and 7.1 per cent by chemicals (see Table 71).

Textiles

Despite the presence of many economic and political hardships, the manufacture of textiles is the region's principal industry. Nine spinning and weaving mills now produce cotton yarn and cloth, two in Edessa, three in Naousa, and four in Thessaloniki. The principal ones are Pierrakos and Macedonian Cotton Industry in Thessaloniki, and Estia and Tsitsis and Company in Naousa (124). The three biggest wool spinning and weaving mills are Lanaras and Kyrtsis in Naousa, Sefertjis and Kokkinos in Edessa,

124. In Veria, the two small cotton spinning plants (Vermion and Chatjenikolaou Brothers) are closed. Two factors may be cited for their shutdown: 1) out-moded equipment, and 2) poor management.

and Yfanet-Makris and company in Thessaloniki. These plants are well-built and most of the machinery is less than 15 years old and less efficient machinery is being gradually replaced with more efficient equipment. There are, however, a few old plants, which still employ out-moded equipment. In 1959, 86,000 spindles and 481 looms repesented 21 per cent of the total number of spindles and looms in Greece (125). Many of the textile factories bleach of dye yarn or cloth on their own premises. Some of the plants were built as early as 1904 at Edessa, Naousa, and Veria to take advantage of the ample water power available on the fall line of the Vermion mountain, the availability of capital and skilled handicraft workers, and an expanding market.

The number of workers and the volume of production has been steadily declining since 1950 (see Tables 58 and 70). In that year textiles represented 50.4 per cent of the total Northern Greek industrial output, but in 1959, it was down to 3.15 per cent. The production of cotton increased from 8,700,000 meters in 1938 to 17,000,000 in 1958 and then dropped to 16,000,000 in 1959. That of cotton yarn started to decline in 1959 following a steady increase since 1939 (see Table 72). Practically all the cotton yarn produced is used locally. No cotton yarn was exported after 1957. Before the war, Yugoslavia was an important importer of Northern Greek cotton yarn. The output of woolen cloth decreased from 2,130,000 meters in 1955 to 1,270,000 in 1959. However, the production of woolen yarn had increased from 850 tons in 1950 to 1,580 in 1959 (see Table 72). The woolen spinning and weaving plants produce annually about three-fourths of the national production of woolen goods. Four factors may be cited to explain the decline in textile production: 1) high cost of production hampering the exports of textiles, 2) restrictions imposed by importing countries, 3) competition from the other Greek centers of textile production, and 4) an ever-increasing domestic demand for synthetic cloth. Then umber of textile workers also decreased from 8,300 in 1950 to 4,725 in 1959. Approximately 73 per cent of the workers are employed byt he woolen and cotton spinning and weaving factories.

Northern Greek cotton has now replaced imported raw material. The imports of ginned-cotton decreased from 907 tons in 1938 to 0 in 1959. On the other hand, imports of syntheric fibers have increased during the past three years. Imports of rayon yarn increased from 49 tons in 1957 to 1,079 tons in 1959. The region will continue to import wool because

125. Ministry of Northern Greece, Division of Industry, Thessaloniki, 1960.

the local wools are, in the main, coarse. Sisal and hemp are also imported (see Table 73).

The demand for silk fell after the war owing to severe competition from synthetic fibers such as rayon. The silk industry was also seriously affected by the liberalization of imports. The production of silk decreased from 45 tons in 1950 to 10 tons in 1959 (see Table 72). In Soufli, Evros, an important silk producting town, the production of cocoons dropped from 4,000 tons in 1938 to less than 1,000 tons in 1959. In that year one cocoon-processing plant was in operation, although it operated for only two months and employed approximately 50 workers, mostly women. The production of silk-cocoons provides the local farmers with extra employment and income despite the fact that the price of cocoons has decreased from 80 drs. per kilo (2.2 lbs.) in 1938 and to 50 drs. in 1959. The slackening silk market is now causing some of the farmers to cut down the old mulberry trees and to devote the released land to the production of other economic crops such as sesame.

The notion that there will always be a steady market encouraged the government to build a plant in Soufli in 1952 to process and manufacture pure silk. However, the plant has not operated since its completion, because of mechanical, structural, managerial, and labor difficulties, not to mention a declining silk market. The region's buyers prefer to purchase cocoons rather than processed silk. Also, the school of weavers, which was established in 1948 to improve the skills of the silk workers, has been closed.

The hosiery and knitting section of the industry has been developed considerably since 1950. There are many small shops in the production of garments, stocks, and stockings. Some have two or three machines; the large plants are well-built and designed for efficient production. With the exception of a few mills, the majority of them have adjusted themselves to the new conditions of both urban and rural market. The use of rayon rather than wool has increased markedly. In 1959, 1,070 tons of rayon yarn were imported into the region.

The production of sisal items, mainly by A.E. Sisal Company, has increased from 740 tons in 1952 to 2,230 tons in 1959. The rapid increase in output is the result of an increased domestic demand, plus exports to Yugoslavia and the Middle East. In 1956, 700 tons of sisal products were exported to Yugoslavia. Bags, ropes and other items are also produced both in Thessaloniki and Edessa. The principal plants are "Edessa" in Edessa and "A.E. Bilka" in Thessaloniki.

There is no doubt that the textile industry is experiencing many

difficulties. They stem from such factors as the liberalization of imports in 1953 [126], which brought unbearable competition to local fabric producers, shortage of operation capital [127], and competition from the better organized and more efficient textile industry of Athens, and limited exports.

The optimum utilization of the region's most important labor-intensive industry calls for drastic measures:

a. the reorganization and consolidation of small plants into larger ones for more efficient production

b. the granting of long-term, low-interest loans to the economically-distressed plants

c. the immediate replacement of outmoded equipment in the old plants to enable them to compete successfully against the better-equipped and more efficient plants of Athens.

The growth of the region's cotton textile industry should be encouraged by both private and public interests because it is based on local raw material and is more labor-intensive than any other sector in the textile field. Although the world production of non-cotton fabrics is increasing, it is possible for Northern Greece to increase its exports of textiles by continuing the production of high quality wares.

Chemicals

The chemicals industry is concentrated in Thessaloniki and mainly produces moderately-priced rubber footwear, which is in great demand by the low-income group. The principal rubber products plants are the Alyssida and Ebem in Thessaloniki, which together employ approximately 700 workers. Their products are sold nationally. Other chemical products such as soap, oxygen, dyes, and paints are being produced. With the exception of soap, the production of these products has been increasing steadily since 1950 (see Table 72). The completion of the nitrogen-fixation fertilizer plant in Ptolemais would provide the farmers of the region with low-cost fertilizer. The manufacture of fertilizers is viewed as a promising line of industrial development. The plant when in operation would employ about 1,000 workers. In 1959 this industry represented 6.6 per cent of

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126. The value of textiles imported into Greece totaled 20 million drachmas in 1958 as compared with 4 million in 1952. In 1960 the government raised the import duties on textiles. While this action is not conflicting with the policy of free imports, it would strengthen the economic position of the textile industry.

127. In 1959, the Lanaras plant in Naousa was under compulsory administration. Others have made cuts in personnel.

the total Northern Greek industrial output as compared to less than 2 per cent in 1938. If the present rate of growth continues the possibility is that the chemicals industry may eventually become the second most important industry after food-processing.

Construction Materials

The construction materials branch of the industry has been expanding steadily since 1950 to meet the requirements of the building boom, which continues in the larger sections of the region (see Table 72). The industry produces such items as bricks, roof tiles (Byzantine and French), clay and cement pipes, and other commercial pottery. Only the production of milling stones has decreased because of the accessibility of the flour mills for the once isolated villages, which used to mill their grains locally. The largest plant of clay bricks and tiles is the Anonymous Industrial and Commercial Company of the Thessaloniki (formerly known as the Allatini Company). This is a modern and efficiently operated plant. It is also near an excellent deposit of clay and to the ever-expanding market of Thessaloniki. Since the high quality of its products is in great demand, this company should continue to grow, provided that it adheres to this emphasis upon quality. There are also many small clay products plants throughout the region which have been very successful in meeting the demand for these products. This industry should continue to increase production under the Five-Year Economic Development program. The program calls for the extension of the irrigation-system, the construction of low-rental housing projects, the construction of hotels and motels for the tourists, and the improvement and installation of sewers in the cities and larger towns of the region.

Metal Products

The production of metal products has been rising steadily since 1955 (see Table 72). In 1959, it was 10,750 tons as compared to 7,300 tons in 1955. The total labor force in 1959 was approximately 850. Most of the metalworking plants are in Thessaloniki. Some of them are extremely well-equipped, others struggle along with poor second-hand machinery, and others are only partly mechanized. In the larger, mechanized plants, technical operations are now managed or supervised by local technicians, some of whom received their technological training abroad. Principal products are nails, stoves, beds, furniture, iron, aluminum and copper utensils, agricultural tools, and an indeterminate amount of other products, both machine and handworked. The principal firms engaged in the production

of agricultural machinery are Cornik A.E. in Thessaloniki and N. Karatjanis and Son, Inc., in Serres. The latter, built in 1953, was largely financed by the American Mission to Greece. The plant manufactures about 100 threshing machines and employs approximately 50 workers. The cost of production is rather high because the production of machines is not spread throughout the year but concentrated in a three-month period to the harvesting season. The reason for this concentration is that the company has to wait for orders before starting production. Lack of capital prevents it from maintaining a stockpile of threshing machines.

While the workmanship is good, costs are high because of heavy ove-head. Hence, the region's plants cannot compete successfully with those of Athens and Piraeus. Low interest loans from OHOA [128] would stimulate modernization in plants suffering from high cost of production because of obsolete methods and equipment. Also, the firms manufacturing agricultural implements should be protected from foreign competition. However, the protection should not be allowed to become a permanent screen for inefficiency.

Leather Products

Shoes and other leather products are made by hand or on simple machines in small workshops in most parts of the region, or by the retailer in his own shop. There are two modern shoe factories in Thessaloniki. Although the production of leather shoes has increased from 25,000 pairs 1950 to 51,000 in 1959, it has not reached the 1938 output of 115,000 pairs (see Table 72). The slow increase is due to the greater consumption of rubber shoes. There are a few small tanneries, and some effort is being made to improve the quality of leather. On the whole, the quality of domestic skins used is somewhat poor. It could be improved, however, by putting a stop to the cutting, gouging, and scoring now caused by careless skinners. Proper slaughtering and skinning methods are now being introduced in the abattoirs. Production of leather for soles decreased from 210 tons in 1950 to 70 tons in 1959, largely because of the greater use of rubber soles. In 1959, 143 tons of skins and hides were imported into the region as compared with 275 tons in 1938.

Tobacco - Manipulation

Sorting, grading, processing, and packing tobacco leaves is an important seasonal industry in Northern Greece. The main centers of tobacco

128. Organization for Economic Development.

manipulation are Thessaloniki, Kavala, Serres, Komotini, and Xanthi. The plants employ about 35,000 workers during the tobacco manipulation period, which lasts from May to the end of October. Since 1955, the installation of tobacco sorting machines in the plant has produced a gradual decline in the number of workers, and tobacco manipulation has shifted to Thessaloniki. The mechanization of the plants has created a serious unemployment problem in the cities of Xanthi and Kavala. This problem is an old one, but it appears to be more acute today. The average income of the tobacco manipulation worker is 6,300 drachmas ($ 210) plus a 14 per cent Christmas bonus. Since this is seasonal work, the workers are without employment for about five months out of the year. There are also two cigarette factories – one in Xanthi and the other in Kavala. Most of the production is consumed locally.

Food Processing

The activity of the food processing industry has been improving steadily since 1950. In 1959, the contributions of this industry represented 32.6 per cent of the total value of industrial output in Northern Greece as compared with 21 per cent in the prewar period. This expansion is largely due to an increase in agricultural production, availability of tin cans, increase in the consumption of canned goods, better marketing and distributing methods, and the installation of modern and efficient plants. The industry consists largely of flour mills, macaroni paste and confectionery plants, cotton and sesame seed crushing mills, rice mills, and fruit and vegetable canning plants.

Most of the flour mills are in Thessaloniki and produce more than one-half of the region's flour output. The remainder is produced by the small flour mills in the other large towns and villages. The city of Kavala has a modern flour mill. Approximately ninety-five per cent of the milled wheat is native. Wheat imports into the region decreased from 76,482 tons in 1951 to 3,533 tons in 1959.

The production of alimentary foods, canned foods (fish, fruits and vegetables) candy, seed-oils, cotton and sesame cakes and meals, and rice has increased markedly since 1950 (see Table 72). The hulling of rice is a new industry for Northern Greece. Its production increased from 12,500 tons in 1955 to 16,500 tons in 1959. The output varies from year to year depending upon the availability of locally produced rice. The canning of fruits and production of juice and extract increased from 380 tons in 1950 to 960 tons in 1959. This is largely a reflection of the ever-increasing production of fruits (peaches, apples, cherries, and strawberries) since 1955.

The seed-oil industry is scattered throughout the region. Every large agricultural community has one or two seed crushing mills, which are small and employ a small labor force. The production of seed-oil increased from 750 tons in 1950 to 4,025 tons in 1958. That of sesame and cotton seed cakes and meals increased from 3,800 tons in 1950 to 26,900 tons in 1958. Since the available quantities of seeds are limited, seeds are imported to meet the requirements of the plants for the entire year.

The principal plant producing corn-derived products (syrup, starch) is that of the Viamil Anonymous Company. This plant, built in 1953, is the regional branch of the main plant in Piraeus. The company selected Thessaloniki as the site of the plant for several reasons: 1) a large domestic market, 2) availability of cheap labor, 3) ample supply of water, 4) cheap raw materials, 5) adequate transportation facilities, and 6) absence of competition. The equipment is fairly good. All of the production is consumed locally. Corn is imported periodically from the United States to augment the local supply.

Floka A. E. is the largest candy and chocolate making plant in Northern Greece and employs approximately 400 workers. Its products are sold nationally and internationally.

Northern Greece is in great need of facilities to process and preserve its ever-increasing agricultural production. The fruit and vegetable growers have been exerting pressure on the government to construct the urgently needed cold storage plants, packing and sorting warehouses, and food processing and preserving plants which would help to increase exports. Since 1955, both the government and the agricultural cooperatives have been working toward the establishment of such industries in Edessa, Naousa, Florina, Veria, Serres, Komotini, and Thessaloniki. The Union of Agricultural Cooperatives of Lagada, an agricultural community east of Thessaloniki, built a modern fruit and vegetable canning plant in 1957. A similar plant has also been constructed in Thessaloniki.

Private capital has also been assisting the farmers to increase the amount of cold storage space. The Skydra E. E. Cold Storage plant is a good example of this effort. The plant has a storage caparity of 4,000 cubic meters and covers an area of approximately 1,800 square meters. It is 72 kilometers distant from Thessaloniki and close to the Thessaloniki-Skydra-Edessa highway and railway. Since ice is needed to keep the peaches fresh enroute to the market, the management is considering the construction of an ice-making plant. The plant employs 20 extra workers during the apple-picking season and 50 during the peach-picking season. The maintenance staff numbers about 10 workers.

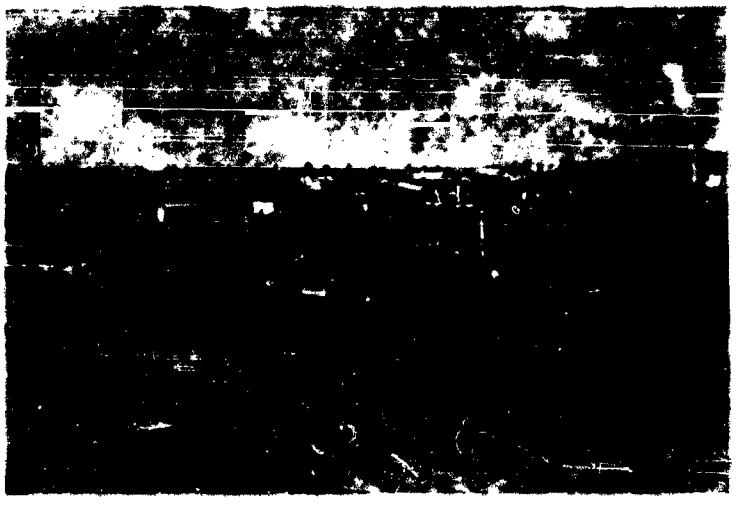

Fig. 65. General view of the Ptolemais industrial basin.

Fig. 66. A vegetable cannery plant in Lagada, Thessaloniki.

The new investment program for the region includes allocation of capital not only for the construction of sorting and packing stations, and cold storage and ice-making plants [129] but also for the construction of a beet sugar refining plant in Serres. Another one has been suggested for the Thessaloniki plain region. Foreign companies have been invited by the government to assist it in the selection of the best sites for the plants. However, apart from the working capital and technical "know-how" required, it will take a considerable time before farmers acquire the needed experience with beet cultivation, to permit beet sugar production on a large scale. Also, the farmers may be reluctant to grow the new crop without assurance of price and market. The sugar refineries are needed not only to produce sugar, but also to provide the farmers' extra hands with work.

The construction of the Serres sugar-beet plant has been awarded to CEKOP (The Polish State Trading Agency). The plant will use locally produced sugar-beets and will be near the city of Serres, an important reservoir of labor. It will operate for approximately 100 days each year, will consume about 200,000 tons of sugar beets, and will produce 28,000 tons of sugar. The total cost of the plant has been estimated at $ 7,200,000. The major part of the construction cost will be met through the sale of Greek agricultural products to Poland.

The agricultural raw material processing industries of Northern Greece have been scheduled for vigorous expansion by the government. A shift in the composition of these industries should be expected. The importance of sorting, grading, processing and packing of traditional export products like tobacco will decrease in the future, but that of fruit and vegetable canning will increase. The possibility is that once the standardization measures are adopted, the products of this industry may gain a competitive advantage in foreign markets, especially in the European Common Market.

Handicrafts

The production of handicrafts is gradually being revived by the government. To assist it, a special bureau, the National Association of Greek Handicrafts, was established at the Ministry of Industry. The bureau has these main objectives: 1) to establish and support home industries, 2) to improve the quality of handicrafts, 3) to study the implementation of measures to increase production, 4) to improve the contact between the

129. Awards have been granted to CEKOP to build a $ 250,000 cold storage plan in Skydra and to the Italian firm SAMIFI for the construction of a $ 20,0000 storage plant at Naousa.

producer and consumer, 5) to familiarize the producer with the needs of the market, and 6) to find new markets.

Their Majesties' Fund, which was established to raise the standard of living in the Greek rural areas (especially in Northern Greece), is also interested in the promotion and development of Greek handicrafts in order to provide the peasants with profitable work during the non-growing season.

The Fund is now providing raw materials, adequate training, and all possible facilities to the village handicraft workers through the Rural Youth Centers. Carpet-making is being taught to rural girls with the hope of increasing the production of carpets which has been declining since 1950 (see Table 72). Every girl who completes the course of instruction receives from the Fund a loom and the raw materials needed to weave two carpets. This is done to give her a good start in her new occupation. The quality of carpets produced has been improved and now successfully competes with the quality of Oriental carpets offered on foreign markets. Every effort is made to weave carpets with purely Greek desings, which proved to be of great interest to foreign buyers when they were shown at the International Exhibition in Florence, Italy. Also, exhibits of Greek costumes and embroideries have been held in the United States under the auspices of Their Majesties' Fund.

The equipment used in handicraft production—hand operated loom, spinning wheel, carding machine, dyeshop, etc.—is primitive, and this is the main cause of the low output of the industry. Even though the output is very low, it is sufficient to meet the demand since no time factor is involved. Handwoven skirts, woolen peasant bags, embroidered linen, handmade carpets, and needlepoint rugs are some of the items produced by the village handicrafters. The "Ousak" rugs of Kozani, incomparable in design and color, are in demand throughout the country. The tradition of embroidery and hand-knitting continues, while small knitting machines are used for the production of household articles. The raw materials used are usually produced locally. Some wool is imported for the production of woolen articles. There are no reliable figures of the number of workers or the volume and value of production. In the tobacco-growing areas, of course, the shortage of labor curtails the expansion of the home industries, for here the farmer's helpers are needed to sort and grade the tobacco leaves in the non-growing season. Tobacco culture is labor-intensive.

The processing of fur clippings, mostly imported from the United States, into furs is carried on exclusively in the towns of Kastoria and Siasista. There are 230 fur-processing workshops, which employ approximately 2,300 workers. The majority of the workers are engaged by shops

doing work for foreign furriers. The largest fur shop employs about 250 workers and the smallest less than 3 workers. Most of the work rooms are small (less than 15 square meters of floor space) and inadequately equipped. The wages paid to workers range from 80 drachmas ($ 2.50) to 150 drachmas ($ 5.00) for an eight-hour work-day. The shops of the foreign-contractors are modern, well-equipped, and efficient. Unlike the small scale fur-processors, they have more capital to devote to the physical improvement of their workshops. On the whole, the Greek fur-processors believe in family-owned and operated enterprises. They do not want to borrow capital for the expansion and improvement of the enterprise outside the family circle. In short, they are simply not interested in forming large corporate structures, even if doing so might mean strengthening the economic position of the fur industry at home and abroad.

Further growth in handicrafts would be determined by the success of the government in solving the two basic problems — poor production methods and lack of markets. The problem of marketing handicraft products is difficult because of the limited contract between the producer and consumer. In its efforts to revitalize the home industries, the government should not try to check historical trends by assisting village industries which will inevitably decline and ultimately disappear. Although the conditions under which the village handictaft industries started and prospered are gradually changing, the production of handicrafts will remain for a long time a determining factor in the economic, social, and cultural milieu of many large and small villages. Even if only limited results can be achieved by the implementation of the handicrafts expansion and improvement program, it should be encouraged as a means not only of raising the earning capacity of the farmers, but also of reducing the pressure of rural labor migration on the labor-surplus urben centers.

Despite the assistance granted by the government and other agencies to the sector of manufacturing, it has not kept pace with agriculture because of the emergence of the Athens-Piraeus areas as the industrial region of the nation. Unlike those factors in Thessaloniki, the compelling factors of Athens are more to the liking of the investors:

1. availability of a large domestic market
2. an excellent rail and road transport system
3. research and maintenance facilities
4. availability of «risk» capital
5. low cost of imported raw materials
6. political favoritism.

The establishment of industries in Northern Greece based upon the processing of imported raw materians is not economical because of the high cost of transportation, and a limited market. The completion of the highway development program under the Five-Year Economic Program would strengthen the position of the Athens-Piraeus urban-industrial region at the expense of Thessaloniki. Even if the government imposes restrictive measures on the expansion of industry in Attica, Athens will continue to grow, because she is the product of geographical location. Athens occupies the geographical center of the economically effective section of the nation, whereas Thessaloniki is situated on the periphery of it. Under the existing economic and social conditions, Northern Greece can only support industries based on the consumption of locally produced materials [130].

I agree with those who say that the concentration of industries in Athens and Piraeus does not favor the development of a national economic balance, and that such concentration also encourages farm labor to migrate to the large urban centers. However, I feel that the nation does not possess the means to execute a dynamic program to "keep the boys down on the farm". The industrialization of not only Northern Greece but also of the other regions is entirely dependent on government capital [131] and other forms of assistance. However, the government's assistance should be restricted to those industries where there is reasonable prospect for efficient production, and where production is within the technical capacity available in Northern Greece. Outside technical and managerial assistance should be invited when needed.

Northern Greece is scheduled to receive economic and technical assistance under the Five-Year Economic Program [132]. It is felt that further industrialization is needed to alleviate the region's chronic unemployment problem [133]. The problem has become very acute since the rural population has been exposed to the "revolution of rising expectations",

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130. The largest and perhaps most promising possibility for new industrial development lies in the utilization of the regions lignite deposits (Ptolemais, Serres, Vevi, etc.).

131. There is some private capital, but most of it is invested in urban or rural real estate, or in highly profitable commercial transactions.

132. IDO (Industrial Development Organization) has been formed by government and other private interests as the principal agency for industrial development. Its main task is to make recommendations to the government for the promotion of industry.

133. In 1958 there were about 50,000 unemployed workers in the large cities of the region. Unemployment figures, even if available, are often untrustworthy.

since it became more aware of its poverty and social insecurity, and since the improvement of transportation and communications between the villages (mountain and plains) and the urban centers. The urban workers have become alarmed by the influx of farm labor competing with them and aggravating already existing unemployment, particularly in the textile industry. It is also hoped that the proposed developments in agriculture and animal husbandry would open significant prospects to the villagers and tend to check the flow of labor from the villages to the cities. The most useful technical assistance that could be given to the industry would be the improvement of its local raw material supply. This would require an educational program for the producers, processors, and distributors of raw materials.

In spite of the presence of a host of handicaps—shortage of capital, technical inexperience, inadequate market, and competition from the Athens-Piraeus industrial center—considerable progress was made by industry after the end of the Second World War. The outstanding development was the exploitation of the lignite deposits of the Ptolemais basin for industrial uses. The completion of the nitrogen-fixation plant, together with already completed thermo-electric plants, will convert the basin into a small industrial complex. The government also contemplates construction of small chemical plants to utilize the by-products of lignite. The region's need for food-processing and preserving plants, cold storage plants, and other facilities is now being earnestly tackled by the government. The primary objectives of the region's industrialization program as conceived by the government are these: 1) to fully utilize both the completely neglected and only partially exploited resources, 2) to meet the future demand of the market, and 3) to create new jobs for the unemployed workers. Since 1950, the expansion of the construction building materials, metals, food processing, and chemical industries is gradually reducing the importance of the textile industry as a major provider of industrial jobs. The textile industry has been unable to recover its prewar position because of the expansion of this industry in the other sections of the country, especially in Athens and Piraeus.

The implementation of the government's industrialization program for Northern Greece would not only renew the confidence of private capital investors in the future of the area, but would also push the element of psychological fear (resulting from the region's close proximity to the Communist bloc and Communist Yugoslavia) into the background — I hope — permanently.

TABLE 66.

Loans Granted to Different Sectors of Economy, 1949 - 1958.
(in U.S. dollars).

	Greece	Northern Greece	Per cent of total Northern Greece
Industry	39,957,800	4,498,400	11.2
Mining	17,578,[illegible]	15,997,600	90.4
Agriculture	10,085,600	1,738,600	17.1
Fishing	2,093,[illegible]	252,800	12.0
Transportation	4,514,700	290,000	6.4
Tourism	1,417,400	46,700	3.2
Welfare	10,136,900	136,000	1.3
Total	85,[illegible]	22,[illegible]	26.69

Source: Chamber of Commerce and Industry, Thessaloniki, 1960.

TABLE 67.

Index of Industrial Production, 1948 - 1959.

Year	Greece	Northern Greece
1[illegible]	100	100
1948	73	65
1949	[illegible]	69
1950	110	99
1951	135	114
1952	124	111
1953	141	126
1954	172	139
1955	185	142
1956	189	143
1957	205	154
1958	227	165
1959	256	186

Source: Chamber of Commerce and Industry, Thessaloniki, 1960.
Ministry of Northern Greece, Section of Manufacturing, Thessaloniki, 1960.

TABLE 68.

Relative Contribution of Various Branches of Industry to total Industrial Production of Northern Greece, 1938, 1950, 1955, 1958, 1959.

Sector of Industry	1938	1950	1955	1958	1959
Metal Industries	1.80	0.45	0.84	0.75	1.61
Machine shop Industries	5.60	5.93	6.05	6.25	7.10
Construction Materials	1.80	2.10	2.80	3.10	3.25
Textiles	50.40	54.10	46.10	36.35	30.15
Food Processing	22.70	22.40	24.00	31.35	34.35
Chemicals	3.90	6.25	5.10	6.80	8.75
Leather	5.00	1.41	1.75	1.05	1.14
Paper	1.40	0.75	0.76	0.78	0.65
Power	4.10	5.14	10.95	10.98	11.85
Miscellaneous	3.30	1.47	1.62	2.69	3.15

Source: Ministry of Northern Greece, Section of Manufacturing, Thessaloniki, 1960.

TABLE 69.

Size of Plants and Number of Workers, Northern Greece, 1950, 1955, 1959.

Workers per plant	1950		1955		1959	
	No. of plants	No. of workers (Total)	No. of plants	No. of workers (Total)	No. of Plants	No. of workers (Total)
0 - 10	66	398	55	198	77	143
11 - 20	42	614	15	250	19	283
21 - 50	45	1,410	35	1,080	36	1,089
51 - 100	20	1,428	15	1,012	9	655
101 - 200	14	2,046	9	1,635	15	1,955
201 - 500	11	3,267	10	3,080	9	2,842
501 - 1,000	5	3,412	3	1,902	3	1,905
1,001 and above	2	2,322	3	3,202	—	—
Total	205	14,897	135	12,345	145	8,870

Source: Chamber of Commerce and Industry, Thessaloniki, 1960.

TABLE 70.

Number of Workers and percentage of Labor Force in Various Industries, Northern Greece, 1950, 1959.

	1950		1959	
	Number of Workers	Per cent of total	Number of Workers	Per cent of total
Machine shop industries	590	3.9	850	8.4
Construction materials	8,470	56.4	1,040	9.3
Textile industries	8,300	55.3	4,745	50.4
Food processing industries	2,710	18.1	1,645	16.3
Chemicals	900	5.9	930	8.3
Leather	170	1.2	87	0.9
Paper-making	390	2.5	319	3.3
Power	1,700	11.3	514	5.5
Total	15,020	100.0	10,101	100.0

Source: Ministry of Northern Greece, Section of Manufacturing, Thessaloniki, 1960. Chamber of Commerce and Industry, Thessaloniki, 1960.

TABLE 71.

Value of Manufactured Goods, Northern Greece, 1955, 1958, 1959. (in U. S. dollars).

Item	1955	1958	1959	Per Cent of total (1959)
Machine shop industries	2,450,000	3,600,000	3,900,000	6.9
Metal industries	470,000	470,000	950,000	1.7
Construction materials	1,500,000	2,700,000	2,250,000	4.0
Textile industry	22,100,000	21,700,000	16,500,000	29.6
Food processing industry	11,250,000	17,700,000	18,750,000	33.6
Chemicals	3,400,000	4,000,000	3,950,000	7.1
Leather	850,000	400,000	550,000	1.0
Paper	520,000	400,000	370,000	0.7
Miscellaneous	5,100,000	7,350,000	8,585,000	15.4
Total	47,810,000	57,100,000	55,765,000	100.0

Source: Ministry of Northern Greece, Section of Manufacturing, Thessaloniki, 1960.

TABLE 79.

Industrial Production, Northern Greece, 1938, 1950, 1955, 1958, 1959.

Item		1938	1950	1956	1958	1959
Metal Products	Tons	6,300	n. a. *	7,300	9,900	10,750
Nonmetallic Products						
Clay Bricks	1,000 units	8,900	1,200	25,000	55,300	50,000
Clay tiles	1,000 units	6,000	7,200	13,000	13,700	12,500
Clay pipes	1,000 units	60	70	250	350	425
Cement pipes	Meters	5,100	12,050	10,100	13,625	7,950
Asbestos	Tons	25,500	32,050	34,100	42,000	41,750
Textiles						
Cotton yarn	Paks **	500,000	578,000	700,000	900,000	650,000
Cotton cloth	1,000meters	8,700	11,000	14,000	17,000	16,000
Woolen cloth, blankets	1,000meters	2,325	1,500	2,150	1,190	1,270
Woolen yarn	Tons	650	850	1,350	1,400	1,560
Knitted garments, stocks	Tons	85	225	310	295	295
Ropes, bags, etc.	Tons	1,430	1,420	2,740	4,400	3,930
Silk	Tons	85	45	55	12	10
Silk cloth and blended	1,000meters	170	300	430	465	480
Carpets	M2	18,000	4,210	8,250	7,510	7,500
Food Processing						
Flour	Tons	193,000	196,000	185,000	181,000	180,000
Alimentary foods	Tons	4,300	4,995	4,310	4,320	5,525
Rice	Tons	—	—	12,500	13,700	16,500
Beverages						
Beer	Tons	2,724	4,835	4,900	9,440	8,150
Wines	Tons	340	310	450	510	500
Liquor	Tons	2,240	2,210	3,005	3,220	3,225
Canning						
Tomato - paste	Tons	—	225	145	1,028	890
Vegetables	Tons	—	120	255	740	745
Fruits	Tons	75	385	170	515	970
Fish	Tons	14	n. a. *	n. a. *	100	105

TABLE 72.

Continued.

Item		1938	1950	1955	1958	1959
					*	
Vinegar	Tons	—	300	210	490	500
Carbonic acid	Tons	85	85	112	175	145
Ice	1,000 bars	1,350	1,590	2,145	2,980	2,650
Seed - oil	Tons	650	780	1,650	4,050	3,500
Livestock Cakes and meals	Tons	2,250	3,450	9,700	27,000	25,500
Chocolate	Tons	640	620	610	1,150	1,200
Candy (halva, etc.)	Tons	1,710	1,400	3,400	4,200	4,100
Salted Preserves	Tons	610	700	680	525	500
Chemicals						
Soap	Tons	2,100	1,750	1,700	1,600	1,100
Oxygen	M3	64,510	62,400	111,300	148,000	157,000
Acetylene	M3	32,900	n. a. *	43,000	48,980	51,925
Other Chemical Products	Tons	550	810	1,050	2,150	2,650
Leather	Tons	80	210	100	90	70
Leather footwear	1,000 pairs	115	25	42	55	61
Paper Products	Tons	1,500	1,210	2,345	3,520	3,070
Electricity	1,000 Kwhr	17,050	33,140	45,050	117,500	159,610
Miscellaneous	Tons	450	110	95	90	95

Source: Ministry of Northern Greece, Section of Manufacturing, Thessaloniki, 1950. Chamber of Commerce and Industry, Thessaloniki, 1960.

* Not available.

** The weight of a paka ranges from 3 to 5 kilograms.

TABLE 73.

Imports of Raw Materials for Textile Industry Northern Greece, 1938, 1957, 1958, 1959.
(in metric tons).

Item	1938	1957	1958	1959
Ginned - cotton	1981	781	55	—
Cotton yarn	25	—	—	—
Wool and hairs	465	470	245	90
Woolen yarn	145	94	33	55
Hemp	776	334	356	377
Rayon yarn	817	49	243	1070
Sisal	85	1076	946	697

Source: Ministry of Northern Greece, Section of Industry, Thessaloniki, 1960.
Chamber of Commerce and Industry, Thessaloniki, 1960.

CHAPTER VIII

ELECTRICITY

The reorganization, rehabilitation, and expansion of the region's electric power facilities were slowed down until 1950 by the destruction of stations and machinery by air raids during the war, by the seizure and transportation of machinery to Bulgaria by the Bulgarian occupation forces, by damage owing to improper maintenance and operation, or by complete destruction and demolition by the rebels during the Communist-led insurrection.

The production of electrical power was unevenly distributed. It was concentrated in the large cities and towns and was produced by private and municipal companies. These companies had obtained permission from the government to produce and distribute electric power in the provincial cities and towns. Each of these companies served a city or town with separate installations and distribution nets. There was no regional grid system.

The annual consumption of electricity in the region was 5.8 per cent of the national total in 1950[134]. The low consumption of electricity was not caused by any lack in demand for electricity, but by the inability of the local small installations to meet the ever-increasing demand for power by both domestic and industrial users. The available power in some small towns was the by-product of a small generator, hitched to a small mill during the day, and producing feeble current for a few dim lights in homes and shops for two or three hours in the evening. The electric rates were also high because of the use of outmoded generators, powered with imported oil.

Providing cheap electricity not only in Northern Greece but also in the entire country has been the aim of the Greek government since 1945. This goal was also recognized by the American Mission to Greece in 1947. The idea of electrifying the country was conceived by both of them not only as a means of increasing domestic output, but also of increasing the

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134. The data for this chapter was obtained from the Public Power Corporation, Thessaloniki Branch, Thessaloniki, 1960.

cost of agricultural and industrial production and closing the economic gap between the urban and rural areas.

The task of producing and distributing electricity on a nation-wide basis was assigned to the Greek Public Power Corporation (PPC), which was created by the Greek Government in July, 1950. The Corporation was also given the responsibility of gradually purchasing the local electric plants, and providing the involved areas with electricity from the national power system.

The assignment of drawing up a technical and economic survey for the prospective electrification of the country was given to the American firm EBASCO SERVICES INCORPORATED of New York City. EBASCO worked out a national electric power program for Greece based on the existing local resources—lignite and waterpower. The use of these resources would eventually eliminate the country's dependence of foreign exchange for the importation of fuel oil. Although the lignite deposits are sufficient, hydroelectric power is limited by the low volume and gradient of the rivers, the almost total absence of falls or rapids, and the wide variations in seasonal flow.

The EBASCO report, which was adopted by both the Greek government and the United States, called for the construction of a 40,000 kw capacity hydroelectric plant in Agra, Pella. This plant, which has been named after a village near its site on the Vodas river, was completed in 1954 and is fitted with two turbo-generator units of a total capacity of 50,000 kw and an annual output of 60 million kw-hr. A free flow tunnel connects Lake Nissia, which is drained by the Vodas river, with the main power storage reservoir—Lake Ostrovo [135]. This lake is 42 meters higher than Nissia and has a usable volume of 400 million cubic meters of water. Near the mouth of Lake Nissia, a diversion dam directs a part of the flow of Vodas river into a head race canal, then through a pressure tunnel and penstock to the Agra plant. To regulate the discharge of water into the Vodas river, which flows through the city of Edessa before it drops off the escarpment to form the Edessa waterfalls, a re-regulating reservoir has been built next to the plant. The earthen dam is 179 meters long and 9 meters high. When the reservoir is full, it covers an area of approximately 100 stremmata and holds about 400,000 cubic meters of water. Without this protection, the city of Edessa and the plain below the falls would have been subjected to periodic floods because the river cannot carry all the water which may be discharged into it by the plant. The So-

135. It also known as Lake Vegoritis or Arnissa.

cieta Edison Company of Italy designed and constructed the plant. Italian war reparations, and American and Greek funds were used to finance this project which cost $ 14,899,000. Transmission lines carry power to the cities of Thessaloniki, Serres, Drama, and Kavala. Substations along the course of the main transmission line radiate power to smaller towns and large villages.

The 70.000 kw capacity thermo-electric plant at Ptolemais was put into operation in September, 1959, and was the first plant to be completed under the Second Five-Year Electrification Program. This program was initiated and administered by PPC since 1955. In that year EBASCO terminated its administrative tutorship of PPC. The plant, using lignite as fuel, has an annual output estimated at 500 million kwh. Swiss and German credits ($ 8.000.000) were used to finance part of the total cost of this project. Both the Ptolemais and Agra electric plants are connected to the National Power System. Figure 67 shows the system of electric power production and transmission in Northern Greece in 1960.

PPC also considers the construction of a second 125.000 kw capacity thermo-electric plant at Ptolemais and a 25.000 kw capacity plant at Edessa. The former, with an annual output estimated at 900 million kwh, will go into operation in 1962. The French firm ALSTHOM has been assigned the task of constructing this plant. The latter will be built at the foot of the Edessa waterfalls and will be supplied with water by the re-regulating reservoir. The construction of the penstock and hydroelectric turbine has been given to the Austrian firm VOEST. However, the completion of this project may be delayed by opposition and by excessive claims for damage from both the municipality of Edessa and the owners of the textile plants. The former fears that the project will destroy its main tourist attraction – the waterfalls. The latter do not want to lose their water rights. Now they have almost free electricity. They see all too clearly that they will not be in a position to pay PPC for the use of electricity and still operate profitably in a period of stiff competition in the textile field. It is a known fact that the low cost of electric power has kept them in operation despite the long distance from the market and their use of out-moded machinery.

The linking of the national grids of Greece and Yugoslavia was completed in the spring of 1960 and has been in operation since September 1960. The agreement, which was signed between PPC and YUGEL (Yugoslav Union of Electricity) on May 22, 1959, called for the construction of two transmission lines of 150 kv—one from the Ptolemais plant and the other from the Monastir (Bitolj) substation to Niki at the Greek-Yugo-

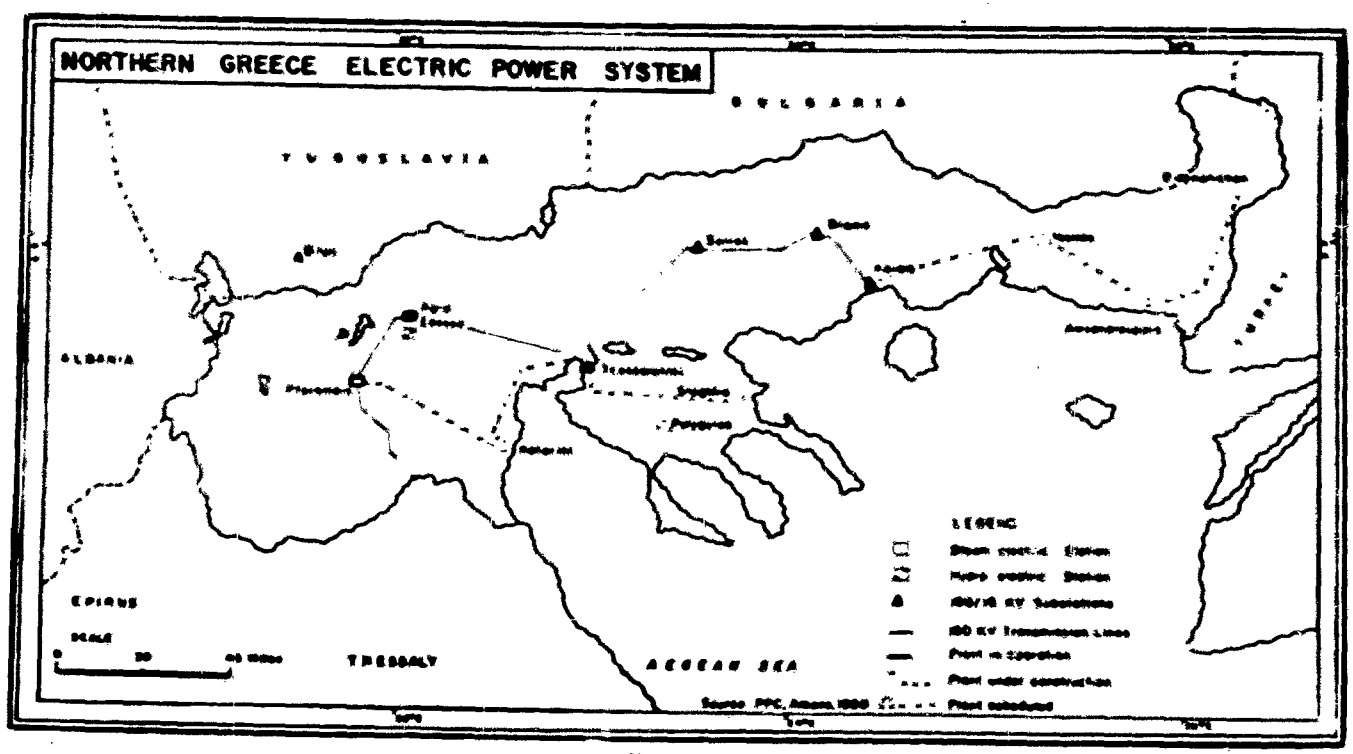
NORTHERN GREECE ELECTRIC POWER SYSTEM
YUGOSLAVIA
BULGARIA
ALBANIA
EPIRUS
THESSALY
AEGEAN SEA
LEGEND

Figure 67.

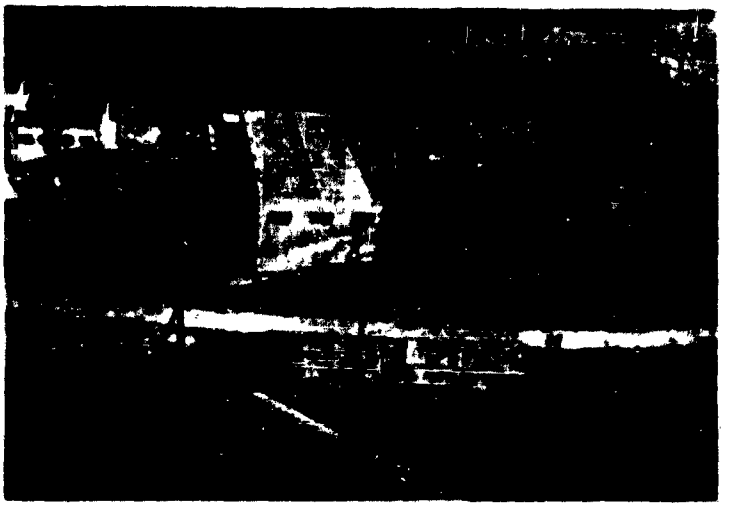

Fig. 68. The Agra hydro-electric plant near Edessa.

Fig. 69. The 70.000 kw thermo-electric plant at Ptolemais.

slav frontier. The agreement also called for the installation of an automatic transformer of 110/150 kv of 40/50 kva at the Bitolj substation. The cost of these installations and other electrical equipment was borne by both companies. This linking has ensured for the entire electric system of Greece the advantages of a large reserve unit. The installation of such a unit would have immobilized capital which is desperately needed by the other sectors of the economy. Similar benefits would also accrue to Yugoslavia. There will be no great difficulty in the exchange or sale of electricity between Greece and Yugoslavia because their peak period of consumption do not coincide. PPC is also considering the possibility of a similar link-up with Turkey.

The availability of electricity and uniform rates has increased the consumption of electricity by the farmers, especially in the irrigated areas. Here PPC is encouraging [136] them to install permanent electrically-operated water pumping facilities for the reasons listed below:

a. the use of electricity for the operation of the water pumps would not place an extra burden on the electric network because the pumps will operate during the off-peak hours

b. it would decrease the cost of irrigation since electricity is cheaper than the use of draft animals to operate the pumps

c. it would provide PPC with new revenue to complete the rural electrification program of the region.

The cost of electricity needed to irrigate a stremma ranges from 53 drs. ($ 1.73) to 26 drs. (86 cents), depending on the crop under cultivation. Such crops as cotton and rice require more water than corn does. Hence, the cost of irrigation is high for them. The irrigation service rate schedule is as follows: 0.9 drs. (3 cents) per kwh for the first 150 kwh per kw of demand, and 0.4 drs. (1.69 cents) kwh for all additional energy.

Since the government is greatly interested in increasing the amount of land under irrigation, it has been granting special assistance to the farmers who wish to install permanent water-pumping facilities. If the distance between the farm and the high tension line is more than 30 meters, the farmer is obligated to share the cost of the installation of an extension line from the main line to the farm. His contribution is determined by

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136. The slogans used by PPC to promote the use of electricity by the farmers are simple and revealing:

"Use electricity to operate the water-pumping installations".

"The use of electricity will decrease your cost of production".

"Irrigated farms produce more and better crops".

subtracting the estimated sales of electricity to him for the next four years from the total cost of installation. To illustrate:

Total cost of installation	15,000 drs.
Value of energy used by the farmer for four years	10,000 drs.
Farmer's share of the total cost of installation	5,000 drs.

The farmer may borrow the money from the Agricultural Bank of Greece without interest for five years. However, he has to pay the bank a small service charge. If the share of the farmer is more than 7,000 drs. (ca $ 23), he may have to wait until electricity is brought closer to his farm before he applies for the installation of an extension line from the main line to his farm for the purpose of installing permanent water-pumping facilities.

As of 1959, PPC supplied electricity to 164 permanent water-pumping installations throughout the region. The geographical distribution of these installations, the number of stremmata under cultivation, kinds of crops cultivated, and the total cost of installation is shown in Table 74. By the end of 1959, more than 2,390 requests had been received by PPC from the farmers of the region to bring electricity to their farms to operate the water-pumps.

The total installed capacity of the generating plant increased from 20,000 kw in 1940 to 125,000 kw in 1959. The annual output of electricity increased from 11 million kwh in 1955 to 150 million in 1959. The distribution of power consumption by various uses in Northern Greece and the total power supply are shown in Table 75. It should be noted that the consumption of electricity for power (industrial) is higher than that for lighting. However, the consumption for lighting is gradually rising and it may eventually surpass that of power. This is largely due to the fact that in the small villages and towns, electricity is consumed almost exclusively for lighting. Approximately 88 per cent of the total electric power produced was sold to industrial, commercial, and residential users. The most important consumer of electricity is the city of Thessaloniki, which in 1959 consumed 106 million kw out of 150 million kwh produced in the region. Fifty per cent of the customers and thirty per cent of the villages served by PPC are in Northern Greece.

The demand for electricity is increasing daily. The villagers now want to use electricity not only for lighting, but also for power purposes. PPC's decision to bring electricity to the low-consuming mountain and

plains villages, especially in the frontier zone [137], must be subsidized by the government because the majority of these villages are poverty stricken and destitute. However, they are of great political and strategic value to Greece in the present struggle between communism and democracy. Greece, a democratic nation, has to prove to the world and especially to her northern communist neighbors that she is really interested in raising the standard of living of the economically and socially backward border-line villages. Some of them have small diesel electric plants ,but eventually will be hooked up to the national power grid. In some cases it would be better to supply the outlying villages with diesel plants. This would be cheaper than attaching them to the existing electric grid. The scarcity of investment capital may delay the completion of the rural electrification program.

There is no doubt that a supply of cheap and plentiful electric power will allow the development of agriculture and industry and a general improvement in the standard of living of the people, particularly in rural regions. The Greek farmer will be given the electric current he needs in his home and on his farm; and power will be available for small agricultural industries. PPC is now holding exhibits on the use of electrical appliances in the rural areas. Some of the farmers have already purchased electric appliances such as stoves and refrigerators. The sector of mining will also be strengthened. The use of cheap power not only would decrease the cost of mining, but also would lead to the establishment of minerals processing industries. A contract already has been signed between PPC and the Magnomin Co., which operates the Vavdos Magnesite Mine. The Hellenic Co. of Chemical Products and Fertilizers in Stratoni, Halkidiki, will receive power from PPC as soon as extension of the 150 kv line and the substation of Stratoniki are completed.

Much progress has been made in the electrification of the region despite the presence of such obstacles as lack of capital, shortage of technically-trained personnel, outmoded diesel electric plants, low-consuming industrial and mining activity, and the high cost of bringing electricity to the outlying towns and villages. The per capita consumption of electricity increased from 21 kw in 1950 to 66 kw in 1959. The yearly consumption of electricity was 8 per cent of the national total in 1959. It is hoped that by 1970 all the people in Northern Greece will enjoy the benefits of inexpensive electric power.

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137. PPC is contemplating the installation of a 24 kw installed capacity hydroelectric station at Agios Germanos in Florina prefecture. The village is near the Greek-Yugoslav border.

TABLE 74.

Electricity Supplied to Permanent Water - Pumping Installations by PPC in Northern Greece, 1959.

Districts	Number of water - pumping installations	Irrigated land in Stremmata	Kinds of crops under cultivation	Cost of installation in drachmas
Thessaloniki	133	3,970	Cotton and vegetables	1,211,172
Agra	13	1,555	Orchards	344,346
Serres	6	16,100	Orchards rice, tobacco seeds	177,500
Drama	4	49	Vegetables, Orchards, Alfafa	50,904
Kavala	6	145	Orchards	30,461
Kozani	2	108	Tobacco seeds	39,691
	164	21,922		1,753,693

Source : Public Power Corporation, Thessaloniki, 1960.

TABLE 75.

Energy Sales by PPC in Northern Greece and Consumer Classifications, 1959.

	Number of Consumers	Total kilowatt hours sold	Total value in drs. of energy used	Per cent of total number of consumers	Per cent of total kilowatt hours sold	Per cent of total value of energy use
Residential	158,010	41,070,879	61,374,000	77.0	27.4	37.7
Commercial	43,660	33,497,194	45,618,365	21.3	22.3	28.0
Industrial	961	54,332,471	39,946,173	0.4	36.9	24.5
Public Authorities	1,646	10,130,564	8,992,097	0.8	6.8	5.5
Rural	505	1,068,444	1,068,444	0.3	0.7	0.7
Street Lighting	426	5,944,380	5,944,380	0.2	3.9	3.6
Total	205,089	150,128,808	162,723,329	100.0	100.0	100.0

Source: Public Power Corporation, Thessaloniki, 1960.

CHAPTER IX

TRANSPORTATION

Railroads

The rehabilitation of the region's railways was a major undertaking in its economic recovery program. The railroads were needed to transport equipment, supplies, machinery, tools, and other items to the different sections of the area in the early postwar years because the highways were in a poor condition.

Efforts to restore the railways began in early 1945, with financial and material help made available by UNRRA, AMAG, American Mission, U.S. Army Surplus, and German and Italian Reparations. Approximately one-third of the total amount of capital spent on the railroad construction program between 1948-1955 was advanced under U.S. Economic Aid Program. The rehabilitation of the railways involved the retraction and renewal of lines; the replacement of roadbeds and sidings; and the construction of railway stations, viaducts, bridges, and water tanks. New rolling stock (steam and diesel engines, diesel cars, passenger cars) was imported from Italy under the Italian Reparations Agreement. In the railroad yards of Thessaloniki the following installations were constructed: a central storage depot, a coach workshop, a new engine shed, a diesel-car shed, and a classification yard.

Despite the Guerrilla War, the acute technical problems that had to be faced, and the construction of engineering works in rugged and inaccessible areas, the railway network [138] was completely rehabilitated in 1949.

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138. This network consists primarily of three branches fanning from Thessaloniki (see Figure 70). One branch runs westward where it meets the Athens-Thessaloniki line at Platí, and from that point through Veria and Naousa to Edessa; it continues on to Florina, then turns south to Ptolemais and Kozani, and north to Nea Kafkasos on the Yugoslav border. The second line runs directly northward from Thessaloniki to the Yugoslav Border at Eidomeni. The third takes a northerly direction and then eastward, parallel to the Greek-Yugoslav frontier. At Sidherokastron, the line turns southeast, passes through Serres, and then turns eastward to Alexandroupolis. From there, the line turns north along the Turkish frontier, passes through Pythion (on the Greek-Turkish border), and terminates at Ormenion

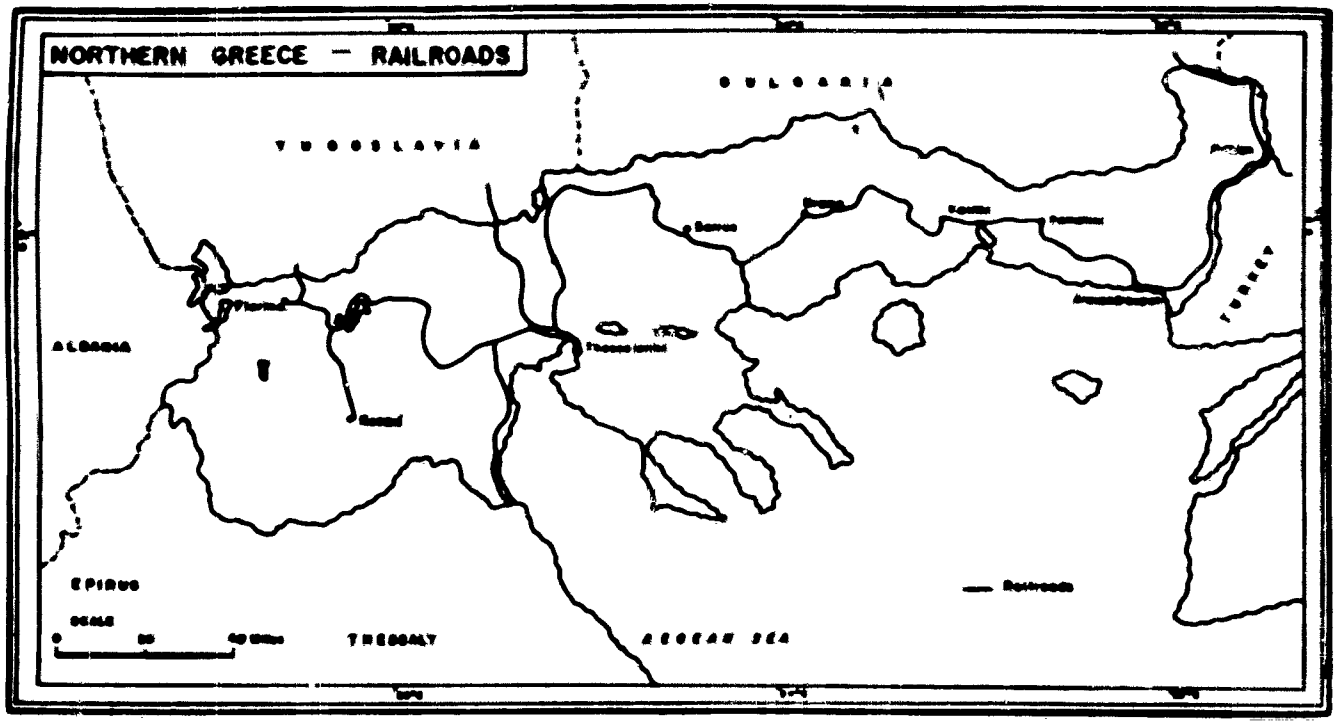
NORTHERN GREECE — RAILROADS
YUGOSLAVIA
BULGARIA
TURKEY
ALBANIA
EPIRUS
THESSALY
AEGEAN SEA
— Railroads

Figure 7.

Since the improvement of the road network, the railroad's share of the passenger and freight traffic has not reached the pre-war level. Much of the region's industrial and agricultural production is now hauled by trucks [139]. The railroad is operating at a loss, which is borne by the government. The uneconomic operations of Greek railways will continue as long as the government is not facing up to the fundamental need for a broad and balanced plan to coordinate transport requirement in Greece. The industrialization of the Ptolemais basin is opening new possibilities for rail transport of heavy equipment and bulky goods (briquettes and fertilizers).

In order to improve the competitive power of the railroad, the officials of the Greek Railways suggested the adoption of the measures listed below:

1. increasing the speed of both passenger and freight trains
2. reducing operating costs
3. laying of second tracks in areas where traffic is dense
4. abandoning the uneconomic routes
5. improving the training of railway technicians and managers
6. supplying packing and collection facilities along the main track to which the farmers could send their products for transport.

Roads

At the conclusion of the war, the roads were badly damaged, and motor transport was reduced to a few dilapidated wrecks in need of repair. Unable to finance the rehabilitation of the road system after the war, the government called on the United States for aid.

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on the Greek-Bulgarian frontier. The former two are of considerable strategical importance because they form the principal route between Greece and the rest of Europe. The connection with Western Europe is subject to political control, i.e., interruption of rail traffic by Yugoslavia would create a major problem in import and export of freight to Central Europe and Western Europe, the more so since rail transportation cannot, in this particular case, be replaced adequately by truck transportation: the trucks have to go through the same area. This third branch is of value in serving the economic needs of Thrace. It is also politically and strategically important, since it is the only railway link between Turkey and Bulgaria. The railroad system of the region is 962 kilometers of standard gauge and all of it is owned and operated by the government. In 1954 the government purchased the concession of the French-Hellenic Railway Co., a stretch of 175 kilometers of standard gauge extending from Alexandroupolis to the Turkish and Bulgarian frontiers in the north.

139. In 1959 there were about 7,000 trucks in the regions. The trucks are owned and operated by merchants, industrial concerns, farmers, and others.

The development of highways ws slow and difficult because of rugged terrain, acute shortages in skilled labor and materials, and political interference. Indeed, not until after World War II did Northern Greece devote real attention to its road syrems. With the financial and technical assistance of the United States, the region embarked in 1947 upon a program of highway rehabilitation. At the end of 1959, serviceable roads totalling 11.519 kilometers were provincial roads, and 3.379 kilometers were municipal or communal roads. The existing roads reach most of the populated districts, but there are areas with good agricultural possibilities, areas which have poor connection with the provincial towns. The roads range from asphalt surface, passable macadem, and ruined macadem to graded and primitive trails. Most of the main surfaced roads are of 5.5 meters width, not sufficient for safety unter present or anticipated traffic conditions. The main arteries are now being widened and surfaced with asphalt. The road system is immeasurably better today.

The region has many transportation problems, but the important ones are these: 1) how to provide transportation to the isolated villages in the mountainous region of Western Northern Greece, 2) how to provide the most efficient and economic method for moving the goods from the village to the cities, and 3) how to provide at least routine maintenance of existing roads in many areas.

The availability of some American capital, in conjunction with the expended agricultural and industrial production with concommitant rise in road traffic, has encouraged the government to continue the highway development program in the region. One of the main objectives was to shorten the distance and time between Thessaloniki and Athens. This was achieved by the completion of the road through the Valley of Tempi. The distance between Athens and Thessaloniki was shortened by more than 80 kilometers. The bridge across the Evros near Epeala, which was built jointly by Greece and Turkey, has been completed, and the work continues on the «Balkan Highway» connecting Yugoslavia with Athens and Istambul via Thessaloniki.

Beyond the improvement of the national roads, an increasing emphasis must be placed on rural roads. These roads are of vital importance to agricultural development. Also, they can be built cheaply, using local materials and employing farm labor in off-season periods, and they require no foreign exchange.

The region as a whole has far too little road-building and maintenance machinery for effective work. Mechanization must, of course, be introduced gradually where so much of the work is now done by hand. The

Fig. 71. Wet weather churns the unpaved roads into practically unirradden tracks of sticky mud.

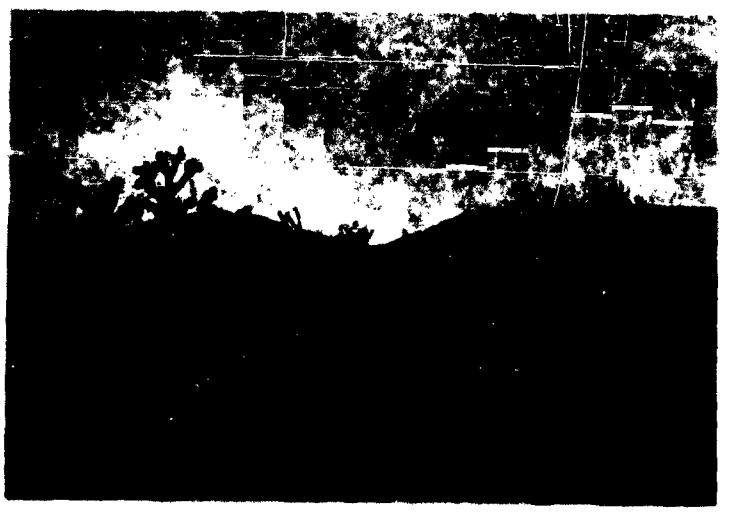

Fig. 72. An asphalt surface road.

present stock of equipment can not meet even current needs. There are only a few graders and bulldozers for maintenance purposes; moreover, the difficulties of road maintenance are augmented by the use of trucks which are too heavy for the roads. The trouble comes from overloading of trucks and excessive axle loads.

Supplementing rail and road transport, a domestic daily air service links the region's cities (Thessaloniki, Kozani, Kavala, and Alexandroupolis) with Athens. However, they are not linked with the capitals of Europe. The service is being provided by the Olympic Airways, which is owned and operated by the Onassis interests. Before 1958, the route was operated by the Greek government. Since 1950 air traffic has been increasing steadily, and it has become apparent that the airport facilities of the region are no longer adequate to meet the increase in air traffic.

Whatever else Northern Greece may undertake in other sectors of the economy, its success will be dependent upon an adequate access to sources of agricultural and non-agricultural production and to domestic and world markets.

CHAPTER X

PORTS AND TRADE

Ports

Northern Greece has several small and large ports, but the most important are Thessaloniki, Kavala, Alexandroupolis and Portolago (see Figure 2). The majority of the ports are just open roadsteads with inadequate harbor areas and obsolete and inefficient handling facilities.

Thessaloniki [140]

Thessaloniki is the region's major port and industrial center. It is a focus for railway, coast shipping, and ocean-shipping facilities. The port lies on the shore of the Bay of Thessaloniki between the estuary of the Axios river and Cape Micro Karaburnu. Its facilities and other installations were not only bombed by the Allied planes but were also virtually destroyed in 1944 by the retreating German army. The repair work was started by the British Army Engineers in 1945. In 1947 it was taken over by the United States Mission to Greece. Approximately $ 3,500,000 was expended on the construction of a new breakwater, quay walls, warehouses, and other harbor installations.

Since 1945, the harbor of Thessaloniki has developed indo a modern port which can be favorably compared with many other important ports. The port now operates efficiently [141]; it is equipped to handle all traffic, incoming and outgoing, without congestion; and there is sufficient margin

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140. Data was obtained from the Thessaloniki Chamber of Commerce and Industry, and the Port Authority of Thessaloniki, Thessaloniki, 1960.

141. In 1959 the port had 24 cranes of varying lifting capacities; 14 lift-trucks, 9 tractors, 40 loading trailers, 7 tub-boats, 40 lighters, and 8,000 meters of rail lines. The stockyards can hold 300 cattle and 4,000 sheep or goats. The cold storage plants have a capacity of 2,330 cubic meters. The storage space (transit sheds and warehouses) covers about 53,000 sq. meters. The open storage space encompasses an area of 200,000 sq. meters. The total area of the port is 470.000 sq. meters. The depth of the water in the harbor basin ranges between 7 & 10 meters. The existing three piers can easily accomodate vessels with tonnage of less than 20,000 tons. Larger ships can be handled with special care.

to cope with the increase in traffic to be expected from further development of the region. It has been estimated that 200,000 metric tons of raw materials needed in the manufacture of non-organic fertilizers would be shipped through the port to the plant in the Ptolemais basin. Approximately 200.000 tons of briquettes would be sent from Ptolemais to the port for export to the other sections of the country; moreover, the establishment of assembly plants in the Free Zone will increase the volume of cargo traffic to the port. To handle the expected rise in trade, the Port Authority is now contemplating the construction of a fishing pier and a grain silo warehouse. A silo capacity of about 20,000 to 40,000 metric tons, equipped for mechanized delivery, is required to regularize flow of export cereals.

The Thessaloniki Free Zone was established in 1925 to assist the transit trade through the port and to take advantage of the location of the port, i.e., its location mid-way along the commercial route between central and southeastern Europe and the Middle East. The war-damaged facilities have been restored and are more than adequate to handle the present cargo traffic. The area covered by the Free Zone is 230,000 sq. meters or about one-half of the total area of the port.

The growth of the Free Zone was interrupted during the Second World War. However, the most unfortunate development was the creation of the Iron Curtain, which separated it from its non-Greek hinterland. The communist countries, with the exception of Yugoslavia have more or

Fig. 73. The port of Thessaloniki handles both large and small ships.

Fig. 74. The port of Kavala.

less discontinued shipping goods through the port. The transhipment of goods decreased from 23,640 metric tons in 1938 to 4,831 tons in 1959 (see Table 76). Much of the cargo in 1959 was destined for Turkey and Yugoslavia. Transit trade with Albania has not been resumed, and the volume had dropped from 4,387 metric tons in 1938 to 0 tons in 1959. Practically all imports go through the Free Zone, except liquid fuel and other combustibles.

The Yugoslav Free Zone, functioning since 1928, was created to assist the trade of Yugoslavia. The Zone covers an area of about 94,000 square meters but is not as well equipped as the Greek Free Zone. The Yugoslav Free Zone is administered by Greek laws, but the actual operations are under the jurisdiction of Yugoslavia. Although it was opened in 1950, actual transhipment of goods began in 1954. The volume of cargo has been increasing steadily since 1954, but it has not reached the 1938 level of activity (see Table 77). The exportable items are few, consisting of tobacco, animals, and semi-processed minerals. Wheat is the most important of the imported items. The completion of the port of Fiume by Yugoslavia, together with the improvement of the internal road and rail network, has lessened her dependence on the port of Thessaloniki. However, the Port Authority officials are of the opinion that an increase in trade between Yugoslavia and the Middle East would increase the present volume of cargo handled by the Zone.

The main foreign imports of the port of Thessaloniki are metals, chemicals, pharmaceuticals, lumber, and sugar (see Table 78). The drop in the imports of minerals was noticeable in 1959. This was largely due to the greater use of local fuel (lignite) and to the reduction of refined oil imports to the port from abroad since the installation of the oil refinery at Aspropyrgos, Attica. Oil is now shipped to Thessaloniki from Aspropyrgos, but it is not included in the foreign imports category. The table also reveals that the volume of imported agricultural products decreased from 85,105 metric tons in 1938 to 16,921 in 1959. This decrease is the natural outcome of the ever-increasing agricultural productivity of Northern Greece. Table 79 reveals the successful effort of the region to lessen its dependence on overseas for such agricultural commodities as wheat, barley, beans, and rice.

The principal exports to foreing markets are agricultural products, fruits, minerals, and textiles (see Table 80). There was a remarkable increase in the volume of agricultural exports: they increased from 54 metric tons in 1938 to 47,773 tons in 1959. The new farm exportable items are peaches, apples, and cotton (see Table 81). In 1959 there was a considerable drop in the exports of magnesite and calcined magnesite, largely because these minerals were shipped through the small ports of the prefecture of Halkidiki.

Although foreign imports decreased from 518,400 metric tons in 1951 to 263,565 tons in 1959 (see Table 82), the volume of total imports (foreign and domestic) increased from 247,144 metric tons in 1949 to 937,607 tons in 1958. The large volume of imports in 1951 coincides with the start of the economic rehabilitation of the region. Thessaloniki's share of the total national imports decreased from 15.6 per cent in 1938 to 6.5 per cent in 1959, largely because of the decrease of oil imports from abroad and the shipment of more Greece-bound cargo to the port of Piraeus. The value of imports between 1950 and 1959 averaged $ 50,000,000 per year.

The exports, however, have shown a steady increase since 1949 (see Table 82). The port's share of the total national exports increased from 3.9 per cent in 1949 to 8.4 pet cent in 1959. This shows the increasing economic importance of the region as an exporter of agricultural and non-agricultural products since 1945. The value of exports in 1959 amounted to $ 56,568,166, most of it coming from the sale of agricultural and horticultural products and minerals.

The number of vessels (foreign and domestic) calling at the port increased from 487 in 1946 to 1,579 in 1958, while that of sailing boats de-

creased from 3,236 in 1946 to 2,326 in 1958. The greater use of trucks to transport goods from Northern Greece to the other sections of the country is largely responsible for the drop in the number of sailing vessels since 1946. International steamship lines such as American Export lines, Inc., Waterman Steamship Corporation, Adriatica Societa An. di Navigazione, and Svenska Orient Linien Goteborg. The number of passengers dropped considerably--decreasing from 51,970 in 1948 to 1,172 in 1958. The removal of the guerrilla threat and the improvement of rail and road transport is responsible for this change in the passenger traffic picture. Since there is no direct steamship connection between Thessaloniki and the Aegean islands, one now has to go to Piraeus to obtain passage on a ship that is bound for the islands.

Port Lago[142]

The port, which now serves the prefecture of Xanthi and the Eastern section of Rhodopi, is Porto Lago. It is situated on the eastern end of the neck of land which separates Lake Vistonida from the Aegean Sea and is also half-way on the coast between Kavala and Alexandroupolis. The port was very active in the early post-years. During this period, it was very difficult to ship goods by rail and other carriers to the hinterland of the port from the other sections of the region. Shipping traffic has been gradually increasing, but it has not reached the 1952 figure. In that year 700 vessels passed through the port. Average shipping traffic amounts to 500 coastal steamers and sailing vessels annually, and 1200 fishing crafts. The leading exports are tobacco, oil seeds, (sunflower, broom-corn), sardines, and eels. Imports are sugar, coffee, wheat and sundry manufactured goods.

The existing facilities of port are inadequate to handle the cargo that passes through it. Its new 100 meter quay was financed by the Marshall Plan. The port has several imperative needs:

a. the expansion and improvement of the docks

b. the deepening of the harbor to handle vessels larger than 1000 tonnage, which now by-pass it

c. electricity (The Greek Public Power Corporation will bring electricity to the port as soon as the substation in Iasmos, Rhodopi, is completed).

d. loading and unloading facilities.

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142. Data was obtained from the office of the Harbor Master, Porto Lago, 1959.

Kavala [143]

The port of Kavala is situated half-way on the coast between Thessaloniki and Alexandroupolis. The hinterland of the port is limited to the prefectures of Drama and Kavala. The war-damaged harbor facilities were rebuilt, and new harbor improvement works were undertaken. The expansion of the waterfront, the construction of the protective walls, and the electrification of the harbor were completed by 1955. However, there is still a need for more sheds, cranes of 8 to 10 tons lifting capacity, and a fish receiving station. The harbor, with its ample docking facilities, can handle ships up to 10.000 tons capacity. Average shipping traffic amounts to 130 foreign vessels and 450 coastal steamers and sailing boats annually. The annual average volume of exports is 100.000 metric tons; imports average 45.000 tons. The leading exports are tobacco and manganese. The main imports are fertilizers, wheat, and lumber. The number of vessels calling at the port has been decreasing steadily since 1954, largely because Kavala now has to share the cargo-traffic with the other ports of the region; moreover, the completion of the land communications between Central Macedonia and Thrace has led to a greater use of rail and road transport. The future of Kavala as a port rests on the efforts of the local citizens to expand its hinterland. If for some reason they fail, the port is doomed.

Alexandroupolis [144]

The port of Alexandroupolis (Dedeagats), situated about 20 kilometers west of the Evros river, serves the prefectures of Evros and the western section of Rhodopi. The war-damaged harbor facilities were rebuilt after the war with American financial and technical assistance. New facilities were rebuilt, but the lack of capital has retarded the completion of the original harbor improvement program. The port's imperative needs are these:

1. the widening of the docks to handle two-way traffic
2. the construction of more storage sheds
3. the installation of cranes
4. the deepening of the harbor to accommodate vessels larger than 5,000 tons (the present depth of the water is 18 feet)
5. rearranging the existing railway network at the port to speed up the transfer of cargo from the freight cars to the ships and vice-versa.

143. Data was obtained from the office of the Harbor Master, Kavala, 1960.

144. Data was obtained from the office of the Harbor Master, Alexandroupolis, 1959.

Despite the contraction of its hinterland [145], the port activity has been increasing steadily since 1952, but it has not reached the pre-war level of activity. In 1952 cargo-passing through the port totaled 52,000 tons and in 1959 it totaled 90,000 tons. In 1958, 40 foreign vessels and 837 coastal steamers and sailing crafts called at the port. However, the facilities are inadequate to handle the anticipated cargo traffic when diplomatic and commercial relations between Bulgaria and Greece improve. The main exports are wheat, lignite, livestock, broom-corn, sunflower seeds, and sesame. The imports consist of fertilizers, coal, lumber, sugar, and manufactured goods.

Northern Greece has a sufficient number of ports to handle the present level of foreign and domestic trade. Their importance to the economic development of the region and to the adjacent communist countries, if and when diplomatic relations between them and Greece improve, has encouraged the government to undertake a comprehensive program to increase port capacity and operational facilities.

Trade

The importation of mainly industrial goods and the exportation of raw materials (agricultural produce and minerals) characterize the trade pattern of Northern Greece. The imports include a variety of manufactured products such as machinery, tractors, automobiles, and chemicals. Since the inauguration of the industrial and agricultural expansion and improvement program, imports of machinery and equipment have increased. Western Europe, especially West Germany, still remains the main supplier of manufactured items despite the increase of imports from the Communist bloc countries. Until the economic recovery of Western Europe, Northern Greece was solely dependent upon the United States for its industrial goods needs. The importation of agricultural products has been declining because of the increase in agricultural production since 1950 (see Table 79).

Northern Greece's leading exports are agricultural products. The distinctive feature of the region's exports is its heavy dependence on one commodity: tobacco. West Germany and the United States are the main importers of tobacco. After 1956, tobacco exports to the communist bloc countries have gradually been increasing. In 1958, they were approximately 13 per cent of the region's total tobacco exports (see Table 51). The exportation of substantial quantities of cotton, fruits, and grapes is a post-Word War II development. The cultivation of cotton for export is encouraged,

145. Before 1920, Bulgaria and Eastern Thrace were included in its hinterland.

because unlike such semi-luxury crops as tobacco, fruits, and grapes, it is less vulnerable to economic dislocations in importing countries. It can also be stored without spoilage. To lessen the dependence of the region upon tobacco for a large share of its foreign exchange, the government has been emphasizing the diversification of agriculture. The exportable minerals are chrome, iron, pyrites, iron ore, magnanese, and magnesite.

The inclusion of Greece in the European Common Market would enable Northern Greece to increase its exports to her. If Western Europe fails to absorb the region's agricultural surpluses, economic necessity would compel Northern Greece to increase its trade with the Communist bloc countries.

TABLE 76.

Transhipment of Cargo through the Thessaloniki Free Zone between 1958 and 1959.

Year	Volume in metric tons
1958	23,640
1960	45
1961	8,088
1962	517
1963	4,253
1964	10,251
1965	911
1966	2,562
1967	5,130
1968	914
1969	4,831

Source: *Annual Bulletin*, Chamber of Commerce and Industry, Thessaloniki, 1960, p. 97.

TABLE 77.

Transhipment of Cargo through the Yugoslav Free Zone between 1958 and 1969.

Year	Volume in metric tons
1958	195,293
1964	524
1965	10,732
1966	136,300
1967	136,493
1969	171,357

Source: *Annual Bulletin*, Chamber of Commerce and Industry, Thessaloniki, 1960, p. 97.

TABLE 78.

Major Imports of the Port of Thessaloniki.

Commodity	Volume in Metric Tons				
	1938	1950	1956	1958	1959
Livestock and fish products	3,755	8,350	4,116	6,172	6,254
Agricultural products	85,015	40,633	35,861	19,021	16,921
Oil Seeds	1,089	120	148	550	156
Sugar	34,510	2,470	13,308	23,274	23,539
Lumber	48,314	58,965	80,139	34,916	32,302
Minerals	212,196	169,302	249,239	240,045	39,240
Metals	36,338	38,162	30,347	46,089	44,567
Chemicals and pharmaceuticals	3,533	5,941	26,396	76,591	69,394
Automobiles, trucks and automotive parts	1,080	3,081	4,292	5,096	11,162

Source: *Annual Bulletin*, Chamber of Commerce and Industry, Thessaloniki, 1951, 1956, and 1960.

TABLE 79.

Selected Agricultural Imports, Port of Thessaloniki.

Commodity	Volume in Metric Tons		
	1938	1951	1959
Wheat	83,696	30,185	1,546
Barley	1,110	—	—
Beans	8,080	40	1,379
Rice	5,287	2,276	490

Source: *Annual Bulletin*, Chamber of Commerce and Industry, Thessaloniki 1952 and 1960.

TABLE 80.

Major Exports of the Port of Thessaloniki.

Commodity	Volume in Metric Tons				
	1938	1950	1955	1958	1959
Livestock and fish products	277	62	68	179	305
Agricultural products	154	—	487	539	47,773
Horticultural products	17,638	8,517	26,263	62,759	62,299
Oil seeds	409	110	419	274	884
Lumber	178	53	854	816	1,062
Minerals	18,136	2,706	37,334	53,252	38,020
Textiles	743	64	16,865	23,863	25,906

Source: *Annual Bulletin*, Chamber of Commerce and Industry, Thessaloniki, 1951, 1956 and 1960.

TABLE 81.

Selected Agricultural Exports, Port of Thessaloniki.

Commodity	Volume in Metric Tons		
	1938	1950	1959
Rice	—	—	69
Pulses	196	—	2,001
Apples	—	—	4,554
Peaches	—	—	23,413
Grapes	110	—	4,081
Vegetables	797	—	25,098

Sourse: *Annual Bulletin*, Chamber of Commerce and Industry, Thessaloniki, 1952 and 1960.

TABLE 88.

Imports and Exports shipped through the Port of Thessaloniki.

Year	Imports (in metric tons)			Exports (in metric tons)		
	Greece Total imports	Port of Thessaloniki	Per cent of total national imports	Greece Total exports	Port of Thessaloniki	Per cent of total national exports
1948	2,741,349	426,764	15.6	1,249,350	42,154	3.1
1949	2,580,671	118,136	4.7	343,248	13,351	3.9
1950	2,981,765	335,352	11.7	437,560	11,578	2.6
1951	3,319,392	518,400	15.6	814,220	30,471	3.7
1952	2,881,098	399,952	13.9	1,129,903	39,819	3.5
1953	2,595,333	369,041	14.2	1,261,019	38,220	3.0
1954	3,066,118	360,468	11.7	1,251,494	67,300	5.5
1955	3,340,712	396,548	11.9	1,618,994	81,592	5.0
1956	3,529,291	367,990	10.4	2,086,594	112,910	5.5
1957	3,808,501	395,937	10.4	2,190,111	131,539	6.0
1958	4,202,986	472,215	11.2	2,155,000	141,476	5.5
1959	4,045,741	263,565	6.5	2,102,000	176,858	8.4

Source: *Annual Bulletin*, Chamber of Commerce and Industry, Thessaloniki, 1952, 1955, 1958 and 1960.

CHAPTER XI

TOURISM

Although it has many of the same assets that have enabled other sections of Greece to build a rather flourishing industry, Northern Greece has had little success in attracting tourists from abroad, or from Southern Greece. Inadequate facilities, lack of communication, and the lack of a concerted effort to obtain a share of the tourist trade appear to be the basic difficulties. In 1960 approximately 40,000 out of 390,000 tourists who came to Greece visited this region. In that year the estimated income earned from tourism was $ 2,200,000 [146].

Since 1955 there has been an increasing awareness on the part of both the government and the people that the natural beauties (natural beaches, rugged terrain) of Northern Greece and its classical and Byzantine heritage could become the basis of a thriving tourist industry. The cities of Thessaloniki and Kastoria have many unique churches, which date from the early days of Christianity. Mt. Athos' rustic monasteries possess precious icons and manuscripts [147]. Hellenic, Hellenistic, and Roman monuments are found throughout the region—Thassos, Samothraki, Phillipi, and Pella. The excavations at Pella, the capital of Philip II and Alexander the Great, are still in progress, and many interesting findings have been made.

Despite the relative scarcity of capital and managerial resources, tourism has progressed significantly since 1956. By 1959 the important regional towns and cities had modern and comfortable hotels. The National Bank of Greece financed the construction of a motel at Alexandroupolis and a hotel at Kavala. The government built a hotel at Kastoria and tourist pavilions at Niki and Evzoni, ports of entry on the Greek-Yugoslav border, and at other tourist sites to accommodate the tourists. Also, it has initiated the construction of new hotels at Florina, Thessaloniki, Serres, and Mount Olympus. The modern beach resort area at Agia Triada, 27 kilometers from Thessaloniki, was dedicated on August, 1960. The improve-

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146. National Tourist Organization, Athens, 1960.

147. The number of tourists who visit Mount Athos could double, provided the 'no-female' prohibition were removed.

ment of this beach marks the beginning of a concerted effort on the part of the government to improve the tourist facilities of the Thessaloniki area. Service stations at regular intervals have been placed on all tourist routes.

Under the Five-Year Economic Development Program, the region will receive some financial assistance to increase the quality and extent of local accommodations. Even though the financial resources of Northern Greece and the government are insufficient to meet the many development needs, and the promotion of tourism must be done at the expense of some urgently needed economic activity, the returns from tourism are large in relation to the amounts expended. If Northern Greece can obtain private capital to finance the construction of new tourist facilities, its main burden will be represented by the cost of promoting the invitation of foreign private capital and of supporting the tourist trade once it is underway.

Besides the construction of new tourist facilities and the improvement of existing ones, other important measures are needed to stimulate tourism:

a. elimination of importuning by guides, hawkers, and beggars
b. improvement in services offered
c. training of guides in the history and folklore of the region
d. elimination of unreasonable prices for souvenirs and handicrafts.

The National Tourist Organization is responsible for domestic and foreign publicity and for the development of the tourist industry. It regulates hotels and motels, registration of travel agencies, and examination and licensing of tourist guides. Its tourist school at Kiffisia, Attica, is training the workers needed by the industry. The Organization also gives special emphasis to the promotion of native handicrafts and art. In some villages these handicrafts were almost defunct, but they are now being revived to satisfy the desire of tourists for souvenirs. Also, the Organization for the Financing of Economic Development (OHOA) is assisting private tourist investments. Another factor which may aid the drive for the region to attract more tourists is the continuously expanding world travel market together with rising standards of living, increased leisure, and the tremendous strides in air transport. The holding of local festivals and the Annual International Trade Fair of Thessaloniki bring to the region hundreds of domestic tourists. Although the local people feel that the National Tourist Organization and other Government Agencies have neglected to improve or develop the region's tourist assets, such a view is not supported by the substantial progress in the field of tourism since 1955.

The promotion of tourism will mean to the area a new era of hope. The construction necessary to provide the tourist certain comfort will give

Fig. 75. A Byzantine church in Thessaloniki.

Fig. 76. General view of the grounds of the International Fair of Thessaloniki.

employment to the chronically unemployed workers. The many services required by tourists will increase income, and the standards of health and sanitation that must be maintained for the tourists will help to develop a higher standard of living for the residents of the area. It would also affect the farmers of the region. They now would sell their surplus products on local markets, rather than having to ship them elsewhere. Those near the main tourist sites will receive additional income from renting rooms to the tourists.

In view of the rather substantial contributions that tourism has been making to the economies of many sections of Greece, it would appear advisable for Northern Greece to give serious consideration to tourism as a potentially important part of its over-all economic development.

CONCLUSION

In the preceding chapters I have indicated the problems and also the accomplishments achieved by the sectors of the region's economy. The obvious effect of the economic progress since 1945 has been a steadily rising standard of living. The agricultural and industrial transformation which took place during this period is reflected by such signs as the Aliakmon and Axios rivers diversion dams, irrigation networks, flood control and anti-erosion measures, mechanized farming, well-cultivated fields, well-groomed orchards, improved animals, modern barns, storage plants, cold storage plants, hydro-electric and thermo-electric plants, electric-transmission lines, and the foundations of a heavy industry in the Ptolemais lignite basin.

However, in assessing the future development of the region, it is extremely important to take note of the presence of certain negative and positive factors to economic development. The negative factors are 1) the possibility that changes in the government may occur unexpectedly before any long term economic progress programs are completed; 2) lack of technically trained personnel; 3) shortage of capital; 4) shortage of arable and grazing land; 5) limited water supply; 6) limited market; 7) limited mineral resources; 8) rugged relief, especially in the western section of the region, making progress more expensive and slower than might be the case elsewhere; 9) the physical proximity of the region to communist countries, causing some of the private capital investors to invest their capital in Central and Southern Greece; and 10) scarcity of basic overhead facilities.

The positive factors, which are just as important as the negative ones, are 1) the presence of a strong desire for economic development on the part of both the government and the people, 2) the expansion of the non-tobacco economy (tourism, livestock, irrigated crops), 3) the availability of technical assistance, and 4) the existence of definite plans for development.

The region is now providing the nation with some of the needed agricultural and industrial raw materials for its economic growth. Table 83 shows the share of Northern Greece in the fish, agricultural, and industrial production, as well as its share of mineral exports. The importance of

Northern Greece to the economy of the nation is reflected by the fact that a considerable sum of money has been earmarked for the full development of its resources under the Five-Year Economic Development Program (1959-1963)[148]. Agriculture is scheduled to receive about 30 per cent[149] of the total expenditures. This figure would seem to reveal the government's awareness of the fact that agriculture provides the greater opportunity for immediate increase in productivity, and that a well-developed and well-organized agriculture is an essential prerequisite for industrial development. Although some of the features of the development program have been criticized, the program, as a whole represents a refreshing and radical departure from the inefficient methods of the past. The over-all objective of the program is create wealth-producing factors. When the development of the region, as envisioned by the government, is completed, Northern Greece would become an important supplier of agricultural and industrial raw materials for the national economy.

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148. It is very difficult to ascertain the exact amount of capital that would be invested by the government in the development of the region's resources. The Five-Year Plan calls for the investment of 31,450,000,000 drachmas in the expansion of Greece's economy.

149. This figure was obtained from studying the proposed agricultural development schemes.

TABLE 88.

Fish, Agricultural, Industrial Production, and Mineral Exports: the Share of Northern Greece, 1959.

Item	Northern Greece - Per cent of total	Greece - Per cent of total
Wheat	44.78	55.22
Corn	57.55	42.45
Pulses *	37.80	62.20
Rice	56.16	43.84
Cotton	53.88	46.12
Tobacco	68.35	31.65
Industrial Output	12.00	88.00
Fish Production	29.30	70.70
Mineral Exports	54.00	46.00 **

* It does not include the area of pulses interplanted with other crops.

** Ministry of Northern Greece, Section of Mining, Thessaloniki, 1960.

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