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INFORMATION REPORT

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PREPARED AND DISSEMINATED BY
CENTRAL INTELLIGENCE AGENCY

COUNTRY
USSR (Lithuania)

SUBJECT
A History of the Lithuanian Forests and Forestry

DATE DISTRIBUTED
7 February 1958

NO. OF PAGES 7 | NO. OF ENCLS. -1- 55 pages

SUPPLEMENT TO REPORT # 50X1-HUM

unclassified copy of 226 page study entitled "A History of the Lithuanian Forests and Forestry". The Table of Contents follows:

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2. [redacted] with the above described text are the following sketches and photographs mentioned in the text: 50X1-HUM

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	14.	Photograph: Young oak-spruce stand	D. 3 (b) (1)
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	16.	Photograph: Typical Northern Alder peasant forest exploited by peasants in the Daugai District	
	17.	Sketch: Scheme of the Russian Forestry Administration in 1910	B. 9 (g)
	18.	Photograph: Typical Lithuanian forest lane	B. 15 (f)
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	29.	Photograph: Reforestation of sand dunes around Palanga on the Baltic Coast (poor quality)	B. 23
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Chapter VI			
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Chapter VII			
	39.	Sketch: Soviet Lithuanian Forest Administration, 1956	E. 3 (b)

3. [redacted] an eight-sheet sketch of Lithuania and surrounding areas prepared by source. Enclosure (A) to this report has been prepared as an aid in using this sketch. The Table of Contents to Enclosure (A) describes the purpose of the sketch and provides indices and tables which are supplementary to the sketch. [redacted]

Enclosure (A): Sketches and Factual Data to be used as aid in using eight-sheet sketch of Lithuania. [redacted]

4. [redacted] Photographs have same classification as report.

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INTRODUCTION

1. The accompanying sketches and textual material have been prepared for the following purposes:

   a. As an aid in understanding the text of [redacted] 50X1-HUM

   b. To present a general picture of the Lithuanian forests, their distribution, size (area), and their location in relation to roads and railroads, populated places and rivers and lakes. These features are included on the incomplete (non-colored) portions of the sketches which lie outside the boundaries of Lithuania, as well as the complete (colored) portions within the boundaries;

   c. to present a special picture of predominant representative forest types and their distribution and size (area), as an aid in estimating accessibility and forest production.

2. The sketches were traced from "Preussiche Landesaufnahme", 1:300,000. Sheets "S-56, Schaulen, "R-56, Tilsit", "T-56, Wilkomierz", and "T-55, Ebenrode" of this basic source were of the 1942 edition, compiled in 1912. Sheet "T-55, Wilna", 1940 edition, was compiled in 1899. Sheets "R-57, Libau", "T-57, Jekabpils", and "S-57, Riga", 1912 edition, were also compiled in 1899.

3. The sketches should not be considered accurate in every detail and should be used as sketches, not maps. Details should be checked against the original sheets (see Index sketch) for accuracy. The size and form of the sketches was chosen to avoid distortion caused by the reproduction process (blue-print) which on the periphery of these sketches will approximate 5-7%.

4. Boundaries of the former Republic of Lithuania and of the autonomous district of Klaipida-Memel were also taken from "Preussiche Landesaufnahme 1:300,000". The boundaries of Soviet Lithuania were taken from "A M S Series, M501, 1:250,000, Daugapils NN 35-2," and Vilnius 35-4".

5. Only those roads and railroads which play an important role in the local traffic of Lithuania are shown on the sketches.

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6. Only the larger cities and towns, and important villages are shown on the sketches. The latter are indicated where they contain churches, seats of village officials, or seats of forest district managers or sub-district managers.

7. The hydrographic network shown on the sketches is quite complete although the location of creeks and smaller rivers should not be considered completely accurate. Largest and most important swamps, as taken from "Preussiche Landesaufnahme" have been included.

8. An Index net was drawn on the sketches with an index point (x-y coordinates) at 23°E longitude and 54°N Latitude. The net is numbered vertically and lettered horizontally and begins at approximately 20°55'E longitude and 56°30'N latitude ("A-1").

9. To avoid overcrowding, forestry sub-district boundaries and boundaries of the forest guards have not been included on the sketches. The average area of responsibility of the forest guards is shown on the accompanying table entitled "Lithuanian Forests (as of 1937), Land Use and Administration". Boundaries of the forestry districts and the locations of district foresters and sub-district foresters (rangers) are included. District boundaries were taken from an administrative map, 1:300,000 used in the Lithuanian Directorate of Forests, Kaunas, in July 1944, which was brought to the US by a private individual following World War II. Locations of the foresters were plotted from the address book of the Forestry Administration, "Misku Generaline Direkcija, 1 February 1944, Kaunas".

10. Various forest types (shown in color on the sketches) were located with the aid of a map of the Lithuanian forests in Professor H. Mortensen's book Litauen, Hamburg, 1926.

11. Included in the accompanying textual material is an "Index of Forestry Districts and Sub-districts as of 1944" which lists district and sub-district names, sheet numbers (of the sketches) on which they are located, and their coordinates. Also included is an "Alphabetical Index" of the sub-districts which includes their names, the number of each within its own district (on the sketches), sheet number, and coordinates. There is also an "Index of Geographical Names" listing 709 place names, geographical designations, sheet numbers, and coordinates. The Table, "Lithuanian Forests (as of 1937), Land Use and Administration" has been mentioned above.

12. For additional details [redacted] 50X1-HUM

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12. For additional details

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Enclosure (A): C-O-N-F-I-D-E-N-T-I-A-L
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Subdistrict Name	District Name Abbreviated	Subdistrict Number on Sketch	Sheet Number	Coordinates
	-A-			
Agenikio	Bir.	1.	3	Q 3
Agurkiškio	Jur.	1.	7	K 13
Aisėnu	Sve.	1.	4	D 7
Aisėtos	Lab.	1.	6	T 10
Akmenės	Kur.	1.	2	H 3
Alsedziu	Tel.	1.	1	E 4
Altoniškės	Lek.	1.	7	L 12
Alytaus	Aly.	1.	7	M 16
Ančios	Vei.	1.	7	M 18
Andrijavo	Rtv.	1.	4	D 7
Anelyno	Trg.	1.	5	G 9
Antazavės	Zrs.	1.	6	W 6
Anykščių	Utn.	1.	6	Q 8
Aukštadvario	Azm.	1.	8	O 14
Aukštakalviu	Krt.	1.	4	B 5
Ąžuolų Būdos	Kaz.	1.	7	K 14
	-B-			
Babtų	Rau.	1.	5	L 11
Bačkoniu	Zzm.	2.	8	P 13
Bagdonavo	Rtv.	2.	4	E 7
Bagotosios	Kaz.	2.	7	K 13
Baisogalos	Bai.	1.	5	L 7
Balbieriskio	Prn.	1.	7	M 15
Balėnu	Maz.	1.	1	F 3
Balsku	Paj.	1.	4	F 9
Baltadvario	Lab.	2.	6	S 10
Baltkoju	Sak.	1.	7	I 12
Batakiu	Trg.	2.	5	G 9
Beržėnu	Jon.	1.	2	J 4
Bingeliu	Dau.	1.	7	N 18
Birbiliškės	Ras.	1.	5	J 10
Birštono	Dzu.	1.	7	M 14
Biržu	Bir.	2.	3	P 3
Braziūku	Lek.	2.	7	K 12
Bubiu	Sia.	1.	5	J 6
Būdos	Kau.	1.	7	N 12

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Daunarėvos	Jon.	2.	2	L 3
Debeikių	Utn.	2.	6	R 7
Degučių	Zrs.	2.	6	V 6
Delturvos	Tauj.	1.	6	O 10
Dotnavos	Ked.	1.	5	L 9
Drabužninkų	Zzm.	4.	8	O 14
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Dzirmiškių	Aly.	2.	7	M 16

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Eržvilko	Jur.	2.	5	H 10

Gadunavo	Tel.	2.	1	F 4
Garliavos	Pnm.	2.	7	M 13
Geurės	Jur.	3.	5	G 10
Gėdinčių	Kur.	2.	2	I 4
Gegužinės	Kai.	3.	6	O 11
Geguzių	Bir.	3.	3	Q 4
Gelgaudiškio	Sak.	2.	5	J 11
Gelvonų	Ukm.	1.	6	P 11
Gervaraiščio	Zzm.	5.	8	P 13
Giedraičių	Ukm.	2.	6	R 11
Giliogirio	Rtv.	3.	4	E 6

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Gimbogalos	Bai.	2.	5	L 6
Giniočių	Sia.	2.	5	J 5
Girdžių	Ras.	2.	5	I 10
Gitėnų	Skn.	1.	5	H 5
Gitėnų	Klg.	1.	6	P 7
Graužiškių	Vlk.	1.	7	I 15
Grinkiškio	Bai.	3.	5	L 8
Grušlaukės	Kre.	3.	1	C 4
Grusdžių	Sia.	3.	2	L 4
Gudžiūnų	Bai.	4.	5	L 8

-I-

Impilties	Kre.	4.	1	C 3
Inklūnų	Sim.	1.	6	R 6
Inturkės	Lab.	4.	6	S 10
Ivoniškio	Prn.	2.	7	L 15

-J-

Jagelonių	Zem.	6.	8	P 14
Jankų	Lak.	3.	7	K 13
Jeznas	Dzu.	3.	7	N 14
Jonavos	Kau.	2.	5	N 11
Joniškėlio	Pas.	2.	2	N 4
Joniškio	Jon.	4.	2	K 3
Joniškio	Jon.	6.	2	K 3
Josvainių	Ked.	2.	5	M 10
Juknaičių	Pkr.	1.	5	M 5
Juodgirio	Tauj.	2.	6	P 8
Jurbarko	Jur.	4.	5	H 11
Jurdaičių	Jon.	5.	2	K 2
Jurės	Jure	2.	7	L 13

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Kaišiadorių	Kai.	4.	8	O 12
Kalkiškės	Trg.	3.	5	G 9
Kalniškės	Mar.	1.	7	K 16
Kaltinėnų	Trg.	7.	5	G 8
Kamajų	Rok.	2.	6	S 6
Kapčiamiesčio	Vei.	2.	7	L 18

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Karalgirio	Rau.	3.	5	L 11
Karčiūdos	Lak.	4.	7	J 12
Karsakiškio	Zlg.	2.	6	O 7
Kaukinės	Zzm.	7.	8	O 13
Kauno	Kau.	4.	7	M 12
Kazlų-Rudos	Kaz.	3.	7	K 13
Kėdainių	Ked.	3.	5	M 9
Kedeblišķio	Sak.	3.	5	J 11
Kelmės	Tyt.	1.	5	I 7
Kertupio	Kau.	5.	7	N 12
Kiaunelišķio	Lab.	5.	6	T 9
Kibyšiu	Vei.	3.	7	M 18
Klebiškio	Prn.	3.	7	L 14
Klovainių	Pkr.	2.	5	M 5
Kovarsko	Sim.	2.	6	Q 8
Krakių	Ked.	4.	5	L 9
Kražių	Tyt.	2.	5	H 8
Krekėnavos	Pnv.	1.	5	M 8
Kretingos	Kre.	5.	4	B 5
Krinčino	Pas.	3.	3	O 4
Kriūkų	Jon.	6.	2	L 3
Kruonio	Kai.	5.	7	N 13
Kruopių	Kur.	3.	2	I 3
Kulių	Pln.	1.	4	D 6
Kulvos	Rau.	4.	5	M 11
Kuodziškės	Prm.	3.	7	L 12
Kupiškio	Sim.	3.	6	Q 6
Kuro	Lak.	5.	7	K 12
Kuršėnu	Kur.	4.	2	I 4
Kurtavenų	Skn.	2.	5	I 6
Kužių	Sia.	4.	5	J 5

-L-

Labanoro	Lab.	6.	6	T 9
Labardžiu	Rtv.	4.	4	F 7
Lančiūnavos	Ked.	5.	5	N 9
Lapių	Rau.	5.	7	M 12
Lazdijų	Mar.	2.	7	K 16
Legečių	Bal.	5.	5	L 7

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Lakečių	Lak.	6.	7	K 12
Leno	Tauj.	3.	6	O 9
Linkuvos	Pkr.	4.	2	M 4
Laukėnų	Fln.	2.	4	E 6
Lukšių	Lak.	7.	7	K 12
Luokės	Tel.	3.	5	G 5
Lydavėnų	Tyt.	3.	5	I 8
Lygumų	Pkr.	3.	2	L 5
	-M-			
Mantvilių	Jure	5.	5	H 10
Mažeikių	Maz.	3.	2	G 3
Mažuikių	Fln.	8.	4	C 7
Medemrodės	Maz.	4.	2	G 3
Medingėnų	Tel.	4.	4	F 6
Merkinės	Dau.	4.	7	N 17
Meškapievio	Prn.	4.	7	M 14
Meškuicių	Jon.	7.	2	K 4
Metelisi	Aly.	3.	7	M 17
Mikališkio	Prn.	5.	7	L 14
Mituvos	Rok.	3.	6	R 5
Moliunų	Pas.	4.	6	O 5
Musninkai	Ukm.	3.	8	Q 12
Mykoliškio	Fln.	3.	4	C 6
	-N-			
Naujamiesčio	Pnv.	2.	5	N 6
Naujėninkėlių	Jrb.	6.	5	H 10
Nemunaičio	Dzu.	4.	7	M 16
Nemunėlio	Bir.	4.	3	P 2
Nemunėlio Radviliškio	Bir.	5.	3	P 2
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Obelių	Rok.	4.	6	T 5
Obelyno	Trg.	4.	4	F 8
Onuškio	Dau.	5.	8	P 15

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Pabiržės	Bir.	6.	3	O 3
Padauguvos	Rau.	6.	5	K 11
Padubysio	Ras.	3.	5	J 8
Paežerių	Skn.	3.	5	I 5
Paežerių	Zlg.	3.	6	O 6
Pagelažių	Tauj.	4.	6	O 10
Pagramančio	Paj.	2.	4	F 9
Pakruojo	Pkr.	5.	5	L 5
Pajėsio	Kaz.	4.	7	K 14
Pajėvonio	Vlk.	2.	7	I 15
Pajūrio	Paj.	3.	4	E 8
Palangos	Kre.	6.	4	E 5
Paliepio	Vei.	4.	7	L 18
Paliepių	Kad.	6.	5	K 9
Palių	Mar.	3.	7	K 16
Pandėlio	Rok.	5.	3	R 4
Panemunėlio	Rok.	6.	6	S 5
Panemunės	Pmn.	4.	7	M 13
Panemunio	Ras.	4.	5	I 10
Panevėžio	Pnv.	3.	6	N 6
Papilės	Kur.	5.	2	H 3
Papilvio	Jure	3.	7	L 13
Pasaltuonio	Jrb.	7.	5	H 10
Pašvenčio	Jrb.	8.	5	H 11
Pavijonio	Rau.	7.	5	L 11
Pavižinčio	Lab.	7.	6	T 9
Pažižnės	Kur.	6.	2	I 4
Perlojos	Dau.	6.	8	O 17
Pernaravos	Kad.	7.	5	M 10
Pikelių	Mar.	5.	1	F 2
Piniavos	Zlg.	4.	6	O 6
Pivašiūnų	Dau.	7.	8	O 15
Plateliai	Pln.	4.	1	D 4
Plinkšiu	Maz.	6.	1	F 3
Plokščių	Sak.	4.	5	J 11
Plungės	Pln.	5.	4	E 5
Pravieniškių	Kau.	6.	7	N 12
Priemų	Prn.	6.	7	M 14
Pumpėnų	Zlg.	5.	5	N 5
Pūnia	Aly.	4.	7	M 15

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Purvės	Prn.	7.	7	L 14/L 15
Purvių	Maz.	7.	2	G 4
Pušaloto	Zlg.	6.	5	N 5

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Radviečių	Sve.	2.	4	E 8
Radviliškio	Bai.	6.	5	K 6
Radvilonių	Bai.	7.	5	L 6
Raguvėlės	Pnv.	4.	6	O 8
Raguvos	Pnv.	5.	6	O 8
Ramygalos	Pnv.	8.	5	N 8
Raudėnų	Kur.	7.	2	H 4
Raudondvario	Rau.	8.	7	L 12
Rokyvos	Sia.	5.	5	J 6/K 6
Rietavo	Rtv.	5.	4	E 6
Ringių	Trg.	5.	4	F 9
Rokiškio	Rok.	7.	3	S 4
Rozalimo	Pkr.	6.	5	L 5
Rumšiškės	Kau.	7.	7	N 12
Runkiai	Jurb.	4.	7	K 13

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Šakalynės	Paj.	4.	5	G 10
Šakių	Sak.	7.	7	I 12
Šakynos	Jon.	9.	2	J 3
Šalako	Zrs.	3.	6	U 7
Šalsmiesčio	Pas.	5.	6	P 5
Šasnavos	Kaz.	6.	7	K 14
Šateikių	Pln.	6.	4	D 5
Šaukėnų	Skn.	4.	5	I 6
Šedos	Maz.	8.	1	F 3
Šeduvos	[redacted]	8.	5	L 6
Šeirijai	Aly.	5.	7	M 17
Šemeliškių	Zzm.	8.	8	P 14
Šeredžiaus	Rau.	9.	5	J 11
Šeruolių	Ukm.	4.	6	Q 10
Šėtos	Ked.	9.	5	N 10
Šiaudinės	Kur.	8.	2	H 4
Šiaulėnų	Sia.	7.	5	K 6
Šiauliu	Sia.	8.	5	J 5

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Siesiku	Trg.	5.	6	O 9
Silinės	Paj.	5.	4	F 10
Silosėdų	Kai.	6.	8	O 12
Siluvos	Tyt.	4.	5	J 8
Simkaičių	Ras.	5.	5	I 10
Simonių	Sim.	6.	6	R 6
Simulių	Pln.	7.	4	D 5
Sipylių	Sia.	9.	2	L 4
Sirvintų	Ukm.	5.	6	Q 11
Skapiškio	Rok.	8.	6	R 5
Skiemonių	Utn.	3.	6	R 9
Skuodo	Kre.	7.	1	D 3
Slavikų	Šak.	5.	5	H 11
Spirakių	Zlg.	7.	5	N 6
Stakliškių	Dzu.	5.	8	O 14
Stirnių	Lab.	8.	6	T 9
Strasdų	Sia.	6.	5	J 5
Subačiaus	Sim.	4.	6	P 6
Sudargo	Šak.	6.	5	H 11
Sudvajų	Dzu.	6.	7	M 16
Šumsku	Mar.	4.	7	K 14
Surviliškio	Ked.	8.	5	M 9
Sutku	Lek.	8.	7	J 12
Suvainiškių	Rok.	9.	3	R 3
Svedasų	Sim.	5.	6	R 7
Švėkšnos	Šve.	3.	4	D 8
Šventosios	Kre.	8.	1	B 4
Šventupės	Ukm.	6.	6	P 10

-T-

Taujėnu	Tauj.	6.	6	P 9
Tauragės	Trg.	6.	4	F 10
Tauragnų	Zrs.	4.	6.	T 8
Telšių	Tel.	5.	4	F 5
Tenenių	Šve.	4.	4	E 8
Tirkšlių	Maz.	9.	1	F 3
Troškūnų	Sim.	7.	6	Q 7
Trumpiškių	Paj.	7.	4	E 9
Tryškių	Tel.	6.	2	G 4
Turžėnų	Kau.	8.	7	N 12

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Tvėru	Rtv.	6.	4	F 6
Tyrelio	Paj.	6.	4	F 10
Tytuvėnų	Tyt.	5.	5	J 7
	-U-			
Uirijos	Aly.	6.	7	L 15
Upynai	Ukm.	7.	6	P 10
Upyno	Skn.	5.	5	H 5
Upytės	Pnv.	6.	5	N 7
Utenos	Utn.	4.	6	S 8
Ūkpalių	Utn.	5.	6	S 7
Ūkpelkių	Tyt.	6.	5	J 7
Ukmėnio	Tauj.	7.	6	O 9
Ukvėnčio	Skn.	6.	5	H 6
Ukvinčio	Zrs.	5.	6	U 8
	-V-			
Vabalninko	Pas.	6.	6	P 5
Vadoklių	Pnv.	7.	5	N 8
Vadų	Kai.	7.	5	N 11
Vaidagirio	Ras.	6.	5	I 10
Vaiguvos	Skn.	7.	5	H 7
Vainagių	Skn.	8.	5	L 16
Vaineikių	Kre.	9.	4	C 5
Vaimuto	Paj.	8.	4	E 9
Vaišvidavos	Pnm.	5.	7	M 13
Varnabūdės	Kaz.	5.	7	K 14
Varnių	Tel.	7.	5	G 6
Veisėjų	Vei.	5.	7	L 18
Veiviržėnų	Sve.	5.	4	D 7
Velniakalnio	Kaz.	7.	7	K 13
Vendžiagolos	Rau.	1.	5	M 11
Verbėnų	Sia.	10.	2	L 4
Vidukles	Ras.	7.	5	I 9
Viešintų	Sim.	8.	6	Q 7
Vievio	Zzm.	9.	8	Q 13
Viliukų	Tauj.	8.	6	O 9
Vilkaviškio	Vlk.	3.	7	J 14

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Vilkenu	Sve.	6.	4	D 8
Vilkijos	Rau.	11.	5	L 11
Vinksniniu	Bir.	7.	3	P 3
Vistycio	Vlk.	4.	7	H 15
Vyzunu	Rok.	10.	3	S 4

-Y-

Ylakiu	Maz.	2.	1	E 3

-Z, Ž-

Zadvainiu	Rtv.	7.	4	E 7
Zaiginio	Ras.	8.	5	K 9
Zagares	Jon.	10.	2	J 2
Zaliosios	Vlk.	5.	7	I 14
Zaliosios	Zlg.	8.	6	O 6
Zapyskio	Pnm.	6.	7	L 12
Zarasu	Zrs.	6.	6	V 6
Zaremu	Tel.	8.	4	F 6
Zasyciu	Sve.	7.	4	D 8
Zeimelio	Jon.	11.	2	M 3
Zeimiu	Ked.	10.	5	N 11
Zemaitkiemio	Ukm.	9.	6	Q 9
Zemales	Maz.	10.	1	F 3
Zibalu	Ukm.	8.	6	Q 11
Ziezmariu	Zsm.	8.	8	O 13
Zilinu	Dau.	8.	8	P 15
Ziobiskio	Rok.	11.	6	S 5
Zuku	Lek.	9.	7	J 13

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NOTE

ABBREVIATIONS

Aly.	"	Alytus
Bai.	"	Baisogala
Bir.	"	Birzai
Dau.	"	Daugu
Dzu.	"	Dzuku
Jon.	"	Joniskio
Jrb.	"	Jurbarko
Jure.	"	Jures
Kai.	"	Kaisiadoriu
Kau.	"	Kauno
Kaz.	"	Kazlu Rudos
Ked.	"	Kedainiu
Kre.	"	Kretingos
Kur.	"	Kursenu
Lab.	"	Labanoro
Lck.	"	Lekeciu
Mar.	"	Marijampoles
Maz.	"	Mazeikiu
Paj.	"	Pajurio
Pkr.	"	Pakruojo
Pnm.	"	Panemunes
Pnv.	"	Panevezio
Pas.	"	Pasvalio
Pln.	"	Plunges
Prn.	"	Priemu
Ras.	"	Raseiniu
Rau.	"	Raudondvario
Rtv.	"	Rietavo
Rok.	"	Rokiskio
Sak.	"	Sakiu
Skn.	"	Saukenu
Sia.	"	Siauliu
Sim.	"	Simoniu
Sve.	"	Sveksnos
Tauj.	"	Taujenu
Trg.	"	Taurages
Tel.	"	Telsiu
Tyt.	"	Tytuvenu
Ukm.	"	Ukmerges
Utn.	"	Utenos
Vlk.	"	Vilkaviskio

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Enclosure (A):
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C-O-N-F-I-D-E-N-T-I-A-L

Vei.	District of Veiseju
Zrs.	" " Zarasu
Zlg.	" " Zalgirio
Zzm.	" " Ziezmariu

C-O-N-F-I-D-E-N-T-I-A-L

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Enclosure (A): C-O-N-F-I-D-E-N-T-I-A-L
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District	Subdistrict	Sheet	Coordinates
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	2. Dzirmiškių	7	M 16
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	4. Púnios	7	M 15
	5. Seirijų	7	M 17
	6. Udrijos	7	M 15
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	2. Gimbogalos	5	L 6
	3. Grinkiškio	5	L 8
	4. Gudžiūnu	5	L 8
	5. Legecių	5	L 7
	6. Radviliškio	5	K 8
	7. Radvilonių	5	L 6
	8. Šeduvos	5	L 6
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	4. Nemunėlio	3	P 2
	5. Nemunėlio Radviliškio	3	P 2
	6. Pabiržės	3	O 3
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	4. Merkinės	7	N 17
	5. Omuškio	8	P 15
	6. Perlojos	8	O 17
	7. Pivašiunų	8	O 15
	8. Zilinų	8	P 15

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	2. Duonionių	7	N 16
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	3. Drąsių	2	J 4
	4. Joniškio	2	K 3
	5. Jurdaičių	2	K 2
	6. Kriukų	2	L 3
	7. Meškučių	m2	K 4
	8. Skaistgirio	2	K 3
	9. Sakynos	2	J 3
	10. Zagarės	2	J 2
	11. Zeimelio	2	M 3
VII. Jurbarko		5	H 11
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	2. Kryvilko	5	H 10
	3. Geurės	5	G 10
	4. Jurbarko	5	H 11
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	8. Pašvenčio	5	H 11
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	2. Jurės	7	L 13
	3. Papilvio	7	L 13
	4. Runkų	7	K 13
	5. Sališkių	7	L 13

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	1. Būdos	7	N 12
	2. Darsūniškio	7	N 14
	3. Gegužyno	6	0 11
	4. Kaišiadorių	8	0 12
	5. Kruonio	7	N 13
	6. Silašedų	8	0 12
	7. Vadų	5	N 11
	8. Ziežmarių	8	0 13
X. Kauno		7	N 12
	1. Būdos	7	N 12
	2. Jonavos	5	N 11
	3. Kalnėnų	5	N 11
	4. Kauno	7	N 12
	5. Kartupio	7	N 12
	6. Pravieniškių	7	N 12
	7. Rumšiškės	7	N 12
	8. Turžėnų	7	N 12
XI. Kazlu-Rudos		7	K 13
	1. Ažuolu-Būdos	7	K 14
	2. Bagotosios	7	K 13
	3. Kazlų-Rūdos	7	K 13
	4. Pajėsio	7	K 14
	5. Varnabūdės	7	K 14
	6. Sasnavos	7	K 14
	7. Velniakalnio	7	K 13
XII. Kedainiu	5	5	M 9
	1. Dotnavos	5	L 9
	2. Josvainių	5	M 10
	3. Kedainių	5	M 9
	4. Krakių	5	L 9
	5. Lančiūnavos	5	N 9

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7.	Pernaravos	5	M 10
8.	Surviliškio	5	M 9
9.	Šėtos	5	N 10
10.	Zeimių	5	N 11
XIII.	Kretingos	1	B 5
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2.	Darbėnų	1	B 4
3.	Gruślaukės	1	C 4
4.	Impiltie	1	C 3
5.	Kretingos	4	B 5
6.	Palangos	4	B 5
7.	Skuodo	1	D 3
8.	Šventosios	1	B 4
9.	Vainelkių	4	C 5
XIV.	Kuršėnų	2	I 4
1.	Akmenės	2	H 3
2.	Gedinčių	2	I 4
3.	Kruopių	2	I 3
4.	Kuršėnų	2	I 4
5.	Papilės	2	H 3
6.	Pažižmės	2	I 4
7.	Raudėnų	2	H 4
8.	Siaudinės	2	H 4
XV.	Labanoro	6	T 9
1.	Aisėtos	6	T 10
2.	Baltadvario	6	S 10
3.	Dubingių	6	S 11
4.	Inturkės	6	S 10
5.	Kiauneliškio	6	T 9
6.	Labanoro	6	T 9
7.	Pavižinčio	6	T 9
8.	Stirnių	6	T 9

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	1. Altoniškės	7	L 12
	2. Braziuky	7	K 12
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	4. Karčrūdės	7	J 12
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	6. Lekečių	7	K 12
	7. Lukšių	7	K 12
	8. Sutky	7	J 12
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	3. Palių	7	K 16
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	1. Balėnų	1	F 3
	2. Ylakių	1	E 3
	3. Mažeikių	2	G 3
	4. Medsmrodės	2	G 3
	5. Pikelių	1	F 2
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	7. Purvių	2	G 4
	8. Sėdos	1	F 3
	9. Tirkšlių	1	F 3
	10. Zemalės	1	F 3
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	2. Pagramančio	4	F 9
	3. Pajūrio	4	E 8
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	5. Silinės	4	F 10
	6. Tyrelio	4	F 10

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	7.	Trumpiškių	4	E 9
	8.	Vainuto	4	E 9
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	2.	Klovainių	5	M 5
	3.	Lygumų	2	L 4/L 5
	4.	Linkuvos	2	M 4
	5.	Pakruojo	5	L 5
	6.	Rozalimo	5	L 5
XXI.	Panemunes		7	M 12
	1.	Dubravos	7	N 13
	2.	Garliavos	7	M 13
	3.	Kuodziškės	7	L 12
	4.	Panemunės	7	M 13
	5.	Vaišvidavos	7	M 13
	6.	Zapyškio	7	L 12
XXII.	Panevezio		5	N 7
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	3.	Panevėžio	6	N 6
	4.	Raguvėlės	6	O 7
	5.	Raguvos	6	O 8
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	8.	Ramygalos	5	N 8
XXIII.	Pasvalio		3	O 4
	1.	Daujėnų	6	O 5
	2.	Joniškėlio	2	N 4
	3.	Krinčino	3	O 4
	4.	Moliūnu	6	O 5
	5.	Salamiesčio	6	P 5
	6.	Vabalninko	6	P 5

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	2. Luknėnų	4	E 6
	3. Mykolaičio	4	C 6
	4. Platelių	1	D 4
	5. Plungės	4	E 5
	6. Šateikių	4	D 5
	7. Šimulių	4	D 5
	8. Mazuikių		C 7
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	2. Ivoniškio	7	L 15
	3. Klebiškio	7	L 14
	4. Meškapievio	7	M 14
	5. Mikališkio	7	L 14
	6. Priemų	7	L 14/M 14
	7. Purvės	7	L 14/L 15
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	2. Girdzių	5	I 10
	3. Padubysio	5	J 8
	4. Panemunio	5	I 10
	5. Simkaičių	5	I 10
	6. Vaidžgirio	5	I 10
	7. Vidukles	5	I 9
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	2. Čekiškės	5	L 11
	3. Karalgirio	5	L 11
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	5. Lapių	7	M 12
	6. Padauguvos	5	K 11
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11.	Vilkijos	5	L 11
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2.	Bagdonavo	4	E 7
3.	Giliagirio	4	E 6
4.	Labardžių	4	F 7
5.	Rietavo	4	E 6
6.	Tverų	4	F 6
7.	Zadvainių	4	E 7
XXIX. Rokiškio		3	S 4
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2.	Kamajų	6	S 6
3.	Mituvos	6	R 5
4.	Obelių	6	T 5
5.	Pandėlio	3	R 4
6.	Panemunėlio	6	S 5
7.	Rokiškio	3	S 4
8.	Skapiškio	6	R 5
9.	Suvainiškio	3	R 3
10.	Vyzunų	3	S 4
11.	Ziobiškio	6	S 5
XXX. Šakių		7	I 12
1.	Baltkojų	7	I 12
2.	Gelgaudiškio	5	J 11
3.	Kadebliškio	5	J 11
4.	Plokščių	5	J 11
5.	Slavikų	5	H 11
6.	Sudargo	5	H 11
7.	Šakių	7	I 12
XXXI. Šaukėnų		5	I 6
1.	Gitėnų	5	H 5
2.	Kurtuvėnų	5	I 6

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3.	Paežerių	5	I 5
4.	Siaukėnų	5	I 6
5.	Upyno	5	H 5
6.	Užvenčio	5	H 6
7.	Vaiguvos	5	H 7
8.	Vainagių	5	I 6
XXXII.	Šiaulių	5	K 5
1.	Bubių	5	J 6
2.	Giniočių	5	J 5
3.	Gruzdžių	2	L 4
4.	Kuzių	5	J 5
5.	Rekyvos	5	J 6/K 10
6.	Strazdų	5	J 5
7.	Siaukėnų	5	K 6
8.	Siaulių	5	J 5
9.	Šipylių	2	L 4
10.	Verbėnų	2	L 4
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2.	Kovarsko	6	Q 8
3.	Kupiškio	6	Q 6
4.	Subačiaus	6	P 6
5.	Svedasų	6	R 7
6.	Šimonių	6	R 6
7.	Troskynų	6	Q 7
8.	Viešintų	6	Q 7
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2.	Radviecių	4	E 8
3.	Šveksnos	4	D 8
4.	Tenenių	4	E 8
5.	Veivirženų	4	D 7
6.	Vilkėnų	4	D 8
7.	Zasyčių	4	D 8

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	1. Deltuvos	6	O 10
	2. Juodgirio	6	P 8
	3. Leno	6	O 9
	4. Pagėlažių	6	O 10
	5. Siesikų	6	O 9
	6. Taujėnų	6	P 9
	7. Uzulenio	6	O 9
	8. Viliukų	6	O 9
XXXVI. Tauragės		5	G 9
	1. Anelyno	5	G 9
	2. Batakių	5	G 9
	3. Kalkiškės	5	G 9
	4. Obelyno	4	F 8
	5. Ringių	4	F 9
	6. Tauragės	4	F 10
	7. Kaltinėnų	5	G 8
XXXVII. Telšių		1	F 4
	1. Alsėdžių	1	E 4
	2. Gadunavo	1	F 4
	3. Luokės	5	G 5
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	6. Tryškių	2	G 4
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	1. Kelmės	5	I 7
	2. Kražių	5	H 8
	3. Lydavėnų	5	I 8
	4. Šiluvos	5	J 8
	5. Tytuvėnų	5	J 7
	6. Užpelkių	5	J 7

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2.	Giedraičių	6	R 11
3.	Musninkų	8	Q 12
4.	Šešuolių	6	Q 10
5.	Širvintų	6	Q 11
6.	Šventupės	6	P 10
7.	Upynų	6	P 10
8.	Žibalų	6	Q 11
9.	Žemaitkiemio	6	Q 9
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1.	Anykščių	6	Q 8
2.	Debeikių	6	R 7
3.	Skiemonių	6	R 9
4.	Utenos	6	S 8
5.	Užpalių	6	S 7
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2.	Pajėvonio	7	I 15
3.	Vilkaviškio	7	J 14
4.	Višty čio	7	H 15
5.	Zaliosios	7	I 14
XLII.	Veisėjų	7	L 18
1.	Ančios	7	M 18
2.	Kapčiamiesčio	7	L 18
3.	Kibyšių	7	M 18
4.	Paliepio	7	L 18
5.	Veisėjų	7	L 18
XLIII.	Zarasų	6	V 6
1.	Antazavės	6	U 6
2.	Degučių	6	V 6
3.	Salako	6	U 7
4.	Tauragnų	6	T 8
5.	Užvinčių	6	U 8
6.	Zarasų	6	V 8

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	1. Gitėnų	6	P 7
	2. Karsakiškio	6	O 7
	3. Paežerio	6	O 6
	4. Piniavos	6	O 6
	5. Pumpėnų	5	N 5
	6. Puišaloto	5	N 5
	7. Spřiakių	5	N 6
	8. Zalíosios	6	O 6
XLV. Žiežmarių		8	O 13
	1. Aukštadvario	8	O 14
	2. Bežkonių	8	P 12
	3. Dainavos	8	P 12
	4. Drabužnyku	8	P 13
	5. Gervaraisčio	8	P 13
	6. Jagėlonių	8	P 14
	7. Kaukinės	8	O 13
	8. Semeliškių	8	P 14
	9. Vievio	8	Q 13

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2.	Akmene	Vill.	2	H 3
3.	Alanta	Creek	4	D 5
4.	Alaušas	Lake	6	T 7
5.	Alderawalde	Vill.	7	G 13
6.	Aleksandravėlė	Vill.	6	U 5
7.	Aleksandrija	Vill.	1	D 3
8.	Alkiakis	Vill.	2	I 3
9.	Alizava	Vill.	6	Q 5
10.	Alovė	Vill.	7	N 16
11.	Alsėdžiai	Vill.	1	F 4
12.	Alte Gilge	Stream	4	G 10
13.	Alt Sauken	Vill.	3	S 3
14.	Alumšiai	Vill.	6	O 8
15.	Alunta	Vill.	6	R 9
16.	Alytaus	Town	7	M 16
17.	Amtshagen	Vill.	7	G 14
18.	Andrijavas (see Endrejavas)	Vill.	4	D 7
19.	Aniksta	Vill.	3	T 3
20.	Antaliepte	Vill.	6	T 7
21.	Antvardė	Creek	5	I 11
22.	Anykščiai	Vill.	6	Q 8
23.	Apaščia	Creek	3	Q 4
24.	Ariogala	Vill.	5	K 10
25.	Assern	Vill.	3	T 4
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29.	Aukštadvaris	Vill.	8	O 14
30.	Aura	Creek	4	E 7
31.	Aušvara	Creek	2	M 2
32.	Aviliai	Vill.	6	U 6
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34.	Ažunlu-Dvda	Vill.	7	K 14

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35.	Babrungas	Creek	4	E 5
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37.	Bage-Asite	Vill.	1	D 1
38.	Baisogala	Vill.	5	L 7
39.	Bakalarzewo	Vill.	7	H 18
40.	Balbieriskis	Vill.	7	M 15
41.	Balninkai	Vill.	6	R 9
42.	Balosza	Lake	6	U 9
43.	Baltic	Sea	4	A 6
44.	Barbern	Vill.	3	O 1
45.	Barčiūnai	Vill.	5	N 6
46.	Barstyčiai	Vill.	1	E 3
47.	Barta	River	1	B 2
48.	Barta	Vill.	1	C 2
49.	Bartininkai	Vill.	7	I 15
50.	Batakiai	R.R.Station	5	G 9
51.	Batakiai	Vill.	5	G 9
52.	Bauska	Town	2	N 2
53.	Beižionys	Vill.	8	O 14
54.	Beniakonie	Vill.	8	S 17
55.	Berezina	River	8	V 18
56.	Beržoras	Lake	1	E 4
57.	Bewern	Vill.	3	U 4
58.	Bezdany	Vill.	8	S 13
59.	Birkenmühle	Vill.	7	G 15
60.	Birkštala	Creek	1	G 2
61.	Biržai	Town	3	P 3
62.	Biržulis	Lake	5	G 6
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64.	Bodebach	Vill.	7	G 15
65.	Bohdanow	Vill.	8	V 17
66.	Boruny	Vill.	8	V 16
67.	Brunava	Vill.	3	O 2
68.	Bubiai	Vill.	5	J 6
69.	Budrai	Vill.	4	C 5
70.	Bukonys	Vill.	6	O 10
71.	Bunka	Vill.	1	C 1
72.	Buschhof	Vill.	3	T 2
73.	Butingė	Vill.	1	B 4
74.	Butrimonys	Vill.	7	N 15

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75.	Butrymance	Vill.	8	R 17
76.	Bystrzyca	Vill.	8	U 13

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77.	Čedasai	Vill.	3	S 4
78.	Čekiškė	Vill.	5	K 10
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80.	Czarna Hancza	Creek	7	I 18

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83.	Darbėnai	Vill.	1	B 4
84.	Darsūniškis	Vill.	7	N 13
85.	Daugai	Vill.	8	O 16
86.	Daugaliai	Vill.	6	U 7
87.	Daukšiai	Vill.	7	L 15
88.	Debeikiai	Vill.	6	Q 8
89.	Degučiai	Vill.	4	D 9
90.	Didkiemis	Vill.	4	F 9
91.	Diliai	Vill.	3	Q 4
92.	Domija	Creek	1	F 4
93.	Dotnuva	Vill.	5	M 9
94.	Dotnuvėlė	Creek	5	M 9
95.	Dovinė	Creek	7	K 15
96.	Dowgieliszki	Vill.	6	V 9
97.	Druskieniki	Vill.Resort	7	M 18
98.	Dryswiaty	Lake	6	W 7
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104.	Dukštas	Vill.	6	V 8
105.	Dukszty	Vill.	6	V 7
106.	Dukszty	Lake	6	V 7
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108.	Durba	Creek	4	B 5
109.	Durys	Lake	6	S 10
110.	Dusėtos	Vill.	6	T 6
111.	Dusia	Lake	7	L 17

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112.	Dziewieniszki	Vill.	8	T 17
113.	Dzisna	Lake	6	V 8
114.	Dzisna	Creek	6	V 8
115.	Dzisna	Vill.	6	V 8
116.	Ebenrode	Vill.	7	G 14
117.	Eglona	Creek	3	U 3
118.	Eigirdžiai	Vill.	2	G 4
119.	Ejszyszki	Vill.	8	Q 17
120.	Ellern	Vill.	3	S 3
121.	Endrėjavas	Vill.	4	D 7
122.	Erla	Creek	1	C 3
123.	Ervylkas	Vill.	5	H 10
124.	Eydtkuhnen	Vill.	7	H 14
125.	Ežerė	Creek	5	L 5

-F-

126.	Fillipow	Vill.	7	H 17

-G-

127.	Gadunavas	Vill.	1	F 4
128.	Galona	Lake	6	S 10
129.	Gardamas	Vill.	4	D 9
130.	Gargždai	Vill.	4	C 7
131.	Garliava	Vill.	7	L 13
132.	Gavieze	Vill.	1	C 1
133.	Gawia	Vill.	8	T 18
134.	Gelgaudiškis	Vill.	5	I 11
135.	Gelvonys	Vill.	6	P 11
136.	Giedraičiai	Vill.	6	R 11
137.	Gieranony	Vill.	8	T 18
138.	Gierwiaty	Vill.	8	V 14
139.	Gilge	Stream	4	C 11
140.	Gižai	Vill.	7	J 14
141.	Gramzda	Vill.	1	D 2
142.	Grauźyszki	Vill.	8	U 16
143.	Gražiškiai	Vill.	7	I 15
144.	Graziskiai	Vill.	7	J 13
145.	Grenzhof	Vill.	2	K 2
146.	Grinkiškis	Vill.	5	L 8
147.	Griškabūdis	Vill.	7	J 13

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Enclosure (A):
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C-O-N-F-I-D-E-N-T-I-A-L

148. Gross Salyen
149. Gruślewicz
150. Gruszkiai
151. Gudziūnai
152. Gustonya

-H-

153. Hazelberg
154. Heidekrug (see: Šilutė)
155. Heinrichswalde
156. Heuduszki
157. Herzumberge

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Enclosure (A): C-O-N-F-I-D-E-N-T-I-A-L
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148.	Gross Salven	Vill.	3	R 2
149.	Gruślaukis	Vill.	1	C 4
150.	Gruždžiai	Vill.	2	J 4
151.	Gudžiūnai	RR Station	5	L 8
152.	Gustonys	RR Station	5	N 6

-H-

153.	Hazelberg	Vill.	7	G 12
154.	Heidekrug (see Šilūte)	Town	4	C 9
155.	Heinrichswalde	Vill.	4	D 11
156.	Hoduciszki	Vill.	6	W 10
157.	Hofzumberge	Vill.	2	K 1

-I-

158.	Ignalina	Vill.	6	U 9
159.	Ilgis	Lake	7	N 17
160.	Illukste	Vill.	6	V 5
161.	Imbradas	Vill.	6	U 6
162.	Indrioniškis	Vill.	6	Q 7
163.	Inkertas	Lake	6	S 9
164.	Inturkis	Vill.	6	S 10
165.	Iŝnoras	Lake	6	T 10
166.	Ivoniškiai	Vill.	4	F 7

-J-

167.	Jagléna	Creek	3	P 4
168.	Jarkė	Creek	7	G 16
169.	Jaszuny	Creek	8	S 15
170.	Jekobpils	Town	3	T 1
171.	Jeleniewo	Vill.	7	I 17
172.	Jelau	Creek	3	O 1
173.	Jelowka	Vill.	6	V 5
174.	Jiesia	Creek	7	L 14
175.	Jiesra	Creek	2	H 1
176.	Jéznas	Vill.	7	N 14

C-O-N-F-I-D-E-N-T-I-A-L

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177.	Joda	Creek	6	O 7
178.	Jokūbavas	Vill.	4	C 6
179.	Jonava	RR Station	5	N 11
180.	Jonava	Town	5	N 11
181.	Joniškėlis	Vill.	2	N 4
182.	Joniškis	Vill.	6	T 11
183.	Joniškis	Town	2	L 3
183.	Joniškis	RR station	5	G 10
185.	Josvainiai	Vill.	5	L 10
186.	Jotija	Creek	4	D 7
187.	Juodkrantė (see Schwarzort)	Vill.	4	B 8
188.	Jura	River	4	E 7, E 9, F 11
189.	Jura	Creek	6	R 6
190.	Jura	Creek	7	K 13
191.	Juraciszki	Vill.	8	U 18
192.	Jurbarkas	Vill.	5	H 11
193.	Jurgiškis	Lake	6	Q 6
194.	Južintai	Vill.	6	T 6

-K-

195.	Kaimelis	Vill.	5	H 11
196.	Kaišiadoriai	Town	8	O 12
197.	Kaletnik	Vill, RR St.	7	J 17
198.	Kalnaberžis	Vill.	5	M 9
199.	Kaltinėnai	Vill.	5	G 8
200.	Kaltinėnai	Vill.	6	U 10
201.	Kaltisa	Creek	1	E 2
202.	Kalvarija	Town	7	J 16
203.	Kamajai	Vill.	6	S 6
204.	Kamana	Swamp	2	H 3
205.	Kapčiamiestis	Vill.	7	L 18
206.	Kartena	Vill.	4	C 5
207.	Katyčiai (see Kosdjuten)	Vill.	4	E 9
208.	Kaunas	City	7	M 12
209.	Kazlų-Rūda	Vill.	7	K 13
210.	Kėdainiai	Town	5	M 10
211.	Kelmė	Vill.	5	I 7

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212.	Kĕrnava	Vill.	8	Q 12
213.	Kertojis	Lake	6	S 10
214.	Keturvalakis	Vill.	7	J 15
215.	Kiemieliszki	Vill.	8	U 12
216.	Kirsna	Creek	7	K 16
217.	Kivĕ	Creek	2	K 2
218.	Klaipĕda (see Memel)	City	4	B 6
219.	Klewica	Vill.	8	T 16
220.	Klovainiai	Vill.	5	M 5
221.	Kluszczany	Vill.	8	V 12
222.	Klykuoliai	Vill.	2	I 2
223.	Koadjuten (see Katyčiai)	Vill.	4	E 9
224.	Kobele	Vill.	7	N 19
225.	Kolainiai	Vill.	5	H 6
226.	Komajka	Creek	6	X 10
227.	Koniawa	Vill.	8	P 18
228.	Kontaučiai	Vill.	4	F 5
229.	Konwaliszki	Vill.	8	S 17
230.	Korkozyszki	Vill.	8	T 12
231.	Kovarskas	Vill.	6	Q 8
232.	Kowno (see Kaunas)	City	7	M 12
233.	Kozaczyzna	Vill.	6	V 8
234.	Krakerorter	Lake	4	C 9
235.	Krakiai	Vill.	5	L 9
236.	Krasnapol	Vill.	7	J 18
237.	Kražantĕ	Creek	5	H 8
238.	Kražiai	Vill.	5	H 7
239.	Krekenavas	Vill.	5	M 8
240.	Kretinga	Town	4	B 5
241.	Krewo	Vill.	8	V 16
242.	Kriaunos	Vill.	6	T 5
243.	Krinčinas	Vill.	3	O 4
244.	Kriŭkai	Vill.	2	L 3
245.	Kruoja	Creek	5	L 5
246.	Kruonis	Vill.	7	N 13
247.	Kruopiai	Vill.	2	I 3
248.	Krutĕ	Vill.	1	C 2
249.	Kuckerneese	Vill.	4	C 10
250.	Kudirkos Naumiestis	Vill.	7	I 13
251.	Kukliškis	Vill.	6	T 9
252.	Kŭliai	Vill.	4	D 6

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253.	Kupiškis	Vill.	6	Q 6
254.	Kurisches Haff (see Kuršių Marios)	Bay	4	B 10
255.	Kurische Nehrung (see Kuršių Neringa)	Peninsula	4	B 7, 8, 9
256.	Kurkliai	Vill.	6	Q 9
257.	Kuršėnai	Town	2	I 4
258.	Kuršių Marios (see Kurisches Haff)	Bay	4	B 10
259.	Kuršių Neringa (see Kurische Nehrung)	Peninsula	4	B 7, 8, 9
260.	Kurtavėnai	Vill.	5	I 6
261.	Kužiai	RR Station	5	J 5
262.	Kvėdarna	Vill.	4	E 8
263.	Kvietkai	Vill.	3	Q 3
264.	Kybartai	Vill.	7	H 14

-L-

265.	Laba	RR Station	5	M 6
266.	Labanoras	Vill.	6	T 10
267.	Laižuva	Vill.	2	H 2
268.	Lakaja	Lake	6	T 10
269.	Landwarow	Vill.	8	Q 14
270.	Landwarow	RR Station	8	Q 14
271.	Laugsargen (see Lauksargė)	Vill.	4	F 10
272.	Laukėsa	Creek	3	U 4
273.	Lauksargė (see Laugsargen)	Vill.	4	F 10
274.	Lauksode	Vill.	2	M 3
275.	Laukuva	Vill.	4	F 7
276.	Laukžemis	Vill.	1	B 4
277.	Lavėna	Creek	6	Q 6/R 5
278.	Lazdijai	Vill.	7	K 17
279.	Leckava	Vill.	1	F 2
280.	Leipalingis	Vill.	7	M 18
281.	Lekeciai	Vill.	7	K 12
282.	Leliūnai	Vill.	6	R 8
283.	Lėnas	Vill.	6	O 8
284.	Lenkimai	Vill.	1	C 3

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285.	Liauda	Creek	5	M 8
286.	Liepaja	City	1	B 1
287.	Liepaja	Lake	1	B 1
288.	Lieplaukis	Vill.	4	F 5
289.	Linkaičiai	RR Station	5	L 6
290.	Linkuva	Vill.	2	M 4
291.	Lipniszki	Vill.	8	T 18
292.	Liškěva	Vill.	7	M 18
293.	Liubavas	Vill.	7	I 16
294.	Liudvinavas	Vill.	7	K 15
295.	Livenhof	Vill.	3	U 2
296.	Lokysta	Creek	4	F 8
297.	Lomenė	Creek	8	O 12
298.	Lomenė	Vill.	8	O 12
299.	Lootj	Vill.	3	V 1
300.	Lukšiai	Vill.	7	J 12
301.	Lukštas	Lake	5	G 7
302.	Luoba	Creek	1	E 3
303.	Luodis	Lake	6	V 7
304.	Luokė	Vill.	5	G 5
305.	Lusza	Lake	6	U 9
306.	Lydavėnai	Vill.	5	J 8
307.	Lygumai	Vill.	2	L 4
308.	Lyngmiany	Vill.	6	U 9
309.	Lyntupy	Vill.	6	V 11

-M-

310.	Malėtai	Vill.	6	S 10
311.	Marcinkańce	Vill.	8	O 18
312.	Marijampolė	Town	7	K 15
313.	Mastis	Lake	4	F 5
314.	Mažeikiai	Town	2	G 2
315.	Mažupė	Creek	5	M 5
316.	Medingėnai	Vill.	4	F 6
317.	Medniki	Vill.	8	T 15
318.	Mejszagola	Vill.	8	Q 12
319.	Mekes	Lake	1	B 2

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320.	Memel (see Klaipėda)	City	4	B 6
321.	Memel	River	4	F 11
322.	Mereczanka	River	8	R 15
323.	Merkinė	Town	7	N 17
324.	Merkys	River	8	O 17
325.	Meškučiai	Vill.	2	K 4
326.	Mesoten	Vill.	2	M 2
327.	Meteliai	Vill.	7	L 16
328.	Metelys	Lake	7	L 16
329.	Michaliszki	Vill.	8	V 13
330.	Mielegany	Vill.	6	W 9
331.	Minija	River	4	C 6, C 7, E 6
332.	Mišupis	Creek	4	D 5
333.	Mituva	Creek	5	J 10, H 10
334.	Mockdis	Vill.	1	D 3
335.	Mostejki	Vill.	8	O 19
336.	Murowana Oszmiana	Vill.	8	T 15
337.	Muša	River	2	M 1, N 2, K 4
			3	O 3
338.	Musė	Creek	8	P 12
339.	Musninkai	Vill.	8	Q 12

-N-

340.	Naujėna	Lake	7	K 16
341.	Naumiestis (Panev)	Vill.	5	N 7
342.	Naumiestis (Taurag)	Vill.	4	D 9
343.	Nava	Creek	7	J 12
344.	Nedzingė	Vill.	8	O 17
345.	Nedzingis	Lake	7	N 17
346.	Nemakščiai	Vill.	5	H 9
347.	Nemaniūnai	Vill.	7	N 15
348.	Nemunaitis	Vill.	7	M 16
349.	Nemunas	River	5	J 11
			7	L 12, M 15
350.	Nemunėlis	River	2	N 2
			3	R 4, O 2
351.	Nerimdaičiai	Vill.	2	G 4
352.	Neu Auz	Vill.	2	H 1
353.	Neukirch	Vill.	4	D 11
354.	Nevardėnai	Vill.	5	G 7

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355.	Nevėžis	River	5 6	M 8, M 10 P 7
356.	Nica	Vill.	1	B 2
357.	Nida (see Nidden)	Vill.,Resort	4	A 9
358.	Nidden (see Nida)	Vill.,Resort	4	A 9
359.	Niemenczyn	Vill.	8	S 13
360.	Niestaniszki	Vill.	8	V 13
361.	Nigrande	Vill.	1	F 1
362.	Notė	Creek	1	D 4
363.	Nowo Święciany	Vill.	6	U 10
364.	Nowo Wilejka	Vill.	8	S 14

-O-

365.	Obelė	Creek	7	N 15
366.	Obeliai	Vill.	6	T 5
367.	Obelija	Creek	5	L 5
368.	Obelija	Lake	7	L 16
369.	Okainiai	Vill.	5	N 9
370.	Olkieniki	Vill.	8	Q 16
371.	Onuskis (Takų)	Vill.	8	P 15
372.	Onuškis (Rokiškio)	Vill.	3	S 4
373.	Osa	Lake	6	V 6
374.	Ostrowiec	Vill.	8	U 14
375.	Oszmiana	Town	8	U 15

-P-

376.	Pabiržė	Vill.	3	O 3
377.	Pagėgiai (see Pogegen)	Town	4	E 11
378.	Pagramantis	Vill.	4	F 9
379.	Pajėvonis	Vill.	7	H 15
380.	Pajūrėlis	Vill.	4	E 8
381.	Pajuris	Vill.	4	E 8
382.	Pakruojus	Vill.	5	L 5
383.	Pakuonis	Vill.	7	M 13
384.	Palanga	Vill.,Resort	4	B 5
385.	Palaukiai	Vill.	6	P 6

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386.	Palonė	Creek	5	M 7
387.	Panėlys	Vill.	3	R 4
388.	Panemunėlis	Vill.	6	S 5
389.	Panemunis	Vill.	3	R 4
390.	Panevėžys	Town	6	O 6
391.	Paparčiai	Vill.	8	P 12
392.	Papes	Lake	1	B 3
393.	Papilys	Vill.	3	Q 4
394.	Pašaltuonis	Vill.	5	H 10
395.	Pasvalys	Vill.	3	Q 4
396.	Pasvitinys	Vill.	2	[illegible]
397.	Patyrėliai	RR Station	5	H 5
398.	Perloja	Vill.	8	Q 17
399.	Peršakis	Creek	7	L 15
400.	Perty	Lake	7	I 18
401.	Pervazninkai	Vill.	5	H 11
402.	Perwelk	Vill.	4	B 9
403.	Pierszajuszna	Creek	6	T 10
404.	Pievėnai	Vill.	2	G 3
405.	Pikšliai	Vill.	1	F 2
406.	Pilva	Creek	7	L 13
407.	Pilvė	Creek	7	J 14
408.	Pilviškiai	Vill.	7	J 14
409.	Planisata	Creek	2	M 2
410.	Plateliai	Vill.	1	D 4
411.	Platena	Creek	2	K 2
412.	Plicken	Vill.	4	G 6
413.	Plinkšys	Lake	1	F 4
414.	Plokščiai	Vill.	5	J 11
415.	Plungė	Town	4	E 5
416.	Plusze	Vill.	6	U 9
417.	Plutiškiai	Vill.	7	L 14
418.	Pocunėliai	Vill.	5	M 8
419.	Podbrodzie	Vill.	8	T 12
420.	Podbrzezie	Vill.	8	R 12
421.	Pogegen (see Pagegiai)	Town	4	E 11
422.	Poluknie	Vill.	8	Q 15
423.	Pomorze	Lake	7	K 18
424.	Porudomino	Vill.	8	R 15
425.	Powewiorka	Vill.	8	U 12

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Enclosure (A):
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C-O-N-F-I-D-E-N-T-I-A-L

426.	Praviena	Creek	7	N 12
427.	Priekulė (Latvia)	Town	1	D 1
428.	Priekulė (Memel) (see Prokŭls)	Town	4	C 8
429.	Prienai	Town	7	M 14
430.	Prokŭls (see Priekulė)	Town	4	C 8
431.	Przerosl	Vill.	7	H 17
432.	Pumpėnai	Vill.	6	O 5
433.	Pŭnia	Vill.	7	N 15
434.	Punsk	Vill.	7	J 17
435.	Purmsati	Vill.	1	D 2
436.	Pušalotas	Vill.	5	N 5
437.	Pyvėsa	Creek	6	O 5

-R-

438.	Raczkowszczyzna	Vill.	6	U 11
439.	Raduń	Vill.	8	Q 18
440.	Radunka	Creek	8	R 18
441.	Radviliškis (Nemun.)	Vill.	3	P 2
442.	Radviliškis (Siauliu)	Vill.	5	K 6
443.	Ragainė (see Ragnit)	Town	4	E 11
444.	Ragnit (see Ragaine)	Town	4	E 11
445.	Raguva	Vill.	6	P 8
446.	Raižiai	Vill.	7	N 15
447.	Rakuże	Lake	6	V 9
448.	Ramygala	Vill.	5	N 8
449.	Raseiniai	Town	5	J 9
450.	Raspuda	Lake	7	G 17
451.	Raudėnai	Vill.	2	H 4
452.	Rausė	Creek	7	J 14
453.	Rekijavas	Lake	5	J 6
454.	Renavas	Vill.	1	F 3
455.	Rietavas	Vill.	4	E 6
456.	Rokiškis	Town	6	S 5
457.	Rospuda	Creek	7	H 17
458.	Rossbach	Creek	7	G 15
459.	Rotnica	Vill.	7	M 18
460.	Rozalinas	Vill.	5	M 5
461.	Rubikiai	Lake	6	R 8
462.	Rubno	Vill.	8	T 13

C-O-N-F-I-D-E-N-T-I-A-L

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Enclosure (A): C-O-N-F-I-D-E-N-T-I-A-L
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463.	Rucava	Vill.	1	B 3
464.	Rudomina	Vill.	7	K 17
465.	Rudomino	Vill.	8	S 14
466.	Rudnia	Vill.	8	P 18
467.	Rudniki	Vill.	8	R 15
468.	Rudziszki	Vill.	8	Q 15
469.	Rukojnie	Vill.	8	S 14
470.	Rumšiškis	Vill.	7	N 13
471.	Rusnė (see Rusz)	Town	4	C 9
472.	Rusz	River	4	D 10
473.	Rusz (see Rusnė)	Town	4	C 9
474.	Rykantai	Vill.	8	Q 13
475.	Rzesza	Creek	8	R 13
476.	Rzesza	Vill.	8	R 13

- S & Š (Sh) -

477.	Sakalynė	Vill.	5	G 10
478.	Šakiai	Town	7	I 12
479.	Šakyna	Vill.	2	I 3
480.	Salakas	Vill.	6	U 7
481.	Salanta	Creek & Vill	1	D 4
482.	Samowo	Lake	6	V 7
483.	Sartas	Lake	6	T 6
484.	Sartininkai	Vill.	4	E 10
485.	Šatė	Vill.	1	D 3
486.	Šateikiai	Vill.	1	D 4
487.	Šatekšna	Creek	6	S 5
488.	Saugai (see Saugen)	Vill.	4	C 8
489.	Saugen (see Saugai)	Vill.	4	C 8
490.	Šaukėnai	Vill.	5	I 6
491.	Šaukotas	Vill.	5	K 8
492.	Schameitkehmen (see Zemaitkiemis)	Vill.	4	D 10
493.	Scharischken	Vill.	7	G 18
494.	Schillfelde	Vill.	7	H 12
495.	Schirwindt	Vill.	7	H 13
496.	Schloszberg	Town	7	G 13
497.	Schmalleningken (see Smalininkai)	Vill.	5	G 11
498.	Schönberg	Vill.	3	O 2
499.	Schwarzort (see Juodkrante)	Vill.	4	B 8

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500.	Šėda	Vill.	1	F	3
501.	Šeduva	Vill.	5	L	6
502.	Šeinė	Creek	7	J	14
503.	Seinis	Lake	7	M	17
504.	Seirijai	Vill.	7	L	17
505.	Sejny	Town	7	K	18
506.	Šemeliškės	Vill.	8	P	14
507.	Šepeta	Swamp	6	Q	6
508.	Seredžius	Vill.	5	K	11
509.	Šerkšnė	Creek	1	F	3
510.	Šešuoliai	Vill.	6	Q	10
511.	Šešupė	River	7	K	14
512.	Šešuvėlė	Creek	7	N	12
513.	Šėta	Vill.	5	N	10
514.	Šiaudinė	Vill.	2	H	4
515.	Šiaulėnai	Vill.	5	K	7
516.	Šiauliai	Town	5	J	5
517.	Šiaušė	Creek	5	J	6
518.	Sieniškki	Vill.	6	V	8
519.	Siesartis	Creek	7	I	12
520.	Siesartis	Lake	6	S	10
521.	Siesikai	Vill.	6	O	9
522.	Šilalė	Vill.	4	F	8
523.	Šilėnai	RR Station	5	K	6
524.	Šilutė (see Heidekrug)	Town	4	C	9
525.	Siluva	Vill.	5	J	8
526.	Simnas	Vill.	7	L	16
527.	Sintautai	Vill.	7	I	12
528.	Šipiliai	Vill.	2	I	4
529.	Širvinta	Creek	6	Q	11
530.	Širvinta	Creek	7	H	15
531.	Sirvintos	Vill.	6	Q	11
532.	Skaisgirys	Vill.	2	K	2
533.	Skapiškis	Vill.	6	R	5
534.	Skaudvilė	Vill.	5	H	9
535.	Skiemonys	Vill.	6	R	9
536.	Skirsa	Creek	3	T	3
537.	Skirsnemune	Vill.	5	I	11
538.	Skorbuciany	Vill.	8	R	15
539.	Skriaudžiai	Vill.	7	L	13
540.	Skudutiškis	Vill.	6	S	9

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541.	Skuodas	Vill.	1	D 3
542.	Šlapaberžis	Vill.	5	M 9
543.	Slavikai	Vill.	7	H 12
544.	Slikiai	RR Station	5	M 10
545.	Slobada	Vill.	7	I 13
546.	Smalininkai (see Schmalleningken)	Vill.	5	G 11
547.	Smelina	Vill.	6	V 6
548.	Smolwy	Vill.	6	V 7
549.	Solcza	Creek	8	Q 16
550.	Soleczniki Male	Vill.	8	S 16
551.	Soleczniki Wielkie	Vill.	8	S 16
552.	Solomianka	Vill.	7	L 12
553.	Soły	Vill.	8	V 15
554.	Sonnaxt	Vill.	3	S 1
555.	Staciūnai	RR Station	5	L 5
556.	Stakliškis	Vill.	7	N 14
557.	Strěva	Creek	8	O 13
558.	Streveninkai	Vill.	8	O 13
559.	Strujnozy	Vill.	6	V 11
560.	Subačius	RR Station	6	P 6
561.	Subačius	Vill.	6	P 6
562.	Subata	Vill.	3	U 4
563.	Subotniki	Vill.	8	T 18
564.	Sudčikiai	Vill.	6	T 7
565.	Suderwa	Vill.	8	R 13
566.	Sudraba	Creek	2	L 3
567.	Šumskas	Vill.	7	J 14
568.	Suostai	Vill.	3	P 2
569.	Surwiliszki	Vill.	8	U 17
570.	Sušeja	Creek	3	Q 2,S 3,U 2
571.	Sušeja (Little)	Creek	3	T 2, U 2
572.	Šušvě	Creek	5	L 8
573.	Suvainiškis	Vill.	3	R 3
574.	Suviekas	Vill.	6	U 6
575.	Suvingis	Lake	7	N 16
576.	Suwałki	Town	7	I 18
577.	Svedasai	Vill.	6	R 17
578.	Svedě	Creek	2	I 2
579.	Švěkšna	Vill.	4	D 8
580.	Šventežeris	Vill.	7	L 17

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581.	Šventoji	Creek	1	C 3
582.	Šventoji	Vill. (Fishing Port)	1	B 4
		River	6	T 7, S 7
583.	Šventoji	Creek	2	M 3
584.	Švitė	Town	6	V 10
585.	Święciany	Vill.	8	U 12
586.	Swiżonki	Creek	6	W 10
587.	Switka	Vill.	7	N 18
588.	Szklary	Lake	6	V 7
589.	Szwinta			

- T -

590.	Taboryszki	Vill.	8	T 15
591.	Tatula	Creek	6	P 5
			3	O 3
592.	Taujėnai	Vill.	6	P 9
593.	Tauragė	Town	4	F 10
594.	Tauragnai	Vill,Lake	6	T 8
595.	Telšiai	Town	4	F 5
596.	Teneniai	Vill.	4	E 8
597.	Tenže	Creek	4, 7	B 5
598.	Tilsit (see Tilžė)	Town	4	E 11
599.	Tilžė (see Tilsit)	Town	4	E 11
600.	Tirkšliai	Vill.	1	F 3
601.	Tollvungen	Vill.	7	G 15
602.	Traby	Vill.	8	U 17
603.	Traupis	Vill.	6	P 8
604.	Trokiele	Vill.	8	S 18
605.	Troki Nowe	Town	8	Q 14
606.	Troki Stare	Vill.	8	Q 14
607.	Troškūnai	Vill.	6	Q 7
608.	Tryškiai	Vill.	2	H 4
609.	Turgiele	Vill.	8	S 15
610.	Tvėrai	Vill.	4	F 6
611.	Tyrulis	Swamp	5	J 6
612.	Tytuvėnai	Vill.	5	J 7

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- U -

613.	Udrija	Vill.	7	L 15
614.	Ukmergė	Town	6	P 10
615.	Ukrinai	Vill.	1	F 2
616.	Utena	Town	6	S 8
617.	Uzjana	Creek	6	U 8
618.	Užpaliai	Vill.	6	S 7
619.	Užusaliai	Vill.	7	N 12
620.	Užventis	Vill.	5	H 6

- V -

621.	Vabalninkas	Vill.	6	P 5
622.	Vadakstis	Creek	2	H 2
623.	Vaičiaičiai	Vill.	1	E 3
624.	Vaiguva	Vill.	5	H 7
625.	Vailabai	Vill.	5	I 9
626.	Vainodė	Town	1	E 2
627.	Vainutas	Vill.	4	E 9
628.	Vaižgirys	Vill.	5	I 10
629.	Varduva	Creek	1	E 4
630.	Varėna	Vill.	8	O 17
631.	Varėnė	Creek	8	O 16
632.	Varniai	Vill.	5	G 6
633.	Vaškai	Vill.	2	N 3
634.	Veisėjai	Vill.	7	L 18
635.	Veivėriai	Vill.	7	L 13
636.	Veivirža	Creek	4	D 7
637.	Vegeriai	Vill.	2	I 2
638.	Veliunna	Vill.	5	J 11
639.	Vendžiogala	Vill.	5	M 11
640.	Venta	River	1	G 2
			2	I 4
			5	I 5, H 6
641.	Venta	Canal	5	I 6
642.	Vepriai	Vill.	6	O 10
643.	Verknė	Creek	7	N 15
644.	Vėžaičiai	Vill.	4	C 6
645.	Vidavis	Creek	5	I 10
646.	Videniškiai	Vill.	6	R 10

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647.	Viduklė	Vill.	5	I 9
648.	Viekšniai	Town	2	G 3
649.	Viesa	Creek	3	Q 2
650.	Viešintos	Vill.	6	Q 7
651.	Viesitė	Vill.	3	U 2
652.	Viešvėnai	Vill.	4	G 5
653.	Vievis	Vill.	8	P 13
654.	Vilčia	Creek	2	N 2
655.	Vilija or Neris	River	5	N 11
			6	O 11
			7	M 12
656.	Vilkaviškis	Town	7	I 14
657.	Vilkija	Creek	2	K 2
658.	Vilkija	Vill.	5	L 11
659.	Vilkyčiai	Vill.	4	F 11
660.	Vilyčia	Creek	2	K 2
661.	Vinkšnupiai	Vill.	7	I 15
662.	Virbalis	Town	7	I 14
663.	Virkštas	Lake	1	E 4
664.	Virvytė	Creek	2	G 4
			5	G 6
665.	Višakio Ruda	Vill.	7	K 13
666.	Višakis	Creek	7	K 13
667.	Vištytis	Lake	7	H 16
668.	Vištytis	Vill.	7	H 15
669.	Vyžuna	Creek	6	S 8
670.	Vyžuonai	Vill.	6	S 7

- W -

671.	Waka	Creek	8	R 14
672.	Waldheide	Vill.	5	H 11
673.	Warenów	Vill.	8	S 17
674.	Warzoka	Creek	8	P 17
675.	Wesełowo	Vill.	6	W 7
676.	Wigry	Lake	7	I 18
677.	Wigry	Vill.	7	J 18
678.	Wilejka	Creek	8	T 14
679.	Wilija	River	8	S 12
680.	Wilke	Creek	4	E 10

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681.	Willkischken (see Vilkyciai)	Vill.	4	F 11
682.	Wilno (Vilnius)	City	8	R 14
683.	Wiluhnen	Vill.	7	H 13
684.	Winda	River	1	F 1
685.	Windenburg	Vill.	4	B 9
686.	Wiszniew	Town	8	V 17
687.	Wizajny	Vill.	7	I 16
688.	Worniany	Vill.	8	U 13

- Y -

689.	Ylakiai	Vill.	1	E 3

- Z -

690.	Žagarė	Vill.	2	J 2
691.	Žaiginys	Vill.	5	K 8
692.	Zapyškis	Vill.	7	L 12
693.	Zarasai	Town	6	V 6
694.	Zarėnai (Tel.)	Vill.	4	F 6
695.	Zarėnai (Sia)	Vill.	2	I 3
696.	Žasliai	Vill.	8	O 12
697.	Žeimelis	Vill.	2	M 3
698.	Žejkinia	Vill.	6	V 10
699.	Zelva	Vill.	6	Q 10
700.	Žemaitkiemis (see Schameitkehmen)	Vill.	5	M 8
701.	Zybartoniai	Vill.	5	M 8
702.	Žiežmariai	Vill.	8	O 13
703.	Žiobiškis	Vill.	3	S 4
704.	Zlibinai	Vill.	4	E 5
705.	Zoden	Vill.	2	N 1
706.	Žuvintas	Lake	7	L 15
707.	Žvingiai	Vill.	4	E 9
708.	Žydikiai	Vill.	1	E 2
709.	Žygaičiai	Vill.	4	E 9
710.	Žyrmuny	Vill.	8	R 18
711.	Žyžma	Creek	8	S 18

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Enclosure (A):
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LITHUANIAN FORESTS (AS OF 1937)

LAND USE

DISTRICTS 1937		(see note) 1944		FORESTED AREAS			NON-FORESTED AREAS					TOTAL
				Forest	Cut-over land	Denuded land	Farm-land	Meadow-land	Swamps	Rivers, Lakes	Roads Lanes	All Areas
				HECTARES								
1	Mokomoji	1	Alytaus	9,813	308	143	219	112	429	5,919	145	17,088
2	Baisogalos	2	No change	15,113	1,152	625	271	461	807	34	179	18,642
3	Birsų (!)	3	"	27,226	1,195	746	476	582	832	109	369	31,535
4	Dzūkų	5	"	9,841	1,007	153	220	115	268	840	81	12,525
5	Joniškio (!)	6	"	21,726	1,489	519	880	490	1,457	35	233	26,829
6	Jurbarko	7	"	20,842	736	203	255	399	4,058	683	297	27,472
7	Jūrės	8	"	12,777	702	223	67	240	1,330	19	270	15,628
8	Kaišiadorių	9	"	15,257	790	1,907	263	221	668	283	230	19,619
9	Kauno	10	"	13,852	859	275	220	255	816	10	185	16,472
10	Kazlų Rūdos	11	"	13,552	490	58	205	208	112	3	214	14,842
11	Kėdainių	12	"	21,536	596	735	264	876	353	31	193	24,584
12	Kretingos	13	"	13,828	989	1,260	204	1,109	716	15	179	18,300
13	Kuršėnų	14	"	18,282	1,526	53	288	711	2,394	49	154	23,457
14	Labanoro	15	"	19,150	963	244	275	207	2,002	8,499	278	31,618
15	Marijampolės (!)	17	"	14,152	595	118	415	283	6,552	2,037	109	24,261
16	Mažeikių	18	"	19,077	130	550	267	530	2,806	474	178	24,012
17	Pajūrio (!)	19	"	22,062	1,486	688	186	1,022	624	8	84	26,160
18	Pakruojo (!)	20	"	16,089	343	173	459	234	120	23	203	17,644
19	Panemunės	21	"	10,269	211	218	129	177	1,661	1,215	166	14,046
20	Panevėžio	22	"	15,071	1,587	460	262	535	392	58	229	18,594
21	Plungės	24	"	14,705	1,036	687	351	413	1,533	86	150	18,961
22	Prienų	25	"	12,658	- -	160	277	259	1,256	70	113	14,793
23	Raseinių	26	"	16,794	1,033	38	289	368	46	4	113	18,685
24	Raudondvario	27	"	17,096	2,242	210	352	311	186	1,529	160	22,086

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Enclosure (A):
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LAND USE

DISTRICTS 1937		DISTRICTS 1944		FORESTED AREAS			NON-FORESTED AREAS					TOTAL
				Forest	Cut-over land	Denuded land	Farm-land	Meadow-land	Swamps	Rivers, Lakes	Roads Lanes	All Areas
				HECTARES								
25	Rietavo (!)	28	No change	16,955	1,735	804	156	469	1,124	92	131	21,466
26	Rokiškio(!)	29	"	17,291	874	699	437	619	3,756	2,166	234	26,076
27	Seinu	42	Veiseju	14,558	511	781	169	86	582	143	160	16,990
28	Sudargo	30	Sakiu	11,687	520	134	270	233	403	- -	150	13,397
29	Šakių	16	Lekeciu	21,845	631	217	160	448	400	- -	400	24,101
30	Šaukėnų	31	No change	14,245	2,251	768	246	710	431	636	157	19,444
31	Šiaulių	32	"	16,316	717	362	375	361	5,291	1,692	221	25,335
32	Šimonių	33	"	13,417	1,953	417	268	152	1,890	789	215	19,101
33	Taujėnų	35	"	14,089	972	977	341	377	543	417	230	17,946
34	Tauragės(!)	36	"	13,150	767	329	130	360	327	298	119	15,480
35	Telšių	37	"	11,043	1,992	1,056	148	343	1,941	1,259	156	17,938
36	Tytuvėnų	38	"	11,436	1,128	517	231	512	3,178	382	116	17,500
37	Trakų	45	Ziezmariu	16,753	1,242	113	378	255	176	2,828	200	21,945
38	Ukmergės	39	No change	18,581	962	562	417	417	1,577	1,317	245	24,078
39	Utenos	40	"	9,393	657	63	227	204	217	3,745	38	14,544
40	Varėnos	4	Daugu	19,266	150	1,506	289	166	448	3,683	201	25,709
41	Zarasų	43	No change	17,933	795	200	279	177	890	9,187	- -	29,461
42	Žalgirio	44	"	19,458	1,053	403	277	467	471	17	264	22,403
			TOTALS	668,184 77%	40,375 5%	20,354 2%	11,892 1%	16,467 2%	55,063 6%	50,683 6%	7,749 1%	870,767 100%
		*23	Pasvalio									
		*34	Sveksnos									
		*41	Vilkaviskio									

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ADMINISTRATION						
1937	DISTRICTS (see note)	1944	SUB-DISTRICTS		FOREST GUARDS	
			Total No. in District	Average Area - (Hectares)	No. assigned to District	Average area of responsibility
1	Mokomoji	1 Alytaus	6	2,848	41	416
2	Baisogalos	2 No change	7	2,663	56	333
3	Biržų (!)	3 "	10	3,153	87	362
4	Dzuku	5 "	5	2,505	45	277
5	Joniškio (!)	6 "	9	2,994	78	341
6	Jurbarko (!)	7 "	6	4,578	42	654
7	Jūres	8 "	5	3,126	38	411
8	Kaišiadorių	9 "	8	2,452	52	377
9	Kauno	10 "	7	2,353	42	392
10	Kazlų Rūdos	11 "	6	2,474	38	391
11	Kedainių	12 "	9	2,730	78	315
12	Kretingos	13 "	8	2,287	53	345
13	Kuršėnų	14 "	7	3,351	61	385
14	Labanoro	15 "	9	3,537	56	568
15	Marijampolės(!)	17 "	9	2,696	62	391
16	Mažeikių	18 "	10	2,401	67	358
17	Pajūrio (!)	19 "	9	2,913	64	409
18	Pakruojo (!)	20 "	6	2,941	56	315
19	Panemunės	21 "	5	2,809	34	413
20	Panavežio	22 "	8	2,324	54	344
21	Plungės	24 "	8	2,370	61	311
22	Priemų	25 "	5	2,958	38	389
23	Raseinių	26 No change	7	2,669	59	317
24	Raudondvario	27 "	9	2,454	67	330
25	Rietavo (!)	28 "	7	3,066	55	390
26	Rokiškio (!)	29 "	9	2,897	83	314

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ADMINISTRATION

DISTRICTS 1937		DISTRICTS 1944		SUB-DISTRICTS		FOREST GUARDS	
				Total No. in District	Average Area - (Hectares)	No. assigned to District	Average area of responsibility
27	Seimų	42	Veiseju	5	3,398	49	347
28	Sudargo	30	Sakiu	5	2,679	40	335
29	Šakių	16	Lakečių	7	3,443	55	438
30	Šaukėnų	31	No change	6	3,240	50	388
31	Šiaulių	32	"	6	4,226	52	487
32	Šimonių	33	"	8	2,388	53	370
33	Taujėnų	35	"	7	2,567	43	417
34	Tauragės (1)	36	"	6	2,500	37	385
35	Telšių	37	"	6	2,989	53	338
36	Tytuvėnų	38	"	6	2,916	51	343
37	Traku	45	Ziezmariu	8	2,743	68	323
38	Ukmergės	39	No change	9	2,664	71	339
39	Utenos	40	"	5	2,908	48	303
40	Varėnos	4	Daugu	6	4,284	61	421
41	Zarasų	43	No change	7	4,220	55	537
42	Zalgirio	44	"	8	2,800	50	448
		*23	Pasvalio				
		*34	Sveksnos				
		*41	Vilkaviskio				
			TOTALS	299	2,912	2,303	378

C-O-N-F-I-D-E-N-T-I-A-L

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Enclosure (A): C-O-N-F-I-D-E-N-T-I-A-L

Notes:

The three new forestry districts established between 1937 and 1944 were formed by combining sub-districts taken from other districts as follows:

No. 33 -- Panevelis - from Joniskis, Mirsu, Pakruoje, and Rokiskis

No. 34 -- Krakunai - from Kretinga, Tauragio and Taurages

No. 41 -- Vilkaviskis - from Marijampoles

Various name changes between 1937 and 1944 are noted on the chart.

Statistics given are correct for 1937. They are also correct for 1944 except for the eight districts marked (!) which were reduced in size to form the three new districts marked (*). Source of the statistics is "Lietuvos Miskų Statistika 1937 m., I," Kaunas 1939 m., pp 2-3.

C-O-N-F-I-D-E-N-T-I-A-L

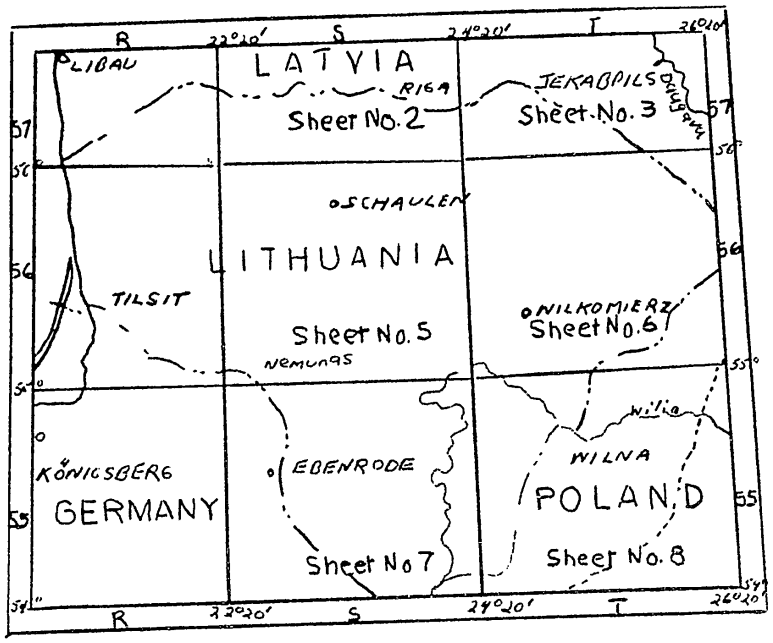
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Enclosure (A)
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INDEX SKETCH

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L E G E N D

GENERAL SIGNS:

1. Boundaries:


State Boundaries of Republic of Lithuania in 1938


Eastern and Southern Boundaries of Soviet Lithuania in 1955


Boundaries of Autonomous District of Memel -- Klaipeda

2. Populated Places:


Cities and Administration Centers


Towns and Villages

3. Roads:


Double Track Railways


Single Track Railways


Narrow Gauge Railways


aved Highways


Unpaved Graveled Roads

4. Others:


Rivers and Lakes


Swamps


Forests

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III

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Enclosure (A): C-O-N-F-I-D-E-N-T-I-A-L

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S P E I A L S I G N S:

1. Forests:

A. Seedling Types:

Purple — Norwegian Spruce (Picea Excelsa)

Orange — Common Pine (Pinus Silvestris)

B. Sprout Types:

Yellow — Permanent Type: Alder (Alnus Glutinosa) Swampy Forests

Green — Temporary Type: Mostly Asp (Populus Tremula) or Birch (Betula Verrucosa)

2. Other Areas:

Brown — Swamps

Blue — Rivers and Lakes

3. Forestry Administration:

Central Forestry Administration

District (Uredya) Forester Headquarters

Subdistrict (Ghirya) Forester Headquarters

Boundaries of Forestry Districts

C-O-N-F-I-D-E-N-T-I-A-L

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POOR ORIGINAL

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C-O-N-F-I-D-E-N-T-I-A-L

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2. On file in CIA Library with the above described text are the following sketches and photographs mentioned in the text:

Chapter	No.	Description	Mention in Text (Paragraph)
Part I Chapter I			
	1.	Political Map of Lithuania	A
	2.	Physcographic Map of Lithuania	C. 2
	3.	Sketch: European Soils	C. 3
	4.	Sketch: European Climatic Zones	D. 1
	5.	Sketch: Atmospheric Pressure and Winds	D. 1
	6.	Sketch: Mean Temperature	D. 2
	7.	Sketch: Precipitation	D. 9
Part I Chapter II			
	8.	Sketch: European Vegetation	A. 1
	9.	Photograph: Ripe Scotch Pine Forest of the Fresh type in the Vilno District	C. 1
	10.	Photograph: Young spruce stand of the Fresh type near Alytus	C. 2
	11.	Photograph: Northern Alder stand of Sprout origin in the Alytus District	C. 3
	12.	Photograph: Typical Oak forest in the Dangai District	C. 4
	13.	Photograph: Young Scotch pine stand with Norway Spruce undergrowth - a typical fresh pine forest	D. 3 (a) (2)

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Chapter	No.	Description	Mention in Text (Paragraph)
Part I			
Chapter II (Cont'd)			
	14.	Photograph: Young oak-spruce stand	D. 3 (b) (1)
	15.	Photograph: Middle age (approximately 50 years old) Spruce stand of the fresh type in the Alytus District	D. 3 (b) (1)
Part II			
Chapter I			
	16.	Photograph: Typical Northern Alder peasant forest exploited by peasants in the Daugai District	A. 2 (b)
	17.	Sketch: Scheme of the Russian Forestry Administration in 1910	B. 9 (g)
	18.	Photograph: Typical Lithuanian forest lane	B. 15 (f)
	19.	Sketch: Russian Timber Export through the Lithuanian Province and its Distribution in East Prussia, 1904	C. 3 (b)
Part II			
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	20.	Sketch: Forest Density Map of Lithuania, 1937	B. 3 (a)
	21.	Sketch: Stand Plan of Svendriai Forest Range, 1930	B. 3 (k)
	22.	Sketch: Wood Supply map of Lithuania	B. 4 (g)
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	24.	Photograph: Agricultural College, Dotnava	B. 16 (d)
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	26.	Photograph: Forest Watch tower in the Jure District, 1938	B. 19 (e)
	27.	Photograph: A "clear-cut" strip in the Prienai District	B. 20 (a)
	28.	Photograph: Peasants preparing an area for Scotch pine seeding in the Jure District	B. 23 (b)
	29.	Photograph: Reforestation of sand dunes around Palanga on the Baltic Coast (poor quality)	B. 23 (e)
	30.	Sketch: Approximate scheme of timber circulation in Lithuania in 1935	C. 5 (d)

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Chapter	No.	Description	Mention in Text (Paragraph)
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Chapter III (Cont'd)			
	31.	Photograph: Workers loading timber in the Kazlu-Rudos District	C. 5 (d)
	32.	Photograph: Floating timber on the Vilija River	C. 5 (f)
	33.	Photograph: Workers stripping bark from pulp wood in the Kazlu-Rudos District	C. 6 (b)
	34.	Photograph: Mast timber in Vilno County	C. 7 (i)
	35.	Photograph: Lumber yard of the Viesvile Company (poor quality)	C. 7 (j)
	36.	Photograph: Paper mill in Petrasiunai (poor quality)	C. 7 (s) (2)
Part II			
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	37.	Sketch: Soviet Lithuanian forest administration, 1941	D. 4 (a)
Part II			
Chapter VI			
	38.	Photograph: Vilno Park showing results of German logging	B. 7 (b)
Part II			
Chapter VII			
	39.	Sketch: Soviet Lithuanian Forest Administration, 1956	B. 3 (b)

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CHAPTER I

The Geography of Lithuania

A. Boundaries

The Republic of Lithuania was proclaimed in February, 1918. Boundary disputes in 1919-20 were settled by 1923 and a final determination of the frontiers located the country between approximately 53° 50'N and 56° 30'N latitudes and 21° 00'E and 26° 20'E longitudes. /Sketch #1, "Political Map of Lithuania", see end of report for availability./(1)

B. Latitude and Its Effect on Climate

Summer daylight hours are long because of the high latitude, compensating in part for the short growing season (170-200 days).(2) In Birzai (approximately 56° 25'N) and Sventoji (approximately 56° 00'N), daylight and twilight last almost 24 hours a day at the time of the summer solstice.(3) The following chart comparing the relative time of sunrise and sunset in Vilno /Vilnius/ (approximately 54° 45'N) and Chicago, Illinois (approximately 41° 45'N) illustrates the effect of high latitude on Lithuania:

Place	Time	18 March		23 June		23 Sep		23 Dec	
		Time	Duration of Daylight	Time	Duration of Daylight	Time	Duration of Daylight	Time	Duration of Daylight
Vilno (Time as of 1904)	Sunrise	06:09	11 hrs 58 min	03:28	17 hrs 07 min	05:49	12 hrs 08 min	08:26	6 hrs 56 min
	Sunset	1807		2035		1757		1532	
		21 March		21 June		23 Sep		22 Dec	
Chicago (CST)	Sunrise	0602	12 hrs 11 min	0429	15 hrs 05 min	0548	12 hrs 08 min	0720	9 hrs 16 min
	Sunset	1813		1934		1756		1636	

(4)

Lithuania's latitude is approximately the same as that of the Labrador Peninsula. The latter has a severely cold climate, however, while Lithuania's climate is milder due to the tempering effect of the warm Gulf Stream and of warm Atlantic air masses. The forest vegetation of Lithuania does not vary within the country due to differences in latitude and longitude. In general, for comparative purposes, Lithuania is most like Northern Michigan and Northern Wisconsin in surface, soil, climate, and vegetation.

C. Landforms, Topography and Soil

1. Almost all of Lithuania (as of 1938) was included within the basin of the Nemunas (Neman) River. The area of Lithuania then was 52,820 sq km and the autonomous District of Klaipeda totalled 21,850 sq km, a total of 55,670 sq km or 21,494 mi.(5) By way of comparison, the area of the State of West Virginia is 24,181 sq mi. As of 1938, approximately 75% of the area of Lithuania was farmland, 17% forests, 6% lakes and rivers, and 2% unproductive wasteland.(6)

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2. Approximately two-thirds of Lithuania is a plain. Average height of the country above sea level is about 150 meters.(7) The surface has been glaciated at least twice, the last time only over the northern portions of the country making it the younger part, geologically speaking. In some places the newer deposits overlying the old moraine are more than 100 meters thick. Glacial (moraine) deposits cover about 90% of Lithuania. Glacial action shaped two upland regions, one in the east and the other in the west. /Sketch #2, "Physiographic Map of Lithuania", see end of report for availability./ The eastern upland rises above 280 meters at several points in Vilkaviskis County while in places the western upland rises above 230 meters.(8) Both upland regions have terminal moraines and fairly steep hills in their central portions which become less rugged and smoother toward the edges. A central plain which is generally level but includes some hilly strips lies between the two uplands.(9)

3. The soil of Lithuania lies within the general specifications for the gray-brown podzols. /Sketch #3, "Europe Soils", see end of report for availability./ This soil corresponds to that found in Upper Michigan, northern Wisconsin, and the southern portion of central Canada.(10) Most of the rock (material from earlier geologic periods) is from the Diluvial Era and forms a moraine loam of rounded stones and rock chips.(11) This loam is rich in calcium ($CaCO_3$) in the form of limestone and its residue, and in magnesium carbonate ($MgCo_3$). The rock is of volcanic and sedimentary origin and is usually of small size. Stones over 60 cu ft are rare. Where the moraine loam has been exposed to water erosion, various types of soil have been deposited depending on the water velocity. These include heavy clays, light clays; heavy, medium, and light loams; loamy sands, regular sands, and silty clays. Generally, all of these soils contain calcium; the gravels (in the presence of limestone) up to 75%, the clays 10-20%, and the sands just a small percentage.(12)

4. The uplands are composed mainly of light materials of a sandy character (sandy loams and gravels). The plains are largely composed of clays and loams, and in the south there are large areas of swampy, sandy soils. The soils in the north are of a dark brown color. They are younger and have not been leached as much as the lighter colored soils in the south. About 25% of the soils are sands and are found mostly in pine forests.

5. It is possible to divide Lithuania into three parts according to soil types:

   a. North-west (western upland) - loam and loamy sands with marshy podsols and a medium-to-strong podsol process;

   b. Central (plain) - loams and clays, old soils rich in carbonates - the best, most fertile soils in Lithuania with a very slight podsol process;

   c. South-east (eastern upland) - loamy sands, sandy, and light loamy soils -- medium podsol process.(13)

6. Originally, the pine forests of Lithuania were located on the sandy soils of the two upland regions and the deciduous and Norway Spruce forests grew in the heavy loams and clays of the plains. The upland soil generally has less calcium than the plains' soils which contain up to 12% calcium. Humus soils are found in the swampy forests and swamps. The forest litter (leaves, etc) decomposes readily. The soils of the coniferous forests have a concentration of P_H = 3.5 - 4.0. The deciduous forests growing in the calcium-rich soils react neutrally, P_H = 5-6.(14) The best places for forest growth are those where drainage is best and where the soils are sandy, loamy sands, or loam.

7. Both upland regions are well drained because of the velocity of the creeks and rivers and because the sandy soil is transported readily by the water. The ground-water level of the uplands lies 3-20 meters deep. Most wells (not artesian) in these areas are dug to these depths. The good drainage and ready water supply of the uplands made them most desirable for human habitation and they were settled before the plains, except for the areas

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of Marijampole and Vilkaviskis. Roads in the area are good. Drainage in the plains is poor because of the heavier soils. Ground-water level is high and often reaches the surface after heavy rains or spring thaws. When this occurs, the plains and their forests are very difficult to cross. The roads, even when maintained, are not very good and are not of use over long periods of time. The river network of Lithuania is insufficient for the country's need.(15) River distribution is not uniform and the fall is insufficient overall. This is particularly true in the northern portion of the country and Kamana, Tyrulis, Rekijavas, and Zuvintas are well-known swamps and peat bogs.

D. Climate

1. In general, Lithuania lies in the European northern moderate zone and has a moist, continental climate with a warm summer and cold winter.(16) Precipitation is moderate in all seasons with a summer maximum. /Sketch #4, "Europe: Climatic Regions", see end of report for availability./ The climate is similar to that found in the Great Lakes and New England Regions of North America. Lithuania lies at the juncture of the continental climate of the Russian plain, and the marine temperate climate of the Atlantic regions. Its climate is tempered by the warm Gulf Stream. Because of its location between these two climatic regions, Lithuania has unstable weather, subject to frequent changes and very difficult to predict. The climate is chiefly influenced by the Atlantic air masses in the form of a series of cyclones which form in the moderate latitudes of the Atlantic and move eastward across Lithuania. The extreme winter cold of the Asian land mass causes a high pressure area (approximately 770 mm) from which cold air masses move southwest, west, and northwest and cross Lithuania. In January air pressure in Lithuania is about 763 mm and isobars run vertically. /Sketch #5, "Atmospheric Pressure and Wind", see end of report for availability./ For this reason, prevailing winds in January blow from the land towards the southwest. In the summer (July) a high is formed in the Atlantic Ocean and winds blow from the ocean toward the east and northeast. Mean isobars (759 mm) in July run northwest-southeast.(17) In spring and fall the climate is a typical continental type.(18) The influence of the Baltic Sea is negligible, affecting Lithuania only about 50 km inland.(19) The influence of the Gulf Stream is less important than the barometric differences.(20)

2. The mean annual temperature of Lithuania is about /6°C (according to observations made from 1931-40, it is /6.4°C).(21) /Sketch #6, "Mean Temperature", see end of report for availability./ The coldest month is January (-4.8°C). The hottest month is July with a mean temperature of /17.2°C (1931-40 observations recorded means temperatures for January of -5.2°C and for July of /18.2°C).(22) The mean annual amplitude is 23.8°C at Zarasai /approximately 55° 45'N - 26° 15'E/ and 19.1°C at Klaipeda /approximately 55° 45'N - 21° 10'E/. Lithuania is progressively hotter in summer and colder in winter as one moves eastward. Annual mean amplitude is also greater in the east because of the influence of the climate. The growing season (temperatures above /5°C) differs according to latitude and longitude. On the shores of the Baltic it is 169 days, around Kaunas /approximately 55° 50'N - 23° 55'E/ 199 days, and around Kibartai /approximately 54° 40'N - 22° 45'E/ 202 days.(23) Winter (below 0°C) lasts three and one half months on the Baltic Coast, four months in the center of the country, and four and one half months in the eastern part of the country. Spring (0°C - 15°C) lasts two and one half months on the Baltic Coast and two months in the east. Summer (over 15°C) and fall (15°C) last about three months over all the country. The beginning and end of the seasons do not vary more than two weeks throughout Lithuania.(24)

3. When the influence of the continental high is strongest, summers are hot and dry and winters are cold, with an accumulated snow cover up to 50 cm by the end of the winter season. The hottest days of the summer occur at the end of June and in early July. The first two weeks of July usually vary between 27-30°C (up to 86°F). Hot days occasionally occur in August and even in early September but the nights are much cooler during these months. The coldest temperatures of the winter are generally not lower than -20°C, but in 1929 and 1941 temperatures of -30°C and below were recorded. January is the coldest month, particularly its last two weeks.

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4. During May and early June a wave of cold Arctic air often threatens orchards and the young plants of the forests. These cold air masses also occur in October. The average time of first and last frosts and the length of the growing season is:

Birzai	3 Oct - 5 May
Kaunas	13 Oct - 28 Apr
Lasdijai	Sep - 8 May(25)

The cold air mass invasions do not occur every year but are very important to the forest economy because of the damage they do to the young sprouts of the oak, the Norway Spruce, and others.

5. Temperatures below 0°C (/32°F) begin regularly in November and occasionally in October or even September. They end in March. In Kaunas this period averages 198 days (1930-1940 statistics), in Zarasai 206 days, and in Lasdijai 225 days.(26) Again, this period increases as one moves eastward from the Baltic. Icy conditions are prevalent on approximately 40% of these days.(27) Ice on lakes and rivers reaches an average thickness of about 50 cm (sometimes 60 cm) and lasts as long as the cold weather holds (longer on the lakes).(28) Open water freezes first in the NE part of the country and the freezing process progresses SW. The ice breaks up the same way, thawing first in the NE and last in the SW. The most important rivers (Nemunas, Vilija /Neris/, Sesupe) flow from East to West and are often blocked by ice from the east, causing widespread flooding. This occurs particularly at Kaunas where the Vilija joins the Nemunas. The Nemunas at Kaunas is frozen across by 20 December (on the average) and the ice breaks up by 18 March, a total of approximately 90 days. Smaller rivers and lakes usually freeze and break up earlier than the larger.(29) Ice forms on the Baltic for short periods only and only for a few hundred meters out from shore.(30) The last time the Baltic froze across was in 1712 when direct communication with Sweden was possible across the ice. During May, 1712, the ice was still thick enough on the Baltic for sleds to be used.(31)

6. The heavy clay soil in the central portions of Lithuania freezes to a depth of approximately one meter (occasionally 1.20 meters). The light sandy soils, which are better drained, freeze to a depth of about 80 cm as do the soils along the Baltic.(32) In the vicinity of Koenigsberg soil temperatures below 0°C last:

0.03 meters depth	- 127 days
0.31 " "	- 61 days
0.63 " "	- 57 days
1.25 " "	- 0 days(33)

7. Wind direction in Lithuania depends upon the high pressures of the Azores and the lows of Iceland, and on the Gulf Stream. Prevailing winds are west and northwest. Wind direction is more dependent upon barometric pressure differences than upon the Gulf Stream.(34) Changes in the wind are most extreme on the Baltic Coast and less extreme inland. Klaipeda has calm weather just 2% of the time while Vilno has calm weather for an average of three months per year (25% of the time and as much as 38% in summer).(35) Wind velocity also varies according to location, diminishing as one goes inland. The mean velocity at Klaipeda averaged 5.5 meters per second, at Riga, Latvia, 2.8 meters per second, and at Vilno 1.8 meters per second (1879-94 figures).(36) Most powerful winds occur in November, the time of cyclone formation. Mean velocity of the wind in Klaipeda during October-January is 6.3 meters per second and during May-August 4.9 meters per second. Winds are stronger during the daytime than at night. Violent storms occur at the end of hot days 10-15 times a summer and are characterized by heavy rain and thunder. Most occur during July and August which have two-thirds of all the severe storms of the year.(37) Lithuanian forests are inured to violent winds and storms and are fairly resistant to them. Only pure Norway Spruce forests suffer uprooting and then usually only when the soil is wet and the winds are very strong.

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8. Tornados are very rare. They also occur only in summer after very hot days, follow a narrow path (a few km wide) and rise and disappear very quickly. They cause widespread destruction in Norway Spruce forests. Occasionally strong winter winds also cause damage in spruce forests.(38)

9. Annual precipitation in Lithuania (1926-39) was 611 mm.(39) Telsiai received 718 mm, Kaunas 600 mm, and Siauliai 547 mm per year during the period. /Sketch #7, "Precipitation 1926-1936", see end of report for availability./ Percentage distribution of precipitation by area and season is as follows:

Area	Winter	Spring	Summer	Fall
Baltic coast	20.7%	15.8%	30.3%	33.2%
Continent	16.4%	20.0%	40.5%	23.1%

(40)

During the spring when rainfall is most needed for agricultural purposes it is generally scarce. Occasionally the shortage is sufficient to cause crop failures. Forest seeding and planting is very much hurt by these spring droughts. Heaviest rainfall occurs during July and August during harvest times. August is a particularly rainy month.

10. Snow is tremendously important in Lithuania as a means of transporting heavy bulky loads (wood, etc). First snowfall occurs in October and the last snow usually disappears by April. Rarely does any remain into May. The four winter months average about the same number of snowfalls. Snow cover remains longest in the uplands. It lasts an average of 89 days per year inland and 69 days per year on the coast. Snow cover is deepest in January and February and allows the use of sled roads to transport timber from the forests to railroads and rivers. If snow cover is light and sled roads cannot be used, the timber lies in the forests and usually spoils. Ordinarily, sled roads can be used (except during thaws) from New Year's Day until the end of February, an average of three to four weeks each year. A single day of thawing weather is sometimes sufficient to ruin the snow roads. Those in the forests remain longer than those in open areas and are used to transport timber to the forest edges until the last possible moment. Generally, snow cover is 10-25 cm deep with a maximum of approximately 50 cm.

****

FOOTNOTES

(1) Mortensen, H, "Litauen", 1926, p 41

(2) Bolshaya Sovietskaya Encyclopedia, 1955, Vol 25, p 248-250

(3) Author's note

(4) Vilenskij Kalendar, 1904

(5) Bendorius, A, "Lietuva", 1953, p 17

(6) Kripas, S T, Untersungen, 1932, p 9

(7) Ibidem

(8) Musteikis, A, Z. U. Statisika, 1948, p 216

(9) Mortensen, geological map

(10) Encyclopedia Britannica, 1945, p 3-0

(11) Ruokis, V, Pietulietuvos Dirvozemiai, 1937, p 7

(12) Ibidem

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(13) Bolshaya Encyclopedia, Vol 25, p 248

(14) Kripas, p 9

(15) Mortensen, p 23

(16) Encyclopedia Britannica World Atlas, 1945, p3-K

(17) Mortensen, p 5-6

(18) " " " "

(19) Bolshaya Encyclopedia, Vol 25, p 248-50

(20) Ibidem

(21) Musteikis, p 14

(22) Bolshaya Encyclopedia, Vol 25, p 248-50

(23) Ibidem

(24) Pakstas, K, Lietuvos Klimatos, 1926, p 19

(25) Musteikis, p 19

(26) Ibidem

(27) Pakstas, p 25

(28) Author's note

(29) Pakstas, p 27

(30) Ibidem

(31) Bendorus, p 38

(32) author

(33) Pakstas, p 30

(34) Ibidem, p 34

(35) Ibidem, Table 14

(36) Ibidem

(37) Ibidem, p 54

(38) Author

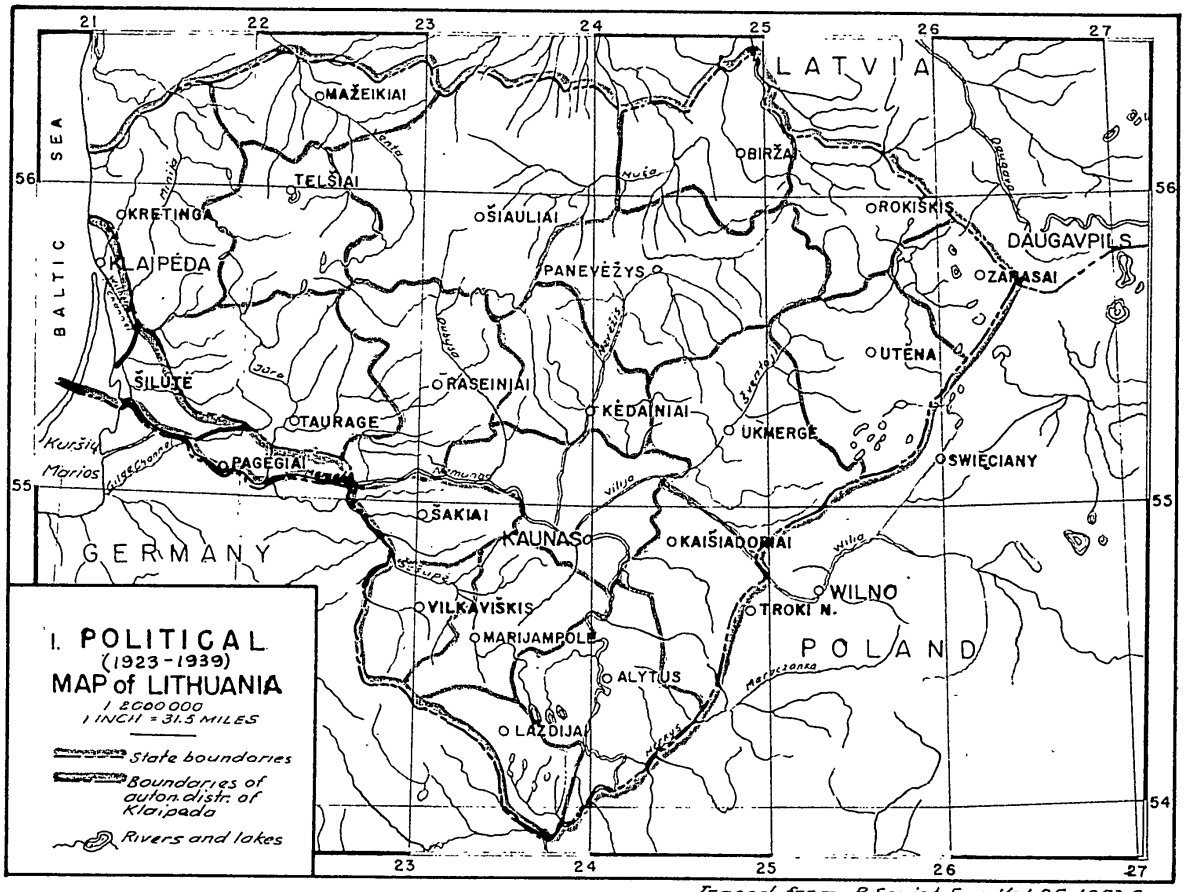
(39) Musteikis, p 15

(40) Ibidem

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#1.



I. POLITICAL
(1923-1939)
MAP of LITHUANIA
1 : 2 000 000
1 INCH = 31.5 MILES

State boundaries
Boundaries of auton. distr. of Klaipeda
Rivers and lakes

Traced from B. Soviet. Enc. Vol 25. 1953 Aug.

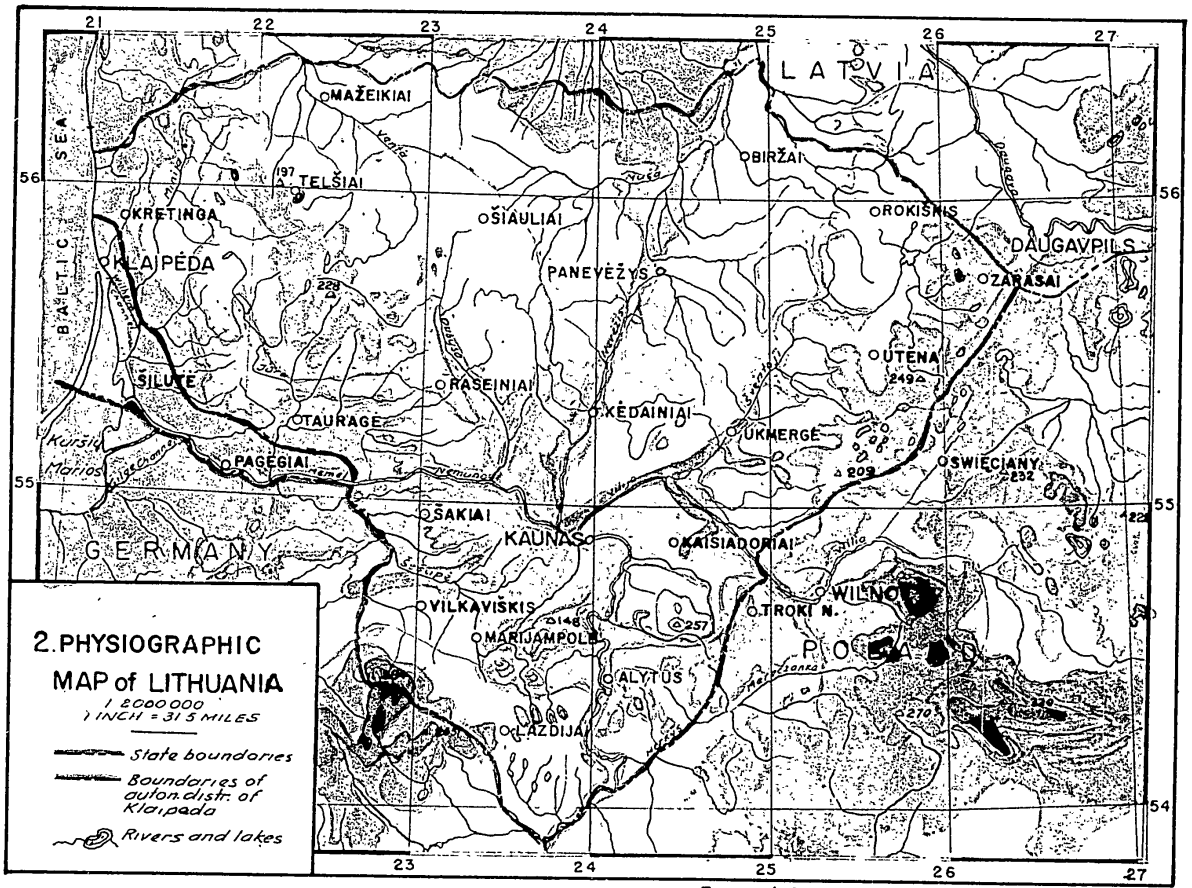
LEGEND:

Limits of counties in main land.
Limits of counties in autom. district of Klaipeda

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#2



2. PHYSIOGRAPHIC MAP of LITHUANIA

1 2000 000
1 INCH = 31 5 MILES

State boundaries

Boundaries of auton. distr. of Klaipeda

Rivers and lakes

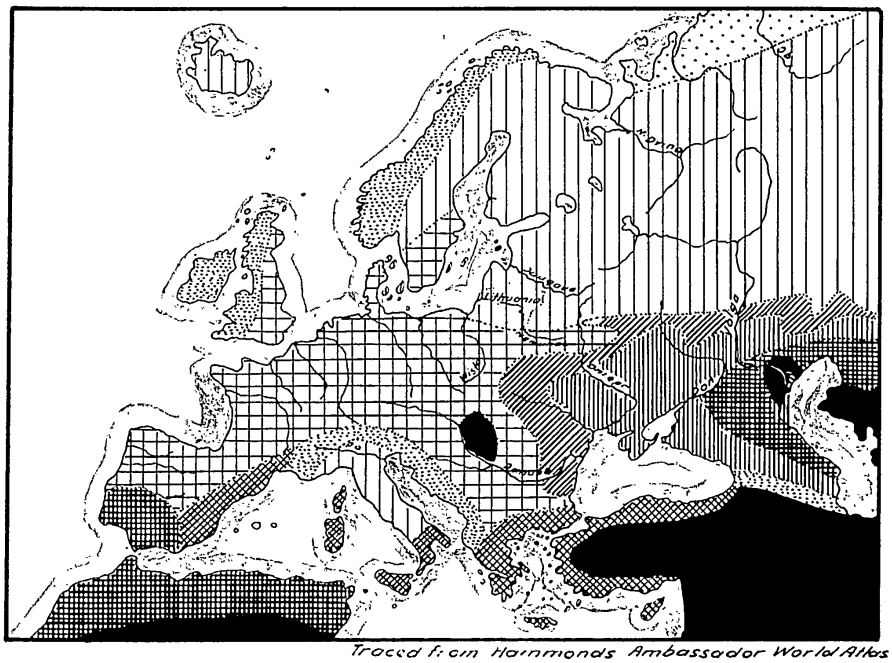
Traced from B. Soviet. Enc. Vol. 25. 1953 Aug.

LEGEND:

Heights in Meters · · ·

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#3



Traced from Hammonds Ambassador World Atlas

LEGEND:

- Tundra
- Mountin soils
- Podsol with much bugs
- Gray brown podsol
- Chernozem & redish chesnut soils.
- Chesnut & brown soils
- Prarie soils and degraded chernozems
- Lateritic soils
- Serozems & deser soils
- Seas

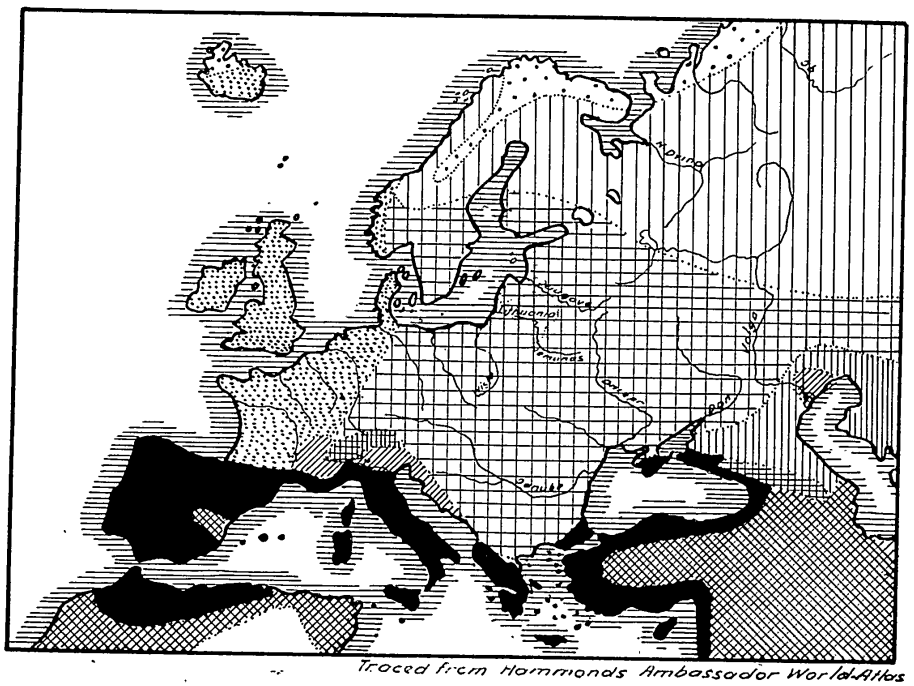
3. EUROPE SOILS

Source: Encyclopedia Britanica, World Atlas 1945 - 30.

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#4



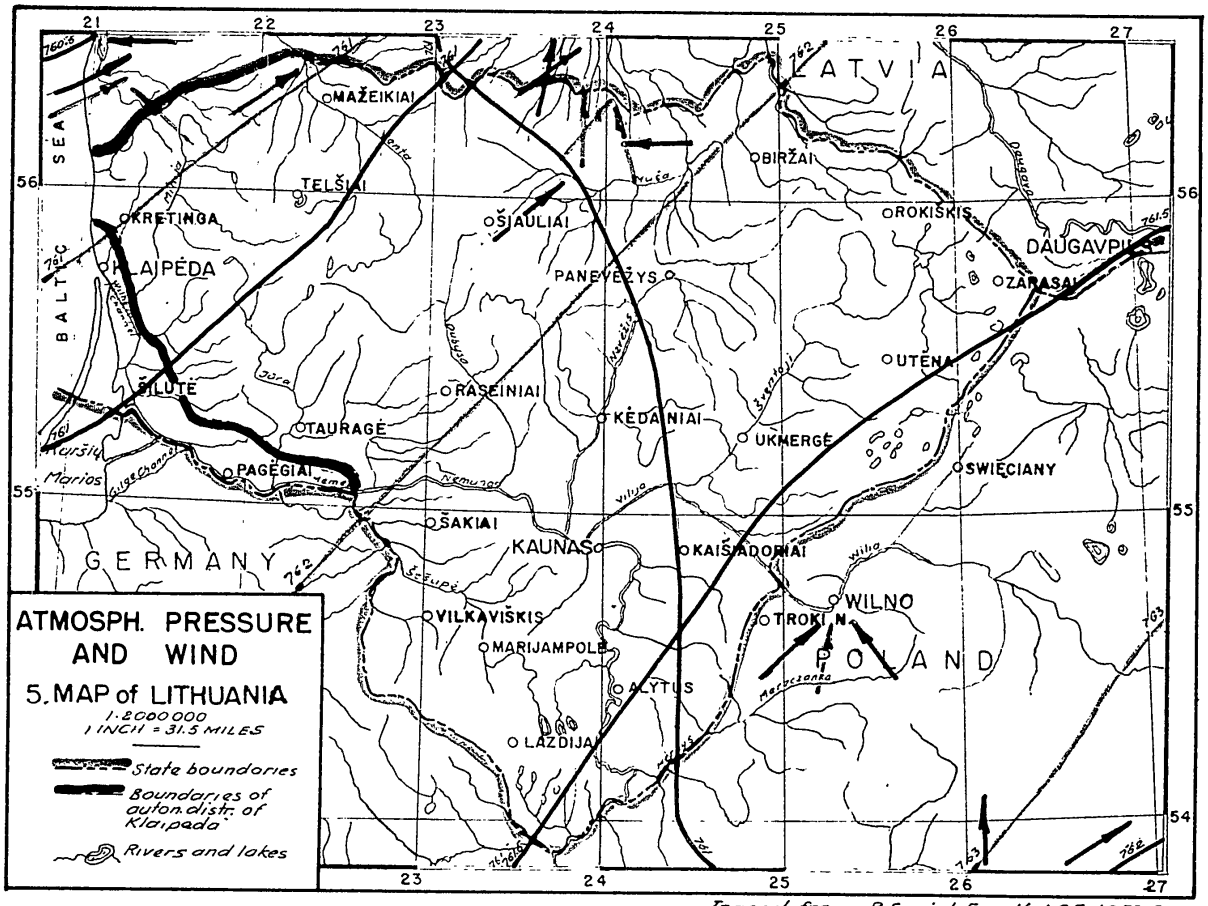
4. EUROPEAN CLIMATIC ZONES

Source: Encyclopedia Britanica, World Atlas 1945, pg. 3-K.

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#5



ATMOSPH. PRESSURE AND WIND

5. MAP of LITHUANIA

1:8000000
1 INCH = 31.5 MILES

State boundaries

Boundaries of auton. distr. of Klaipeda

Rivers and lakes

Traced from B. Soviet. Enc. Vol 25. 1953 Aug.

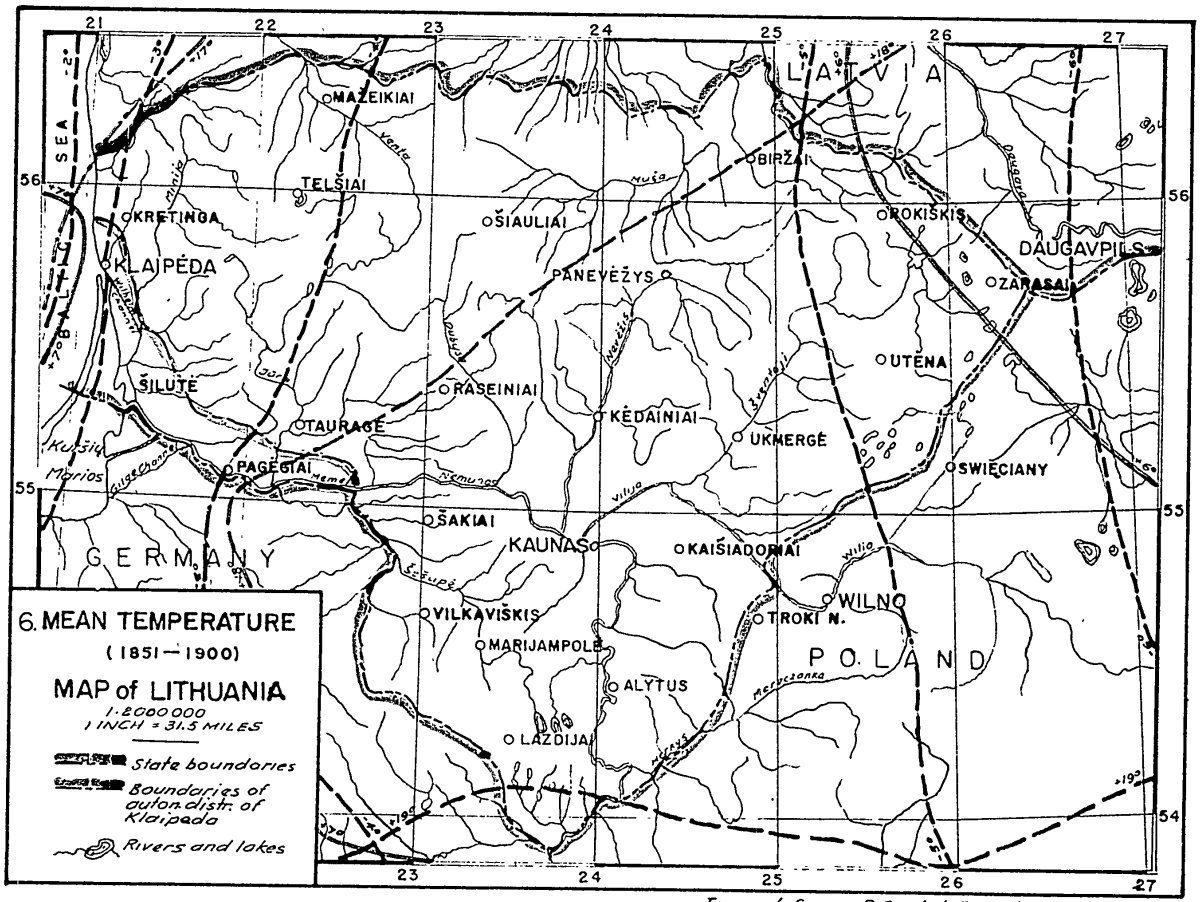
LEGEND: 761mm Annual izobares & prevalent winds
761mm April izobares & prevalent winds
761mm November izobares & prevalent winds

Sources:
K. Pakštas. Lietuvos klimatas. Klaipėda. 1926. Tabl. 124-126 pg.

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#6



6. MEAN TEMPERATURE
(1851—1900)
MAP of LITHUANIA
1:2000000
1 INCH = 31.5 MILES

State boundaries
Boundaries of auton. distr. of Klaipeda
Rivers and lakes

LEGEND: -2°C Izothermes of January
+17°C Izothermes of July
+7°C. Izothermes annual

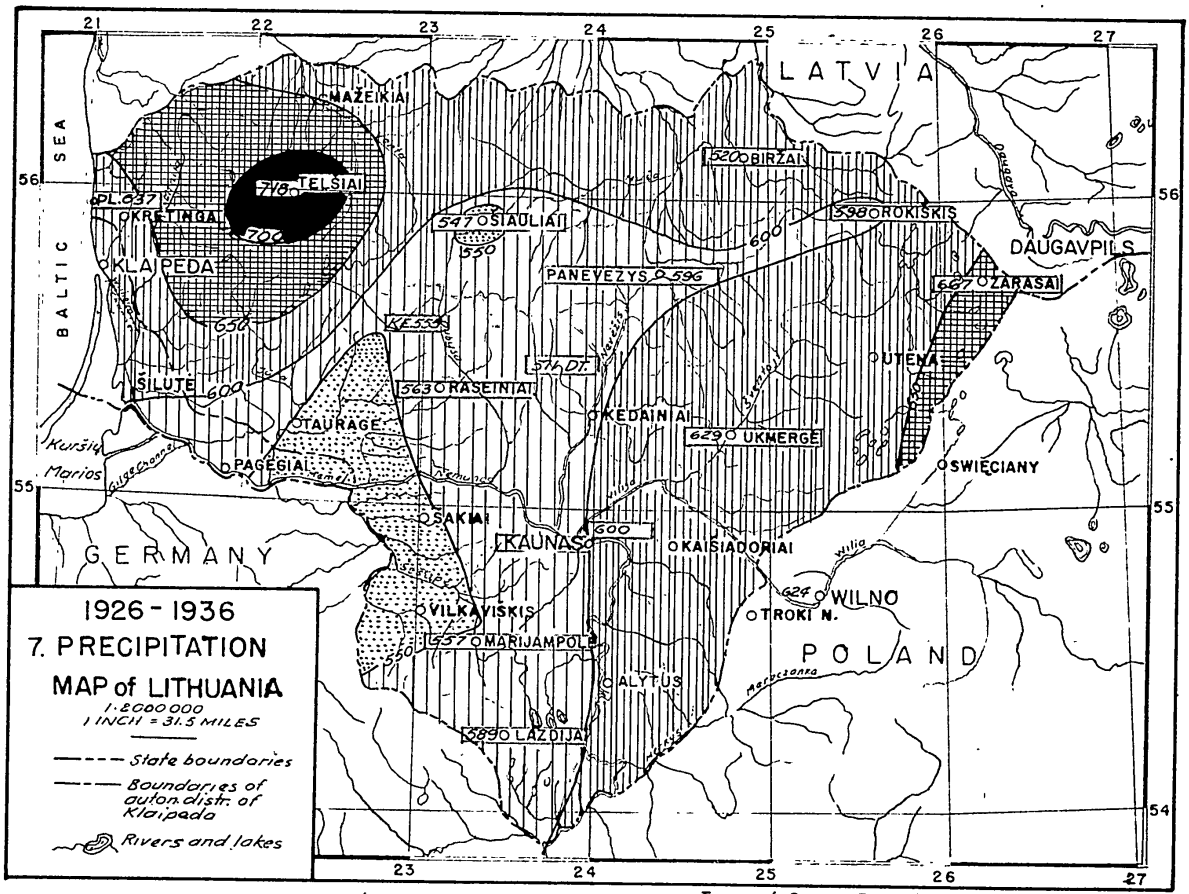
Traced from B. Soviet. Enc. Vol 25. 1953 Aug.

Sources:
K. Pakštas. Lietuvos klimatas. Klaipėda. 1926.
Map of Lithuania. P. Matnieks Riga 1940

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#7



1926 - 1936
7. PRECIPITATION
MAP of LITHUANIA
1:2000000
1 INCH = 31.5 MILES

——— State boundaries
——— Boundaries of auton. distr. of Klaipeda
Rivers and lakes

Traced from B. Soviet. Enc. Vol 25. 1953 Aug.

LEGEND: 500-550mm. 550-600mm. 600-650mm 650-700mm 700mm & up

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PART I

CHAPTER II

The Indigenous Vegetation of Lithuania

A. Place in World Forest Zones

1. The soil and climatic conditions of Lithuania and the other factors which influence vegetation all tend toward the growth of forests.(1) Lithuania occupies a place in the temperate forest zone(2) and belongs in the sub-zone of mixed coniferous and broad leaf trees.(3) /Sketch #8, "Europe Vegetation", see end of report for availability./ English oak (Quercus pedunculata) and Norway Spruce (Picea excelsa) are typical of this zone and are found in Lithuania. In natural reforestation of large, deforested areas soft-deciduous forests (aspen, birch, hoary alder, etc) are formed first followed by permanent mixed coniferous forests.

2. The temperate forest zone (including Lithuania) is suitable for agriculture. For this reason, most of the zone has been deforested and the chief areas remaining under forest cover are those less suitable for agriculture.

B. Indigenous Trees and Bushes

Lithuania counts 26 types of trees and 31 types of bushes growing naturally within its boundaries.(4) Only a few of these, however, are important in the establishment of forests. These include:

1. Permanent forest builders

(a) Scotch Pine	(Pinus Sylvestris) (L)
(b) Norway Spruce	(Picea Excelsa) (Link)
(c) Northern Alder	(Alnus Glutinosa) (Gaerth)
(d) English Oak	(Quercus Pedunculata Ehrh or Quercus Robur-L)

2. Temporary forest builders

(a) European Birch	(Betula Verrucosa) (Ehrh) and (Betula Pubescens) (Ehrh)
(b) European Aspen	(Populus Tremula)
(c) Hoary Alder	(Alnus Incana) (Moench)

3. Bushes

(a) Coniferous
Common Juniper (Juniperus Communis) (L)
(b) Deciduous
(1) European Hazelnut (Coryllus Avelana) (L)
(2) European Fly (Lonicera Xylosteum) (L)
(3) European Cornels (Cornus Mas) (L)
(Cornus Sanguinea) (L)
(4) European Spindle Trees (Evonymus Verucosa) (L)
(5) European Spindle Trees (" Europea) (L)
(6) European Raspberry (Rubus Idaeus) (L)

C. Properties of the Most Common Trees

1. The common Scotch Pine /see end of report for availability of photograph/ is a handsome evergreen which grows to 40 or 50 meters in height and 70 to 80 cm in thickness at a height of at least 1.3 meters from the earth. (All dimensions are given for the largest of the species growing under the most favorable conditions.) In peat bogs its growth is limited to not over four meters and not over 20 cm in diameter. The trunk is straight and the few branches are ordered in conspicuously regular whorls.

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The upper bark is orange and paper-thin; the lower bark is reddish gray; the crown is light and cone-like in youth, and umbrella-like in age. The Scotch pine is intolerant to shade. Self-cleaning of the lower branches is good. It is tolerant to soil quality and can grow on all types of soils, even in peat bogs with extremely poor mineral content. On loams and clays, the Scotch pine is usually replaced by other types of trees which are more tolerant to shade. The Scotch pine can withstand the worst droughts and will grow on dry sandy soil. Its root system is well developed and the tree will grow well in exposed places, such as sea shores, without being uprooted. The roots grow to such a depth that the Scotch pine can exploit the deeper portions of the soil. Its life span lasts up to 300 years but the yearly increment of wood growth is small. The tree is ordinarily allowed to grow for 100-160 years in cultivated forests. It reaches maturity (the first flowering) in 15-20 years in open areas and in 50-60 years in stands. The fruit of the tree is wind pollinated and its "wingy" seeds are widely distributed by the wind. A repetitive cycle occurs every two to three years in which there is considerable cone and seed production. A strong, healthy tree produces over 100 cones with about 45-50 seeds on each cone. Sprouts do not appear when the tree is cut down but conditions in Lithuania are moderately favorable to the Scotch pine's natural reforestation. Lithuania's dry spring and hot, dry early summer are major obstacles to its natural regeneration. If not reseeded or planted, cut-over areas of Scotch pine are succeeded by temporary birch stands until the Scotch pine succeeds in regenerating itself. The wood of the Scotch pine is a valuable, durable product if it is dried properly, showing good resistance to pressure (breaking or shearing). As a result, it is very desirable for construction purposes or for export. Its value as fuel is below that of birch or northern alder but it produces naval stores products such as turpentine, tar, resin, etc. The Scotch pine primarily grew in the eastern and southeastern portions of Lithuania. It is resistant to insects and fungi except for the bark beetle (Myelophilus Piniperda Minor) if aged and two fungi Agaricus Mellus and Trametes Pini. The young plants are susceptible to Hylobius Abietis and the May Bug (Melolontha Vulgaris). The wood is subject to blue stain fungi if not entirely dried. Scotch pine forests are particularly susceptible to fire.

2. The Norway spruce is a handsome tree with a cone and a dark green crown /see end of report for availability of photograph/. It grows to a height of 40-50 meters and to 75-80 cm in diameter. Its life span reaches 200 years. The Norway spruce is very tolerant to shade and, therefore, drives other trees out of its area and forms mixed forests with deciduous trees. The tree is intolerant to poor or to moist soils. It prefers well drained loams, sandy loams, and clays. Such soils are found in the central portions of Lithuania in the central plains, and in both uplands. The root system of the Norway spruce fans out and lies close to the surface. For this reason, the tree is easily uprooted by wind storms, especially when it grows in pure Norway spruce stands, with deciduous trees which have lost their leaves, or when the soil is very wet after prolonged rains. The Norway spruce grows slowly and the young trees are sensitive to freezing temperatures, especially during vegetation periods. Natural regeneration is best when it occurs under the shelter of light deciduous trees (birch, willow, aspen, etc). Under cover of the mother-stand, regeneration is difficult and normal growth can proceed only in large open clearings. Natural regeneration is good. The trees mature in 30-40 years and are wind pollinated. An abundant seed crop in the prolonged cones occurs every 3-4 years. Like the Scotch pine, the Norway spruce does not produce sprouts when cut-down. Natural selection of the trees in a Norway spruce stand is much slower than in a Scotch pine forest. Norway spruce wood is white and light, and is used for structural beams, blocks, pier pilings, lumber, pulp wood and shingles. After Scotch pine, it is the most popular and useful wood in Lithuania. The tree is subject to the ravages of the bark beetle /Ips Typographus/ in old age, and suffers red root rot on soils which do not suit it.

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3. The Northern alder is a handsome, medium sized deciduous tree, up to 30 meters high and 50 cm in diameter /see end of report for availability of photograph/. The crown is shaped in a cone, and the leaves are broadly oval, and dark green above. The bark is smooth and grayish brown in color with pale gray horizontal markings. The tree's life span reaches 150 years and maturity is at 15 years. Seeds are produced annually. The small, 2 mm oval seeds float readily and thus, reforestation of the Northern alder is easy. When the trees are cut, sprouts appear which grow in nests of 3-4 each. Growth is very fast, especially from sprouts which can grow to 20 meters in height within 30 years. The Northern alder prefers moist, fertile soils, and does not do well in standing soil waters or dry soils. It does not endure shade well and grows in rather light stands. The roots are powerful and resistant to uprooting. The tree is hardy and resistant to low winter temperatures and freezing temperatures in the spring. The tree is susceptible to rot in its wood and roots, especially if it originates from a sprout. Its soft wood is used in the production of cheap veneer plywood and cigar boxes. It is a desirable fuel. It is found largely in eastern and southern Lithuania where it forms large stands in the water sheds.

4. The English oak grows to a height of 30-40 meters and up to two meters in diameter /see end of report for availability of photograph/. The oak is a handsome tree, sometimes having a branchless trunk up to 15 meters from the ground. The crown is large and oval. There are many thick limbs and branches. The bark is gray, with shallow, short perpendicular furrows. The leaves are dark green on the upper side, paler and smoother on the under side, and consist of 9-11 lobes. The light brown acorn of the English oak is 2 - 2.5 cm long and shaped like a hemispherical cup. The tree is wind pollinated. It reaches maturity in 70-80 years and produces seed in mass every three to four years after that. The acorns are distributed by birds, squirrels, and mice; and wild boars as they root in the ground are helpful in burying the acorns. The trunk will produce sprouts if the tree is cut when 50-60 years old, but not if it is cut after that age. The life span is 900-1000 years. The tree is intolerant to shade and requires the protection of other trees. It is susceptible to freezing temperatures, and sensitive to soils, doing poorly on podzols. It grows best on loams and sandy loams and on soils which are deeply aerated and well drained. The best area in Lithuania for the English oak's growth is in the uplands, particularly in the eastern upland. The roots of the tree are very powerful, the main root growing 6-7 meters deep where the water table lies far beneath the surface. The tree is very resistant to drought and therefore, is important in the reforestation of Russian prairies. The tree grows slowly when young but faster as it matures. The wood is dark brown, hard, and resistant to pressure and breaking. Hard oak is used for heavy structures such as beams and for production of veneer and lumber where high quality wood is desired (furniture, etc). Soft oak is used for fuel and in plywood veneer production. The English oak does not form pure oak forests. If they occur it is as a result of artificial planting. Generally, the oak grows in company with the Norway spruce and with beech (Carpinus Betulus) trees. The oak occupies only a small area (about 1%) of all Lithuania's forests, and is not particularly important, but deserves attention here because of the emphasis which Soviet Lithuania places on its growth.

5. Type: European Birch

   Height: 30-35 meters

   Diameter of Trunk: 40 cm

   Prevalence: Common in Lithuania, especially on forest edges.

   Life Span: With favorable conditions, 500 years.

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Description: Slender, flexible branches which droop if aged. The leaves are smooth, deep green, oval, sharply pointed, and have jagged (saw-tooth) edges. The bark grows in paper-like layers, the upper being white, the lower black with deep, chalky-colored cracks. The limbs and branches are brown with some carmine tinge. The twigs of Betula Verrucosa are verrucous, those of Betula Pubescens are smooth and woolly.

Maturity: 15 years.

Pollination: Wind, in May. Light, yellowish wingy seeds ripen in June and are distributed by wind.

Reforestation Properties: Excellent, inured to late spring frost, a pioneer tree which quickly covers abandoned meadows and farmland. If cut before age 80 the stump will sprout. The tree does not cast heavy shade and thus, Norway spruce, oak, etc, which require protection can grow in its stands. The birch is, therefore, apt to form only temporary stands when it grows on well-drained soils. The trees do not require special soils and grow equally well on dry soil or in peat bogs.

Enemies: The root system is well developed and the tree is rarely uprooted. Youthful growth is rapid. The tree is resistant to disease and insects.

Woods: Decays rapidly if not stripped of its bark. If dried and protected against the weather the wood is durable; the most durable found in Lithuania. Used for wagons, furniture, repairs and construction around farms, and most valued for use in veneers and aircraft construction. The best fuel found in Lithuania. The bark tar is useful as a medicine.

6. Type: European Aspen

Height: 30 meters plus

Diameter of Trunk: To 1.5 meters.

Prevalence: Common in Lithuania

Life Span: One hundred years if grown from seeding, 60-80 years if sprouted from an older tree. The shorter life of the latter is due to rotting of the wood in the original tree. Growth is rapid.

Description: Forms a light crown with broad, heart-shaped leaves which tremble at the slightest breeze. The leaves are lusterless and have fine-toothed edges. The trunk gradually tapers toward the top. The bark has a smooth greenish-gray texture on the upper portion of the trunk; toward the base of older trees it becomes rough, thick, and chalky with perpendicular furrows.

Maturity: 15-20 years

Pollination: Every year. The seeds are small and carried in a cotton-like bundle. They are widely distributed by the wind.

Reforestation Properties: Excellent. The tree is a pioneer because of the wide distribution of its seeds. In addition, the root system develops very strongly and roots may remain alive beneath the earth's surface for as much as 100 years after cutting.(5) When old Norway spruce forests are cut, the areas may be quickly reforested by European aspen sprouts from live roots beneath the surface. About 95% of European aspen in Lithuania are of sprout origin.

Enemies: The tree is intolerant to shade and forms light, thin stands providing an opportunity for other trees to take root (particularly Norway spruce). Soil quality is important. The tree grows best on loamy soils. Freezing spring temperatures do not harm it. Resistant to insects but subject to rot.

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Wood: White and light weight. Not particularly durable if unprotected from moisture. Used principally for match wood. Has minor uses for light boards and for wagon parts. Its usefulness for fuel is slight. Considered a forest weed until 1918 when match production became important.

7. Type: Hoary Alder

Height: Usually 10-12 meters, occasionally to 20 meters.

Diameter of Trunk: To 30 cm.

Prevalence: Common in Lithuania.

Life Span: 50-60 years.

Description: Trunk tapers very sharply from bottom to top. The crown is light.

Maturity: Similar to the Northern Alder (see Paragraph 3).

Pollination: Similar to the Northern Alder (see Paragraph 3).

Reforestation Properties: Far less able to grow from sprouts than is the Northern Alder, but a pioneer tree. Resistant to frosts, insects, and rot. More tolerant to shade than the Northern Alder and will sometimes form undergrowth in light stands of other trees (particularly pine). Needs better soil and avoids poor, sandy areas.

Wood: White and light weight. It has no value, even as fuel. The roots enrich the soil with nitrogen, as do the roots of the Northern Alder, and both trees are planted temporarily on bad soils between pine for their fertilization properties.

D. Types of Forest Formations

1. Lithuanian forests have been badly used since ancient times, and bear many scars. Generally they now cover only lands unsuitable for farming but even these few survivors of the previous virgin forests have been cut-over many times and severely damaged by fire. There are few pine forest areas, for example, which have not been burned over. The spruce forests have suffered severe insect damage and uprooting. While the question of forest types has been discussed in Lithuania since the late 1930s, any conclusions are questionable.(6) It is very difficult to determine the real, natural forest types of Lithuania, especially in those areas which were formerly under control of the landed aristocracy or of the peasants. The ideas of the Russian school of forest typology were applied to Lithuanian forests in the 1930s when plans for forest administration were prepared. The large Rudniki forest is the only one in which Lithuanian forest typology can now be studied, because in it the stands are most closely related to the climax forests.(7) This area was under Polish Forestry Administration control until 1939. It had been a royal forest and was not utilized in any way until the first Russian occupation in 1795. Following that year, the Russians used the forest very extensively until the end of the 19th Century. The forest is mainly of pine. The stands have suffered much fire damage but the forest still remains as the closest example of what natural forest cover in Lithuania would be.(8)

2. Classified according to soil type, soil fertility, and soil drainage main Lithuanian forest types include such permanent forests as:(9)

   (a) Pine - Pineta forests originally on sterile sands and sandy loams of low fertility in dry or well drained areas except for one special type which grew in mossy, peat areas;

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(b) Spruce - Piceta forests on loams and clays in well and moderately drained areas;

(c) Alder - Alneta forests on fresh, moist soils with unvarying fertility.

3. These three main types can be further divided into arid, fresh, and moist sub-types as follows:

(a) Pineta

(1) Arid Types

Dominant - Scotch pine

Associate -

Shrubs - Common Juniper
The range of this type covers the alluvial terraces of the rivers in sterile, dry sands. The type is mainly found in eastern Lithuania (Alytus and Seinai counties). At the age of 120 years this type produces an average tree 19 meters high and 19.8 cm in diameter with a volume of approximately 160-200 fest meters(10) at the normal density (= 1).(11)

(2) Fresh Types

Dominant - Pine

Associate - Norway spruce
European birch
Hoary Alder (occasionally)

Shrubs - Common Juniper
Hazelnut (occasionally)

/See end of report for availability of photograph of Scotch pine of "fresh" type./ The trees of the fresh type grow on sandy or sandy loam soils which are deep and well drained but have some contact with the underlying water table. The type is mainly located in both the eastern and western uplands. Its trees compose the most valuable and productive pine forests. At an age of 120 years, the average tree is 27-31 meters tall and 35-37 cm in diameter. The volume on one hectare at normal density (= 1) is 500-600 fest meters.(11)

(3) Moist Types

Dominant - Pine

Sub-dominant - Birch
Spruce

Associate - Aspen

Shrubs - Common Juniper
Buck thorn /Rhamnus Cathartica/

The type grows on sandy humus, in areas where the ground water level is close to the surface. It is found generally in low areas bordering swamps. At 120 years of age, the average tree is 24 meters high and 28 cm in diameter. Its volume equals 285-350 fest meters per hectare.

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(4) Peat Bog Pine Forests

Dominant - pine

Associate -

Shrubs - Some Common Juniper

Herbs - Labrador tea /Ledum Palustre/
Moorworth /Andromeda Polifolia/
Small cranberry /Vaccinium Oxyccocus/
Moss - Sphagnum species

The type grows on peat formations which are normally moist. These formations are usually found in valleys and hollows among hills. These pine trees are the least productive and are not even included in work plans for forestry production. At 120 years of age, the average tree is 9-12 meters high and 14 cm in diameter. Volume equals 70-120 cubic meters per hectare.

(b) Piceta

(1) Fresh Types

Dominant - Spruce

Associates - Aspen
Oak
Birch
European Mountain Ash /Sorbus Occuparia/
Elms
Sorbus (Pyrus) Occuparia

Shrubs - European fly
Spindle trees
Cornels

These types grow on deep, loamy, well aerated soils which are well drained but have some underlying ground water. They are found mainly on the hilly portions of the eastern and western uplands. These types are the most productive trees in Lithuania. At an age of 100 they reach an average height of 27 meters and a diameter of 32 cm, and normal stands have a volume of 600-650 fest meters per hectare. The associate oak forests which belong to this group sometimes have a higher volume than the spruce. /See end of report for availability of photograph of a spruce forest of the fresh type and a photograph of a young oak-spruce stand on deep loamy soils./

(2) Moist Types

Dominant - Spruce

Associates - Aspen
Pine
European ash
Oak

Shrubs - Hazelnut
Willow
Buck Thorn

This type grows on loams and loamy sands in areas where the ground water level is high, particularly in lowlands bordering swamps and in the valleys of hilly areas (Taurage, Raseiniai, Kedainiai, Panevezys Counties). At 100 years of age, the average tree is 23-25 meters tall and 28 cm in diameter. Volume per hectare is 440-500 fest meters. Among this type of tree the spruce suffers from red rot.

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(c) Alneta

(1) Fresh Types

Dominant - Alder

Associate - European ash

Shrubs - European Bird Cherry /Prunus Padus/
Buck Thorn

The type grows on sandy humus or sandy loam in the areas where the ground water level is high but fluctuates (lowlands bordering swamps). The type is found particularly in the counties of Marijampole, Birzai, and Trakai. At an age of 80 years, the average tree is 20 meters high and has a diameter of 30 cm. The volume per hectare reaches 500 fest meters.

(2) Moist Types

Dominant - Alder

Associates -

Shrubs -

The type grows in small humus deposits located near swamps or in depressions where water is occasionally present (melting snow in spring or stagnant pools). Production equals 100-120 fest meters per hectare. The average tree at 80 years of age is 13 meters high and 12 cm in diameter. It is used mainly for fuel.

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FOOTNOTES - CHAPTER II

(1) Bolshaya Sovietskaya Encyclopedia, 1955, Vol 25, p 248-250

(2) Hammond's Ambassador World Atlas, p 28

(3) Bolshaya Encyclopedia, Vol 25, p 614

(4) Rauktys, J, "Pastabos Apie Lietuvos Augalija", 1945, p 181

(5) Morosov, "Uchenie o Lese", Aspen, 1932

(6) Matulionis, P, "Kiek Girioje Medziu Kirstina", 1924

Regel, K, "Lietuvos Misku Tipai, Musugirios, 1932

Buteikis, P, "Alneta Grupe Kazlu Rudos Miskuose", Musu Girios, 1938, p 401

Jankauskas, M, "Del Lietuvos Misku Tipai", Musu Girios, 1935, p -

Vileinskos, J, "Medynu Tipai Kazlu Rudos Miskuose", Musu Girios, 1933, p 245

Jankauskas, "Padubysio Girios Medynu Tipai", Musu Girios, 1938

(7) Author's opinion

(8) Miklaszewski, J, "Lasy i. Lesnietwo w Polsce", 1927

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(9) The types given are not definite and should be considered only as a sketch based on the author's opinion.

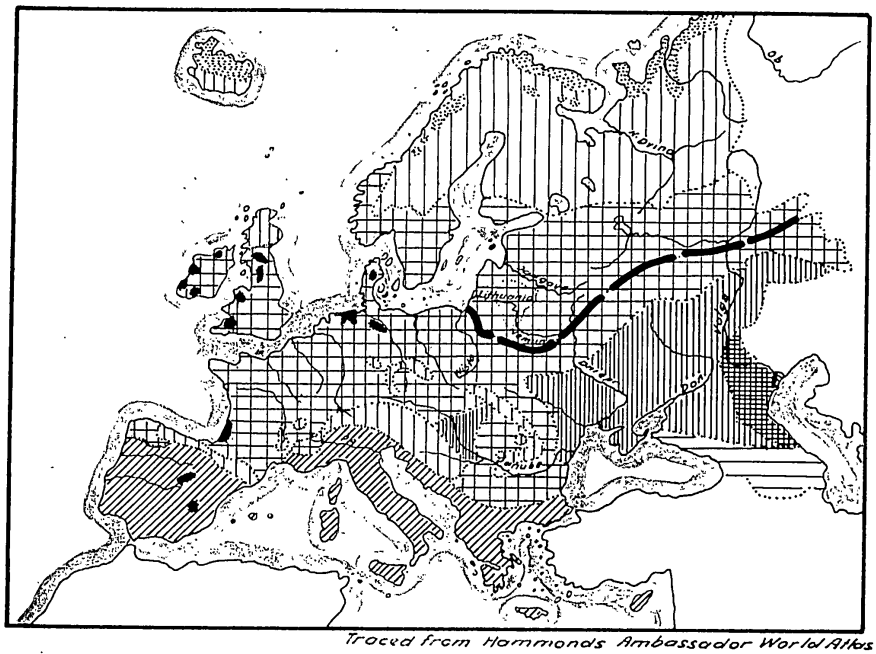
(10) A cubic meter used in measuring rough timber (trunks with the bark remaining, etc).

(11) The productivity estimates given are only approximate and frequently fall below the figures given.

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#8



Traced from Hammonds Ambassador World Atlas

8. EUROPE VEGETATION

Sources: 1. Hammond Amb. World Atlas, Maplewood N.J. Pg 28.
2. Europe vegetation. Encycl. Britanica World Atlas 1945
3. Europe vegetation. Bolsh. Sovetskaya Encycl. 1954. v. 24

35a

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#9

45MN USSR LITHUANIAN SSR

RIPE SCOTCH PINE FOREST OF A FRESH TYPE IN VILNYUS FOREST

50X1-HUM



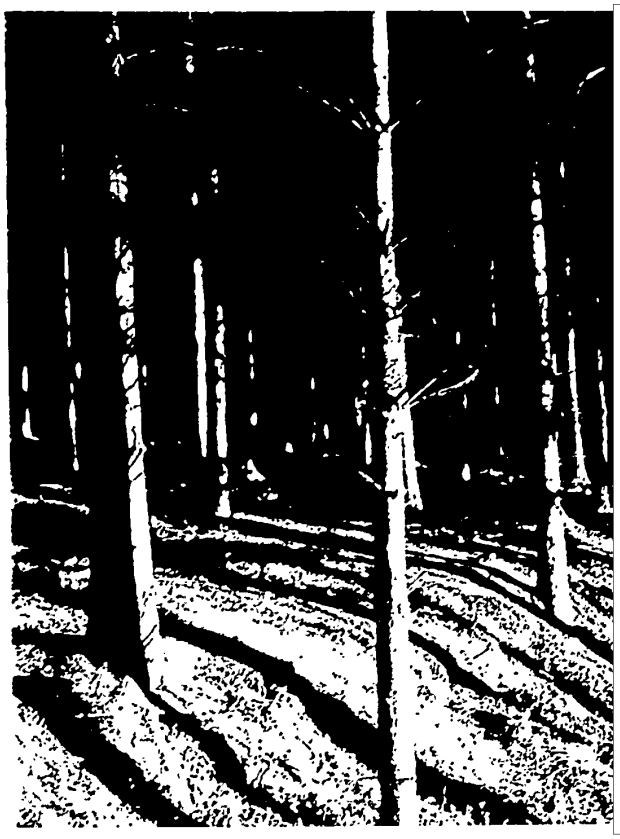
9. Typical ripe scotch pine forest of fresh type in forest master district Vilnius

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#10

50X1-HUM



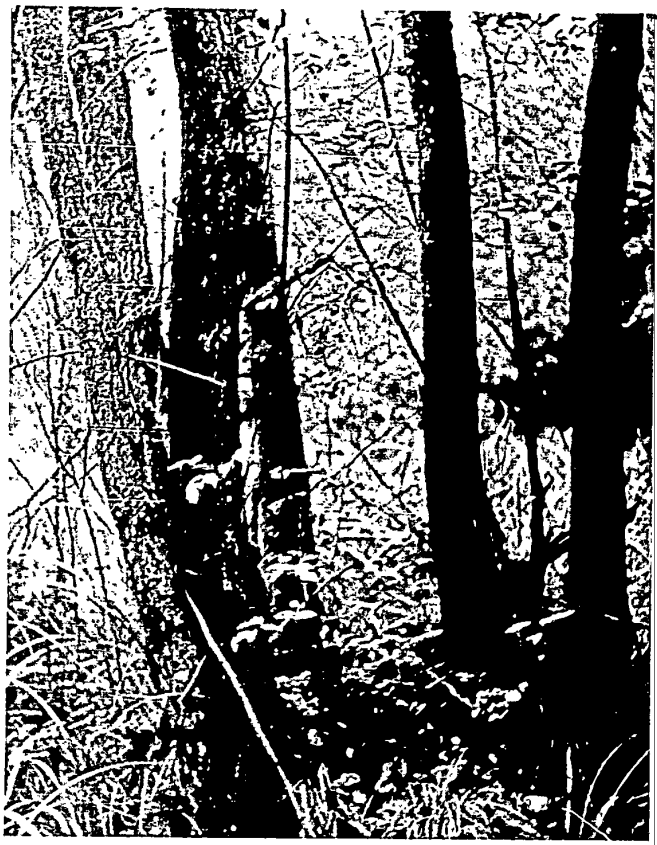
45MN USSR LITHUANIAN SSR
YOUNG SPRUCE STAND OF FRESH TYPE IN ALYTUS FOREST DISTRICT.

10. Young spruce stand (ca
2 for. mast. dist. Alytus) of a
fresh ~~st~~ type.

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#11



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NORTH ALDER STAND OF SPOUT ORIGIN IN ALYTUS FOREST

X. Typical sprout origin. north alder stand. in Forestmaster district alytus

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#12

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OAK FOREST IN DAUGAI FOREST DISTRICT. 00-B 3,095,800,

X. Typical oak forest in forest master district Daugai

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#13



13. Young scotch pine stand with norway spruce undergrowth. Type of fresh pine-forests

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#14



14. Type of young oak-spruce stand in winter [Forest master district Daugai]

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#15



15. The middle aged spruce stand (about 50 years old) of the Fredtype. Forest master district Alytus

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PART II

THE FOREST AND WOOD ECONOMY

Introduction

1. From ancient times, forestry has been second in importance only to agriculture in the economy of Lithuania. Wood is used very extensively. In 1939, 91% of all Lithuanian buildings were of wood. In spite of this high percentage, however, 70% of all wood produced was used as fuel. (The production of peat, reserves of which are estimated to be sufficient for 100 years, has always been inadequate, and the country does not have reserves of either coal or oil.) The low standard of living in Lithuania is partly responsible for the great use of wood. The country simply has not been able to afford such expensive substitutes for wood as oil, coal and iron, and there is no indication that the situation will change in the future.

2. Lithuanian boundaries have often changed and many governments and occupying forces have instituted new forms of administration and legislation. The basic territory of Lithuania, as considered here, is that which was under Lithuanian sovereignty from 1918-1939. In dealing with the meager and primitive historical statistics for the area, difficulties were encountered because of the boundary changes. Sometimes application of the available statistics was impossible.

3. Another item of difficulty in studying the area was occasioned by the confusing mass of topographic terms. Until 1918, these were of Slavic or German origin and differed sharply from the Lithuanian terms. In the material which follows, both terms are given originally to ensure clarity but the preferred term is that of the area in question (e.g. Lithuanian names in Lithuania, Polish in Poland, etc.).

4. Source materials on Lithuanian forestry including wood production and utilization, are usually organized according to political and economic eras. The divisions of Part II are, therefore, organized in like manner as follows:

Chapter I - The Czarist Occupation, 1795-1915

Chapter II - The Imperial German Occupation, 1915-1918

Chapter III - Independent Lithuania, 1918-1939

Chapter IV - Lithuania, 1939-1940

Chapter V - The Soviet Occupation, 1940-41

Chapter VI - The Nazi Occupation, 1941-44

Chapter VII - The Second Soviet Occupation, 1944-

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CHAPTER I - THE CZARIST OCCUPATION, 1795-1915

A. The Succession of the Polish Kingdom

1. The Polish Kingdom of 1795

(a) The United Polish Kingdom (which included the Grand Duchy of Lithuania) was a republic with an elected monarch who held office for life. The ruling class, composed of the gentry and clergy, jealously guarded its special privileges against the monarchist tendencies of the King. Tension between the King and this powerful class weakened the resistance of the state to outside forces. Agricultural and forested lands were owned by the members of the two opposing sides, and serfs bound to the land provided the labor force.

(b) Under the Kingdom, the economy of the area suffered. By 1795, the transition from a barter to a money transaction had just been realized to a point where the latter was supreme; industry had not developed; and the foreign trade balance was negative (the Kingdom exported grain, cattle, cattle products, timber, and forest products).

(c) The Kingdom was partitioned in 1795 by Austria, Prussia, and Russia. The northern portion of the area, including Lithuania, became a province of Russia. The value of the Polish monetary unit, the zloty, was set at 20 Russian kopeks, and Russian measurements were introduced.

2. Forest Property Relationships Under the Czars - Common Rights

(a) The property right was hereditary and absolute. It could be revoked only for treason. All forests were under royal ownership or were the property of the clergy or landlords. The royal forests took two forms:

(1) Large tracts lying between former tribal areas which had been "no-man's lands". They were generally swampy watersheds and were used mainly for hunting. They were called "Pushchas";

(2) Smaller tracts within the boundaries of the royal estates. They served two purposes: To provide timber and fuel for the royal owner's use; and for the use of the local peasant population as partial compensation for its labor. The forests owned by the clergy and landlords were small ranges within their estates and were managed by them for their own uses.

(b) The best managed forest areas were those in the first category of the royal forests, the "Pushchas". Lithuanian silviculture had its beginnings in these forests, where early progress was made toward establishing laws, regulations, and proper protection and basic management programs. The second category of royal forests was managed very poorly. The worst of these areas were those used by the peasants /see end of report for availability of a photograph of a typical northern alder forest exploited by peasants/.

(c) Royal forests made up about 20% of the total area of forest land. The landlords and clergy owned the remaining 80% of these areas. When the lands of the clergy were seized by the state, the forests were combined with the royal forests and all became Russian state forests. A special category, "Crown Forests", was established. The revenues from this group were used to maintain the royal family. The woodlands and small forests used by the peasants included large areas and in the Kaunas government area included an area of 1/12 (8%) of all the land owned by the government.

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3. Forest Property Relationships Under the Czars - The Right of Entry

(a) The right of entry, i.e. the right of the serf to enter upon and use the property of the titled land owners, was voluntarily created by the land owners in order to attract labor. The peasant population, decimated by war and pestilence, was sometimes insufficient to fill the needs for labor. The right of entry was designed to keep the serf on the estate and to attract serfs from other areas where the right had not been granted or was less generous. The right of entry included at one time or another the right to use timber for structural or fuel purposes, to graze livestock, to exploit and maintain bees in hollow trees or hives, to cut hay, and to fish. It was hereditary and once granted for an area could not be revoked.

(b) The grant of the right of entry originally harmed the land owners very little since the forests had no value and the peasant population was very small. As populations increased and timber grew in value, however, the right of entry became a serious burden to the land owners. In many cases it led to the complete deforestation of forest areas. The royal forest administrators were first to recognize the danger of this situation. As early as 1557 the problem served to stimulate the land reform programs of King Zygmunt II.

(c) As a result of Zygmunt's reforms, the royal forests were surveyed, their boundaries were marked, and entry rights were exchanged for land. In 1795, the right of entry to hunting estates had already been exchanged for land, but forests on royal agricultural lands were still open for woodcutting and grazing. The right of the peasant to access to this land and to the land of the clergy and land owners was never taken away.

4. Forest Distribution

(a) The royal forests were small in the areas of oldest settlement in Lithuania (the counties of Trakai, Vilno, and Ukmerge, and the area around Telsiai). Typical farm estate royal forests still exist in the forestry districts of Ziesmariai, Daugu, Kaisiadoriu, Utenos, and Labanoro. The hunting forests were located in the eastern portion of Lithuania. Remains of these forests exist in the districts of Veiseju, Ziesmariai, Kazlu-Rudos, Jures, Lekeciu, Sakiu, Panemunes, and Prienu. Large areas of the royal forests were located in northern Lithuania around Swienciany.

(b) The forest estates of the landlords and clergy were to be found mainly in western and northern Lithuania. Largest concentration of these lay along the Russian border in the countries of Taurage, Raseiniai, and Ukmerge, Panevezys, and Birzai. The forests and woodlands used by the peasants were distributed throughout the country.

(c) In 1795, most of the land had been surveyed, the farm lands located in compact areas around the villages divided into three fields and each field was sub-divided into as many strips as there were farm (family) units (voloki). These strips were further sub-divided as it became necessary to pass property on to heirs. In addition to these family-held farm units, each village held a common area including pasture, moor, and sometimes forest. Such areas were in existence even until 1935 when they were divided into individual farmsteads.

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5. Forest Size

(a) As of 1795, the eventual limits and size of Lithuanian forests had not been determined. The process of the conversion of forest land to agriculture was still going on. In particular, the forests used by the peasants were affected, since the practice was then common of cutting down a forest, using the area for agriculture, and then abandoning it. The abandoned areas reforested with trees of a quality suitable only for fuel and to a density of only 40-50%-(according to the estimate of Prof P Matulionis).(1)

(b) As a result of historical practice, the Lithuanian forests of today primarily occupy areas unsuitable for agriculture.(2) Under Czarist rule, Lithuania was a land of small to large forest-areas separated by agricultural areas and meadows. The forest area was steadily growing smaller, but was still abundant. Highly valuable timber remained in the properly managed areas, but those under peasant control were being rapidly devastated. The pine forests with their valuable tall trees were particularly harmed, especially those within a distance of 20-30 km of the rivers which offered a means of transporting their timber. Oak almost disappeared because it grew mainly on fertile soils. Hardwoods in general became scarce because of enormous potash production. Softwoods and spruce suffered tremendous insect and wind damage. Only the more remote forests still contained valuable trees.(3)

(c) According to all sources of this period, only the royal hunting forests contained mature and old timber in abundance. The forests of the royal farm estates were denuded of all but young and middle age growth. An inventory for the year 1768 of the Olava estate of about 2,000 hectares near Alytus mentions that the forests of the estate contained no structural timber at all. This forest area was located about 15 km from the Nemunas River. The peasant forests contained only young growth, mainly softwoods of sprout origin.

(d) Prof Matulionis estimates that the forest density in Lithuania in 1795 was 40-50% on about 2,000,000 hectares. The increment (about 3.0 fest meters per year per hectare) may be estimated to have been about 5-6,000,000 fest meters a year for the area included in the Lithuanian Republic (1918-1939).

6. Forest Legislation

(a) Lithuanian laws and traditions were codified in the "Statut Litovskii" in 1530.(4) A later revised version of the code was in effect until 1840 when it was superseded by Russian legislation (Svod Zakonov Rossiiskoi Imperii of 1838). Chapter XIII of the Lithuanian Code was devoted to forest property and its management, including hunting, bee keeping, and other minor uses of forest lands, and emphasized fines and punishments for violations.

(b) The chaos occasioned in the forests by the right of entry resulted in King Zygmunt II's action in 1557. His regulation "Ustav na Voloki, 1557" brought better order to royal farm and forest estates. His regulations were based on the "Huf Ordnung" of the German countryside and anticipated the three field system. The King's properties were surveyed, entry rights exchanged for land, and special regulations were established which, considering all factors, were equal to those in Western Europe. Later on, special royal inspectors visited the forests, approved the results of the forestry reform, and issued new and detailed regulations and orders to the forest masters.(5)

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(c) Regulations covering the forests of the land owners and clergy were occasionally detailed and well developed, especially in the larger holdings, but there was no general code, and regulations usually lasted only during the period of the interested land owner's lifetime. The mass of this type of holdings, therefore, including the majority of the country's forests, were not covered by regulations guiding their management.

7. Forest Administration

(a) Royal Hunting Estates

(1) The best managed forests were those on the royal hunting estates (Pushchas). Wood, except for dead or fallen timber, was never taken from some of them and they were under guard. Special lanes and meadows were maintained for purposes of feeding wild life. They were always administratively connected with a royal farm estate and bore its name (e.g. Rudniki, Olkieniki, Orany, etc). Their forest areas were divided into quarters and the quarters into circuits. Their boundaries were surveyed and marked. The size of a quarter averaged 49,000 hectares, and a circuit 2,850 hectares, and the average Pushcha included 147,000 hectares.

(2) Pushchas were usually managed by a forest master, a noble in the King's special favor, who was compensated for his efforts by being allowed to use the royal farming estate. Another royal appointee, a "Hunting Inspector", supervised the affairs of the forest masters. Both the Hunting Inspector and the forest master were strictly controlled by regulations. As a result the use of the Pushchas was very restricted and they were relatively well controlled. Guard forces were made up of bond servants and free men (Osochniks). As compensation, they received 7-20 hectares of farm land belonging to the royal possessions, to be used as long as they served. They were exempt from the contributions which other peasants had to pay. The guards were supervised by mounted guards or range riders. As compensation, the latter were given for their use an area of land twice as large as that allowed the ordinary guards. In addition to these two groups, there were special hunting aids called "Streltsy" (game wardens) or shooters. They were recruited from the royal army and established on Pushchas to protect wild life and to aid in hunting. They had no right to hunt for themselves. They were compensated in the same way as the mounted guards were. All officials and guards also received structural and fuel wood for their own uses. When a guard became too old for his duties or was otherwise incapacitated, he could hand down his duties to his son. If he had no son, he had to leave the Pushcha. This was a tradition even up to 1939, although it was not covered in the law.

(3) The compensation paid to the guards was insufficient and no part of it was paid in money. As a result, the guards were unscrupulous and subject to bribery. This was especially true at the time of the Polish Partition in 1795. The demand for timber was then high because the valuable trees had been stripped from the property of the land owners and clergy. They remained only on the royal properties, and the guard system was not only inadequate to protect them but the guards themselves sometimes cut them down and sold them. The royal officials, concerned about this, began in 1764 to remove the Osochniks and the Streltzy and to replace them with a hired force of better paid free men who lived on the edges of the Pushchas. The Russian occupation brought an end to the move.(6)

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(b) Forests Attached to Royal Farming Estates

The Pushchas designated to support the economies of the farm estates were in worse condition than those on the hunting estates. Most of the farm estates were rented to tenants who eagerly cut the good timber for their own profit. Most of these Pushchas were designated for conversion into farm land and for colonization by serfs. Those who cut the forests and turned them into farms were given special privileges. As a result, huge forest areas in the present counties of Marijampole, Vilkaviskis, Alytus, and Seinai disappeared very rapidly. By 1795, Pushchas on the farm estates were limited and only sufficient to produce wood for the estate itself and for the serfs bound to that land. Guard duty over these forests was performed by the bound peasants who received as compensation, examption from the usual contributions to the estate. The guards served as fire watchers and were empowered to call out the peasants as fire fighters when necessary. The guard system was inadequate to keep out poachers and to ensure proper use of grazing facilities and wood lots. As a result these tracts were in very poor condition. The guarded areas on the farm estates were smaller than those on the hunting estates. On the Daugau estate (Alytus County) in 1763, for example, one guard was responsible for 1,200 hectares of forest land.

(c) Forests Belonging to the Gentry and Clergy

These forests, in general, were managed like those of the royal farm estates except that the manager was also the owner. If the estate was rented, the forests were also included in the agreement. Violations of these forests and thefts of their timber were more common than from the royal forests. At times armed gangs invaded them (sometimes for weeks at a time) to strip them of valuable timber.(7) It was necessary, occasionally, to call on the army to end these lawless invasions. The smaller land holders were particularly troubled by these gangs. When they could afford guards, they paid them in the same way as those who served on the royal estates.

(d) Peasant Forests

The peasant forests were almost entirely stripped of their valuable timber at an early date as a result of the peasant's need for money. Following the Swedish war and the pestilence of 1710-1712, the obligatory contributions of the peasants were in many cases changed to monetary contributions. Money was scarce, there was no industry, and the only way for a peasant to earn money was to sell his timber. The removal of this valuable commodity also served to protect his property since it decreased its value and made it less attractive to someone who might otherwise seize it. After their own timber was gone and as prices continued to rise, the peasants were apt to go into even the comparatively well-guarded royal forests to steal timber.

8. Education, Research, Press, Reforestation

(a) There were no special forestry schools. Forest masters were appointed on the basis of their reputations for honesty and their ability to work. They were representatives of the gentry and possessed their own estates. The hunting masters (inspectors) were also of the noble class and in addition, had the personal favor and confidence of the royal family. They were experienced organizers of the hunt. The guard was recruited from among middle age, healthy and wealthy peasants.

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(b) There was no press to print works on forestry and no research into proper forest practices. The only recorded remarks on the subject were those added by the forest masters to their reports to Warsaw.

(c) Reforestation was by natural means only but progressed well because cutting was selective. The character of the forest was not materially affected by the cutting.(8)

9. Forest Use

(a) There were no real work plans in the forests, even on the royal hunting estates. Royal forest orders of the time make no mention of the forestry conceptions of yield, increment, cutting rates, etc.(9)The forestry interest was second to the hunting interest and the chief activity on these estates was the protection of the latter.

(b) Measurement of the area of the forests was very haphazard. The width and breadth of the estates were measured in miles (7 KM = 1 German mile) and at best in Voloki (equals approximately 16 hectares).

(c) Wood was not cut on some royal hunting estates until 1795. Portions of royal farm estates were designated for agricultural purposes, and their timber was quickly stripped away. Certain Pushchas were especially set aside for wood cutting. The central portions of these forests were reserved and the most valuable timber was cut for export. These were called "merchandise Pushchas". They were bounded by natural features (roads, meadows, lakes, etc) and fairly well guarded. Sections of forest around the merchandise Pushchas were set aside for domestic use. These were called "Bors" and were very poorly managed. They were constantly stripped of their timber and converted to agricultural land, thereby eliminating the "right of entry" for the peasants. Private forests were logged selectively (according to need). Rights to cut timber were originally sold for a particular area for a particular length of time but by 1795, in most cases the cost of purchase was determined by counting stumps or measuring the individual logs. The stumps and other debris of logging were left in the forests and helped to stimulate insect growth and forest fires. It also became the practice to leave the undergrowth and young trees to help stimulate reforestation. Grazing on the cut-over areas was prohibited for the same reason.(10)

10. Forest Protection

(a) The first serious act to protect the forests was that of Zygmunt II when he issued the "Ustav na Voloki" in 1557. The gentry and clergy, seeing the good results of Zygmunt's measures, took the same steps on their own properties but with less success. In most of these cases the "right of entry" was not revoked. To avoid this obligation, in many cases they cut down their own forests. War, unrest, economic necessity, and the difficulties involved in guarding the valuable timber also stimulated them to strip their forests. The tendency toward converting forest to farmland lasted until 1888 when the Russian authorities issued an edict of "Forest Preservation".

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(b) Fire was most common in the pine forests which were mainly royal possessions and were located in eastern Lithuania. Because these were comparatively well guarded and managed, fire losses were not excessive, but by 1918 there were few pine forests which had not been scarred by fire.(11) Fires were most common during war time. The peasants had an obligation to fight forest fires and to protect the forests of the estates to which they were bound. The forests used by the peasants suffered from fire because of the carelessness of the shepherds and other users.

(c) No care was taken to prevent insect damage in the forests. In 1865, the large spruce forests were blocked by dead and fallen trees killed by insects.(12) One of the most important duties of Russian forest-masters was the removal of fallen timber to keep the forests clean. This was done to protect against fire but there was no realization of the damage caused by fungi and insects.

11. Improvements

(a) Most improvements were made on the largest royal hunting estates. Most important of these was the surveying of the forests; also done by many private landowners. Following the surveys, the boundaries were kept clear and marked by sharp posts set in earthen mounds. Lanes were cut through the hunting forests and kept clear. The guard and sometimes the peasants were charged with this duty.

(b) No money was spent on roads, but the guards were charged with their maintenance. This was very primitive and the roads were always in very bad condition. Holes were filled with gravel or with branches. In swampy areas, logs were placed in layers, and covered with bundles of twigs, and then with gravel. Bridges over the worst marshy spots consisted only of two parallel logs. This is still true today in the swampy woodlands of Western Lithuania (Samogitia). Wooden bridges were built and maintained by the guards. They were constantly in need of repair and frequently dangerous to use. Some bridges of this type were still in use as late as 1939.

12. Wood in the Economy of Lithuania

(a) Significance. The significance of wood in the national economy of Lithuania and in the life of the average Lithuanian has always been enormous. In 1795, for example, each inhabitant required nearly three cubic meters of wood per year and potash production used up each year an amount equal to one fest meter per inhabitant.(13) In 1795, there were approximately two million hectares of forest in Lithuania with an annual growth increment of six million fest meters. In the area (in 1795) lived approximately one million people.(14) Their annual demand for wood equalled three million fest meters and an additional one million fest meters went into potash production. In addition, approximately 50 thousand fest meters of wood were exported and 2,500,000 fest meters were lost through waste, damage, and disease in the forests.

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(b) Logging Operations. The logging season traditionally came in the autumn following harvesting and seeding. The peasants accomplished part of their obligations to the owner by forest work, but after this obligation was satisfied they were free to hire out. For this labor they were usually paid in goods such as salt, sugar, iron and steel implements, etc. They worked close to their homes and were very eager for the opportunity. Thus, labor was cheap and abundant. Supervision of the logging operations was performed by experienced representatives of the timber purchasers. These representatives usually dealt through the local forest guards for the guards could cause trouble if they were not hired. The guard would recruit the labor and take the responsibility for guarding the fallen timber and fabricated lumber.

(c) Business Operations. Large import companies in England, the Netherlands, Denmark, Germany, and other countries had contract agents in Koenigsburg, Danzig, Memel (Klaipeda), and Riga. These agents were merchants and money lenders. They obtained timber from land holders in payment of debts owed to them. Land holders, hard pressed by debts incurred in war time, were forced to sell timber at low rates and the agents made huge profits on its sale abroad. Even the royal treasury was sometimes forced to sell at low rates. The agents formed combinations and worked without competition under the laws of the Czarist state. Most transactions were effected in the seats of the agents, but sub-agents also did business in Kaunas and Vilno. After a contract was signed, representatives of the agents would go to the forest area to establish an office from which the labor was hired and the timber exploitation directed.

(d) Tools. The most important tool was the adze, locally manufactured by the village smith and used to hew boards, planks, and staves. The peasants kept them in good shape and sharp enough for a reasonably good job, but much valuable wood was lost under the adze blade. The cross-cut saw began to be used about 1795 and the pit saw at a somewhat later date. Special chisels were used to make holes through both ends of fallen logs so that they could be fastened for rafting. This practice ruined additional valuable wood. A home-made winch was also in common use.

(e) Lumber. Pine and spruce logs approximately 22-25 cm thick were cut into 10 meter lengths for use in the construction of buildings, sheds, wells, etc. Logs of larger dimension (30-35 cm) were selected for splitting and hewing into lumber. Smaller pieces were chosen for use as roofing material, fence posts, and fuel. Structural material was sold by the piece and fuel wood by the cord. Exports were composed of hewed pine logs about one fest meter in volume; round pine logs of the same size; pine piles; and oak staves and oak boards hewed to various sizes.(15) Common log sizes were:

Pine	-	average 30' x 13" (round and hewed)
Oak Wainscot	-	9' plus 10" x 10" (one side rounded)
Oak and pine mast logs	-	highest quality, minimum 130 cm in circumference six meters from the base, 22-30 meters long, already scarce in Lithuania in 1795 and completely exhausted by 1817.(16)

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(f) Transportation

(1) Land. During the winter the peasants hired out to transport the felled timber from the forests. The logs were placed on primitive horse-drawn sleds by home-made winches. One horse could pull a sled load of approximately 1 - 1 1/2 fest meters of wood. Frozen lakes and rivers were the best avenues of travel. Trips were arranged so that the peasant could return to his home each night (10 Km in hilly country, 15-20 Km where conditions were better). Longer trips which necessitated overnight stays were better paid. Staves and potash were transported greater distances (up to 50-60 Km) and salt (needed for payment) up to 200 Km by riders.(17) The transported timber was collected beside the rivers in accumulations which were called "bindings". These collections were ordinarily the headquarters of the sub-agents and were well guarded.

(2) Water

a. The main rivers on which the wood was floated were the Nemunas; Vilija; the Sventoji (Svienta); a tributary of the Vilija; Merkys (Merechanka); Jura; Nemunelis (Niemenek); and the Daugava (Duna). The velocity of the water on these rivers was 4-4.5 Km per hour.(18) The trip from Merkine (Marech) to Klaipeda (Memel) on the Nemunas took about 11 days. The best rafting conditions were at normal water (mid-level). The rivers were usually frozen over about 15-20 December and were free of ice at the end of March. The spring flood period lasted about 14 days and there were often one or two late summer rises in the river level because of heavy rains. Nevertheless, the rafting period usually lasted from the end of March to mid-November. Some work was done on the river beds in the 18th Century but very little. Even during the 19th Century, the rapids and shallows of the Nemunas destroyed on the average every sixth barge and raft. The same was true on the Vilija and other rivers.(19) It took great skill to pilot the rafts and barges. The water wheels of mills were one formidable obstacle to rafts on the rivers. The most important river ports were Kaunas and Jurbarkas (Jurborg) on the Nemunas.

b. The timber was stored in "bindings" on the rivers and streams until the ice melted. On the smaller streams the best time for moving the timber was at the crest of the spring flood. Brought to a lake or larger river assembly point, the logs were formed into rafts with the logs already there. Work on the formation of these rafts began as early as possible in the spring. The rafts were made of 10-12 meter logs laid parallel to a width of approximately 9 meters.

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Each log was fastened to cross pieces by means of skillfully twisted willow twigs drawn through the holes on each end of the log. A single raft (link) was formed of 10-12 logs. Six to nine links made a chain containing 100-150 fest meters. Single links were floated on the tributaries of the Sventoji, Daugava, Vilija, and Nemunas, and the chains on the main rivers themselves. The length of a chain was about 90 meters, the most convenient length. After the rapids on the Rumsiskes River were blown up in 1925 it became possible to run chains 3-4 times as long containing 450-600 fest meters.(20) The rafts had a secondary function of great importance. They carried not only agricultural products (flax, grain, potash) but even passengers.(21)

c. Labor. The rafts were handled by a crew (drivers) and a supervisor. The smaller chains (90 meters long) were served by a two-man crew and one supervisor. The larger rafts required up to four men and a supervisor. The drivers rode the front and rear links of the chain and steered with strong lever-like oars. Their work was especially hard while rounding bends in the river. The drivers were very skillful and experienced. They were mainly free, White Ruthenians from the small towns along the banks of the upper portions of the Nemunas and Vilija Rivers. They were relatively well paid.

(g) Wood Industry

(1) The Lithuanian population (land holders and peasants) was largely self-sufficient. It made almost everything it needed and bought extremely little except for such rare items as salt, iron implements, etc. The big farm estates had their own artisans (blacksmiths, locksmiths, carpenters, shoemakers, etc) Each estate formed a small town, the origin of most Lithuanian towns of today. In these centers, handicraft specialization progressed most rapidly. Conservatism and frequent war and unrest were serious obstacles to the development of stronger industry. The only one of any importance was the distilling industry. There were no sawmills. In 1817, Grodno Gubernia in Poland was the most industrialized area of the region. There, 536,163 persons lived on four million hectares of forest land. Thirteen saw mills served this area and population.(22) They consisted of saw blades attached to heavy, slow-moving wooden frames run by water power. They served the demands of their own farm estates only. Pit saws also appeared about this time but again satisfied only domestic requirements. A deterrent to the establishment of a saw mill industry in Lithuania was the high tariff placed on sawed wood by the Prussians.

(2) Paper manufacturers used linen rags as raw material. Demand for paper was low and most of that needed was imported. In 1815, the six paper mills of Grodno Gubernia employed only 30 laborers and produced only 463 rolls of paper. This production was sold to the governments of Vilno, Kaunas, and Minsk which had no such production.(23)

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(3) Many of the forests had charcoal pits to produce fuel for smiths and some small foundries which worked with swamp iron ore containing a very low percentage of pure iron. In addition, primitive tar pits were worked using pine stumps as material for the distillation. Production was low and of poor quality, but as late as 1930, a couple of these pits were still in operation in the same manner to produce cheap tar products to grease the wooden axles of wagons.

(4) Potash production had a very ancient beginning in Lithuania. Hardwoods (elm, oak, ash, hazelnut, beech, and maple) were used in its production and huge quantities of wood were consumed. To produce one Kg of pure potash 1.5M3 of hardwood were required. The potash works were primitive installations located in the forests. They were operated by skilled laborers called "budniks". The demand for potash rose steadily and prices kept pace with demand. From 1537-1576 the customs house at Wloclaw, Poland, which controlled potash exports to Prussia, noted annual exports of 9,600,000 Kg of potash, a considerable portion of which came from Lithuania. Sometimes this portion was as much as 30% of the total because most of the forests were located in historical Lithuania (not the Lithuania of 1918-1939, which was smaller). Since the hardwoods made up only 2-3% of the forest growth, they were quickly exhausted. By 1795, customs records do not note any potash exports from Lithuania at all.(24)

(h) Commerce

(1) Lithuania as a duchy and while united with Poland, had developed an export trade in wood. Kaunas and Vilno were headquarters for this trade. The peasants supplied their masters, themselves, and the townspeople with fuel wood. They were able to do this because they had horses. As late as 1945, the peasants brought wood (either purchased or stolen) into the towns for sale. This was a principal means of livelihood after the field work was done in autumn and through the winter. Until 1945, most of the fuel wood burned in the towns was delivered by peasants and in 1939 it was still profitable to bring a raummeter (= 0.7M3 of solid wood) of fuel wood into town for sale from distances up to 70 miles (about a week of riding).(25)

(2) The wood in the forests was valued (with the exception of the larger, valuable trees and hardwoods for potash) only to the extent that labor and transportation affected it. In 1914, a laborer in a state forest received 50 kopeks (approximately US$.25) for an 8-hour day. The same man with a horse cart earned 1-1.5 rubles.(26) In 1795, compensation for the same job was even lower. In 1857 the price for a fest meter of fuel wood was about 0.5 ruble. An average pine log (8 meters long x 16 cm at the top) brought 1.5 rubles.(27) In 1795, prices were even lower. Prices for export wood and potash were set in the Code of Lithuania (1529) which was in force in the private forests until 1840. An oak suitable for one wainscot (about 2.25 fest meters) was priced at 44 zlotys (set by the Russians at 0.2 rubles to 1 zloty). A mature oak, ash, or elm suitable for potash production was worth 2.5 zlotys;

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pine timber of 2 fest meters volume, 11 zlotys; and other structural timber 2-3 zlotys. In 1769-1781, a pine log with a circumference at the base of 20 palms (one palm equals 7.6 cm) or 1.5 meters cost 6-7.5 Tallors(28) at the stump in the forest. One of 18 palms circumference cost 4 tallors at the stump and 6 tallors after being hauled to Daugava. Various prices are shown below:

Tree Circumference (in Palms)	Price at Stump (in Tallors)	Price at Riga (in Tallors)
20	6	18
22	8	35
30	81	110

The best mast timber cost 20-25 Tallors at the stump but 600-1000 Tallors at Riga.(29) (The reason for this disproportionate spread in the price was because of the monopoly held by the Riga merchants.) A low duty was charged on exported timber.

(3) It is difficult to determine the quantities of timber which were exported from Lithuania because the Nemunas River was a main route for shipments to Prussia, not only from Vilno and Kaunas, but from Grodno, Minsk, and Suvalki. Some estimates are available for 1848-57. The following number of timber rafts (100-150 fest meters of wood average) passed the river port of Kaunas:

1848	-	535
1850	-	703
1852	-	1,556
1854	-	1,446
1856	-	1,036(30)

In 1857, Kaunas alone was the departure point for 345 rafts; staves sufficient to build 1,419 barrels; and 280 railroad ties. Most timber on the Nemunas came from Suvalkai. Figures for 1795, while unavailable, must have been essentially the same as above.

(4) Some manufactured paper (quantity unknown) was imported. Demand was low so imports probably were limited. Large quantities of wood from Minsk, Grodno, and Suvalkai passed through Lithuania on the Nemunas. They totalled about three times more than the Lithuanian shipments. Most of the exports of these three areas were wood. Timber rafts were reconstructed at Kaunas until 1914. The sawmill industries of Kaunas and Jonava grew up as a result of the unsuitable wood which was not made into rafts. This could be considered as imported wood. Quantities are not exactly known.

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FOOTNOTES

PART II, CHAPTER I, PARAGRAPH A

(1) Matulionis, P, Visa Lietuva, 1923, "Lietuvos Miskai po didziojo Karo"

(2) Mortensen, "Litauen", 1927

(3) Handwritten Inventory of the Daugai Royal Farm Estate, 1763

(4) Lewicki, A, "Zarys Historii Polski do 1795", 1947, p 90

(5) "Pistsovaia Kniga", Grodnenskoi gubernia, 1881, 220-230

(6) Ibidem

(7) Ibidem

(8) Surozh, 1908, II

(9) "Ordinatsia Pushch B. V. K. Litovskago, 1641", 1867, pp 12, 29, 58

(10) Ibidem

(11) At an age of 50-60 years the pine tree's bark is sufficiently thick to withstand damage from ground fires - author.

(12) Korcov, "Bieloviezskaya Pushcha", 1906

(13) Author

(14) Wielhorski, Litua i Polska, 1947, p 69-106

(15) Lachnicki, J.E., "Statystyka gubernia grodzienskiey," 1817, p 72

(16) Ibidem

(17) The author's grandfather was a "saltman" who transported salt from Merecz to Minsk, a distance of more than 200 kilometers.

(18) Skerys, A, Inaugural Dissertation, Holzmarkt in Litauen, 1947, p 38

(19) Kolupaila, Prof. S., "Nemunas", 1950, p 18

(20) Skerys, Holzmarkt in Litauen, pp 37-38

(21) Afanasyev, "Kovenskaya gubernia", 1861

(22) Lachnicki, "Statystyka gubernia grodzienskiey", p 62

(23) Ibidem, p 65

(24) Hedemann, O. "Dawnepuszczy i wody", Vilno, 1934, p 51-52

(25) Vileinskas, J., Musy Girios, 1939, p 560

(26) Afanasyev, "Kov Gub", 1861, p 392

(27) Scesnulevicius, K., "Tarp Valkinyko ir Varenos", 1950

(28) A tallor was Prussian money used in Lithuania in addition to the ruble until 1850 and worth 0.23 gold rubles, "Grosse Brockhaus", 1892

(29) Hedemann, 1934, p 89-93

(30) Afanasyev, 1861, p 487, 562

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B. The Russian Occupation

1. General Notes -- The Territory and its Administration

a. The northern portion of the partitioned Polish Kingdom, Lithuania, became a part of the Russian Empire. It was called the Province of Lithuania and was subdivided, first into two and later into three government divisions, Kaunas, Vilno, and Grodno.(1) Three divisions were approximately equal in population and area. In 1914 the three were as follows:

Government Area	Area (Sq Km)	Population	Population per Sq Km	Ethnic Group
Kaunas	40,260	1,857,100	45	Primarily Lithuanian
Vilno	41,981	2,075,900	47	Primarily Slavic
Grodno	38,647	2,048,200	52	Entirely Slavic
Suvalki	12,162	718,000	54	Primarily Lithuanian

The fourth area shown on the table, Suvalki, a part of Poland until 1914, was populated by Lithuanians and its northern portion and was included in the later Republic of Lithuania. A narrow strip of land along the Baltic including the villages of Palanga and Sventoji, belonged to Kaunas until 1819 when it was attached to the Latvian populated government of Kuronia.(2) It contained about 4050 people, living on 85.5 sw km, and its administration was changed for ethnic reasons.

b. The Republic of Lithuania (1818-1940) was formed of the three areas of Kaunas (100%-40,260 Km^2), Vilno (9.6%-4,045 Km^2), and Suvalki (69%-8,367 Km^2).(3) Later additions to this area included the 85.5 sq km on the Baltic given to Kuronia in 1819, and a portion of East Prussia amounting to 55,670 sq km which later became the Antomomous District of Klaipeda. Separate statistics for this latter part of the country's history are not available (with the exception of those for Kaunas) so that figures cited below are those of historical Lithuania under the Czars.

c. Each government division was divided into counties and the counties into townships. Each township was made up of a certain number of communities and the communities of a certain number of villages. The head of each area government was appointed by the Czar and his seat was located in the major city of his area. Other administrative officials were located in the larger towns, to serve the county, township, etc. requirements. The Russians treated Lithuania differently than the Poles had. They considered, not without some reason, that Lithuania was an ancient and integral part of Russia which had been taken away temporarily by Poland. The Lithuanians are not Slavs but are more closely related to the Slavs than to other ethnic groups in Europe, and the old Grand Duchy of Lithuania was under strong Byzantine, Orthodox Church, and Slavic influences. There was considerable intermarriage among the Lithuanian, Ruthenian, and Russian nobility. This had not always been the case, however. When the Tartars held power in Russia, the Lithuanian Dukes were ambitious to seize control over all the Russian-Orthodox world. The defeat of the Tartars and the rising power of the Russian Czars, however, changed this and forced the Lithuanians to unify with the Roman-Catholic and Western oriented Poles.(4) The previous trend toward the Ruthenization of the Lithuanians (the official language had been Ruthenian) was halted by the new Polish influences. By 1795, these influences were very strong. Most of the nobility, holding 80% of the large estates, were Polish. Most of the clergy were Polish and a considerable number of the townspeople, even in primarily Lithuanian Kaunas, were Polish. The Russians, therefore, considered themselves to be the deliverers of the Lithuanians.

d. While Lithuania became part of Russia, Poland retained a certain autonomy (until 1830). Lithuania had Russian laws but Poland kept its own laws (Code of Napoleon). Following 1863, Russian laws were stricter for Poles and Jews in the Russian Empire than for

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Lithuanians. This is reflected in the forestry codes.

2. Sources

(a) According to documents of the Russian Central Committee of Statistics dating from 1908, there were no reliable agricultural or forestry statistics in Russia until 1880.(5) Information on the earlier periods comes from older figures and is subject to error and inaccuracies. There were no Russian forestry statistics at all until 1800. The general survey of the Russian Empire (1775-1804) provided data for 28 separate provinces including the Baltic provinces. Some forestry data was recorded during the survey, but it was inadequate and inaccurate.

(b) The first data on all of the Russian forests was included in the annual reports of the Russian governors of the various provinces, who based their summaries on the research of Russian General Staff Officers during the 1860s. Lithuania was one of the provinces surveyed by the military during this period.

(c) The first forest atlases were drawn in 1873 (second edition 1878), and were based on the surveys of the 1860s. The first serious statistical surveys to determine land usage were made in 1881 and additional studies were made in 1887. Most data which exist were for the Russian State Forests. Their areas and annual productivity have been recorded since 1840. Organized data for all private forests, large estates, and peasant properties have existed only since 1888. None of the information mentioned above was uniform and it is impossible to correlate it. Not until 1893 did foresters in the state forests make uniform reports on the types of forest stands, the age relationship of the trees, and the type of forest economy.

(d) In 1895, the Ministry of Agriculture and State Properties ordered a detailed study of the state forests. The most important results of this study were published in 1896, but most of the material was never published. Many statistics on the Russian forest economy were included in the book of J J Surozh, "Lesa, Lesnoy Khoziaistvo i Lesnaia Promyshlennost Rossii", 1908, Varshava, pages I/154, II/180-191.

(e) In considering available source material for studying Lithuanian forests, there are three important periods:

1. Prior to 1840 no data or statistics exist.

2. 1840-1888, a real if primitive forest economy began to develop in the state forests. The Act of Sustained Yield enforced in all Russian forests, produced some statistics.

3. 1888-1914, an increasingly important forest economy with adequate statistical sources.

3. Forest Property Relationships and Policies Since 1795

(a) Property rights to agricultural and forest lands in Russia, as in Poland and Lithuania, were granted by the higher to the lesser nobles or sold. Large areas were donated to monasteries and churches. Feudalism did not develop because the positions held by appointed officials were not hereditary. Russian forests were historically public land. In 1649 the Czar's Imperial Guard had a right to use any forests for their own needs. Up to the reign of Ekaterina II (1762-1796) forest property rights were not absolute. Czar Peter I (1689-1725) took over control of all valuable forest properties, no matter in whose possession they were. They were placed under admiralty direction and their valuable tall timber, vital for naval use, was made state property.(6) The noblemen who owned the properties were forced to establish forest administration units charged with heavy responsibilities for the material in the forests and subject to the regulations of the Navy (with punishment up to and including the death sentence).(7) (In 1719, Czar Peter I gave the populace permission to go into any forest to cut fire wood, because the price of fuel had risen abnormally high.)

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(b) The Czars following Peter I, especially Ekaterina II, radically changed property regulations including those governing the forests. Ekaterina cancelled all of Peter I's restrictions and recognized absolute property rights over the forests. In Russian all large forests and estates of the clergy were expropriated by Ekaterina. The same expropriation was extended to the new Lithuanian province in 1841-1843.(8) Responsibility for the peasant population which had owed allegiance to the clergy (approximately 900 thousand in Russia) was transferred to a special committee set up to govern the crown-peasant group.

(c) Following the Russian annexation, the forests in Lithuania of the former royal farm estates became state forests. The huge hunting estates formerly owned by the Polish Kings also became state forests. The Lithuanian nobles who swore fealty to the Russian Czar were allowed to retain their private forests without restriction upon them. The situation in these forests and in the forests of the peasants remained practically unchanged. The right of entry remained in many forests of the nobility and was extended to state forests because portions of the latter had been expropriated from the clergy and nobility and were burdened with "servitudes". (The right of servitude was cancelled in 1831 but was revived again in 1863 after the Polish insurrection.)

(d) After the insurrections of 1831 and 1863, the Russian administration began the colonization of the lands expropriated from the Polish nobility with Russians. The forests of these estates were primarily made state property. Poles suspected of being revolutionaries were forced, in many cases, to sell their property very cheaply to Russian bureaucrats and nobility. The right to buy property was taken away from people of Polish origin (the Jewish population had never had the right). The ratio of property ownership in Lithuania in 1795 was almost 100-0 in favor of the Poles over the Russians, but by 1918 had declined to three to one, still in favor of the Poles.

(e) In addition to the confiscation of their property to the advantage of the Russian nobility and colonists, the Polish landholders were forced (by economic necessity) to sell their properties. They could sell to the peasants (Lithuanian peasants had the right to buy not over 85 hectares of agricultural and forest property) or to other landholders including the Russian nobility. A brisk sale of forest property for conversion to agricultural purposes was in order until the Act of Sustained Yield in 1888 put a stop to the practice. From this act dates a more progressive and realistic forest economy for Russia and Lithuania.(9)

(f) Peasant forests were used as the peasants desired, both before and after 1861, the date when the peasants were freed. The peasant forests had long been stripped of their timber so there was no considerable change in them after 1861. Together with personal freedom, the peasants received land for common use including large acreage in state forests. The peasants promptly sold the valuable timber thereon and converted the land to agricultural purposes. As a result of these changes and other attrition, forest area and density sank very considerably from 1795-1888. Peasant forests were generally so poor and sparse that they were not considered to be forests and had no forestry supervision. This situation, without significant change, lasted through World War I.

4. Forest Legislation

(a) The Grand Duchy of Lithuania except when it was united with Poland always had its own laws and legialation. The most important was the Code of Lithuania (Statut Litovskii) which contained all laws enforced in Lithuania since 1530. The first edition contained only a few articles on forests and forestry but subsequent editions had special chapters dealing with forestry problems. The Russians retained the Code of Lithuania until it was superseded by the Code of Russian Laws (Svod Zakonov Russkoi Imperii) of 1840. Peasant forests were governed by the Linthuanian Code until this date. State forests and those expropriated by the Russians were under the Russian Code from the beginning of Russian rule, and the first Russian Governor of Lithuania wrote the first instructions for managing state forests in 1796.

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(b) Russian laws did not exist in codified form until 1840. Law was despensed in the form of various orders, instructions and decisions. Attempts at codification were made during the reigns of Ekaterina II and Alexander I but they failed. Forestry regulations were published in the Code of Forest Regulations (Svod Ustava Lesnogo). Editions were issued in 1842, 1857, 1876, 1893, and 1905. This code included all regulations and orders issued since 1649 and still is in force. It was a systemization and not a revision of the existing laws, since there was no thought of reforming forestry policies. Real changes which did occur in the forest economy came from below, not from the top. They were the results of new times and changing situations. A committee was formed in the forestry department of the Russian Ministry of Agriculture and State Properties in 1911 to amend the forestry code, but it succeeded only in reworking it and not in changing its essentials. After two years of work (1911-1913) the project was brought before the Russian Parliament, but the beginning of World War I interfered with its acceptance and execution. (10)

(c) The Forest Preserve Law of 1888 was the most important step taken towards a serious foundation for the Russian forest economy. Former regulations in the Code of Forest Regulations were far behind the requirements of the country's advancing economy. The Code was supplemented, however, by circulars and orders which taken together made up a secondary code. The dual Code was burdensome and awkward and made proper forest management difficult.

5. Forest and Land Usage

(a) In 1881, land usage in European Russia (excluding Finland and the Kingdom of Poland) which included ten Russian government areas, was as follows: (11)

Land Usage	Farm Land		Meadowland & Pasture		Forests		Waste Land		Total	
	Million Hectare	%	Million Hectares	%	Million Hectares	%	Million Hectares	%	Million Hectares	%
Total	117.4	26.2	71.3	15.9	173.3	38.8	85.5	19.1	447.5	100
Crown & State Lands	3.0	1.7	2.9	1.6	112.9	64.3	56.7	32.4	175.5	100 39.2
Private Estates of the Nobility	132.7	27.2	27.9	23.3	45.1	37.6	14.3	11.9	120.0	100 26.8
Peasant Lands	81.4	53.8	40.6	26.6	15.4	10.1	14.5	9.5	152.0	100 34.0

(12)

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(b) In 1899, land usage in the Lithuanian Provinces was as following:(13)

Govt. Area	Farm Land %	Forest %	Meadow Land & Pasture %	Waste Land	Forest Total area (Million Hectares) 1903	- Forest Ownership - %				Forest Density % 1903
						State	Crown	Private	Peasant	
Vilno	40.3	27.6	19.2	13.0	0.99	39.5	-	57.9	2.6	29.3
Kaunas	36.2	22.3	32.7	8.8	0.66	30.8	-	69.2	-	23.6
Suvalki	60.0	25.4	(Included in Forest Land)	14.6	0.64	75	-	25	-	27.1

(c) The State lands in European Russia and Lithuania were used as follows in 1899:

Area	Forest %	Farmland %	Wasteland %
European Russia	53.1	0.5	46.4
Lithuania	65.4	1.8	32.8

The low percentage of farmland is explained by the fact that the most useful farm land was distributed to the peasants emancipated in 1866.

(d) Another source gives slightly different data for the year 1887 but the picture is not significantly different:(14)

Govt. Areas	Farmland		Meadow Land & Pasture		Forest		Other Uses		Wasteland		Total	
	1,000 Hectares	%	1,000 Hectares	%	1,000 Hectares	%	1,000 Hectares	%	1,000 Hectares	%	1,000 Hectares	%
Kaunas	1,443	36.7	1,112	28.3	908	23.1	143	3.6	326	8.3	3,932	100
Vilno	1,557	40.5	609	15.9	1,076	28.1	107	2.7	491	12.8	3,843	100
Suvalki	1,429	47.1	705	20.4	846	22.8	153	2.9	462	6.8	3,595	100

(e) Areas of true forest in Lithuania in 1911 were as follows:

Govt. Areas	Areas W/in Boundaries		Forest Areas W/in Bound.		Forest Ownership W/in Boundaries							
					State		Private		Peasant		Other	
	Km^2	1000 Hectares	1000 Hectares	% of Density	1000 hect	%	1000 hect	%	1000 hect	%	1000 hect	%
Kaunas	39820	3982	620.3	15.79	158.3	25.51	460.1	74.17	-	-	1.9	0.3
Vilno	42210	4221	1015.3	29.04	285.8	28.16	70.73	69.68	20.1	1.97	2.0	0.2
Suvalki	12410	1241	221.5	14.07	180.6	81.55	35.0	15.80	1.3	0.59	4.6	2.06

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(f) Russian forest economists and statisticians figured the relative abundance of forest products by comparing the supply with the demand.(15) The supply was deemed abundant when there was more than one hectare of forest per person; adequate if there was one-half to one hectare per person; and inadequate if there was less than one-half hectare per person. In measuring forest density they considered 15% density and under to be inadequate; 15-34% adequate; and above 35% abundant. In Lithuania in 1899 and 1911, the relation of forest area and density to population was as follows:

Govt Area	1899(16)			1911(17)		
	Forest Density %	Forest Area per Person (Hectares)	Annual Wood Supply per person Festmeters(18)	Forest Density %	Forest Area per Person (Hectares)	Annual Wood Supply per Person Festmeters
Kaunas	23.6	0.52	1.8	15.8	0.33	1.0
Vilno	29.3	0.64	2.25	29.0	0.48	1.44
Suvalki	27.1	0.44	1.55	14.1	0.17	0.51
		Average	2.10		Average	1.3

It can be seen from the above table that the wood supply situation in Lithuania in 1899 was on the borderline between an adequate and inadequate supply (based on the Russian measuring stick) but that by 1911 the supply was definitely inadequate. Because of non-uniform distribution of the forests, the Kaunas area (Telsiai, Ponevesh, and New Alexandrovsk -- later Zarasai counties) and the Suvalki area (Vilkayiskis county) already suffered from a scarcity of wood as early as 1857. Peat was used in these areas as a substitute for fuel wood.(19)

(g) In the Vilno area, state forests were widely distributed in small forest areas. Larger tracts of state forest lay in the central portion of the area on the boundary between Troki and Lida counties. Private forests were concentrated primarily in the northern portion of the territory (Svienciany county) and in the southeast (Dzisna and Oszmiana counties).

(h) In the Kaunas area the state forests were concentrated around the city of Kaunas. Private forests were uniformly distributed over the area with a larger concentration to the north.

(i) Large state forests were located south of Suvalki city and east of Augustov, and in the northern part of the area. Private forests were uniformly distributed throughout the territory.(20)

(j) The average size of state forests in Lithuania was 5,500 hectares. Smaller areas were handed over to the peasants for farming use.(21)

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(k) The composition of state forests in Lithuania as of 1899 was as follows:(22)

Types of Forest Stands	Government Areas					
	Vilno		Kaunas		Suvalki	
	1000 Hectares	%	1000 Hectares	%	1000 Hectares	%
Pine (Pure or Predominant)	146.3	59	42.9	27	145.2	80
Spruce "	63.8	26	63.8	41	33.0	17
Evergreen (Deciduous)	1.4	-	29.7	19	1.1	1
Birch (Pure)	6.6	3	4.4	3	-	-
Oak "	4.4	2	-	-	-	-
Alder "	6.6	3	2.2	1	1.1	1
Other Deciduous	1.2	1	9.6	5	0.5	-
Non Reforested	12.1	6	2.2	1	-	-
Totals	242.4(23)	99	154.8	97	180.9	99

(l) It may be concluded that in general the state forests of Lithuania were in good shape at the end of the 19th Century, except for the Vilno area where there were large areas which had not reforested.

6. Division of the Forests by Age Classes(24)

(a) Age relationships in state forests at the end of the 19th Century can only be estimated from comparison between annual cuttings and wood production. At the beginning of the 19th Century, only fallen and dead wood was taken from state forests. About the middle of the century some cutting of live timber began. The income in European Russia from all state forests for the years 1819-1837 averaged only 500 thousand rubles per year. From 1838-1858, it averaged only 1,100,000 rubles. Only after 1860 was there an interest in obtaining an income from the state forests. In 1866 they earned seven million rubles. As a result of the conservative use of these forests, they were primarily composed in the 1850s of ripe or over-mature trees. From 1866-1885, the average annual cut of timber from the pure forest areas of the state forests rose to 0.22 festmeters of timber per hectare and from 1886-1898, to 0.25 festmeters per hectare. During these years it was estimated that state forests were 80% composed of ripe or mature stands, but that private forests, on the other hand, were 80% young growth.(25) The private forests were logged very heavily from 1870-1890 because of high demand, high prices, and low supply from the state forests.

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(b) The use of the state forests in Lithuania was much greater than the use of those in Russia. Statistics from 1878 show that in the Kaunas area 0.75 festmeters of timber per hectare per year were taken from state forests; in Vilno 0.80 festmeters; and in Suvalki 0.30 festmeters.(26) The figure applied to the Russian state forests (80% ripe or over mature timber) cannot be used to describe the Lithuanian state forests because they were logged more intensively. Lithuanian state forests in 1914 formed stands probably somewhat more mature than normal. The first forest estimates made by the Lithuanian government (in 1920-21) showed that the stands were 3% more mature than normal. The survey and research of 1937 criticized the earlier estimate as exaggerated. It may be roughly said that the Lithuanian state forests of 1914 were normal.(27) The private (landed gentry) forests were like the private forests in Russia, about 80% young growth.

7. Properties of the Trees in State Forests

(a) A study was made in 1901 of the main types of trees growing in ripe stands in state forests. The results concerning size and dimensions were as follows:(28)

Tree Type Location	Age	Diam (cm) at Chest Heights	Height (m)	Height to First Dry Branch (m)	Height to First Growing Branch (m)
Pine					
Grodno	110	40	31	15	19
Minsk	115	44	31	11	21
Lomzha	117	40	21	6	14
Oak					
Minsk	135	58	28	13	17

(b) The research of Professor Buryi in 1899 established the following properties:(29)

Tree Type Location	Age Section 2.8 M Above Ground	Specific Gravity of Completely Dry Wood		Resistance to Pressure pounds per square inch
		Average	Maximum	
Pine				
Minsk	243	0.505	0.563	692
"	184	0.450	0.477	598
Prussia	100	0.490	-	
Spruce				
Minsk	64	0.467	0.495	672
"	62	0.439	0.468	584
Prussia(30)	80	0.440		
Oak				
Ekaterinaslav	45	0.681	0.708	626
Prussia	120	0.760		
Birch				
Novgorod	52	0.649	0.671	840

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Tree Type Location	Age Section 2.8 M above Ground	Specific Gravity of Completely Dry Wood		Resistance to Pressure pounds per square inch
		Average	Maximum	
Alder Viatka	71	0.467	0.466	566
Aspen Moghilev	44	0.446	0.451	582

8. Forest Yields. The subject of forest yield was not studied in Lithuania. There were no volume tables for Vilno, Kaunas, or Suvalki, and the Lithuanian government (1930-39) used German tables for evergreens and Russian tables for deciduous trees.(31) The only available figures for areas near Lithuania are those given below. They are taken from German or Russian sources:(32)

Forest Type and Location	Average increment in Festmeters per Hectare of Normal Stands at Age 120 Years on Sites Varying in Quality From 1-5				
	I	II	III	IV	V
Pine (12 yrs)					
St. Petersburg	6.1	5.1	4.1	2.9	2.1
N. Germany	9.5	7.9	5.8	4.3	2.4
Kaunas (1940)(33)	8.5	7.1	5.7	4.4	3.0
Spruce (100 yrs)					
St. Petersburg	6.6	5.6	4.4	3.0	2.0
N. Germany	15.6	12.4	9.7	6.9	5.0
Kaunas (1940)(33)	13.2	10.5	8.3	6.0	4.2
Birch (60 yrs)					
St. Petersburg	6	5	4	3	2
Kaunas (34)	7.2	5.7	4.4	3.1	2.2
Aspen (50 yrs)					
Tula	7.9	7.0	5.4	4.0	3.3
Kaunas(34)	9.1	7.6	5.3	4.2	3.0

9. Forest Management

(a). The peasant forests and those of the lesser nobility were managed by the owner himself. The larger forests of the landed gentry were handled by "Lovchys", or forest rangers. Almost all of the larger forests were guarded by peasants.

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(b) The state forests of Russia had a more formal administrative system. Historically, they had been open to every man's use. In 1762, however, those considered to have strategic defense possibilities were put under military guard. Peter I set up the first primitive system in 1722, not only in state forests but in the private forests along important rivers.(35) These areas were guarded by dragoons and special civil guards. Private forest owners were forced to furnish a Valdmeister (forest ranger) and the guards for the forests which they owned along the rivers, in order to watch not only both river banks for 20-30 kilometers but the valuable tall timber which belonged to the state. The direction for this effort came from the admiralty in St. Petersburg. A navy officer directed the operations of the forest rangers. Ekaterina II released the nobles from this obligation and recognized their right to use their property freely, but the system continued to operate in the state forests. She extended the system to Lithuania when it became a province of the Russian state. Navy officers controlled the stands of valuable mast timber and sailors supervised by pilots guarded the timber. State economists ran the other state forests and the peasant forests.(36) Peasants made up the guard force and were obligated to fight fires.

(c) Under Czar Paul I (1796-1801) the central forest management remained in admiralty hands, under a special forestry division. Forest masters and a higher rank of supervisors were appointed. The first systems of this type were set up in St. Petersburg, Kostroma, Voronezh, Kursk, Orlov, Vologda, and Pskov. Other areas including the Lithuanian Province, were headed by a forest master supervisor who directed a staff of surveyors. In 1802, the Russian state established a system of ministries, and state forests were handed over to the control of the Ministry of Finance. In 1804, a forest code of laws and regulations for Russia was issued and a forestry college was established in a suburb of St. Petersburg. Another college was established in Kozelsk in 1805, and a third on Elaghin Island in 1808.

(d) The forestry department remained under the Ministry of Finance but was divided in 1811 into two sections, state forests and naval timber forests. In 1826, a new system of administration was introduced under which territorial and district supervisory forestmasters, forestmasters, sub-forestmasters, and forestmaster-scientists ran the forests. State forests were placed under the control of local government units and sub-divided into forest-master districts. Peasants still made up the bulk of the forest guard but were supervised by range riders. In 1837, European Russia had 400 professional range riders and 462 other forestry professionals.

(e) A permanent guard was established in 1832 and compensated for its service by not having to pay taxes and by the right to use 33 hectares of farm land. 1837 begins a new era in the economy of the Russian forests. In that year control of the state forests was given to a new agency, the Ministry of State Properties. A total of 507 foresters of various rank (including only 84 trained professionals) and 42 thousand forest guards (80% appointed for only one year) served in European Russia under this Ministry. Prior to 1837, damage in the forests was extensive and the prevailing conservation system was hopelessly inadequate. For example, in the Kazan area, forest damage was estimated to be as high as 15 million rubles per year, and the situation was not much better in other areas.(37) Income from the state forests was negligible, about 500 thousand rubles annually, and expenses were approximately 400 thousand rubles.

(f) In 1843, the Ministry of State Properties divided the forestry department into six divisions. At this time the Corps of Foresters was put under military discipline but in 1867 it reverted to a civilian organization. The number of forestry personnel increased each year and by 1903 there were 3,715 professional positions (69 vacant) in European Russia. 87% of the foresters were professionals.

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(g) As of 1914 the central forestry administration was set up in a very formal, centralized manner.(38) /See end of report for availability of a chart of the Russian Forest Administration./ The forestry department was in charge of enforcing forest laws and regulating all questions regarding the forests; supervising the activity of the forest conservation committee; collecting forestry statistics; directing forestry policies throughout the country; and educating professional foresters. The department had eight divisions and was sub-divided into 17 bureaus. The survey division and the Forest Institutes were directly subordinated to the Ministry of Agriculture and State Properties. Fifty senior surveyors and 235 surveyors served in the survey division.

(h) In 1910, there were 49 territorial divisions in the Russian Empire.(39) Each of these divisions had a local Bureau of the Ministry of State Properties which represented that agency in its fields of responsibility. The Bureaus supervised the forest masters and gave them their orders.

(i) In the Lithuanian Province, the Bureau Offices were located in Vilno (serving the areas of Vilno and Kaunas - 560,000 hectares), and in Suvalki (serving Suvalki and Lomzha - 362,000 hectares).

(j) The most important unit in the administrative system was the forest master district. The size of each district is the best measure of the intensity of the forest economy in that area. The number of districts and the size of the forests within the Russian Empire varied from year to year as follows:(40)

Year	Forest Districts	Total Area of State Forests
1866	599	308,000,000 hectares
1899	741	407,000,000 "
1893	761	-
1902	1161	253,000,000 "
1903	1232	308,000,000 "
1908(41)	1261	-
1915(41)	1549	-

As of 1889, the average district in Siberia was 350 thousand hectares. In 1909, the average district in European Russia was 90 thousand hectares. The Lithuanian Province in 1857 had 21-23 districts averaging 35,000-38,000 hectares each.(42) Because of the high population of Lithuania and the accessibility of the forests, timber was sold rapidly and the area of the forest districts decreased constantly. By 1899, the average forest district was:(43)

Kaunas	17,600 hectares
Vilno	24,200 "
Suvalki	14,300 "

The districts varied in size because of the unequal distribution of the forests. In Kaunas, the forests were scattered in small stands, while in Vilno, there were large, solid areas of forest. The number of districts was increased in 1914, but many new districts were not staffed because of a shortage of trained foresters. In 1914, there were about 50 districts in Lithuania with an average size of 15-20,000 hectares. Individual districts varied in size from 9-25,000 hectares.

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(k) Each forest district was directed by a forest master or ranger. Supervisory forest masters were subject to professional examination as early as 1798, and all forest masters had to pass examinations after 1802.(44) In 1837, 84 of 507 foresters had been professionally trained. The best trained men served in the most important, accessible forests and in the forest institutes. In remote areas the foresters, even in 1915, were non-professionals. The number of trained men in Russia was never adequate and this was one of the major reasons for the failure of the Russian forest economy. For long years, the Russian forests produced almost no income. Relative figures were:

Year	Income	Expenses
1800	250,000 rubles	?
1805	283,930 "	99,940 rubles
1825	541,456 "	220,000 "

The productivity of the forests remained at this low level until 1837. Actually, considering the vast reserves of valuable timber, Russia had no forest economy at all.

(l) As the number of trained foresters grew, the forest districts grew smaller and the central forest administration got more and better educated personnel. The state was driven, by the shortage, to set up forest institutes. Lithuania had a comparatively high number of forests, though not an adequate number. Religious discrimination was invoked against Roman Catholics in Lithuania, who couldn't get a job as a forest master even if they were formally trained. The Russian policy to "russify" the Baltic Province extended to the forest master system. When the Russians withdrew from Lithuania after World War I, the Russian forest masters went along and left Lithuanian forests without professional manpower.

10. Forestry Education

(a) During Ekaterina II's reign, German forest masters held the most important central and local positions.(45) They were of little help, however, because they were poorly trained and did not speak Russian.(46) In 1773, a class in forestry was opened for 10 hunting pages at military school. In 1779, four students of the St. Petersburg naval college went to England to study forestry as it applied to ship building. In 1800, the naval college established a special forestry division to train 35-50 students. The plan failed, however. The most important step forward was the establishment of a "Practical Forest School" in a suburb of St. Petersburg, the Crown Village (Czarskoie Selo). The school was moved into St. Petersburg and later became the Senior College of Forestry. It still plays the most important role in training the foresters of Russia.

(b) Many schools were opened, closed, and opened again to train men for forestry on a lower professional level (guards, etc.). These were usually located in rural areas as a part of the facilities of a forest district. In 1908, for example, there were 33 of these lower level institutions plus the Senior College of Forestry in St. Petersburg, and forestry divisions at agricultural colleges in Moscow and Pulawy (Poland). From 1908-1915 an additional 11 lower level schools opened and the enrollment of those in existence was increased to about 15 or 20.(47)

(c) The forestry colleges had a very large number of students. In 1908, the Senior College, for example, had four hundred, and Pulawy 150. At the same time, Hungary had only 150, Eberswald (Saxony) 76, Gmunden 78, Tharandt 69, Munich 63, and Ithaca (US) 35. While Russia was training so many foresters on a high level, however, it was not training enough men for the practical everyday purposes of forestry. The lower level schools each had only about 20 students. This situation is a rather typical disadvantage of the Russian education system.(48)

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(d) The Russian Government spent about two thousand rubles per person for the college students' educations and about 750 rubles per person for the lower level students. From 1838-1887, 1914 persons were graduated from various courses, 1638 of them on the forest master level. During the period 1903-1908 about 150 persons graduated from the forestry colleges each year. Refesher courses for forest masters were established beginning in 1912.(49)

11. Forestry Salaries

(a) The salaries paid Russian forestry officials, both in the central and local administrations, were miserably low. Growing requirements of a higher standard of living and the rising costs of living put these officials in a very bad plight. The educated professionals preferred assignments to work with other professions at higher salaries. Of the 408 persons graduated from 1905-1911, only 286 went to work in the forests.(50) Salaries were set in 1872 and unchanged until 1912. The salary range during this period was from 600-1050 rubles (about US$300-525).

(b) In addition to their salaries, officials in the forests received supplements in the form of fuel wood, free dwellings (or additional payment for one), and 33 hectares of land for their use, tax free. Officials in the cities received special additional payments. From 1837, forestry personnel received a certain percentage of the increased income from the areas under their direction. Added up anyway, however, forestry personnel were poorly paid and this fact alone was sufficient to hinder progress. The raise in 1912 increased forestmasters' salaries to 1600-2700 rubles a year plus the additional supplements; forest inspectors' to 2800-3000; forestmasters' assistants' 600-1000; and estimators 1200-1500. An annual salary of only 100-250 rubles was paid for secretaries to assist the forest masters, but in Lithuania, Roman Catholics could be hired for this job. The experience these people gained helped the young Lithuanian Republic very much after the Russians left the country. In 1912, the secretaries' salaries were raised to 480 rubles per year.

(c) The prices paid for commodities during the year 1911 provide an indication of thefinancial plight of the foresters:(51)

100 Kg of Wheat	-	7 rubles
100 Kg of Rye	-	5 "
100 " " potatoes	-	1.8 "
1 work horse	-	75 "
1 cow	-	48 "
100 Kg of beef	-	30 "
100 " " pork	-	36 "
1 man's suit (woolen)	-	12 "
1 pair men's shoes	-	2 "
1 cubic meter of fuel wood	-	4 "

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12. The Standards of Russian Forestry

a. The influence of German forestry policies were very strong in Russia. The first Russian forestry books were translated from German, and until 1850, almost all rules and regulations for the forest economy were taken from the Germans. After 1850, however, there was a trend away from the blind copying of the German ways. The forest colleges, which had great influence in Russian forestry as a result of the large number of students they graduated, led the way in liberating Russia from the German policies. Silviculture and planning were the first areas of Russian forestry to become independent, although German ideas were later accepted and developed (e.g. Dauerwald's idea of a rapid growing system). Russian thoughts on such broad and highly developed doctrines as soil science, meteorology, climatology, forest types, etc, followed world research and there was no real independent movement in Russia in these areas.

b. The bad situation in Russian forestry would have improved rapidly (as it started to do from 1908-1914) if World War I had not begun.(52) Signs of decentralization had begun in 1896 when remote bureaus had received the right to act independently in organizing the forest guard, prosecuting poachers, and approving timber auction prices.(53) Responsibility for running the Russian forest economy was transferred in part from a few very highly placed officials to a council of forestry experts.(54)

c. The first forestry association in Russia, the "Royal Forest Association", existed from 1832-1851. Its activities were limited but during the period of its existence, it issued a "Magazine of Forestry and Hunting". A second forestry association organized in 1871 at a time when the level of Russian forestry had begun to rise. It was called the "Forest Association of St. Petersburg" and it lasted until the Revolution of 1917. It issued the "Lesnoi Zhurnal" (Magazine of Forestry) until its demise. This magazine was the most important organ to mirror and influence public opinion on forestry. It was a very important factor in the development of the Russian forest economy. Associations similar to the St. Petersburg group were later formed in Moscow, Ekaterinoslav, Orenburg, Minsk and elsewhere. All of them were designed to aid private owners to manage their forests properly. They organized meetings of the owners and forestry experts, trips to points of interest, and exhibitions and fairs. While these associations were small (50-300 members) their influence was large.

d. The bibliography of forest literature in the 18th Century was very limited. Most of the available literature came from the German work. The first book was printed in 1766 and five more followed (all translations) before the end of the century. From 1801-1888, the situation was almost as bad. The "Forest Magazine" was available from 1830 to 1850. The "Magazine of Forestry and Hunting" was available from 1855-1859. From 1871-1917 the "Magazine of Forestry" was issued, and in Kiev the "Forest Industrialist" was published from 1866-1890.

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From 1890-93, the magazine "Russian Forestry" was available, and from 1898-1918, "The Forest Industry Herald". In addition, the colleges published the results of research, and from 1838-1893 about 120 original works and 20 translations appeared. After 1893, book publishing increased considerably until World War I.

e. The outstanding forest scientists of the Russian school were the doctrinists Morosov, the botanist Sukachov, the soil scientists Glinka, and Dokushaiev. While the Russian Empire sharply limited political expression, other criticism was accepted. Scientists were encouraged to express themselves freely on economic or scientific subjects.(55)

13. Forest Research

a. Forest research in Russia began in 1840, forced by the need to reforest the treeless steppes of southern Russia. At that time two forest districts were established, in Berdyansk and Velikii Anadol, and the areas were planted in trees (mainly oak). The first problem faced in these two districts was the study of the results of this artificial reforestation and of the natural conditions affecting the project. Special, low-level schools were set up in the area to educate technicians for the task.

b. In the 1870s, public opinion as mirrored in the forestry magazines, demanded the establishment of a permanent research program, not only for the steppes but for the whole empire. The concensus of the professionals, published in the "Reports of the Forest Department" (1890-1895), also agreed on the need for a research program. Following 1895, special sums were allotted to research, and special groups were assigned to study forests in 20 government areas. In addition to this official program, the state colleges conducted their own projects. The greatest overall research effort was concentrated in the southern steppes.

c. Research interests became more specific in 1908 when special districts were established to deal with special research problems. Again, most of the interest was concentrated in the steppes. Studies of the May Bug were begun in three districts, and other districts studied the seeding problems of various trees, stands, and localities. After 1909, the central forestry administration in St. Petersburg became a special advisory committee, dealing only with reforestation problems. It directed research on reforestation and made suggestions to the central government.(56)

d. The only forestry research conducted in Lithuania was that of individual forestmasters acting on their own initiative. Some very interesting research was done in Troki County on the growth of oak trees. In Marijampole County a program was initiated to plant larch seeds. These beginnings have since been very helpful to later researchers.

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14. State Forest Guards

a. The guarding of the state forests against misappropriations was the duty of those peasants bound to the area. The peasants were appointed to guard duty, without having the right to protest, for periods of from one to two years. During their service, they were exempt from payment of any taxes on the land they used. In 1837, over 40 thousand persons guarded the more important state forests, of whom over 80% were bound peasants. Supervision of this group was lax because of a shortage of supervisory personnel. The system worked badly and led to many abuses. The violations in Lithuania in 1857, where control of the guard force was very difficult, were tremendous.(57) The state forests were particularly difficult to protect because they bore the last surviving stands of the tallest, most valuable timber.

b. The difficulties in protecting the forests are partially explained by the eastern concept of property rights. Under Czar Peter I, the rights of an owner in his forests were uncertain. The state considered itself a sub-owner with the right to use the forests. In ancient Lithuania, property rights were more precisely determined, but the right of entry complicated the situation. Until 1940, Lithuania applied the Russian law which characterized the misappropriation of timber from another's forest as a violation but not a theft. The taking of another's wood was only considered to be theft when that wood had been altered by human labor (cut for fuel or other purposes). The Russian Czars never changed this custom because of their political conservatism and the Lithuanian Republic also let it stand for political reasons (the desire to win peasant support).

c. Wood was enormously important to the Lithuanian peasant because of its high price and relative availability. After grain and livestock it was Lithuania's most important product. Construction in rural areas was almost 100% of wood and in towns and cities 50%-80% of the buildings were of wood. Wooden structures were easy to erect and each village or town had its own skillful builders. With a few simple tools (axes, hammers, a few drills, pit saws, and cross-cut saws) they could build quickly and cheaply. Until 1918, most buildings had simple foundations of large round stones lying on the ground. The consequent lack of ventilation and adequate support caused most buildings to last only 10-15 years. The oldest buildings lasted no more than 50 years.

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d. As a result of the constant need for wood, its acquisition became one of the peasants' most important problems. Part of the fuel wood ordinarily came from his own land, the rest he took from state lands, or bought. He sometimes bought wood in order to gain access to a forest and while he was there would try to bribe the guard to allow him to take more than he was entitled to. Structural wood had a monetary value in the peasant's life. He attempted to build up a stock of it to fill his own needs and to sell if necessary or when prices were high. He even gave it to his daughters as a dowry. Wooden dwellings were built so that they could be taken apart and moved and were actually a portable part of the peasant's estate.

e. While the desire to obtain structural timber was always great, it was most readily available during periods of unrest and warfare. During the warfare of 1812, the uprisings of 1831 and 1836, and the revolutionary activity of 1905, the position of the Russian government was so weakened that the peasants invaded the forests (even openly) to cut wood for their needs and for sale. For political reasons they were never punished for these incursions, and so each succeeding invasion became more determined and widespread. In 1918, misappropriation of timber in the forests of the new Republic of Lithuania was particularly serious.

f. The attitudes and circumstances described above made the operation of an effective guard force and conservation program very difficult. The problem is not appreciably different today under Soviet rule, although the primary need is now for fuel wood. The attitude of the peasants toward the forests has its roots in an ancient religious principle; that God gave what he created to all men. If a forest owner considered his property to be his alone, he was violating a law of God, because growing timber belonged to all men. This belief held true on a larger scale as applied to state forests, too.

g. In 1795, the Russians organized a military guard force for the Lithuanian forests but after a short period of pacification replaced it with a peasant guard. The peasant guard force proved to be a failure and after 1832, the forest guard was hired. This force was paid with the use of 33 hectares of land and occasionally given a dwelling place. It received no money. The Russian government made it a policy to try to place guards in localities remote from their homes and to make them independent of the local populations. The local populations, on the other hand, resented this and actively and passively objected to it. In times of unrest, the guards were terrorized and their posts frequently burned. Guards recruited locally to watch their native forests generally were corrupted by this circumstance, even if they had originally been honest men. In order to get along with his neighbors and live in peace such a man had to agree to their misappropriations of wood.

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h. In general, the operations of the peasants and occasional wood merchants was not too harmful to the forests. They took mainly dry, fallen timber or smaller trees. The guards sometimes allowed the peasants to take the wood suitable for fuel in order to gain their cooperation as agents who would report the theft of valuable timber. The forest areas were large, and the help of such informants was necessary to effectively guard them. Most of the fuel wood taken by the peasants was paid for in some manner; by services to the guard, contributions, or "treatments" (whiskey). This was still true from 1918-1940, if not to such a high degree as under the Czar.

i. A guard was able to retain his post as long as his cooperation with the peasants was moderate. If the peasants took or he gave too much, he soon lost his job. Frequently his own agents were his prime accusers, or if he had cooperated with only a few peasants, those who had not received any favors were apt to denounce him. In most cases of complaints, the guard was removed. When a guard was too strict in his duties he was often terrorized and his buildings or forest (if pine) burned. In times of unrest and revolution, the guards were the object of attack and were sometimes killed. As a result, when danger threatened, the guards were the first to flee, leaving forests open to exploitation. The situation, as described above, was true to some extent even up to 1940.

j. In 1869, the peasants were freed and the forest guard was hired. As of 1889, there were 19 thousand in the 30 government areas of European Russia, in charge of 4,000,000 hectares of forest. Each man guarded between 100-650 hectares, an average of 440. By way of comparison, at the same time a German forest guard was responsible for 880 hectares, an Austrian 1,670 hectares, and a Hungarian 1,350 hectares.(58) In Lithuania in 1857, one man guarded an average of 470 hectares.(59) In 1899, there were approximately 1,430 forest guards and 180 mounted guards in the forests of Lithuania. These guards were each responsible for the following average areas:

Vilno	550 hectares
Kaunas	440 "
Suvalki	660 " (60)

By 1899, the forest guard had already been abandoned in Prussia as unnecessary.

k. The income of the guards consisted of a small salary and supplements in the form of land, a dwelling (if available), fuel wood, and pasture. Before World War I, a forest guard received 60-180 rubles per year in salary. As a result of his low income, the guard was susceptible to bribery. This low income factor and the need for the guard to cooperate with the local populace and even live with it where forest dwellings were not available, made a failure of the policy of settling guards in areas away from their homes.

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l. Range riders (Obyeshchiks) were hired after 1826 to supervise the forest guards. In 1837, there was approximately one range rider (400) for each forest district.(61) In 1869 there were two thousand; in 1903, 6,254; and the number continued to grow until 1915.(62) The average territory of a range rider was 42 thousand hectares, but this includes the large northern forests which were very sparsely guarded. In Lithuania, every range rider supervised approximately 500-600 hectares and 8-10 guards. The range rider reported to the forest master and handled legal details surrounding the prosecution of timber poachers. The range riders were poorly educated but usually had an elementary education and practical forestry experience. The guards were 70% illiterate, but were required to be able to recognize figures.(63) The range riders were also poorly paid. In 1900, they were paid 400 rubles a year and slightly higher supplements than the guard. They too were subject to bribery.

m. The range riders, guards, and clerks in forest district offices were appointed primarily from native populations and could be Roman Catholics. When the Russians withdrew from Lithuania, the range riders and clerks formed the skeleton of the new forestry service.

n. The Russian government's expenses for forest guard forces from 1866-1898 ranged from 300,000-2,800,000 rubles per year and from 6-94 rubles per person. In 1863, only 1% of the guard had a state dwelling.(64)

15. Forest Planning

a. An accurate knowledge of the forests is a prerequisite to any proper forest planning. In Russia, Peter I divided the industrial forests into regular annual cutting areas.(65) Ekaterina II ordered (1782) a general survey, the division of the forests into districts, the limitation of cleared lanes to a width of 40 meters, and the policy of leaving at least 30 seedlings on each hectare of cleared land.

b. Presumably the first real working plans were made in 1811-1837 and were applied in the best forests around St. Petersburg. The first plan to be published was issued in 1830 for the Ural industrial forests. In 1837, the forests of European Russia were divided into squares, quarters, etc. Regular use of working plans dates from 1842, when 16 government areas began to use them. Instructions on them were published in 1845 and 1854. The area under plan grew rapidly (1842 - 110 thousand hectares, 1843 - 165 thousand hectares, 1849 - 2,710,000 hectares). Progress stopped in 1849 because portions of the forests were given to the peasants and the foresters were busy on this task. In 1859, working plans were in use for a total of 3,130,930 hectares.(66) While the plans were being prepared, exploitation of forests outside the plans stopped and they produced no income. Simplified instructions issued in 1859 speeded up the preparation of the plans. By 1884, 18,400,000 hectares were under planned exploitation and an average of 418 thousand hectares was added annually.

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c. In Poland (including Suvalki), working plan preparations were begun in 1816. By 1896, only 46,200 hectares in Poland had not been surveyed and all other areas were under working plans. The plans were generally poor until about 1890 when their quality improved.(67) By 1905, 20,000,000 hectares in Russia had working plans. In Lithuania in 1905, 32,120 hectares in Kaunas and 27,940 hectares in Vilno had not been included under working plans, but some areas of greater interest had already been surveyed twice. Average expenses for a survey were from 60-90 kopeks per hectare.

d. In the 1840s, the first working plan for the Vilno area was established in the forest district of Olkieniki and for Kaunas in the Rumsiskis area. These plans were sometimes revised more than once. For example, in Vilno the Labonora district plan was revised in 1850, 1873, and 1883; the Miedzyrzech district in 1850, 1857, and 1878; and the Olkieniki district in 1848, 1857, 1862, and 1888. In Kaunas, the Pieniany district plan was revised in 1850, 1861, and 1875.

e. By 1915, all state forests in Lithuania had working plans, many of which had been revised. The plans were the results of the efforts of the 560 (as of 1909) officials who had forest planning responsibilities in Russia.

f. A typical forest working plan provided for a survey of the forest, its division by soil type into specific areas (farmland, forest, meadow, etc.), further division of the stands according to age and type, computation of timber volume and yearly increment, and determination of cutting areas. The forests were divided into squares of varying size. In Vilno and Kaunas, these squares ranged in size from 100-450 hectares depending on the quality and density of the timber. The squares were smaller in better areas. In 1915, the average was 110 hectares. Borders of the squares were geographic features (creeks, roads, etc.) if possible, or cleared lanes wide enough for a horse cart to pass. /See end of report for availability of photograph of a typical forest lane./ Most state forests were surrounded by ditches (about three feet deep and 20-40 inches across at the bottom), and corners were marked by wooden posts (the sign of state owned property).

g. Until 1838, cutting was on a selective basis over all forest ranges. After 1838, selective cutting was confined to fixed areas marked with special signs.(68) Since 1854 cuttings have been determined by computation of timber volume and area.(69) In Lithuania cutting rates have been high:

Pine	at 160-180	years of age
Spruce	at 160-180	" " "
Aspen and alder	at 60-100	" " "(70)

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The quantities cut were low and never exceeded the yearly increment, especially in Lithuania. Moreover, the state forests had a large backlog of mature timber which could be taken without harming the forest stands.

16. Conservation

a. Peter I issued the first conservation laws, those transferring the forests to admiralty control and establishing a forest administration. Penalties for cutting valuable tall timber were very severe. They were softened somewhat by Ekaterina II when she freed private forests from state control and obligations. The unrestricted cutting of the private forests and the conservative policy in the state forests tended rapidly to denude the private forests. This state of affairs lasted almost 100 years and seriously alarmed the bureaucracy and ruling classes of the Empire.(71) The deforestation caused considerable erosion and consequent choking of river beds with silt. All of these effects caused the state to intervene, and after long considerations a law to preserve the forests was proclaimed on 4 April 1888. It was the first important, firm step toward conservation. As a result, the state assumed control of the private forests. The law applied to all of European Russia except the remote northern swamps and forests. Its provisions were relatively mild. The owners (state or private) could not convert forest land to other use, and were required to follow simple working plans. All private forests were supervised and checked by the state.

b. The organization in charge of the conservation program was the Chief Administration of Forest Conservation which was subordinate to the Forest Department of the Ministry of Agriculture and State Properties. Its directives were carried out by territorial committees, by local forestry officials, and by local police officials. The territorial committees were appointed by the central government and included a president (the local governor); a leader of the local gentry; the president or a member of the circuit court; the director of the local office of the Ministry of Agriculture and State Properties and his assistant or a forestry inspector; and others as appointed in special circumstances. The committees were comparatively flexible and workable because their membership included all important local leaders of public life. They were responsible for the posting of the forests as timber or water-conservation preserves; for amending local forest regulations; for changing the status of local forest areas for other uses; for regulating cutting for conservation purposes; for approving new working plans; for naming areas to be reforested; and for prosecuting violators of the forest laws.(72) The Chief Administration annually spent 32% of its budget on the administrative expenses of the territorial committees and 25% to pay 80 forest masters and their assistants. Total expenses for a year averaged 138,785 rubles.(73)

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c. The effect of the conservation policies was remarkable. They stopped disorder in the private forests, caused prices to rise, and awakened the interest of forest owners in maintaining their properties. Many of the owners began to experiment with fast growing trees (the attempts failed) and with artificial reforestation. Some of the private forest owners became excellent forest managers and began to receive some income from their property in spite of the enforced low cutting rates, lower prices, and lack of large timber. Some of them began to leave their timber for eventual cutting when maturity was reached. All in all, the private forest economy after 1888 improved very much. By 1914, almost all private forests operated correctly under working plans supervised by the central forestry administration.

d. The difficulties in guarding the forests against timber thieves were described above. The expenses of the guard force were a considerable burden on the state. The number of guards tended to rise as expenses rose. A guard force of 31,864 men cost the state 3,126,000 rubles, 27% of the total (11,536,000 rubles) expenses of the forestry program.(74) As said before, the Prussians had eliminated their guard as unnecessary, but in Lithuania the forest guard has remained even down to the present day.

e. In 1903, damages to the Russian forests were assessed as follows:

Theft or poaching	-	208,000	-	700 thousand rubles
Fire	-	4,000	-	700 " "
Other	-	39,000	-	100 " "

Ninety-six percent of the instances of damage were discovered and reported by the forest guards. The increased number of guards and the greater efficiency of the forestry service cut down the number and cost of forest damages as follows:

1866	-	11,000 cases	-	56,000,000 rubles
1882	-	193,000 "	-	7,000,000 "
1886	-	271,000 "	-	4,000,000 "
1898	-	193,000 "	-	6,000,000 "
1903	-	251,000 "	-	1,500,000 " (75)

f. Damage from forest fires in state forests averaged about 100 thousand rubles annually with an increase during periods of drought. In 1900, 4,373 fires were reported in an area of 1,200,000 hectares. They damaged 11,000,000 trees of commercial value and 7,000,000 of lesser worth. In 1901, fires burning in an area of 1,600,000 hectares destroyed 14,000,000 trees of commercial value and 20,000,000 of lesser value. The amount of damages in 1903 was estimated at 3,700,000 rubles. In 1903, 700 thousand trees were destroyed in an area of 200 thousand hectares with a loss of 500 thousand rubles, and during the period 1904-1908, annual losses averaged 441,723 rubles from fires over an area of 165 thousand hectares.

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Fires in Lithuania occurred primarily in pine forests and peat logs. They were 95% the work of man.(76) Shepherds' (usually children 10-15 years old) fires and smudges (against mosquitoes) started many of them. The most serious fires, however, were set by peasants as acts of vengeance against guards. If they wished to get rid of an unpopular guard, they would repeatedly set fire to his forest. The only solution to this problem was the transfer of the guard to another area. Forest fires occurred occasionally as a by-product of war and unrest and were also sometimes set to force the sale of desirable wood. The system of selling timber from state forests was an involved procedure, but fire damaged wood could be obtained quickly and cheaply.

g. Most forest fires were ground fires. Top fires occurred in young pine stands but were rare. Most dangerous months for fire were from the end of April through May and June. Most fires occurred during daylight hours, were small and easily extinguished, but the fires set on purpose usually occurred on holidays, in dry weather, and in remote stands of valuable wood. As a result they caused great damage. The people of the area might sometimes be 5-7 kilometers from home (and the forests) attending church. In their absence the guards were unable to organize a defense force. In Vilno especially, the pine forests always bore the scars of frequent forest fires. The low density of these forests is the result of fires. The only protection against fire was their prevention by watchful guarding; matches were taken from shepherds and other forest users, smoking was prohibited, cut-over areas were cleared of debris, and cutting was prohibited during the summer. If a fire could not be localized, it was reported by a horseman to higher echelons of the forestry administration which would then organize a large scale fire fighting force. Fire fighting has been a duty since ancient times of the peasants who live in forest areas. The head man of the village would order out the young men (two from each dwelling) with their axes, shovels, and other tools to fight the fire.(77) In Lithuania none of the forest ranges was particularly large, so that fires could always be contained and large scale damage seldom occurred. A man could be called to fight any fire within 15 kilometers of his home.(78) He was not compensated for his efforts until recent times when he might be paid in fuel wood.

h. The Russians always allowed cattle to graze in mature or semi-mature forests but denied this access to pigs, horses, and goats. The poor quality of this pasturage was recognized but was necessitated by the low standard of living and lack of other suitable land. Even the guards and officials of the forestry administration were forced to pasture their own cattle in the forests.(79) In Lithuania, with its large population, damage to the forests from grazing was severe.

i. Damage from insects was extensive in the forests of Lithuania and European Russia. The history of this damage in particular species follows:

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(1) Norway Spruce

(a) The tree is subject to attack by many harmful insects, most important of which is the Bark Beetle (Ips Typographus). It spreads very rapidly in fallen and wind damaged trees and in very old trees, and sometimes infects very large areas with resulting severe damage. In the 1880s, wind damage provided a fertile field for the bark beetle. An epidemic started in the Baltic States and spread into Russia in 1881. The hurricane of 1881 increased the danger. Removal of the debris of the hurricane from the forests was very slow and by 1889, the beetle had reached the Volga area. Damage was very great. The epidemic lasted 12 years in the Baltic States until no mature Norway Spruce remained.(80) The inefficient system of the forestry administration kept the prices of damaged wood high and thus, large quantities of usable timber spoiled in the state forests. Damage was not quite so severe in private and crown forests because they sold their damaged timber quickly at the lower prices and thus managed to save something from the ruin.

(b) In 1852 and 1853, the nun moth (Ocneria Monacha) appeared in the forests of Prussia and Poland. This nocturnal moth destroys the needles of adult spruce and usually the tree dies as a result. In 1855, the moth appeared in Suvalki, and Kaunas (Rossieny and Kaunas Counties), and very heavily in Vilno (Troki County). The cold spring and summer of 1856 stopped the epidemic, but large areas of the spruce forests had already been devastated.(81) While the nun moth is an occasional threat, the Bark Beetle (or Printer) is an annual danger to the spruce stands and kills large numbers of trees. The success of these two insects was due to the presence of large stands of pure spruce. There was no successful defense against them. Only the swift removal of diseased trees helped, and this was hindered in the state forests. The damaged timber the insects left was sold annually at prices 30%-50% below normal.

(2) Scotch Pine

(a) Most important enemy of this tree is the May Bug, an insect the size of a large acorn. The larvae live in the soil for five years during which period they damage the roots of the young pines. They thrive in large burned or cut-over pine areas. When the cutting system was changed from selective logging to the clearing of strips, danger from the May Bug increased considerably. The only defense was a change in this system. A study of harmful insects was made in Russia, but not in Lithuania.(82)

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(b) Pine bark beetles (Myelophilus Peniperda and Minor) were a secondary enemy of pine trees which destroyed already weakened trees. A type of weevil (Hylobius Abietis), hurt pine seedlings by devouring their bark. To combat this pest, the bark was removed from the stumps of cut trees and the cleared areas surrounded by vertical ditches.

j. The most prevalent fungus in the forests was the honey mushroom (Agaricus Melleus). It harms older stands extensively, particularly where the forest is used excessively as pasture. The Rhizomorphus of the fungi infects the tree and spreads between the bark and the wood. The mushroom itself appears in autumn. No defense against this pest was practiced because the use of pasturage was legal and the selective cutting of weakened or diseased trees was not applied. Fungi of the lower orders are very common in Russian and Lithuanian forests, particularly in old, diseased, or damaged trees. Birch and aspen suffer from common white rot and its typical sponge-like growth on their trunks. Aspen grown from sprouts is particularly susceptible to this rot and suffers annual high losses. Types of red rot attack old spruce trees, alders, and old oak trees. In Lithunia, during the period 1918-40, 60% of the oaks 150-200 years old, were infected with rot. There was no plan to combat it at that time.

k. Insect and fungi damage was very extensive.(83) The ratio of timber killed by these pests to growing timber held steady at 1.3 and dead wood sold at a loss of 30%-40% in value.

17. Forest Exploitation (Use)(84)

a. The quantity of wood cut annually is the best yardstick for measuring the intensity of the exploitation of the forests. This figure is available in festmeters per hectare and should be compared with the annual increment in growing timber and the distribution of the forest stands according to their age in order to arrive at a fairly accurate estimate of forest use. Some representative figures follow for European Russia as a whole:

	Festmeters of Wood Cut per Hectare of Forest
1891	0.2
1897	0.3
1903	0.5

b. Russian forestry instructions governing the cutting of timber in unsurveyed forests which were not under working plans, prescribed the following cutting norms:

Forest Density	Quantity (Festmeters) per Hectare
Normal (good) stands	2.8
Moderate stands	2.1
Poor (scattered) stands	1.5

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c. By way of comparison, at the same time Western European norms were:

Austria	3.25 festmeters per hectare
Germany	3.30 - 5.10 festmeters per hectare

The result of the conservative Russian policy was that its forests were used too little. The European forests were primarily young and vigorous and the Russian forests over-ripe and susceptible to disease and decay.

d. From 1890-1894, all the forests of European Russia produced 195,000,000 festmeters of wood. Of this quantity, 66.4% was cut from live timber and 33.6% was cut from dead wood. This ratio also held true in 1903.(85) From 1890-1894, the following amounts of wood were used per hectare per year in the various Lithuanian Provinces:

		Average Value
Kovno	1.12 festmeters	1.06 rubles
Vilno	1.68 "	0.33 "
Suvalki	1.12 "	1.41 " (86)

Wood production in Lithuania during two representative years was as follows:

Area	Years	Forest Area in Hectares	Wood Production F.M. From Total Area in F.M.	Wood Production F.M. From 1 Hectare	Net Income Rubles Total	Net Income From 1 Hect. in Rubles	Net Aver. Price 1 F.M. Rubles
Kaunas	1878(87)	191,840	143,850	0.75	123,267	64.25	0.85
	1911(88)	156,860	898,175	6.30*	783,005	500	0.80
Vilno	1878	313,404	188,042	0.60	110,802	35.4	0.59
	1911	283,317	1,268,883	4.70*	1,512,689	590	1.20
Suvalki	1878	334,630	100,390	0.30	60,300	18.0	0.60
	1911	219,447	604,933	2.70*	1,620,784	740.0	2.60

*The heavy cuttings in 1911 point to a concerted drive to cut surplus and over-ripe timber especially in Vilno.

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e. From 1866-98, the state forests of the Vilno and Kaunas areas annually produced on an average, 1.10 fest meters of wood per hectare and the Suvalki area two fest meters per hectare.(89) Eighty percent of this quantity was ordinarily prepared for sale, indicating that the supply was more than sufficient to satisfy the demand. The stock available for purchase included the timber earmarked for cutting plus the uncut surplus stock from previous years. In European Russia in 1903, for example, 184,000,000 fest meters of wood were available for sale, of which 100,000,000 was newly designated for cutting and the balance remained uncut from previous years. Forty-two percent of the new stock and 19% of the rest were actually sold.

f. In 1903, Lithuania and Poland used the clear cutting system. The only trees cut selectively were the dead ones. The right to cut these on areas of not less than one square (100 hectares) was sold to agents and merchants. In 1867 and 1878, wood production in European Russia was consumed as follows:

	1867	1878
Peasants on state farms	49%	8%
State requirements	4%	15%
Private interests	47%	77%
	100%	100%(90)

The decrease in the peasants' use of wood is explained by the fact that they were awarded their freedom and lost the right to use the wood of the state forests. In 1878, they had to purchase the wood they used. The 1878 figures are fairly typical and remained about the same until World War I.

g. The 184,000,000 fest meters of wood available for sale in 1903 in European Russia were valued at 49,800,000 rubles (43,000,000 rubles for the 100,000,000 fest meters of freshly designated wood and 6,800,000 for the stock remaining from earlier years). The sale price was set at 60,700,000 rubles (53,200,000 rubles for the fresh stock).(91) The average rise in value (bid over the official price) of the wood at the auctions was 22%. In 1867, it reached 45% and in 1874, 36%. The increase in the bids over the official price is explained by the rising demand, falling production, and rising price.

h. In 1907, the state forests of European Russia produced 56,700,000 fest meters of wood valued at 60,000,000 rubles.(92) In 1913, they produced 88,800,000 fest meters valued at 96,400,000 rubles. Production and forest income steadily increased during the period.

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18. Reforestation

a. The first steps toward encouraging natural reforestation were taken in the Polish Kingdom in the 17th Century when grazing in royal hunting forests was restricted in order to stimulate growth in cut-over and burned areas.(93) The first steps were taken in Russia in 1786, with a proposal for clearing strips on the lee sides of the forests not over 40 meters wide, and leaving 20-30 seedlings on each hectare for reforestation purposes.(94) Conditions for natural reforestation in Lithuania and the northern portion of Poland are generally favorable and areas selectively logged reforest quickly.(95) On cleared strips, the natural process was badly retarded. The cleared strip type of logging was introduced in 1840.(96)

b. According to statistics of 1883, during the period from 1862-1882 successful (70% of the primary trees replaced) natural reforestation followed strip logging operations in 25% of the evergreen and 8% of the deciduous forests (a total of 91,576 hectares), located in 242 forest districts in 27 government areas.(97) "Sufficient" reforestation (40-70% of the primary trees replaced) occurred in 11% of the evergreen and 11% of the deciduous forests. "Unsatisfactory" reforestation (10-40% of the primary trees replaced) occurred in 12% of the evergreen and 11% of the deciduous forests. The hardwood deciduous trees reforested only 3% of the primary trees, the soft woods replaced 11%, and no reforestation at all occurred in 8% of the cases. Reforestation of deciduous trees fell into the "unsatisfactory" category as high as 43% of the time. A particularly bad situation existed under the Kingdom of Poland, since annual cutting exceeded the reforestation rate by five times.

c. The initial reforestation period did not exceed 12 years (i.e. within 12 years after an area was cleared it had achieved a sufficient ground cover of new trees mainly of the soft deciduous type).(98) Natural reforestation supplied 93% of the new growth during the period (1862-1882) and cultivated plantings the rest. Total new growth averaged 165 thousand hectares per year during this period. The system of clear strip logging led to large areas of reforestation and vacant areas as well. In 1898, in central and southern Russia and in Poland there were 200 thousand hectares of unreforested land (mainly in the pine forests).

d. In Lithuania, the clear cutting method has been the primary logging operation since 1900, and therefore, reforested areas are largely of the soft deciduous type. The final reforestation of an area with its predominant trees usually began 10 years or more after cutting. The desire of the forestry administration was to achieve a natural reforestation of an area with the same type of trees which had been cut down. The most desired trees were spruce, pine, and oak.

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Birch, aspen, alder, and other soft woods were not important until 1922, when they began to be used in the production of veneers. The forestry administration stimulated natural reforestation by leaving 30-50 seedling trees per hectare, prohibiting grazing in the cut-over strips and in parallel zones double the height of the predominant trees in the area. In 1870, the German system was introduced of using the cut-over areas as beds to raise seedlings for 1-3 years.(99) In Germany, the person using cut-over strips as farmland was required to plant the desired trees with his crops. In Lithuania the same system was in use, but the peasants disliked using the rich forest land for crops because of the difficulty in removing stumps and keeping down sprouts. Growing trees from seeds was abandoned on the light, sandy soils because of the danger of wind erosion.

e. The changeover from selective cutting (helpful to natural reforestation) to the cleared strip process resulted in the growth of soft deciduous trees of lesser value in the cleared areas, and delayed by 10 or more years the regrowth of the original and more valuable tree types.(100) Furthermore, large areas did not reforest at all. There is no indication that any artificial reforestation took place in Lithuania prior to 1795. Wealthy land holders did plant large numbers of foreign trees and plants (including entire parks of these) on their estates, but only for decorative purposes. The presence of these plants, however, offers an opportunity to study their adaptability to the Lithuanian climate and the advisability of trying to grow them commercially on a large scale.

f. The Russian forestry administration was interested in protecting the most valuable trees (oak and pine). Where soil conditions were suitable, oak trees were introduced. Soil condition was the main factor affecting tree growth whether in natural or artificial reforestation. The black poplar (Populus Negra) with its characteristic rapid growth, was introduced from eastern Russia, mainly for landscaping purposes around military construction (Alytus, Kaunas, and other areas). Another tree brought into Lithuania was the Sheluga (Salix Acutifolia), a type of willow which grew in the continental climate where the Volga runs into the Caspian. The Sheluga was valuable in preventing wind erosion in the sandy areas along the Baltic Sea and in the Vilno area which has large areas of sandy soil. While conditions were good for the growth of the black poplar and Caspian willow, their seed regeneration was very bad, if not a complete failure.

g. The Italian poplar (Populus Pyramidalis) was introduced for urban landscaping. Land owners brought in valuable fruit trees from foreign lands. Peaches, apricots, grapes, and even palm trees grew in their green houses. Horticulture reached a high level in the last years of Polish control over Lithuania and continued under the Czars. After 1888, when the new conservation laws made wood scarce, prices rose and private forest owners began to experiment with fast growing foreign trees. As a result, private forests in Lithuania contain entire areas of the North American Jack Pine (Pinus Banksiana); the Austrian Black Pine (Pinus Nigra);

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The French Maritime Pine (Pinus Maritima); the Polish larch (Larix Polonica); the Siberian larch (Larix Siberica); and the German European larch (Larix Europea). These plantings did not exceed 5-10 hectares each and were in the research stage. Soviet scientists continue to study them and propose to plant some of them widely in Soviet Lithuania.(101) In addition to the above, many shrubs were introduced but only for landscaping purposes.

h. While natural reforestation was most important in the state forests, Russian forestry has an old tradition of artificial reforestation to prevent erosion. Russia has large areas of shifting, sandy soils, eroding gullies, and treeless steppes, and Russian foresters have long used trees to control these areas. The first steps in this program were taken around Astrakhan and the sea of Azov where oak trees were planted. In 1786, private land owners were given financial support to induce reforestation of the steppes. Czar Paul I (1796-1801) established a special "Practical School of Forestry" whose graduates were appointed as silviculturists and assigned to reforestation programs.

i. In 1830, a program was begun to control the shifting sands on the Baltic coast between Palanga (Lithuania) and Ventspils (Vindava) in Latvia. Three thousand rubles were allotted for this purpose. Steps were taken to settle the area and anyone willing to move there received 150 rubles and enough wood to construct the necessary buildings. From 1835-1860, 4,134 hectares of land were reforested although not entirely successfully. In 1870, a new program was initiated to reforest the dunes around Ventspils. The predominant trees planted in this area were the Sheluga (Caspian Willow) and scotch pine.(102)

j. Russian forestry paid the most attention to the reforestation of the southern steppes. Most scientific manpower and financial resources were concentrated in this area. Entire new forest districts of planted trees (primarily oaks) arose in areas such as Veliki-Anadol and Berdyansk. Research developed in the area on the reforestation of arid regions and the work carried on served as a practical school for many famous Russian soil and forestry scientists including Morosov, Dokuchajev, Glinka, and others.

k. In the forests proper, artificial reforestation has really been applied only since the end of the 19th Century. From 1861-1892 natural reforestation was the popular way to replenish a cut-over area. In 1899, artificial planting began to be used.(103) At that time, a certain portion of the money collected from wood sales began to be set aside for reforestation expenses. The forestry authority thereafter used the money for this purpose. In 1890, only 77 thousand hectares of land in European Russia had been cultivated and seeded for artificial reforestation. In 1894, only 72 thousand hectares were under cultivation. From 1890-1893, eight thousand hectares were replanted, which means that 13 thousand hectares had been lost. Of the 72 thousand hectares

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in 1894, 42 thousand (evergreen 22 thousand and deciduous 20 thousand) had been planted and 30 thousand (evergreen 13 thousand and deciduous 17 thousand) seeded. From 1894-1898, an additional area of only 24 thousand hectares was planted or seeded but after 1899, the cultivated area grew rapidly as the deposits for this purpose accumulated. From 1899-1905 the following measures were accomplished:

(1) Support of natural reforestation in eight thousand hectares by means of soil cultivation;

(2) Cultivation of trees on 120 thousand hectares of new land;

(3) Budget appropriation for reforestation measures on a total of 218 thousand hectares, including areas where earlier planting and seeding had failed.

1. In 1899, a total of 121 hectares were under cultivation. By 1903, this had risen to 330 thousand hectares. The following budgeted amounts were set aside for reforestation:

Average Annual Budget 100,000-200,000 rubles

Annual Deposits Received from Collections

1899	60,000 rubles
1900	300,000 "
1901	1,000,000 "
1902	1,700,000 "
1903	2,500,000 "
1904	3,200,000 "
1905	3,900,000 " (104)

As a result of these appropriations, the following land areas were replanted or seeded:

1899	100 hectares
1900	2,000 "
1901	10,000 "
1902	17,000 "
1903	29,000 "
1904	43,000 "
1905	48,000 "

From 1908-1915, 440 thousand hectares were planted or seeded. For this purpose the following sums were expended:

1908	1,062,042 rubles
1909	1,202,739 "
1910	1,404,644 "
1911	1,661,694 "
1912	1,844,043 "
1913	2,419,736 "
1914	2,339,849 "
1915	2,420,000 " (105)

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World War I put an end to the increasing reforestation program.

m. Until 1899, the following areas had been artificially reforested in Lithuania:

Kaunas

Kaunas forestry district	140 hectares
Telshe forestry district	122 "

Vilno

Sventsiany forestry district	206 hectares
Troki forestry district	165 "

Suvalki

Gryshkabuda forestry district	60 hectares
TOTAL	693 "

When compared to the Russian total of 707,619 hectares artificially reforested by 1899, it can be seen that the program in Lithuania had been relatively neglected. Natural reforestation was still the most important at this time.

n. While the deposits for reforestation purposes accumulated rapidly the forestry administration was not staffed sufficiently to use them all.(106) In Lithuania, these deposits accumulated as follows:

Vilno	17 rubles per hectare (cut-over)
Kaunas	18 " " " " "
Suvalki	14 " " " " "

(107)

In 1905, deposits made in all European Russia totaled an average of 0.02 rubles per hectare of pure forest land. Excluding the northern forests, the average was 0.07 rubles. For Lithuania these figures were:

Vilno	0.14 rubles per hectare of forest
Kaunas	0.14 " " " " "
Suvalki	0.08 " " " " "

At the same time expenses for reforestation per hectare of forest land in Western Europe averaged 0.45-0.73 rubles.(108) After 1899, the deposits were transferred to the general budget, and appropriations for reforestation increased.(109)

o. In general, the average outlay for the reforestation procedure was as follows:

Cost of planting or seeding	5.5 rubles
Additional expenses (personnel)	9.0 "
Care and supplementary reforestation	1.8 "
Total per hectare	16.3 "

An expenditure of 18 rubles per hectare was not sufficient and if less was spent, the work was badly done. In Vilno, the deposits accruing from one hectare averaged 14 rubles but only five rubles were spent in reforestation (as of 1905) and the effort suffered.(110) The forestry administration left few reforested areas in Lithuania and those which were established were not cared for. By 1918, they had largely disappeared or had been taken over by successive growth.

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p. The following techniques were used in artificial reforestation:

(1) Seeding in connection with the primary agricultural crop of the area. This was rarely used;

(2) Collection of evergreen cones for seed (done by peasants for compensation). The cones were dried in seed-making establishments which were usually located in block houses. Each of these ordinarily had two drums covered with wire net. Cones were put in and taken out from an opening on the top. The drums were located high, close to the ceiling and could be rotated. The husking house was heated by a stove range to about 100°F and after the cones dried and opened, the seed fell to the floor and was swept up. The guard was required, as part of its duty, to collect the cones, dry them in their own clay ovens, thrash the open cones, and deliver 1-2 lbs of the seed to the forest master before the spring work began in the forests. The seeds were stored in glass or clay containers until they were used.

(3) The guard had another duty; to collect acorns (50 kg) for seed. The peasants also made these collections to earn money. The acorns were gathered after the first autumnal frosts and stored buried in the earth.

(4) Soil was prepared for planting in the fall by youths who were paid 20-30 kopeks a day. The soil was broken by mattocks, shovels, or plows and the sod removed. The seed was sown in early spring, each individual seed in a cultivated plot, 0.5 meters x 0.5 meters.

(5) Each forestry district maintained its own nursery. When the trees were one to two years old they were planted. Planting and seeding always took place in spring; an unfortunate time, because Lithuanian springs are very short and the peasants were eager to work on their own crops. Frequently, by the time they were willing to do forestry work, it was too late to plant or seed. This accounted for the lack of vitality of many of the young trees, and the problem is still present in Lithuania. Acorns grew best because they were seeded in deep holes probed by sharp sticks. Trespassing on the planted and seeded areas was not allowed, either by cattle or humans, but peasant children frequently invaded these areas in search of berries and hazelnuts which grew in abundance. The planted areas were protected by ditches (to combat weevils) and occasionally by crude stave or lath fences.

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q. Each forestry district contained at least one husking house. Production was ordinarily low but sufficient to fulfill the limited needs of the district until artificial reforestation became more important after 1900. From 1908-1915, however, 274 new husking houses were opened in European Russia. Attractive premiums were offered for persons who achieved best results in seed production, planting, and reforestation, and a large step forward was taken in general production and efficiency. Nursery areas were steadily increased. In 1908, there were only 850 hectares in European Russia but in 1914, there were 1,060. In Lithuania, a number of small nurseries were established in the forests.

r. The amount of care extended to growing stands was only incidental until 1898. Thinning and clearing was begun in all state forests of European Russia from 1888-1893, on an annual average of 4,500 hectares, but it should have been done on at least 330 thousand hectares yearly. The area increased sporadically as follows:

1896	17,600 hectares
1897	42,000 "
1898	56,000 "
1899	80,000 "
1900	77,000 "
1901	80,000 "
1902	75,000 "
1903	83,000 "
1904	66,000 "
1905	95,000 "

s. Since there were 127,000,000 hectares of state forest in 1904, this effort was inadequate. Thinning the forests could only be applied in the most valuable areas where demand was highest and supply most inadequate. In such forests, the expenditures for thinning were returned with a profit. Thinning and clearing were applied as follows:

Year	Number of Hectares	Rubles Spent	Taxation Value	Sale Value
1902	75,000	161,000	503,000	891,000
1903	83,000	195,000	556,000	958,000
1904	66,000	191,000	518,000	876,000
1905	95,000	239,000	614,000	877,000

t. The greatest effort in thinning, clearing and nursery development was put forth from 1908-1914, over an area of 820 thousand hectares.(111) There was little loss in clearing the forests because a great deal of it was lost anyway (in Lithuania from 1918-1940, the average loss was 500 thousand fest meters per year).(112) In Lithuania, thinning was carried on in the forests of lesser value and density but not in the more valuable forests. There are no statistics available on the work, but the evidence in the Lithuanian forests indicates that it was very limited.

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19. Other Forest Income

a. In addition to their exploitation for wood products, the forests had auxiliary uses as meadowland and farming areas. The meadow and farming areas were allotted to the guard or forestry personnel as part of their compensation, or rented to peasants. The peasants could take forest litter (for fuel), sand and clay; dig holes to store their potatoes over the winter; graze their stack and collect hazelnuts, berries, and mushrooms. All these minor uses provided but little income to the state, but the rental of farm land and mills was more lucrative. In 1903, the forests of European Russia had 21,472 rental areas or facilities with an area of 20,000,000 hectares providing an average annual income of 1,100,000 rubles. Comparative income from one hectare of forest and one hectare used for an auxiliary purpose was as follows:

	Forest Income Per Hectare Rubles	Auxiliary Income Per Hectare Rubles
1866	0.67	0.07
1875	1.20	0.13
1893	0.97	0.18

b. In some areas, forest land produced less income than auxiliary land did. In the Warsaw area in 1893, pure forest land produced an income of 2.20 rubles per hectare per year while auxiliary areas produced 8.10 rubles per year. This was the result of relative over-population. The ratio in the Grodno area at the same time was 1: 2.2 rubles and in Lithuania it was approximately the same [author's estimate]. The income from such minor items as berries, grazing, hunting, and fishing was 30 thousand rubles in 1866; 100 thousand rubles in 1870; 300 thousand rubles in 1880; 500 thousand in 1890; and 1,100,000 in 1903.

20. Prices, Profits and the Sale of Wood

a. The first official price for wood was set in 1799 and was subsequently changed in 1804, 1805, and 1807.(113) An entirely new price system was established in 1810. Prices were determined according to the type of tree, quality of the wood, and distance of the forest from a "floating" river. After 1826, prices were set by the territorial bureaus and generally were not in tune with market prices. After 1838, market prices and transportation and felling expenses were taken into account in the determination of price. In 1883, limited instructions were issued on how to compose a price schedule so that the price schedules of various areas would to some degree correspond.

b. Wood was generally sold "at the stump". The buyer took the responsibility of transporting the tree from the forest. Until 1845, wood was sold at the set price because demand in European Russia was low.

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After 1847, demand was high everywhere, including Lithuania, and sales by auction began to increase. After 1860, most sales were by auction and after 1869, other types of sale were rare. Following 1869, the territorial forest bureaus were in charge of all sales from state forests. In 1851, peasants on state property were allowed term payments on their wood purchases and after 1881, they could offer their neighbors' guarantees to secure their purchases. Three types of sale were used throughout European Russia:

(1) Privilege sales - at or below set prices to churches, public schools, etc.

(2) Free sales - for state enterprises (bridges, etc.), or to peasants in disaster areas for reconstruction purposes.

(3) Auctions - regular open auctions in which merchants participated, and closed auctions only for the peasants.

c. In 1903, 57,300,000 fest meters of wood were available for sale. Two thousand, nine hundred fest meters were sold at Privilege Sales for 500 thousand rubles (actual value 1,200,000 rubles). An equal quantity of the same valuation was distributed under the Free Sale arrangement and the balance was sold at auction. In 1901, the practice was begun of holding auctions in the forests for the peasants. In that year, 400 thousand trees worth 531,026 rubles were sold to 37,700 persons (an average of nine trees and 14 rubles per person). The prices paid were 36% below the established price structure. The peasantry (26,729 persons) bought, at sales other than auctions, trees worth 1,581,456 rubles (17% above the set price), an average of 56 rubles per person. The average purchase by value per person in Lithuania was 162 rubles in Vilno and 99 in Kaunas. The figures show purchases above the peasants' budgets, indicating resale to wood merchants. The same situation existed in Lithuania from 1918-40. The best timber purchased at the closed peasant auctions was resold to the merchants. This was an abuse of a system which had been established to help the peasant buy without merchant competition.

d. Purchase prices were as much as 45% higher than the established price schedule from 1867-1874 and 36% higher from 1875-1882. In general, the discrepancy tended to decline. Timber to be offered for sale was figured in value by counting individual trees, or by counting the number of trees in a small plot of a certain size and multiplying this number by the number of such plots to be cut.

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On clear cut strips, the Lithuanian system used a plot 20 x 20 meters in size. Deadwood was sold in squares of 110 hectares. The peasant was unable to purchase rights to this large a tract, and as a result the forest income dropped. Smaller units were impossible to service because of the limited size of the forestry administration. Not until the late 1890s were any used, and then only in areas of heavy wood consumption (including Lithuania) where forestry districts were growing smaller.

21. Expenditures

a. Artificial reforestation, care of young forest stands, and particularly the systematic ordering of the forests (working plan system) used up most of the funds budgeted for the forestry program. Other commitments (housing for personnel, improvements in transportation, swamp drainage, bridge repair, etc) were allotted a very small share of the budget. From 1866-1887, in all of European Russia, only the following limited construction and repair was accomplished:

Drainage ditches - 10,000 km
Boundary ditches - 11,000 km
Forest road repairs - 7,430 km
Wooden bridges constructed - 1,391
Boundary sign posts erected - 105,328(114)

Expenditures rose sharply prior to 1910 and remained high until World War I. Huge sums were appropriated to establish new working plans (especially in Asiatic Russia), increase artificial reforestation programs, and to improve the carrying capacity of forest roads and rivers. Funds for the latter purpose grew steadily after 1907.(115) In that year, 65 thousand rubles were appropriated for all of European Russia. In 1908, the sum grew to 190 thousand rubles and by 1915, it reached 950 thousand rubles. Plans for improvements from 1912-16 called for:

(1) Improvement of 44 thousand kilometers of forest road at a cost of 4,200,000 rubles.

(2) Construction of 18 thousand kilometers of new roads (graveled and ditched on both sides) at a cost of 4,300,000 rubles.

(3) Improvement of rivers to make them suitable for timber floating - 2,800,000 rubles.

(4) Construction of new canal locks, ports, etc - 200 thousand rubles. World War I limited the construction which had begun on this program in 1912.

b. The improvements scheduled for 1912-16 were not begun. A special policy for transportation routes near the Prussian border was initiated by the Russian government.(116) It purposely did not care for the roads (except for the strategic highway network) because of the threats of war with Germany. There is no indication of any road improvements in Suvalki, Vilno, or Kovno. Some locks were built on the Zheimiana River and many forest dwellings were constructed. More than 50% of the forest guards and 100% of the forest masters had state owned homes.

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22. Income and Expenses

a. At the beginning of the 19th Century the income from state forests was negligible. The forest density was relatively high, the population density was relatively low, and the demand for wood was slight. Income from state forests grew steadily however, as did the expenses of maintaining them:

Date	Income	Expenses
1805	283,930 rubles	99,940
1825	541,456 "	220,000
1831-36 (aver. annual)	598,280 "	?
1837-43 (" ")	898,679 "	?
1847	1,315,687 "	?
1867	4,739,882 "	1,971,985
1868-78 (" ")	8,900,000 "	4,400,000
1886	13,200,000 "	7,200,000
1897	24,000,000 "	6,600,000
1903	63,100,000 "	11,800,000
1907	59,982,000 "	?
1910	74,976,499 "	?
1913	96,350,330 "	?

b. The following conditions were in effect in the Western portion of European Russia, including Lithuania, the Lake Region, and the Baltic Provinces, but excluding Suvalki:

Forests (Total Area in Hectares)	State Forest Area (in Hectares) Per Person	Total Forest Income 1866-77	Total Forest Income 1878-87	% of Increase	Total Forest Income 1888-97	% of Increase	%
7,260,000	0.55	14,500,000 rubles	24,800,000 rubles	71%	41,900,000 rubles	69%	? (117)

In Grodno and Suvalki in 1903, income from a single hectare of forest averaged 6.60 rubles. By way of comparison, income in Prussia averaged 32 marks, Bavaria 44 marks, and Saxony 72 marks (1 ruble = approximately 2 marks).(118)

c. In 1902, the state forest budget for European Russia was set up as follows:

(1) Income

Rentals (farmland, fishing rights, etc)	1,222,321 rubles
Wood Sales	58,000,000 "
Minor Uses (Pasturage, hunting, etc.)	962,300 "
Fines	525,000 "
Other	98,087 "
Total	60,807,708 "

(2) Expenses

Salaries for central administration	626,386 rubles
Salaries for territorial administration	6,092,877 "
Forestry colleges and schools	306,057 "
Forestry projects (working plans, re-forestation, etc)	2,942,393 " (119)
Construction	490,000 "
Other	1,077,843 "
Total	11,535,556 "

The profit from the forests in 1902 was 49,272,152 rubles. By 1913, income and expenses had both increased 50% above 1902.

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23. Forestry in the Private Forests

a. About 70% of the forest area in Lithuania was in the hands of private owners (the gentry), so this area was very important in the forest economy. The gentry owned a total of 46,600,000 hectares of forest in European Russia during the period 1881-1887. About 66% of this area was regular forest and the balance was covered by brush and undergrowth. The gentry owned forests in Lithuania (Kaunas, Vilno and Suvalki) at this time totalled 1,785,300 hectares of which 1,357,400 hectares were regular forest and the rest (427,900 hectares) was brush or thinly forested pasture and meadowland.(120) After the liberation of the serfs and the subsequent increase in prices, the need of the gentry for money was such that they cut their forests heavily, particularly in Lithuania and Poland. Since the supply of wood from the state forests was then low, the heavy cutting and other factors such as fire and theft caused grave damage to the private forests. In the Novgorod area, private forests were so devastated that there was little possibility of restoring them.(121) As a result of the damage caused, the Forest Conservation Laws of 1888 were passed, but by this time most private forests were already badly damaged. Good timber could only be found in thinly populated, remote areas far from good transportation. The 1888 laws halted the overcutting, established working plans, and applied the principle of sustained yield. Prices rose sharply as the supply of wood dwindled and this gave an added incentive to the owners to maintain and improve their forests. In 1906, the law applied to over 38,000,000 hectares of forest divided into 67,677 separate forest ranges. Working plans were in use on 12,000,000 hectares (31%) and 27,431 ranges (41%). In most government areas, at least 50% of the private forests were managed under working plans.

b. The state forestry administration advised the private owners and aided them with reforestation by selling seedlings and seed cheaply, and by granting premiums for good results. Every area had private forests which were properly managed. Proper guard systems were established, forest rangers were employed, and cutting rates like those in state forests were applied (oaks 180 years, evergreens 120 years, and softwoods 60-80 years). Some owners set up husking houses (for seed), established nurseries, and employed thinning in their stands. By 1914, about 20 years after the law had been applied in Lithuania, ripe stands began to appear in the private forests of the country which could be sold for good money, but the production of the private forests remained far below that of the state forests.

c. The demand for planting material and seeds became so great that the state forestry service could not meet them. Private forest guards had the same duties and rights as state forest guards. Newly seeded or planted areas were exempted from taxation for 30 years and long, cheap credit was given for new planting materials.

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An autonomous institution, Zemstvo, established in 1840 to support the Russian economy, aided very much in the reforestation drive. Its offices existed only in Russian populated areas however, and not in Lithuania or the Polish Kingdom.

24. Management of the Peasant Forests

The forests of the former serfs were supervised from 1802-1873 by a special institution which regulated the life of the peasants. Those forests located in Russia proper got some supervision from Russian forestry officials. In 1873, a special law allotted certain forest areas to the peasants; in European Russia a total of 16,500,000 hectares of former state forest land. The peasants in Lithuania received 84,700 hectares at this time, of which 18,700 hectares were regular forest and the rest (66 thousand hectares) brush and undergrowth to be used for agricultural purposes. These forests were soon exhausted and their timber sold, sometimes very cheaply. By 1888, they were completely devastated. A few, particularly those in areas of shifting sands, were put under supervision for reforestation but most were not affected by the law of 1888.(122)

25. Conclusion

While forestry in Russia proper, especially in Asiatic Russia and the northern portions of European Russia, was extensive, it was comparatively intensive and well organized in Lithuania. Even private forests (excluding peasant forests) were on a proper, if not highly productive, basis after 1888, and were steadily improving. The total production and value of wood steadily increased and a real hope for future progress existed. The Russians left to their successors (the German Army) in Lithuania, some well ordered forest stands, especially in the state forests, with a high percentage of ripe and mature trees.

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F O O T N O T E S

PART II, CHAPTER I, PARAGRAPH B

(1) The name, Province of Lithuania, here applies to the three government areas of Vilno, Kaunas, and Suvalki which were entirely (Kaunas) or partially (Vilno, Suvalki) included in the later Republic of Lithuania (1918-39).

(2) Afanasyev, "Kovenskaya Gubernia", 1861, p 22

(3) "Lietuvos Misky Departmento Metrastis", 1937, p 9 (hereafter LMDM)

(4) Welhorski, W L, "Polska a Litwa", 1947, p 69-101

(5) Surozh, 1908

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(6) Ibid, II, p 148

(7) Buchholz, E, "Die Wald u Holzwirtschaft des Ostraumes", 1943, p 66-69

(8) Klimas, "Lietuvos Zemes Valdymas", 1918, p 41

(9) Buchholz, p 71

(10) Nekhoroshev, 1916, "Lesnoyedelo pr' Krivosheine", p 8-12

(11) Surozh, I, 103; Desiatina - were converted into hectares as follows -- 1 Desiatina = 1.1 hectares (actual value 1.09)

(12) State or national forests were administered by the Ministry of Agriculture and State Properties. Crown forests, maintained to support the royal family, were administered by special institution.

(13) Surozh, III/6

(14) "Statistikos Zinios Apie Lietuva iki, 1914", p 85, 96

(15) Surozh, p I/106

(16) Ibid

(17) "Statistikos, Zinios Apie Lietuva iki, 1914"

(18) Assuming that the average production in fest meters per hectare was 3.5 -- author

(19) Afanasyev, 1861, p 391

(20) Surozh, I/115

(21) Ibid, II/12

(22) Ibid, 131-142

(23) There is an unexplained discrepancy between the figures given for Vilno in this table and those given earlier of 43,400 hectares -- author

(24) Surozh, 143-144

(25) Ibid, 1908, I/143

(26) "Statisticheskii atlas Verekha", 1878

(27) author's opinion

(28) Surozh, 1908, p 144

(29) Ibid, p 144-145

(30) "Neudammer Forstliches Lehrbuch", Vol 4, 1955, p 654

(31) "Miskininku Kalendorius", 1940, Augumo Lenteles, p 31

(32) Surozh, 1908, II/148

(33) "Miskininku Kalendorius", 1940

(34) Figures taken from Russian sources -- author

(35) Surozh, II/149

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(36) Ibid, II/150

(37) Ibid, II/154

(38) Ustav Lesnoi, 1910, Vol 2, p 817-819

(39) A territory was composed of a varying number of government areas which made up a unified whole of one sort or another. For example, the Lithuanian Province was a special economic unit.

(40) Surozh, 1908, II/17

(41) Nekhorushev, 1916, p 20

(42) Koreiva, "Vilenskaya Gubernia", 1861
Afanasyev, 1861

(43) Surozh, II/165

(44) Surozh, 1908, II/153

(45) Ibid, II/170

(46) Ibid, II/143

(47) Ibidem, II/144

(48) Ibid

(49) Nekhoroshev, "Lesnoie Delo", 1916, 21-22

(50) Ibid, p 15

(51) "Lietuvos Statistika", 1914

(52) Buchholz, 1943, p 72

(53) Nekhoroshev, 1916, p 18
Surozh, II/164

(54) Nekhoroshev, 1916, p 18

(55) Surozh, I/43-57

(56) Nekhoroshev, p 46-47

(57) Koreiva, 1861, p 478

(58) Surozh, II/18, 153, 155

(59) Koreiva, p 478

(60) Surozh, III/6

(61) Ibid, II/153

(62) Ibid, III/93, II/18

(63) Ibid, II/18

(64) Ibid

(65) Ibid, II/20

(66) Ibid, I/21

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(67) Ibid, II/23

(68) Ibid, II/155

(69) Ibid, II/158

(70) Ustav Lesnoi, 1910, Vol 2, p 250

(71) Surozh, 1908, II/127

(72) Ustav Lesnoi, II, 597

(73) Surozh, 1908, II/229

(74) Ibid, II/18, 87

(75) Ibid, II/48

(76) Author's opinion as a result of his experiences from 1918-40

(77) Ustav Lesnoi, 1910, I/317-318, 148-153

(78) Nekhoroshev, p 11

(79) Ustav Lesnoi, I/67

(80) Surozh, II/47

(81) Afanasyev, 1861, 254-255

(82) Nekhoroshev, 1916, 47

(83) Afanasyev, p 388

(84) Surozh, II/32

(85) Ibid, II/34

(86) Ibid

(87) "Statisticheskii Lesnoi Atlas", P Verikha and A Materna, 1878

(88) "Lietuvos Z U Statistika Pries Didigi Kara", p 96-97

(89) Surozh, II/34

(90) Ibid

(91) Ibid, II/46

(92) Nekhoroshev, p 43

(93) Ordinatsia Pashch, 1641, Vilno, 1871

(94) Surozh, II/52

(95) Matulionis, "Lietuvos Miskait Podidziogo/Kara", Visa Lietuva, 1922

(96) Surozh, II/52
(97) Ibid

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(98) Ibid, II/53

(99) Ustav Lesnoi, I/125

(100) Jankauskas, M., "Maumedziai Lietuvos, TSR", 1954

(101) Ibid

(102) Surozh, II/53-54

(103) Ibid, II/55

(104) Ibid, II/155-156

(105) Nekhoroshev, p 50

(106) Surozh, II/51

(107) Ibid

(108) Ibid, II/64

(109) Nekhoroshev, 48

(110) Surozh, II/65

(111) Nekhoroshev, p 50

(112) Author's estimate
Musy Girios, 1933, p 477

(113) Surozh, II/156

(114) Ibid, II/78

(115) Nekhoroshev, 37-38

(116) Mortensen, 1926, 144

(117) Surozh, II/83

(118) Ibid

(119) Ibid, II/90 - 1,850,000 rubles were spent on state logging operations alone.

(120) Ibid, II/109-110

(121) Ibid

(122) Ibid, II/107

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C. The Utilization of Wood

1. Resources

a. European Russia as of 1899 (including the Duchy of Finland) had 228,000,000 hectares of forest. Average forest density was 37% and there were 1.8 hectares of forest area per member of the population. On an average the state owned 65% of the forests, the private owners 26%, the peasants 6%, and the crown 3%.

b. In Lithuania as of 1911 (all subsequent data on Lithuania in this section is for this year), wood production compared to population density and need was not favorable, as shown in the table following this page.

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Govt Area	Area in Hectares	Population	% of Forest Density	Ownership	Forest Area		Production (Fest Meters)		Average Price Rubles	Value of Production		Supply per Person	
					Hectares	%	Total	On 1 Hectare		Total	On 1 Hectare	Hectares	Fest Meters
KAUNAS	3,982,000	1,660,900	15.8	State	158,300	25.52	898,175	6.3		783,005	5		
				Private	460,100	74.18)							
				Peasant	-	-)	924,000	2.0		739,200	1.65		
				Other	1,900	.03)							
				Total	620,300	100	1,822,175	2.9	0.8	1,522,205	2.45	0.38	1.1
VILNO	4,221,000	1,770,300	29.0	State	285,800	28.15	1,268,883	4.7		1,512,689	5.9		
				Private	707,300	69.68)							
				Peasant	20,100	1.97)	1,458,800	2.0		1,746,760	2.5		
				Other	2,000	0.2)							
				Total	1,015,300	100	2,727,683	2.7	1.2	3,259,449	3,2	0.57	1.5
SUVALKI	1,241,000	625,600	14.1	State	180,600	81.5)							
				Private	35,000	15.8)							
				Peasant	1,300	0.6)	↓						
				Other	4,600	2.1)							
				Total	221,500	100	604,933	2.7	2.6	1,620,784	7.4	0.33	1.0

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c. In Lithuania, as in the rest of European Russia where no working plan was enforced, a moderate cutting rate was considered to be about 2.1 fest meters per year. This corresponded to annual production in the state forests of Vilno and Suvalki in 1903.(1) As seen in the table on the previous page, the average production was about 2.8 fest meters per hectare in 1911. The extra cutting was of surplus stock in the state forests. (By 1914, all forests in Lithuania were managed under work plans, some of which had already been revised once and even twice.) Highest production which was acceptable to the Russian forestry administration in surplus areas was 3 fest meters per hectare per year. Cutting rates in other areas (private and peasant forests) were much lower, not over 2 fest meters.(2) Normally, growth rate averaged about 2.7 fest meters per hectare per year.(3)

2. Quality and Utilization of the Yield

a. From 1890-1903, the ratio of dead to living timber varied from 27-40% but averaged out to 30% dead wood and 70% growing wood.(4) In the state forests, wood suitable for structural purposes made up 14% of the total quantity of wood cut in those forests in 1867, 30% in 1888, and 58% in 1898. The increase points up the heavier cutting in these forests from the surplus ripe stocks. The ratio was reversed in the private forests where fuel wood made up 58% of the quantity and structural woods 42%. In Lithuania from 1918-1940, the ratio was fuel wood 70% and structural wood 30% of the total quantity. This is a normal ratio which should remain about the same indefinitely.(5)

b. In 1893, wood production in all European Russia by tree type was pine 36%, spruce 30%, other evergreens 1%, oak 7%, beech 4%, birch 9%, ash and maple 1%, other hard woods 1%, other deciduous 11%, and miscellaneous 4%. The total showed a production composed of 67% evergreen and 33% deciduous trees. A somewhat similar production was obtained in Lithuania from 1918-40 as follows:

Pine	24%	Ash and Maple	4%
Spruce	37%	Birch	11%
Oak	3%	Other Deciduous	20%
Beech	1%	Total	100%(6)

In 1937, Lithuania produced 1,200,000 fest meters of structural and export quality wood (21%) and 4,459,000 fest meters of fuel wood (79%), a total of 5,659,000 fest meters.(7)

c. European Russian state forest products were utilized as follows in 1893:

Native industry	- 56,000,000	fest meters	12%
Fuel for industry & Transport	- 10,700,000	" "	2%
Peasant & Home Consumption	- 359,300,000	" "	75%
Export	- 48,600,000	" "	11%
	474,600,000	" "	100%

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d. The supply of wood annually available in the Lithuanian Republic (approximately half the size of the former Lithuanian Province) from 1918-1940 was roughly estimated as:

Structural wood	-	300,000	cu meters	11%
Fuel	-	1,700,000	" "	63%
Export	-	500,000	" "	19%
Spoilage	-	200,000	" "	7%
		2,700,000	" "	100%(8)

3. Supply and Demand

a. Domestic Demand

(1) The demand for wood and wood products can be expressed by showing how much was used per person per year in fest meters. The expression "fest meters per inhabitant per year" (F.I.Y.) is variable since it depends on the standard of living, and material and cultural progress of the country. Thus, in ancient times the inhabitant was almost entirely dependent on wood. Almost all construction, even bridges, was wooden. In 1817, of 1,000 structures in Lithuania, only five were of stone or brick.(9) In 1930, 91.54% of all structures in Lithuania were wooden, and as late as 1938, almost 100% of the fuel consumed was wood.(10) The rural population used large amounts of wood for cooking, baking, cooking for domestic animals, and corn drying. Wood served in ancient times as torches to illuminate dwellings and barns and was used for this purpose even during World War I when petroleum was scarce.

(2) An average Lithuanian farm of 10 hectares populated by five persons consumed in a year as late as 1942 10 raummeters(11) or seven fest meters of wood, an average of 1.4 fest meters per person.(12) The city dweller used a little less, the larger farms a little more, but the overall average was 1.5 fest meters per person per year. Primitive stoves of clay used since ancient times required a great deal of fuel. In the early 1890s, a stove came into use with special cheap brick walls and heating ducts which saved a great deal of fuel. This saving was countered somewhat, however, by the introduction after 1900 of wood shingles in place of rye straw thatching. The shingles were, in turn, succeeded on the homes of the prosperous by sheets of tinplate.

(3) The average 10 hectare farmstead had buildings about 90 cu meters in volume. The rapid rate (50 years) at which these buildings rotted away because of their lack of a real foundation has already been discussed. Concrete foundations were not widely used in Lithuania until after World War I. Formerly, only brick buildings were built on solid foundations (usually field stones joined with mortar).

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As a result of the rapid deterioration, a farm annually needed an average of 1.8 fest meters of structural wood or 0.36 fest meters per person. (Five people per farm average.) Fences and other minor uses required another 0.14 fest meters per person and the total required per person per year around 1911 for all uses (including fuel) equalled 2.0 fest meters. Average demand per person per year from 1795-1830 for all uses had been about 3 fest meters. Russian statistics for 1857 showed that demand in the Lithuanian Province was 4.85 F.I.Y.(13) For all of European Russia it was figured as 3.2 F.I.Y. The former figure is exaggerated; the latter is probably close to reality. The figures of Captain Afanasyev of the Russian General Staff show a consumption of 2.53 F.I.Y.(14)

(4) The average F.I.Y. steadily declined as concrete, brick, and iron came more widely into use. Before World War I the figure was about, but not below, 2 F.I.Y. The subsequent rise in living standards raised wood consumption again for materials like paper, plywood, matches, furniture, textiles, and export, and this factor kept the demand figure fairly constant. Thus, in 1928-29 the Latvians used 2.82 F.I.Y., the Estonians 2.78, the Swedes 4.61, and the Germans 0.98. The Lithuanians used only 0.72 F.I.Y. indicating that supply was short.

b. Foreign Demand

At the beginning of the Czarist occupation, the requirements of industry were negligible and may be ignored. The export market for timber and lumber was steadily brisk. As the best timber disappeared from the Lithuanian forests, prices rose and the supply for the foreign market dropped off. Most timber went to Prussia, floated down on the rivers and concentrated at Jurbarkas, the border river port. In 1817, the Prussian market capacity was about 120,000 fest meters; in 1878, 330,000; and by the last years before World War I, it had reached 1,000,000-2,000,000 per year.(15) The export demand for wood rose steadily and Lithuanian timber, as well as Polish and White-Ruthenian, contributed to the trade /see end of report for availability of a sketch showing Russian timber export through the Lithuanian Province/.

c. The Supply

(1) In general, the wood supply in Lithuania was insufficient. The abandonment of control over the private forests forced the state forest managers to tighten up their policy and wood did not flow freely from these forests until the early 1890s. This policy caused the private owners to cut their forests freely in an attempt to fulfill the demands of their own estates, the peasants, and the export trade. The supply in 1899 for domestic and foreign sale was 2.10 F.I.Y. and in 1911 only 1.3.

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The average annual growth increment in Lithuania is approximately 2.7 fest meters per hectare and the demand was about the same. As the population grew, the supply became progressively less adequate.

(2) The demand for wood was, and still is, partially eased by the use of old wood (fences, old buildings, etc) as fuel, and by wood substitutes. Fuel wood was in short supply before World War I and in many districts (Siauliai, Marijampole, and Telshe Counties) was insufficient as early as 1857. The demands of the sawmill industries in Kaunas and Yanava were supplied somewhat by considerable quantities of excess saw logs which were taken from rafts made up in the Polish and White Ruthenian forests and reconstructed at Kaunas and Yanava. Peat has been cut in many sparsely forested areas of Lithuania since ancient times, and many landowners raised such fast growing trees as willows, alders, and aspen along roads and in swamps (especially in Marijampole and Vilkaviskis Counties) for use as fuel wood. Individuals frequently supplied themselves with wood, especially during periods of unrest, by theft from the forests and a considerable amount of wood was lost in this way. The wood shortage did not become acute in Lithuania prior to World War I because forests were being steadily converted to agriculture, the peasant forests stripped of their trees, more peat was being used, a little wood was being imported, and the state forests were being stripped of their surplus.

4. <u>The Assortment</u>

a. In European Russia in 1897 a total of 485,000,000 fest meters of wood were used by:

Industry	-	44,500,000	9.2%
Transport	-	10,400,000	2.2%
Farm & Cottage Industry	-	359,300,000	74.0%
Fuel (Industrial)	-	12,400,000	2.5%
Export	-	48,400,000	10.0%
Other	-	10,000,000	2.1% (16)

The percentage of the various uses is very close to that of Lithuania from 1918-39 and may be considered typical. It has been shown previously that the ratio of structural wood to fuel wood was about 44 to 56. The ratio changed later (1918-39) in favor of fuel wood.

b. The assortment of wood required for domestic use did not change appreciably during the Russian occupation. The assortment for export to Europe in 1890 consisted of:

Sawed Products	-	57%
Hewed "	-	3%
Round timber and other wood	-	25%
Other structural wood	-	9%
Cord (fuel) wood	-	6%
		100% (17)

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The forests and wood industry of European Russia produced the following for export:

(1) Pre-fabricated material for homes (walls, doors, roof, etc.)

(2) Paper Pulp

(3) Naval Stores (tar turpentine, etc.)

(4) Sawed Lumber. (Planks, battens, and boards differing in dimension. Planks were not less than 3" x 9"; battens not less than 2" x 4"; and boards not less than 1/2" x 4". Most planks were 15-16' long and boards were 14-15'. Sawed lumber was valued according to its quality in four grades. In 1898, European Russian lumber production consisted of 20% first grade, 45% second grade, 20% third grade, and 15% fourth grade. The sawed lumber was produced according to English measurements, sold by the Russian standards (165 cu ft), and priced by an average length of 8'.)

(5) Hewed Wood. (Various beams which were primarily fabricated in the forests. They included English and Dutch beams, Plancons, and wainscots. Dimensions varied and lots were sold and shipped in units of 50 cu ft.)

(6) Round (rough) Timber. (The bark was not removed and dimensions varied. Primarily pine and less spruce was sold in this manner. Mast timber of the greatest length was sold this way as were posts which came in 3-9' lengths with a thickness of 3-7" on the upper section. Standard pulp wood (mostly spruce) was sold in logs about two meters long.)

(7) Oak Staves. (Came in various dimensions.)

The most popular export woods in Lithuania were pine and spruce timber, pulp wood (since 1870), staves, mine timber, and hewed products (e.g. ties). Very little sawed lumber was exported because of the prohibitively high Prussian tariff against it. The export of fuel wood grew larger every year.

c. The high Prussian tariff caused the Russian government to turn in 1910 to the construction of the Venta-Dubysa Canal at the expense of the Farm Bank of Russia. The canal was begun a kilometer north of Lake Rekijavo (Siauliai County), and ran along the Siauliai-Radviliskis railroad for 17.5 kilometers, thereby connecting the upper Dubysa (a tributary of the Nemunas River) with the upper Venta. The Russian government hoped to avoid floating timber to Prussia and to divert timber from the Nemunas to Vindava in Latvia, then a Russian Baltic Port. The Prussians lowered their tariff and canal construction slowed down. Export of sawed lumber rose 30% in 1913. The beginning of World War I interrupted work on the canal. It was renewed in 1918 but for drainage purposes, not for floating timber. There was no longer any point in the project for its original purpose, since the Nemunas' outlet to the Bay of Kuronia and the Baltic Sea now belonged to Lithuania.

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5. Industrialization

a. The most heavily industrialized district of the northern portion of the former Polish Kingdom was the area later included in the government area of Grodno, but even here there were only such small establishments as wooden saw frames working off the water-driven power of corn mills. They produced only for home consumption and not for sale. Saw mill production in all of European Russia did not amount to more than that in Grodno until the 1850s.(18) In the 1860's, regular saw mills with English frames were introduced, and planing and groove benches came into use in the late 1890s. By 1887, there were 567 saw mills in European Russia with 15 thousand laborers, and a production valued at 17,000,000 rubles; in 1897, 1,266 with 42 thousand laborers, which produced materials valued at 70,000,000 rubles.

b. In 1887 shops to manufacture fabricated materials (doors, frames, etc) and packing cases numbered 133 with 5,530 laborers and production of 7,000,000 rubles worth of goods; in 1897, 431 shops employed 20,493 persons and produced 16,000,000 rubles worth of material. Other shops producing such items as wheels, cars, wooden nails (for shoes), excelsior, reels, etc, numbered 75 in 1887 with 2,215 laborers and a production worth 2,000,000 rubles; and in 1897, 195 such shops employed 625 people and had a production worth 5,000,000 rubles. There were 80 barrel shops in 1900 with 3,037 laborers producing three million rubles worth of barrels. Other industrial installations included:

Type	Date	No.	Laborers	Value of Production
Pulp shops	1887	19	437	500,000 rubles
	1897	26	487	1,000,000 "
	1903	48	1,762	1,400,000 "
Match Shops	1887	64	4,694	500,000 "
	1897	111	11,273	200,000 "
Wood Distillation Shops	1887	240	1,208	600,000 "
	1897	246	1,301	1,000,000 "
Bark Mills	1887	6	35	30,000 "
	1897	8	47	60,000 "
Charcoal Shops	1887	9	192	20,000 "
	1897	11	167	20,000 "
Cellulose Shops	1903	7	2,023	1,800,000 "

c. There were no cellulose shops in Lithuania until 1914; only a few mills which produced wrapping paper and cardboard from pine pulp. In the three government areas of the Lithuanian Province the following forest industries were operating as of 1908:

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Enterprise	Kaunas				Vilno				Suvalki			
	No.	No. of Em-ploy-ees	Pro-duc-tion in Rubles	Horse Power Used	No.	No. of Em-ploy-ees	Pro-duc-tion in Rubles	Horse Power Used	No.	No. of Em-ploy-ees	Pro-duc-tion in Rubles	Horse Power Used
Cardboard Shops	3	67	73,100	271	5	156	165,400	600)				
Paper Mills					13	627	1,357,000	647)				
Saw Mills(19)	24	367	386,700	735	17	428	952,300	573)	11	228	155	-
Furniture Shop	1	40	35,000	12	3	117	86,100	6)				
Excelsior Shop	1	15	2,900	15	1	79	34,900	110)				
Match Shop	2	202	116,300	14	1	28	12,500	10)				
TOTAL	31	691	624,000	1,017	40	1,435	2,608,200	1,946	11	228	155	-

(20)

Combined match production in Kaunas and Vilno with only three small shops rose in 1912 to 3,307,400 units (pocket size packets). The lumber most valued by the forest industries was pine.

6. Commerce

a. Producers and Their Prices

(1) State forest production was most important and valuable during the last years of the Czarist occupation. State forest products were priced according to the price schedule of the territorial bureaus. These schedules were graded according to the forest location and had three levels: high, medium, and low. For example, the prices of a cubic foot of solid wood at the stump was as follows:

Pine (Grodno & Vilno):	High quality	17	kopeks
	Low "	7	"
Spruce (Kaunas & Vilno) :	High quality	7-10	kopeks
	Low "	2-4	"
Oak (Grodno & Vilno) :	High quality	16-29	kopeks
	Low "	4	"
Birch Fuel Wood :	High quality	3-4	kopeks
	Low "	1	"

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By way of comparison, average prices in Prussia and Bavaria from 1850-55 for a fest meter (35.3 cu ft) of solid wood were:

1872-1875	Prussia	6.6 marks
	Bavaria	7.4 "
1880-1886	Prussia	6.5 "
	Bavaria	7.1 "
1902	Prussia	7.8 "
	Bavaria	9.9 "

As mentioned above, all purchases were accomplished by contract. In general, it was difficult for a small purchaser (peasant or small merchant) to buy from the state forests because of the large land units involved (the result of the lack of personnel in the forestry service).

(2) Wood from private forests was priced in accordance with that from state forests but was generally cheaper. Large sales were by written contract but smaller ones by verbal agreement and there were seldom any auctions of private forest stock. Terms for the buyer could be arranged. At one time, owners frequently borrowed money from the lumber companies to be repaid later in lumber but this practice died out. Fuel wood from the private forests was often more expensive than that from the state forests. Structural wood was cheaper since that available in the private forests was limited and of lower quality. In general, it was easier to purchase wood from the private forests because they were willing to sell an individual tree. It should be recalled that private forest cutting was controlled after 1888.

(3) Peasant forests of lower quality (sparsely forested with young growth) were never controlled. The peasants usually used their timber for their own purposes or sold it as fuel to nearby towns. They seldom sold wood to merchants. Some towns in 1880-90 received 100% of their wood supply from peasants. Some of the wood supplied by the peasants was purchased by them in the state forests for resale. Their prices included the cost of transportation and sometimes amounted to a ruble or more for one Raummeter of wood. The trade in fuel wood was always an important source of income for the peasant and he played an important role in the economy of the towns as the deliverer of their fuel. When wars and other unrest cut off these deliveries, the towns frequently found themselves in a critical situation. The peasants paid no taxes on the income from the wood they sold.

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b. The Merchants and the Wood Trade

(1) Three types of merchants participated in the domestic wood trade. The small operators bought wood (primarily fuel), transported and stored it (at railroad stops, on river banks, or near towns), and sold it to individuals or institutions within the towns. They paid taxes as established merchants and ran their businesses on small capital and limited credit; the more successful merchants operated with larger capital and longer credit arrangements, and usually ran a saw mill. They participated more in the trade in structural wood and also handled fuel wood. There were usually a couple of these merchants in each county seat and more of them in the larger cities; a few merchants operated on a large scale within the country. They bought and sold large quantities of wood wholesale for both domestic and foreign consumption. The merchants were all in close contact and frequently served as agents for another merchant or for a foreign concern. Most of them were Jews. They had a good organization with mutual credit and support, and they profited as the wood business continued briskly. Their commissions as agents usually ran 2-3% but were sometimes as high as 5%. Many of them had subagents, and hired personnel as well. Business methods were generally primitive except in the case of the largest merchants who did business in the millions of rubles and were well organized.(21) The bookkeeping of the small operators was minimal. An individual might not even get a receipt if the transaction was small.

(2) Best profits were obtained in dealings with the state or with public institutions. The prices obtained by the merchants varied a great deal, depending on type, quality and distance delivered. Fest meter of structural timber delivered from the forests to Kaunas in 1914 cost 5-6 rubles. A Raummeter of fuel wood under the same conditions cost 1.5-3 rubles.

(3) The following prices on export timber were in effect in Riga in 1903:

(a) Pine beams - hewed, 24-27 foot lengths, 1 English cu ft = 50 kopeks

(b) Spruce beam - same in 27-28 foot lengths = 33 kopeks

(c) Pine timber - 20-22 foot length, 11 inch diameter, 1 Dutch cu ft = 16.5 kopeks

(d) Spruce timber - same = 16.5 kopeks

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(e) Ties - 19 foot length, 10 inch diameter, = 1.59 rubles

(f) Oak Staves - 1 2 1/2" x 5" x 42", 29.8 kopeks
1 3" x 6" x 42" 32.0 "
1 2 1/2" x 5" x 72" 65.0 "
1 3" x 6" x 72" 100.0 "
1 3" x 6" x 96" 140.0 "

After 1890, prices rose steadily, on an average 20-25%. In Jurbarkas a boundary port on the Nemunas, the average price for a fest meter of pine or spruce was 6.7 rubles.(22)

(4) Prices in London in 1903 for wood exported from Russia ran as follows:

(a) Boards of Riga, first and second quality, apiece 75.2 kopeks

(b) Boards of Canadian quality, apiece
1st 24.24 "
2nd 197.5 "
3rd 121.8 "

(c) Pine beams - per fathom 47.29 rubles

(d) Staves of Memel Crown Quality, apiece 212.8 kopeks

(5) Prices in Hull in 1903 for Russian wood were:

(a) Pine timber - for 1 cu ft,
Memel 1st quality 89.9 kopeks
" 2nd " 73.3 "

(b) Pine boards - 3" x 9" x 11 1/2",
1st quality 191.6 kopeks
2nd " 164.3 "

(c) Spruce boards (same size)
Riga 1st quality 89.5 kopeks

(d) Staves - apiece
Memel Crown Quality 196.3 kopeks

Lithuanian lumber exports went mainly to southern Russia.(23)

7. Labor(24)

a. Labor forces were almost always recruited from the peasant population, hired on a verbal agreement, and paid at piece-work rates (seldom by the day). Payments were made in three installments; one-third at the time of agreement, one-third after hauling, and one-third after floating was completed. Piece work was figured according to the cubic foot, cord, or piece. Daily earnings in 1908 for a worker without transport varied from 30-125 kopeks and averaged 55-65.

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A worker with a horse cart could earn 50-200 kopeks and average 120-140 a day. The piece rates for felling a pine tree were 1-5 kopeks; and for removing the bark 4-10 kopeks. Rates for spruce logging were lower; those for oak and ash logging were higher. Payment for forming ties was 5-15 kopeks apiece. A similar amount was paid for hewing each meter of a beam. A sawmill charged 3-4 kopeks for each cubic foot. The cost of producing one raummeter of cord wood was 12 kopeks.

b. Labor was always abundant and, thus, poorly paid. By way of comparison, in 1911 the annual wages of industrial workers in Lithuania were:

minimum	219 rubles
average	431 rubles
maximum	543 rubles(25)

Thus, laborers in the wood industry worked at a rate near the minimum wage. Logging technique was described above and did not change except that wire was introduced to tie rafts together at a saving of wood. The relation between employer and employee was regulated by Russian laws which were far from perfect but which were adequate for the time.(26)

8. Transportation and Its Costs

a. Transportation by road did not change from 1795-1915, and afterwards. It was essentially by horsecart, which changed only by the introduction of steel axles. In 1908, to transport a fest meter of wood in one meter lengths cost, depending on the distance:

0-5 km	10 kopeks
6-10 km	17 "
11-15 km	25 "
16-20 km	30 "

For the same distances, ties were charged for at rates of 5, 8, 10 and 12 kopeks, and for "slippers" (larger ties) 7, 10, 15 and 20 kopeks. A raummeter of cord wood could be transported 5 km for 30-40 kopeks. Drivers, carts and horses were in abundant supply.

b. There was a total, in 1904, in European Russia (excluding Finland) of 129,203 kilometers of navigable rivers. Of this total only 47 thousand kilometers were suitable for floating logs. In the Baltic Provinces, the Nemunas and western Daugava were the most important rivers suitable for floating logs. The Nemunas had 2,000 km of water suitable for this purpose but only 100 km which were adequate for floating loaded barges (below Kaunas).(27) The Daugava, which had a total length of 6,600 km (including its tributaries), had 3,300 km suitable for floating logs but only 330 km adequate for loaded barge traffic.

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Floating conditions on the Nemunas were discussed above for the period 1848-1856. For the period 1892-1901, the average annual number of log rafts (one raft equals 100-150 fest meters) on the Nemunas totalled 14 thousand, with a weight of 900 thousand metric tons and a value of 4,000,000 rubles. Rafts grew in size to include an average of 400-600 cubic meters of wood when iron wire became available with which to fasten the logs. Crews were usually paid on a monthly or weekly basis, seldom daily. Monthly salary, depending on a worker's experience was 7-25 rubles. Piece work rates based on delivering a 100 log raft from the upper Vilija to Kaunas were 40 rubles and from Kaunas to Tilsit, 30 rubles. To build a raft cost 60 kopeks a log. The trip from Vilno to Kaunas took three days and from Vilno to Koenigsburg took six days if conditions were good.

c. A small portion of the timber from Lithuania was floated from the districts of Vilno and Kaunas along the tributaries of the Daugava to Riga. There it was fabricated for export to Europe, primarily as saw lumber. The product was known as Riga ware and had a good reputation throughout Europe. The larger part of the Lithuanian exports and of the White Ruthenian and Polish exports were floated on the Nemunas and its tributaries to Prussia. For a long time all wood went to Koenigsberg and Danzig where a brisk trade in wood had existed since 1800 with England and other western European countries. The first saw mills to produce lumber for export were established in these ports. For a long while, Klaipeda was a transit point for timber coming down the Nemunas consigned to Koenigsberg. After 1840, the Minge Canal was cut, thereby allowing timber rafts to avoid the dangerous Bay of Kuronia. As a result, Klaipeda steadily grew in importance as a lumber port. The first saw mills were established there in 1840. They were wind driven and utilized heavy, slow-moving wooden saw frames. These were later changed to iron frames but speeded up very little since the iron frames were even heavier. The mills worked mainly during the winter months and effected a fairly clean cut on the material. By the end of the 19th Century, Klaipeda was the main center manufacturing lumber from Lithuanian wood.

d. While transporting wood in rafts was cheap, the value of wood transported this way dropped 30%.(28) Wood carried by railroads did not lose its value, but Russian railroads in the middle of the 19th Century were very limited and very expensive (three times the cost of floating wood). Railroads did not become practical for wood shipments until the 1880s. Then their use enabled a merchant to turn over his capital three to four times faster.(29) Railroad lines in Russia in 1840 totalled 30 km; in 1850, 418 km;

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in 1860, 2410 km; in 1870, 11,707 km; in 1880, 24,397 km; in 1890, 33,328 km; and in 1900, 52,900 km. In 1913, the Lithuanian Province had the following railroad lines (Russian gauge):

Area	Length	Density Per 1000 Sq Km	Length Per 1000 Inhabitants
Kovno	606 km	14.1	33.7
Vilno	1,184 "	26.4	60.4
Suvalki	243 "	19.0	36.3

e. Main loads carried by railroads in Russia in 1897 were 8,400,000 tons of corn products; 8,200,000 tons of coal; 6,100,000 tons of wood products; and 3,700,000 tons of oil products of a total of 111,700,000 tons. The load limits of wood for one railroad car were:

Hardwood	12 metric tons
Birch	11 " "
Pine, Spruce, Aspen & Alder	10 " "

A single car of 10 metric tons capacity carried on an average 78 raummeters of fuel wood (2 meter logs). After 1896, transport prices were lowered and railroad transport of wood rose considerably. In 1893, loads totalling 5,000,000 tons were transported; in 1896, 6,000,000 tons; and in 1899, 8,000,000 tons. In 1890, 2,250,000 metric tons of wood alone were shipped; in 1891, 2,000,000; in 1896, 3,000,000; and in 1899, 4,200,000. The rise was steady.

f. Wood transported in 1902 included structural and fuel wood; soaked bast (linden); bark products; charcoal; fabricated materials; and materials for match production in a ratio of 313:244:4:4:10:11:3.(30) Most of the wood products shipped by railroad came from the peripheries of European Russia to the central Russian government centers or toward the southern centers of Tsaritsyn (Stalingrad), Yaroslav, Ekaterinaslav (Krasnodar), and others. Fuel wood was shipped shorter distances for local consumption. Prices on Russian railroads were in three categories: sawed wood, staves, and long, round timber; materials, including ties, which were not listed in the first and third categories; and fuel wood, posts, and other wood of secondary importance. As an example, the cost structure for the first category materials ranged from 1/30 kopek for each Km. Sixteen Kg was transported up to 440 Km. From 440 - 1320 Km. The cost for 16 Kg was 8 kopeks plus 1/200 kopek for each kilometer.

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g. In 1912, the following wood products passed through six railroad stations (Mazeikiai, Kalkuny, Molodechno, Lida, Grodno, Virbalis) on the eastern boundary of the Lithuanian Province:

Items	Total Exports Tons	Total Imports Tons	To Prussia Tons	From Prussia Tons
Corn Products	80,000	33,000	28,000	33
Salt	7,115	13,540	328	-
Oil & Petroleum	13,100	25,426	500	70
Coal	16,230	67,400	50	33
Fuel Wood	55,380	100,000	1,700	-
Structural Wood	222,400	70,000	38,200	50
TOTAL	394,225	309,366	68,778	186 (31)

h. In 1910, 277,780 tons of wood and wood products were exported by railroad from Lithuania of which 170,000 tons were imported from Poland, and White Ruthenia and were merely in transit. The difference of 100,780 tons was native Lithuanian production. During the same year, 1,000,000 tons were transported by water.

i. The railroads were important consumers of fuel wood as well as of coal and oil. In 1890, 39% of the fuel on the railroad was wood, but by 1903 it had dropped to 12% as coal and oil became more important.(32)

9. Customs(33)

a. Imported wood was assessed a tariff as follows:

(1) Birch, beech, elm, oak, spruce, willow, maple, linden, larch, alder, aspen, fir, pine, poplar and ash -

(a) In fascines, chops, or as fuel wood -- no duty.

(b) Timber - 100 kg = 18 kopeks

(c) Unplaned lumber - 100 kg = 54 kopeks

(d) Planed lumber - 100 kg = 90 kopeks

(2) Other wood - logs - 100 kg = 234 kopeks

(3) All veneer or plywood sheets - 100 kg = 1188 kopeks

(4) Cork bark - 100 kg = 90-594 kopeks

(5) Fabricated wood

(a) Plain 100-306 kopeks

(b) Excelsior - 100 kg = 306 "

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(c) Staves - 100 kg = 414 kopeks

(d) Quebrankh - no duty

(e) Pulpwood - 100 kg = 108-360 kopeks

(f) Turpentine - 100 kg = 648 kopeks

(g) Calaphony - 100 kg = 360 kopeks

(h) Tar and Resin - 100 kg = 540 kopeks

(i) Methyl - 100 kg = 360 kopeks

b. The German authorities charged the following duties on Russian wood (mainly from the Lithuanian Province):

Round timber -- 100 kg = 9 kopeks

Sawed lumber -- 100 kg = 36 kopeks(34)

Thus, one cubic meter of lumber imported into Germany paid 2.10 rubles duty and a fest meter of timber 52 kopeks.

10. Results of Russian Utilization of the Lithuanian Forests

a. At the beginning of World War I, the forest economy of the Lithuanian Province and the related industries had an increasing potential and a fairly advanced silviculture. The state forests, maintained by trained, college-educated professionals, had improved greatly on a serious, scientific basis and were continuing to improve. They contained a great deal of valuable, tall timber in sufficiently large, ripe stands. Almost all state forests were run according to work plans; there was no excess cutting and some surplus of ripe timber was built up. Artificial reforestation was steadily increasing but was still insufficient. The number of forestry personnel was growing, forestry districts decreasing in size, and forest protection was adequate when World War I began. The supply of wood from state forests was as much as twice as large by 1913 as it had been in 1850, and the income from a single hectare had increased 10 times. The income from forests in all of European Russia grew steadily. In 1907, it was 59,982 rubles; in 1910, 74,976,499 rubles; and in 1913, 96,350,330 rubles.

b. Private forest stands also improved and the law of sustained yield in 1888 (which did not affect property rights) brought increasing production in the private forests, and growing income (mainly from pulp and fuel wood). The supply of ripe wood in the state forests helped to ease the demand on the private forests and to restore their normal balance of timber. In conclusion, forestry in Lithuania in 1914 was about on a normal, healthy basis, although there were still problems to be solved.

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PART II

CHAPTER I

PARAGRAPH C

F O O T N O T E S

(1) Surozh, 1908, III/6

(2) Author's estimate

(3) Ibid

(4) Surozh, II/35

(5) Author's opinion

(6) "Musy Girios", 1933, p 274

(7) Ibid, p 484

(8) Ibid, p 477

(9) Lachnicki, 1817, p 39

(10) Viliusis, J, "Lietuvos gyv. Aprupinimas Misku", "Musu Girios", 1940, p 546

(11) A Raummeter is used in measuring cord wood. It is 70% of a cubic meter.

(12) Author

(13) Surozh, 1908, III/14

(14) "Kovenskaya Gubernia", 1861, p 391

(15) Braun, J, "Forests and Forestry in Poland and Lithuania", 1878, p 248
Pesotskii, "Inzhenernyi Spravochnik", 1924, p 480
Surozh, III/113
Lachnicki, p 72

(16) Surozh, III/13

(17) Ibid, III/12

(18) Ibid, III/22

(19) The first steam driven saw mill was established in Kaunas in 1870, Skerys, p 40

(20) "Statistines Zinios Apie Lietuva iki", 1914, p 140

(21) Afanasyev, p 425

(22) Bilder von Litauen, 1917

(23) Rimka, A, "Lietuvos Ukio Statistika

(24) Surozh, III/45

(25) "Statistines-Zinios, etc", 1920, p 140

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(26) "Svod Zakonov Russiskoi Imperii", Vol X, Part I, Art 2201-2290

(27) Surozh, III/62

(28) Ibid, III/75

(29) Ibid, III/80

(30) Ibid, III/81

(31) Rimka, A, 1922, 77

(32) Surozh, III/15

(33) Ibid, III/87

(34) Ibid, III/88

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#16

45MN USSR LITHUANIAN SSR

NORTHERN ALDER WOODS EXPLOITED BY PEASANTS IN DAUGAI

50X1-HUM



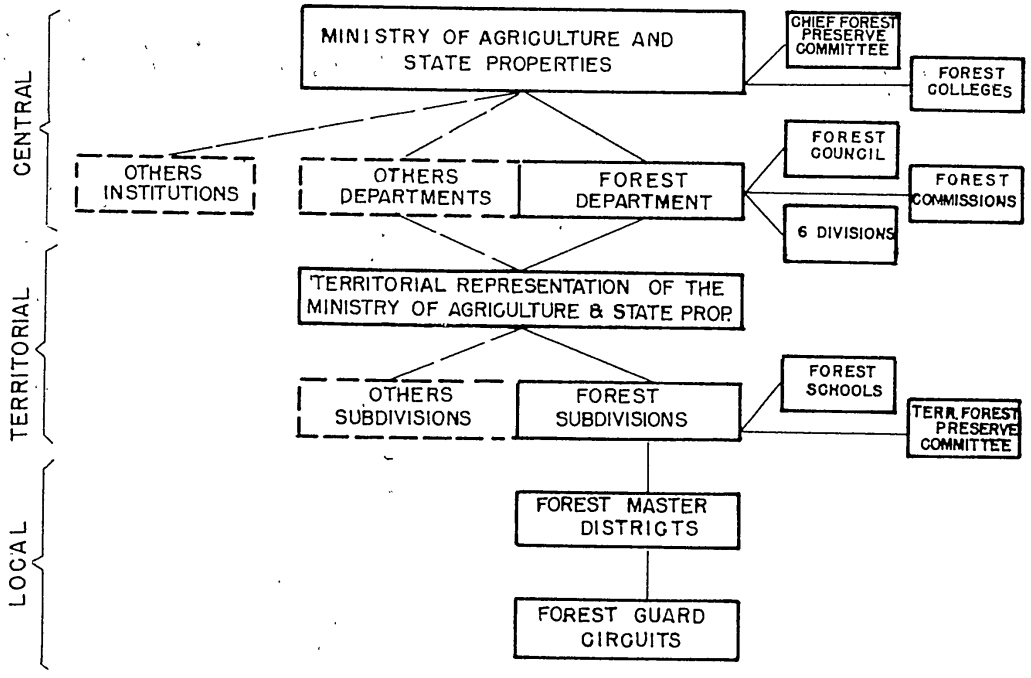
16. Type of peasant wooded (m. alder) meadows [Forest district Daugai]
master)

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#17

SCHEME
OF RUSSIAN FOREST ADMINISTRATION IN 1910



Source: Ustav Lesnoi 1910.

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#18

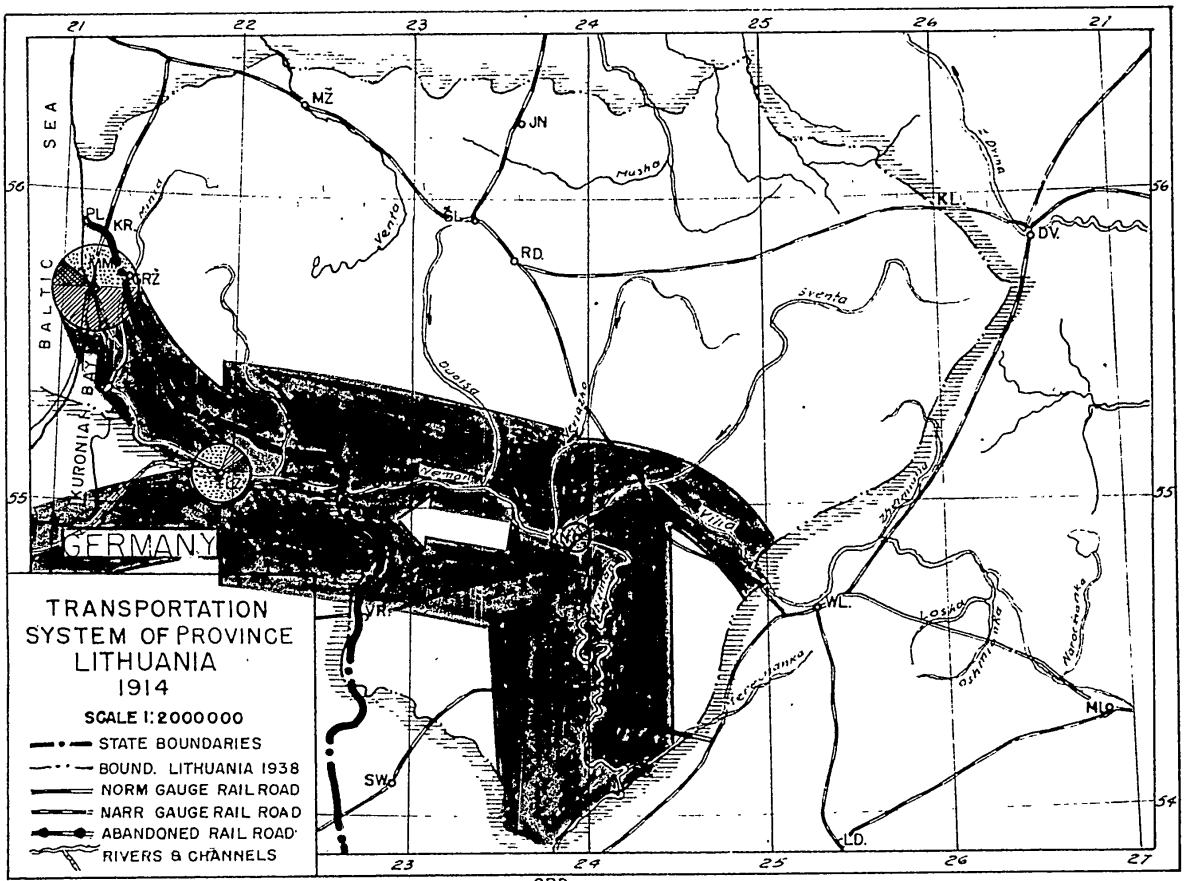


Typical lane in a lithuanian forest.

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#19



LEGEND: Industrial capacity in Lumber Zellulose Plywood GRD

Scale: 1" = 1.000.000 festm.

Sources: J. Marchet. Holzhandel Norddeutschlands 1906 pg. 22 & Surozh. Lesa i lesnoye khoziaistvo. 1908 p 67, Vol. 3

RUSSIAN TIMBER EXPORT TROUGH LITHUANIAN PROVINCE & ITS DISTRIBUTION IN E.PRUSSIA 1904.

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50X1-HUM

PART II

CHAPTER II

The First German Occupation, 1915-1918

A. General Notes-Sources

1. The German occupying forces of World War I established a military administration in Lithuania and retained it, since the battle lines were close by in White Ruthenia - Lake Naroch, Molodechno and the swamps of Pinsk. The regulations and orders which were published in newspapers and posters were limited and strictly military in character. Not many of them remain available today and source materials for studying the period are difficult to locate. Most of the following material on the occupation during World War I comes from eyewitnesses who lived in Lithuania then but now reside in the US, and from their recollections of the time as available in publications.(1)

2. The first phase of the war between Germany and Russia was favorable to the latter and in 1914 its forces drove deep into East Prussia. The Germans struck back during the winter of 1914-1915, drove the Russians back and occupied a portion (Suvalki) of the Lithuanian Province, which they held until the summer of 1915. Then they attacked again and occupied all of Lithuania as well as part of Minsk. They held these positions until the Russian Revolution in 1917 when they moved deeper into White Ruthenia. Following their defeat in the west and the Armistice of November 11, 1918, they withdrew to Germany. The last German troops left Lithuania early in the autumn of 1919. The Germans held Lithuania for three years, or, from the point of view of this study, three logging seasons.

3. The German forces included an area of 63,270 square kilometers in the region which they considered as Lithuania.(2) They used the same sub-division system as the Russians had left, but increased the number of counties and townships so as to more easily control the country's economic life. German military men were given all administrative positions of importance. Most of them were older men who had held similar positions in civilian life. Thus, the Lithuanian forests were controlled primarily by German foresters in army service.

4. The central German organization was the "Oberkommando der Ost Front" or the "Ober-ost." It handled economic and military problems and while it probably functioned adequately in military matters, it was an awkward, inefficient tool in civil matters. An official of the military administration, the "Forest Inspector", was in charge of each political sub-division. County forest masters were responsible to this official. County officers (Kreishauptmann) directed the civil and economic activities of their areas. Township officials (Amtsvorsteher) were responsible to the county officials, and older soldiers were used as military police (2 or 3 in each township). The whole administration totalled approximately 4,000 men.

5. The Germans intended to stay in Lithuania permanently and to colonize the country with veterans of their armed forces. Lithuania was an objective of the "Drang Nach Osten". Therefore, they were eager to replace the Russian administrative system with their own. They introduced the metric system. Their laws, based on military requirements, were cruel and ruthless. Civil rights were strangled. The Lithuanian populace retained the rights to send its children to school and to go to church, but was forced to work for worthless occupation currency and to contribute heavily of its agricultural products. The inefficient military administration was not able to distribute foodstuffs, etc. properly and, therefore, hunger and cold imposed serious burdens on the population, particularly in the city of Vilno and its surrounding area. The Germans were starving themselves and could do little to ease the situation. They were more concerned with forcing out of the country all the labor, food, and raw materials which could be obtained.

6. The import of goods into Lithuania halted completely. The occupation currency, the "Ost-mark or Ost-ruble" was worthless except for paying the high taxes. Officially, the "Ost-mark" was equal in value to the German mark (100 pfennigs) and two "Ost-marks" equalled one "Ost-ruble". The latter was a parallel

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monetary unit valued (officially) at 46.25 Russian gold kopeks or approximately US$.24. Prices at the beginning of the occupation were low but climbed quickly and steadily. The black market flourished and a barter market was set up which was unsuccessfully fought by the German authorities. Banditry forced the German officials to withdraw from the countryside into the protected towns. As a result, the Germans ruled the country by day and the bandits by night.

B. The Forest Economy Production

1. The Germans did not change the property relationships of the Lithuanians but restricted them severely. Real estate holdings could not be divided, given away, sold, or burdened with credit. Collection of debts by Lithuanian creditors was impossible because official evidence of the debts had been removed with the Russians. If taxes and payments in kind were not made, the Germans would take over the land of the delinquent and work it with peasant labor under the direction of inexperienced soldiers, as they did the estates abandoned by the gentry who had fled to Russia.(3) It was an emergency procedure and generally a bad one. State forests were exploited very ruthlessly without regard to the economic or scientific principles of forestry. The properties close to the fighting lines were heavily restricted as to access and use.(4) Final property regulations and settlements were postponed until the war's end when the Germans intended to colonize Lithuania. In the meantime, all regulations were temporary and designed only to suit the needs of the military.

2. While the occupation was comparatively short (3 years), the forests were highly exploited by the Germans, and forest density dropped 1%. Changes in the forest yields, age, quality, and make-up were considerable.(5) A German forest master (army officers of various rank) was in charge of the forests of each area (17 in all, averaging 1-2 counties each)(6) Their areas of responsibility sometimes included two or three of the former Russian forest-master districts, and they lived in the dwellings formerly occupied by the Russian officials. At these places, convalescing German soldiers (sick or wounded) maintained horse herds for the army. They also, under the forest master's direction, enforced military law, assisted the county authorities in their duties, and guarded prisoners of war who worked in the forests. The forest masters directed the activities of foresters (primarily former logging masters in German forests) who held the rank of sergeant. There were 3-4 of these under eachforest master.

3. In the area which later became the Republic of Lithuania, there were 14 German forest masters and 56 German foresters plus a guard force of about 2,000 Lithuanians. There were also one or two forest masters in Vilno. This compares with a former Russian force of approximately 50 forest masters, 50 other professionals, and 120 range riders, plus 2,000 forest guards. The Russian force had been inadequate so it may be seen that the Germans were very understaffed. The forest masters were responsible for protecting the forests and for producing as many wood and forest by-products as possible with the available peasant and prisoner of war labor. The foresters supervised the exploitation of the forests and managed the forest guard. Both the forest masters and foresters were mounted. Their only reimbursements were their army salaries and rations, a place to live, and fuel to heat it. They were, on the average quite honest, but towards the end of the occupation when the population of Germany was on the verge of starvation, they became less scrupulous and began to sell the wood from the supervised forests for their own gain.

4. The personnel of the forest guard was about the same as under the Russian administration. They were experienced and very useful to the German authorities. They continued their duties of guarding the forests and of exploiting the auxiliary production of the woods (e.g. berries, mushrooms, hops, nettles, hazlenuts, acorns, etc.). These were collected and delivered to collection points for distribution to Germany. The work was done by children under direction of the guards. The guards had the additional duties of watching the forests for the presence of strangers and of organizing local labor forces for logging operations. Their pay was miserable - 16 marks, the same as a German private. The German soldier could buy something with his pay at army canteens, but the forest guards could buy nothing with their money and for all practical purposes, they worked for nothing. They were willing to hold their positions, however, because the lands they used as partial reimbursement for their labor were tax-free and they did not have to make the burdensome payments in kind or labor required of the other peasants. Traditionally, the guards continued to cooperate (for bribes) with their neighbors in the misappropriation of timber from the forests.

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5. The presence of bandits in the forests was a phenomenom of both World Wars. Originally, the bandits were escaped prisoners of war who fled mistreatment, starvation, and hard work. They fled en masse and invaded the larger forests where they lived in caves. At first the Germans tried to subdue them, but the occupying forces were not adequate for the task and the bandits had to be left alone. The guards had to coexist both with the dangerous bandits and with other, more harmless fugitives. The forests were very dangerous and German officials stopped visiting them. The bandits outnumbered the police reserves and held the forests and countryside in a reign of terror. The German occupation economy was severely hurt and the abandoned forests were ruled by the guards in cooperation with the bandits. In some cases, the guards even had to pay tribute to the bandits.(8) While theft of wood from the forests at the beginning of the occupation had been possible, by the end it was the rule. The German foresters, desiring to trade wood for fat to send to their starving families at home, found that their deals met stiff competition. Structural and fuel wood could be taken without much difficulty and the job of forest guard became desireable, difficult to get, and costly (The successful applicant had to spend a good deal in the way of bribes and tips.).

6. The system of management in the private forests of the gentry and peasants did not change appreciably. The German authorities took over the estates of fugitives which had frequently been occupied by relatives of the owners who had fled from the cities. Resident owners were allowed enough wood from their own forests to cover their needs but were not allowed to cut any for sale. If they had unfulfilled contracts to sell wood which were dated prior to the occupation, however, they were allowed to complete them. The local wood merchant class had disappeared in the chaos of the times and German agents were assigned to supervise the logging operations until the bandits interferred with their operations. These agents outflanked the strict occupation regulations by buying from the money-hungry private forest owners. Thus, the old traditions of misappropriating small amounts of timber were succeeded by a tradition of wholesale theft. This became a major problem for the Lithuanian Republic. The peasants were able to save their own forests because the unlawful supply of wood from the state forests was so abundant.

C. Forestry Development and Utilization of the Forests

1. The German forest masters were professionally educated foresters and, as such, were equipped to do a perfectly acceptable job in the Lithuanian forests. Some of them were men of high scientific merit who conducted significant research during the occupation (e.g. Professor Stechow), but most of them were older men so engrossed in military requirements that they had little opportunity to display their abilities.

2. During the occupation, there were no professional schools, no research, no artificial reforestation, no professional associations, and no care of young stands. The forests were open to indiscriminate grazing and this damaged young stands very severely. The forests were only exploited during this period. There was no forest economy.

3. The Russians had taken all their plans and data on the forests with them when they evacuated. The Germans worked blindly, having only military maps (1:100,000) as a tool. They used simplified methods to determine productivity. An accurate determination was not necessary because the state forests had sufficient stands of ripe timber to meet the German needs. Cutting was not according to the principle of sustained yield, but simply determined by those areas in which the wood was most abundant, available, and easy to transport. The Germans were most interested in pine, oak and spruce and they cut mainly along main rivers and railroads. The swaths they cut had no particular shape, but usually were 50-100 meters wide and as long as necessary. The cutting went on all year around with no thought of consequent dangers from forest fires and insect damage. The only trees left standing were those too poor to be cut, except in a few areas where seedlings were left standing. Primarily ripe and over-ripe timber was cut, but when it was felt to be necessary, young stands were also sacrificed for their use as posts and pulpwood which were vital to the German war economy. Litter and other wastage of the logging were left in the forests, including some very valuable material.

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4. There is no real evidence of the quantities of wood cut during the occupation, but it is clear that they were huge and much beyond normal amounts. Official Lithuanian sources(9) indicate that 12,000,000 festmeters of wood were cut (26,172 hectares clear cut, and 38,446 hectares selectively cut).(10) These amounts would appear to be exaggerated although they may be close if the timber cut by the native population (especially from autumn 1918 to spring 1919) is included.(11) The misappropriations in 1918-1919 were huge. German sources (Bilder von Litauen, 1917, p.80) state that 3.5 festmeters per hectare were cut annually, but the Germans counted only the timber actually logged and sawed into various assortments. The wood left in the forests (as much as 20%) was not counted. If one counts it, the cut rises to 4.25 festmeters per hectare. The Germans estimated that they cut a total of 1,375,000 festmeters annually and 4,000,000 during the occupation (1915-1918), 8,000,000 festmeters less than the Lithuanians figured.

5. The net result of the occupation and its policies was to hurt the forests very much. The state forests lost all but remote stands of their valuable large timber and the growth increment for many years. The forests were blocked with fallen timber, and insect and fire damage was accelerated. The most heavily damaged forests were those around Panavezys, and in the forest districts of Alytus, Kaslu Rudos, Priengi, Lekeciai, Kaisiadorys, Kaunas, Simonys, and others.

D. Investments

The only investments made by the Germans were those contributing to their war effort. The most important efforts were put into the rebuilding of bridges blown up by the retreating Russians, the change-over of the Russian gauge railroads to the Western European gauge, and the building of a few highways and railroads. They put a good deal of effort into fixing some roads and laying some narrow gauge rail lines to large areas of ripe timber. They brought in many saw mills (captured in other conquered areas) and built many barracks for the prisoners used in the logging enterprises. They set up communications lines, but only for military purposes, not to improve the country. When Lithuania and Germany held treaty discussions in 1922, it was agreed that Lithuania would cancel its demands for payment for the wood taken by the Germans (12,000,000 festmeters valued at 240,000,000 litas) and consider the German investments equal to this amount.(12)

E. Results of the German Forest Management Program

The Lithuanian forest economy built up at the expense of such great effort by the Russians, degenerated under the German occupation. The heavy logging operations under the clear strip system left open areas as large as 200 hectares and a total of approximately 30,000 hectares completely deforested. The areas which were selectively logged (about 30,000 hectares) were left blocked with debris and fallen timber and the spruce forests, in particular, lost a huge quantitiy of trees to the bark beetle. The guard was demoralized, and the population as well. The damage done to the forests could not be corrected even up to 1939, and the Republic of Lithuania had a long struggle on its hands to attempt to do so. The occupation was short enough so that the state forests still had some ripe timber remaining, but the forest density declined by 1%.(13)

F. The Wood Economy and Utilization of Wood

1. Demand

(a) Demand for wood rose sharply during the war. Many villages, especially at points of Russian army resistance, were burned down. Even towns and cities (e.g. Siauliai, Taurage, etc.) were destroyed and the needs for structural timber rose sharply. Since imports had stopped entirely, glass, iron, cement, petroleum and other materials were unavailable. It can be estimated that the demand for wood per inhabitant rose about 20% to 3.0 festmeters per year.(14)

(b) The German army stationed in eastern Lithuania consumed huge quantities of wood for structures (barracks, bridges, etc.) and fuel. Large quantities of wood were also taken from the Lithuanian (and Polish) forests to rebuild structures in East Prussia destroyed by the Russians. Additional huge quantities were consumed in Germany as pulpwood, timber, and lumber. Never before or since has so much lumber and timber been transported and stored in Lithuania. There are no accurate figures available on the total.

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2. Supply

(a) The Lithuanian forests in World War I, excluding the peasant forests, produced about 3,000,000 festmeters of wood per year. The Germans exploited 300,000 hectares of state forest and 200,000 hectares of private forests whose owners had fled to Russia. These 500,000 hectares annually produced about 1,500,000 festmeters of wood. German sources(15) state that no more than 3.5 festmeters per hectare were cut annually. The Germans considered only the assorted timber in collections in arriving at this figure. Taking the wastage into account raises the amount to as much as 4-4.25 festmeters per hectare. Adding the wastage to the German figures raises the total cut per year to about 2,000,000 festmeters. Only about 30% of this was fuel wood since the Germans utilized the wood well, and the balance (about 1,400,000 festmeters) was lumber or structural timber. Thus, during the war (1915-1918) about 6,000,000 festmeters were cut of which 4,200,000 festmeters left the country, but this estimate is still only half of the Lithuanian estimates.

(b) The population (about 2,000,000) needed about 6,000,000 festmeters annually, but was allowed only about one tenth of this amount. In order to restrict the local demand, the Germans limited the building of new structures and the repair of old ones. Necessary timber for rebuilding burned buildings was very scarce. To construct a building, one had to have the permission, in every case, of the local (German) forest inspector. These individuals were very busy with army matters and requests of the local populace were usually ignored.

(c) The populations of large cities, especially Vilno, had the hardest times. The Germans expropriated all commerce, transport, and industry; and unemployment was very serious. The military authorities rationed fuel wood just as they rationed foodstuffs. The Germans strictly prohibited the movements of the population to control disease epidemics, and, as a result, the cities had no adequate supplies of wood or food. The rations of food were insufficient to prevent starvation and the fuel ration was not sufficient even to cook with. As a result, the mortality rate of the cities (particularly among children and Jews) was very high. The mortality rate among the Jews in 1917(16) was 96.5 per thousand. In the years 1915-1918, the cities lost almost all of their older buildings, fences, furniture and trees. No wood or abandoned buildings could be left unguarded.

(d) The German authorities did not allow private and peasant forest owners to sell wood from their properties, considering for all practical purposes that they were no longer the owners of the properties but just their users. The only legal way in which they could sell wood was to deliver it to the military authorities who then rationed it to the population. Practically the German order was difficult to enforce and the owners sold some wood, but not a great deal since money was worthless. The local German officials were authorized to sell small quantities of wood to the population. This led to bribery, corruption, and the demoralization of some of the German officials of lower rank (primarily).

(e) Wood was especially short during the first year of the occupation when the supply from the state forests was cut off. Most of the supply came then, legally and illegally, from private sources. The supply of wood increased after the bandits drove the Germans from the forests as the forest guards allowed the people (for bribes) to take small, and later increasingly large, amounts of wood. By 1917-1918 the supply of wood (except in the cities) was almost plentiful.

(f) Toward the end of the occupation, not only the Germans but the guards themselves were afraid to go into the forests. As a result, large quantities of wood were stolen. After the German surrender, wide open robbery of the state forests occurred, supported by the approach early in 1919 of Communist armies from Russia. The damage done by these raids and by the occupation was very serious. Some small forests disappeared entirely (especially in lightly forested, heavily populated areas), and others were thinned out very considerably. The larger ranges suffered particularly along their edges.

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G. Labor

1. After the war began, the Russians had sufficient time to mobilize the young men in Lithuania into the Russian army. Those unsuitable for army service were taken for other duty and, as a result the labor force available to the Germans in Lithuania was very scarce. The Germans treated the Lithuanians as serfs, exacted heavy taxes and contributions in kind, and enforced virtual slave labor. Pay scales were as low as 1-2 marks a day for laborers and 3-4 marks for a man with a horse. Fed on starvation rations and badly treated, the Lithuanians worked unenthusiastically and participated in passive resistance and sabotage wherever possible.

2. The city people were in a particularly bad situation because they were so dependent on the inadequate German ration. They had to work for the Germans in order to get any ration at all, so recruitment was not a problem for the Germans. Most of the young people were sent to work as forced (called "voluntary") laborers in the forests, on the railroads, on the fortifications of the eastern front, and in Germany itself. Many of them died.

3. The peasants made up the mass of the labor force. Many of their young people hid out from the Germans in barns or in the forests. Some won immunity from forced labor by reason of their need as farm workers. In winter, however, most had to work in the forests. The pay was, of course, very low, but the access to the forests gave them the opportunity to get some wood, legally or illegally.

4. In some forests (around Vilno, Panevezys, Kaslu-Rudos, and other places), barracks and fenced (barbed wire) enclosures were built for prisoners of war. In these areas, the exploitation of the forests was most highly organized and partially mechanized with German equipment (winches, hauling equipment, mechanical saws, saw mills, etc.). The peasants were sometimes able to avoid duty in the forests by pleading that they had no tools. If they requested axes, saws, nails (to shoe horses), iron tires for wagons, etc., the Germans were usually helpless to supply them. The plea of having no tools was a highly effective form of passive resistance and forced the Germans to increase the payment (in wood) and other supplements for such labor.

5. The Lithuanian forests would have suffered even more than they did if the Germans had been able to get enough labor. Labor productivity was very low in spite of threats and punishment. Each year of the occupation, labor grew scarcer as the native population discovered new ways to escape the system. The prisoner labor was particularly unproductive. The prisoners were kept on the point of starvation and their lack of skill ruined tools quickly. They spent as much time as possible looking for things to eat in the forests and worked only when beaten. In the fall, they were able to steal a few potatoes out of the farmers' fields, and this raised their productivity somewhat. Their mortality rate was high, however, and a good deal of their time was spent in planning ways to escape.

H. Logging Operations

1. Logging techniques did not change under the occupation. The principal tools remained the axe and crosscut saw and scrapers to remove bark. Benzine driven saws were tried, but the prisoner labor was not accustomed to them and their use was abandoned. The Germans could not supply enough tools from Germany, and the peasants hid theirs to avoid service in the forests. The year-around operations were directed by logging specialists, primarily Jews, who had done the same job before the war as agents for the merchants.

2. The assortment of wood supplied during the war was quite varied. Pine saw logs 4, 6 and 10 meters long and from 25 cm in diameter were the most important material. Spruce was cut into 10-15 meter lengths in various thicknesses for rafting and 1-2 meter lengths for rail transport. Northern alder, birch and aspen for veneer and match production were transported by rail and were cut in suitable lengths to fit the railcars. Oak blocks for veneer came in 3-8 meter lengths and from 45 cm in diameter. Posts were cut in 8-12 meter lengths and mine timbers in 4-8 meter lengths. Other types included:

   (a) Cordwood and pulpwood - free of bark, in 1-2 meter lengths, 15 cm and up in diameter, delivered by water; northern alder was primarily for fuel and if over 20 cm in diameter was split

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(b) Hewed wood - railroad ties and pine in various sizes; staves and oak wood in various sizes

(c) Auxiliary material - poles, crossbeams and piles for rafting and piers

The fabrication of the assortments was generally well done.

I. Transportation

1. The Germans did a great deal of work on the transportation system, improving roads and building new ones (especially for supply purposes). In the forests they improved many roads which were used in transporting wood and built narrow gauge rail lines where their use was warranted by timber concentrations or where they could supply saw mills. The roads which did not serve their immediate needs were neglected. To avoid having to do too much road improvement, they concentrated logging efforts along the rail lines and rivers.

2. The peasants with their animals and carts were primarily responsible for hauling in the forests, except that the German army supplied horses for the prisoner labor to use. No mechanical hauling was used. The peasants were forced to perform this work, but, as a result, they were occasionally allowed to buy needed nails, horse shoes, and wagon tires (iron). Hauling distances were short. Hauling on the roads was also by horse cart and for short distances. Payment was inadequate, but not as low as for other types of work because of the short distances involved.

3. The techniques of rafting did not change, except that logs were fastened together in some cases by 6-7" long nails to save wire. While the raftsmen were relatively well paid, they were dissatisfied. They worked, however, as an alternative to deportation to Germany. The Germans used as much rafting as possible to avoid overcrowding the railroads. The timber cut along the main rivers (as well as pulpwood, ties and fuel wood) was floated to Koenigsberg, Klaipeda, Danzig, Vilno and Kaunas.

4. It was impossible to supply the German fighting lines in eastern Lithuania by water since the only suitable river for loaded barges was the Nemunas from Klaipeda to Kaunas. The Germans reconstructed the destroyed bridges and rebuilt the tracks to standard European gauge. They built a new strategic line from Pogegiai to Siauliai and they converted captured Russian rail cars to standard gauge. All rail lines were very busy and worked efficiently. Lithuanian engineers drove the trains under German guard. Trains returning to Germany carried lumber and wood in an amount never seen before or since in Lithuania. The system was adequate to move it promptly before it had a chance to deteriorate in storage.

J. Industry

1. Lithuanian industry was badly damaged by the war and by vandals, and, at best, it was weak and undeveloped. The mechanical and chemical industries dependent on wood were particularly undeveloped. There were a few saw mills, cardboard and match plants, and furniture and wagon manufacturers; but they were entirely inadequate to supply the huge requirements of the German army and nation. The sawmills (70 in the territory of the later Republic, produced about 420,000 festmeters of lumber per year) plus other branches of the wood industry (20-30,000 festmeters a year) were supplemented by (not more than 50) German mills imported by the authorities and set up near the railroad stations.(17) 90% of these German mills were destroyed by Lithuanians in the period after the war, but while in use, they provided the Germans with 500,000-1,000,000 festmeters of lumber.

2. The Germans mobilized even the smallest establishment for war production. Every shop worked steadily and the workers fared better than the rest of the population. Carpenters worked on barracks, packing cases, etc.; the wagon workers repaired German transport; and the cardboard and excelsior shops furnished packing for army mattresses. Pine resins for turpentine and colophonium were exported to Germany but this production did not develop greatly because of a lack of skilled labor. The existing paper mill was destroyed in the battles of the period.

K. Commerce

1. The German military government authority was responsible for activities within occupied countries and, thus, for the management and utilization of the Lithuanian forests. It sold the wood and directed all the transactions carried out by the officials located throughout the country. There was no free commerce in wood.

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The official prices charged were those of the pre-war German market. (One festmeter of timber at the stump cost 10-12 marks and one festmeter of fuel wood 3-5 marks.) In addition to this price structure, however, was the black market price list, which at the end of the occupation was 10-15 times higher than the official price list, and the barter market. When the peasants had wood for sale, they demanded payment in clothing, tools and appliances. The gentry were anxious to get labor in exchange for their wood.

2. The tax system drained the money out of the economy, but prices rose steadily (e.g. the price of a farm horse rose from 80-100 marks to 1,000-2,000 and more). The German authorities actively supported the commercial establishments which cooperated with them.(18)

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FOOTNOTES

(1) Osman, "Bilder von Litauen", 1917

(2) Ibid, p. 21

(3) - - - "Litwa za rzadow ks Isenberga", 1919, P. 857

(4) Ibid, p. 55

(5) Skerys, A., Entwicklung and Umfanjdes Litauischen Marktes, 1947

(6) "Bilder von Litauen", 1917, p.80

(7) Skerys, A., 1949, p. 13

(8) Author's experience

(9) Lietuvos Misky Deportmeutos Metrastis, 1937, p. 46 (hereafter LMDM)

(10) Ibid, 1937, p. 46

(11) Author's opinion

(12) "Pirmutinis Nepriklomos Lietuvos Desimtmetis, 1955, p. 161

(13) Skerys, A.,

(14) Author's opinion

(15) Bilder von Litauen, p. 74

(16) "Litva za Panawania ks Icenberja, 1919, p. 16

(17) Skerys, 1918-40, p. 46

(18) Bilder von Litauen, p. 56

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PART II

CHAPTER III

The Republic of Lithuania, 1918-1939

A. Lithuania and its People

1. General Notes and a Brief History

a. The independent Republic of Lithuania came into being after the German surrender in the West in November, 1918. The Lithuanian people had to fight for their boundaries after the withdrawal of the German armies in 1919 and the boundaries were not firmly established until 1923 when Lithuania annexed the district of Klaipeda, a former part of East Prussia, and French occupation forces withdrew. As of January 1923, Lithuanian territory included 55,670 square kilometers.(1) Klaipeda was lost to Nazi Germany in March, 1939, but in the same year, the Soviets gave the long-claimed district of Vilno (9,527 square kilometers) to Lithuania and its territory increased to 62,249 square kilometers.(2) The situation changed again in 1940 when the Soviets took over Lithuania and made it the Lithuanian Soviet Socialist Republic.

b. After 1923 and prior to 1939, Lithuania was divided into 20 counties plus 3 counties in the Autonomous District of Klaipeda. Each county was directed by an appointed official with an office staff and auxiliary institutions. The counties were sub-divided into townships which were directed by elected officials and an office staff. The townships were further divided into communities, each made up of a certain number of villages. In the county and township centers, various state and public institutions were represented, including members of the state forest service, such as forest masters, rangers, guards and some auxiliary officials.

c. After the coup d'etat by Lithuanian Army Officers in 1926 which established a totalitarian government under the Nationalist Party, a military commander took charge of each county under martial law which lasted until 1939. Under this law, the press was censored, and citizens were subject to military justice.

d. The first monetary system of the new Republic was based on the German mark, and German notes were used by the population. The mark declined rapidly in value after the war (e.g. 1 January 1919, 8 marks = US$1.00; 1 January 1920, 48.73 marks = US$1.00; 1 January 1921, 73.37 marks = US$1.00; 1 January 1922, 184 marks = US$1.00; and 1 January 1923, 7,350 marks = US$1.00). In September, 1922 Lithuania introduced its own monetary unit, the Litas (1 Litas = 100 Lithuanian cents = US$.10). After devaluation of the US dollar it was worth US$.17. This system remained in effect until 1917.

e. The metric system of measurements was introduced in 1919.

f. The Lithuanian economy developed steadily, both in quality and quantity. The depression of the 1930's was an important interruption in this development, bringing a decrease in both income and production. After the crisis passed, however, the economy recovered rapidly, and by 1937 was at or above the previous level. The situation in 1937 was fairly typical of the average Lithuanian economy and the data on the economy considered in this study is generally taken from that year.

2. Population

The first Lithuanian census, taken in 1923, showed 2,170,616 inhabitants. By 1937 this figure had grown to 2,549,668;(3) by 1938, to 2,575,363;(4) in 1939 with loss of Klaipeda, it had fallen by 153,793 people to 2,421,570; but in 1940 with the annexation of Vilno, it climbed to 2,985,300(5). According to Lithuanian sources there were in 1923, 1,472,745 people productively employed in Lithuania. This number was divided as follows:

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Agriculture	1,129,870	76.7%
Industry	94,131	6.4%
Transport and communication	15,585	1.1%
Commerce and banking	37,268	2.5%
Public Service and Professional	47,808	3.2%
Other	148,083	10.1%
	1,472,745	100.0(6)

While the above distribution changed somewhat with the loss of Klaipeda and the addition of Vilno, it is fairly typical.

3. Nationalities and their Relationships

a. Official sources state that the Republic in 1923 was composed 83.9% of Lithuanians, 7.6% Jews, 3.2% Poles, 2.5% of Russians, 1.4% of Latvians and 1.4% of Germans.(7) This relationship, while it may be somewhat inaccurate does not differ very much from the true situation and did not change appreciably through 1939. The Germans and Poles questioned the Lithuanian figures, however, claiming a higher percentage of Poles and Germans were included in Lithuanian population.(8) The population was distributed as follows:

	Rural Areas	Towns	Cities
Lithuanians	83.3	6.5	10.2
Jews	5.2	31.3	63.5
Poles	82.5	4.0	13.5
Russians	82.0	3.2	14.8
Latvians	84.4	4.9	10.7(9)

b. The populations' land ownership was divided as follows:

Area	Lith.	Jews	Poles	Germ.	Russ.	Lat.	Total	
Over 500 hectares	2.3%	1.2%	65.0%	3.5%	27 %	1 %	100	
100-500 hectares	15.6%	2.1%	5.4%	5.4%	14.6%	2.2%	100	
1-100 hectares	85.4%	1. %	9.2%	1.2%	2.1%	1.1%	100	

The table shows that the Slavic population (Poles and Russians - the latter were mainly former Russian officials now residing outside of Lithuania) owned about 40% of all the land, mainly in big estates, but some in small peasant holdings and estate villages (okolicy). The mass of the population lived in the country and owned about 60% of the land area. The Polish and Russian gentry had great influence in the agricultural economy of Lithuania.

c. The Jews and Germans were primarily city dwellers. Almost 100% of the Jews were engaged in commerce, transport, and industry, and owned capital. The Germans were also largely engaged in these enterprises. The Lithuanian population, depending heavily on farming, were forced to emigrate because of the shortage of available land. Industrial labor was supplied by the Slavs and Lithuanians.

4. Population Density(10)

In 1923, Lithuania had 39 people per square kilometers; in 1933, 42 per square kilometer; and in 1934, 46 per square kilometer. The annual yearly increment of population was 11 per thousand.(11)

5. The Nationalities and Their Share in the Economy

a. In 1918, the following conditions held true in the new Republic of Lithuania:

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(1) The agricultural population was largely Lithuanian (60% of the farm land) and Slavic (40% of the farmland);

(2) Commerce and banking were run almost entirely by the Jews with a little German and Lithuanian participation;

(3) Industrial ownership was almost all in the hands of the Jews except again for a few Germans;

(4) River transport facilities were owned by the Jews and a few Russians. Klaipeda, the shipping port, was primarily German owned with a few Jews also having a share;

(5) The public servants were representatives of all the groups with Lithuanians holding a slight majority. Professional people came from all the groups.

b. The majority of the population were Lithuanian, rural dwellers on small farmsteads; their only influence being the support they could give to persons of Lithuanian peasant origin who aspired to political success. This group, became a political factor but since the minorities controlled the country's economy they wielded great financial influence which could easily be converted to political power. In addition, the minorities were well organized and had powerful outside connections; the Jews with the Jewish communities of Western Europe, and the Germans and Poles with their homelands.

6. Political Parties

a. All of the majority (Lithuanian) political parties had their beginnings as radical protest groups against the Czarist Russian Regime. Their members grew up in the Russian political school of revolution and violence without any experience in statesmanship and political responsibility. All parties were nationalistic, but the degree of nationalism differed. All agreed in favoring suppression of the minorities, although they differed in degree, and, as a result, the economic policies of all Lithuanian Governments, regardless of their political structure, favored Lithuanians. The methods of accomplishing this differed. The Law of Land Reform in 1922 deprived the Poles of most of their farm and forest estates. The Jews were hurt by the establishment of state supported and state controlled commercial enterprises, and measures of the same sort were enacted to suppress the Germans.(12) What could not be done legally and publicly was accomplished surreptitiously under cover of the martial law which ruled the country. As a result, it can be seen that all economic activity was, in actuality, political also.

b. The results of this discrimination were not long in appearing. After the economic crisis of 1932-1933, a new system of price control and licensing practically paralyzed the business activity of the non-Lithuanian sector of the population. By 1939, 50% (by quantity and value) of the private enterprise of the country had been semi-socialized by the state.(13) As a rule, the state run institutions were under the direction of Lithuanians. The Lithuanian Republic largely imitated the former Russian economic, cultural, and political structure in which certain areas of the economy had already been socialized (e.g. the railroads, highways, postal system, telephone, and telegraph, as well as such industries as liquor manufacture). As a consequence of its economic policies, the government swung the balance of the economy in favor of the Lithuanian people. The commerce in wood, some logging operations, and most sawmills were controlled by Jews.

7. Importance of Forestry and Forest Products

a. The importance of wood in the life of Lithuania has been discussed above. In terms of national income, wood was also important. For example, in 1938 total national income (excluding Klaipeda) was 1,259,000,000 litai (approximately 515 per person).(14) Of this amount 55,600,000 litai or 4.5% came from forestry. The wood industry of the country produced 8% of the value of the national production.(15) Total national production in 1936 and 1937 equaled:

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	1936		1937	
	Litai	%	Litai	%
Food	161,007,000	45.4	178,266,000	41.6
Textiles	52,730,000	14.8	63,873,000	14.9
Wood	26,576,000	7.5	38,745,000	9.1
Other	114,195,000	32.3	147,325,000	34.4
Total	354,508,000	100%	428,219,000	100%

b. 16.9% of the industrial labor force worked in the wood industry and there were more individual enterprises in the wood industry than in any other industry (28.3% of the total number).(16) In 1937, Lithuanian exports totaled 208,300,000 litai. Of this total, 50,300,000 litai or 24.1% were products of the forests.(17)

c. The largest consumers of wood were the peasants who were about 80% of the total population. The matter of supplying this group with wood was one of the government's most important tasks, since almost all of the forests had been nationalized. During the democratic period (1920-26), the political parties competing for the peasant vote made many promises concerning wood. Some even promised free wood and free pasture-land in the forests. The Lithuanian peasants were very conservative and independent and the land and wood promises were the most effective slogans with which to attract them. The peasants demanded so much wood that the forests could not possibly supply it, but the forestry officials were powerless to influence the politicians. As a result, the forestry administration was the most harassed branch of the Lithuanian Government. As a result of this situation and the low living standards special privelege wood prices for the peasants were introduced and remained in effect until 1940.

8. Economic and Political Periods Under the Republic

a. The period 1918-1926 was characterized by very heavy demand for wood from the army and the railroads and for reconstruction. In addition, there were vast needs for wood for the construction of new farmsteads on land expropriated and given to the peasants. This was the era of democratic control with close public control and criticism of forestry programs, both in the press and by special state inspection groups.

b. From 1926-1932, the period of the dictatorship, there was no freedom of speech or press, but forestry was afforded an opportunity to consolidate and operate under less pressure. Education of foresters and the establishment of work plans and proper order in the forests progressed well.

c. The political system did not change from 1932-1939, but the economic crisis of 1932 makes this an era somewhat different than the preceding. The forests were called upon for production greatly exceeding their yearly growth increment, in order to meet budget deficits. This exploitation of the forests lasted throughout the life of the Republic. As a result of the land reform program, most of the peasants moved from their villages to live directly upon their new farmsteads. They lost their forest lands under the new program and this caused a considerable rise in demand for wood. During the last years of the Republic it even became necessary to import wood from the USSR and from Poland.

9. Land Use in 1939(18)

The following division of land use was true in Lithuania in 1939:

Arable areas and gardens	2,935,800 hectares	52%
Meadowland	741,700 "	13%
Pastures	448,000 "	8%
Forests	1,089,000 "	19%
Other	410,500 "	8%
	5,625,000	100%

In actuality, the figures given above for the forests are far too high. They include all lightly stocked woodlands, and pastures with very low wood production and a primary use in agriculture.

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B. The Forest Economy (Production)

1. Property Relationships

a. As shown above, most of the larger farm and forest lands were in the possession of non-Lithuanians. Government policy for political and economic reasons was to break up these holdings in order to distribute land to Lithuanians and to weaken the non-Lithuanian groups. The ratio of private-owned to state-owned forest land changed sharply as follows

Ownership	Prior to 1920	After 1938
State	309,000 hectares	873,555 hectares
Private (Gentry)	564,555 hectares	59,134 hectares
	873,555	932,689

The difference in the total figures is explained by the fact that more accurate surveys had been completed by 1938.(19)

b. All land, except that awarded to the peasants who were freed in 1861, was subject to the Law of Land Reform issued (with amendments) from 1920-1922. No one, under this law, could possess more than 80 hectares of farm land, or more than 25 hectares of forest (included in the 80 hectares). A few exceptions to the rule were allowed to keep 150 hectares, but no more. The lands expropriated were paid for in inflated German ost-marks which rapidly lost their value, and as a result, the unfortunate owners got almost nothing for their possessions.(20) Purchase and sale of farm land was restricted and allowed only under license of the ministry of Agriculture. These licenses could rarely be obtained by members of the minority group.

c. Since the land reform movement was essentially political and designed to inflict damage on the minorities, it was unstable and changeable, especially regarding compensation. Some of the offended owners brought diplomatic pressure on the Lithuanian Government through their western European contacts and a few received property as follows:

Years	Forest Area Formerly Owned (hectares)	Forest Area Returned (hectares)	Persons Involved
1932	3,798	116	1
1933	5,008	109	3
1934	8,060	109	5
1935	6,005	60	2
1936	8,232	36	6
1937	2,375	13	4

(21)

d. Foreigners were not allowed to buy farm or forest land, although a few foreigners who had owned forests prior to the war managed to keep them for a time. In 1925, these holdings totaled 6,377 hectares, but in 1937 they had declined to 4,261 hectares, and eventually they were all expropriated. Large private forests practically disappeared in Lithuania. The only remnants were fragments kept for the use of the farms. The state became the only possessor of large forests; left without competition and able to set prices, policies, and legislation unhindered.

e. The peasants retained about 102,000 hectares of forest and woodland (pasture, meadowlands, and peat bogs).(22) The forests of Klaipeda, were under a different situation, managed by the autonomous District itself except for the Baltic coast forests (2,600 hectares) which were

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used to prevent erosion on the shifting sands of the Baltic shores. They did not produce wood, but were under Lithuanian management. The other Klaipeda forests are not considered in this study.

f. Rights of servitude or entry still existed in 1918 mainly in private forests as follows:

	For Fuel Wood	- 15,304 Hectares
	For Pasture (Individual)	- 72,060 Hectares
	For Pasture (Common)	- 12,821 Hectares
		100,185(23)

After 1925 a program to liquidate these rights in return for forest land was begun. By 1937, the area affected by these rights had shrunk to 28,416 hectares and by 1940, the right was practically extinct. As in Czarist times, state forests were exploited under work plans and the right to enter them was strictly regulated. In the few remaining private forests, the principles of the Russian Forest Preservation Law of 1888 were still applied and the exploitation of these forests was supervised by the state. Peasants forest use was not restricted in any way.

g. Because of their losses in 1920-1922, the owners of the remnants of large estates lived in constant fear of more land seizures. As a result, they cut their remaining forests as much as possible, and in cases, violated the laws and cut their forests and parks completely. Actually, the timber remaining to them was largely valueless except as fuel.

2. Legislation

a. The Lithuanian Republic depended heavily on old Russian laws with a few suitable changes. The old Lithuanian Code (Statut Litovskii) was not revived because it was outmoded. Various parts of the former Russian empire had different legal systems. For example, Kuronia was under German law and Poland under the Code of Napoleon. The Lithuanian Republic was similarly divided. Lithuania proper (the majority of the country) used Russian laws; the portion on the Baltic received from Latvia in 1920 used Latvian or Kuronian Laws; the Suvalki area was under the code of Napoleon; and Klaipeda had German laws. These complications caused a very great deal of difficulty for the administration and in judicial proceedings. Russian laws an d traditions left strong influences on Lithuanian cultural and economic life.

b. In forestry, the Russian "Ustav Lesnoy" (the Code of the Forests) was in wide use, but it was outmoded and its application was difficult. An attempt was made from 1918-1926 under Professor Matulionis to work out a Lithuanian Code but the attempt failed because of a lack of trained people. The attempt was revived in 1937 and a commission worked until 1940, but no appreciable results were achieved.(24) To make up for the inadequacies of the "Ustav Lesnoy", circulars were issued as problems arose. They were unsystematized and were difficult to work with. Under these circumstances, a progressive forest economy was impossible. The legislature passed some new forestry bills, improving the old Russian common laws and adapting them to new requirements, but the main effect was to increase fines and punishments for infractions.(25)

3. The Forests

a. By 1937, all Lithuanian forests had been surveyed and forest areas accurately determined. In 1938, they were as follows:

(1)

Lithuania Proper	Pure Forest	Other Areas	Total
State forests	728,913 hectares	141,854 hectares	870,767
Private forests (under State control)	61,922 hectares		61,922
Private forests (exempt from control-peasant lands)	102,898 hectares		102,898
Total	893,733	141,854	1,035,587

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(2)

Klaipeda	Pure Forest	Other Areas	Total
Government forests	27,773	7,887	35,660
Private forests	7,840		7,840
Klaipeda Port Forests	2,640	705	3,345
Total	38,253	8,592	46,845
Grand Total (1) and (2)	931,986	150,456	1,082,432 (26)

/See end of report for availability of a sketch of the forest density of Lithuania as of 1937./

b. In 1923, there were 0.43 hectares of forest per person and in 1938, 0.36 hectares. In 1937, the forests were composed by area of the following types of trees:

Spruce	262,124 hectares	36%
Pine	247,318 hectares	34%
Birch	89,448 hectares	12%
Aspen and other soft deciduous trees	55,612 hectares	8%
Alder	44,605 hectares	6%
Hoary Alder	10,853 hectares	1.4%
Oak	9,839 hectares	1.3%
Ash and others	9,114 hectares	1.3%
	728,913	100% (27)

The main permanent forests were composed of pine, spruce, alder, oak, and ash stands, totaling 573,000 hectares or 78.6% of the total. Pine forests when cut were usually succeeded by birch stands, and spruce by hoary alder and aspen. Official statistics gave an average forest density for Lithuania of 17% but it was really closer to 15%, since the official sources included the 102,898 hectares of sparsely wooded, peasant meadowland and pasture.

c. The private forests still remaining to the gentry in 1937 consisted of 39,530 hectares (64%) of spruce and pine, and 22,393 hectares (36%) of deciduous trees.(28) This is an indication of how these private forests had been abused, since the percentage of the less valuable deciduous timber was so high. The percentage of deciduous trees in the peasant forests was even greatly higher than that in the private forests.

d. The forests of the Klaipeda District were composed of the following stands:

Pine	21,994 hectares	79%
Spruce	2,155 hectares	8%
Oak	160 hectares	0.5%
Birch	1,511 hectares	5.4%
Alder	1,019 hectares	3.7%
Other	934 hectares	3.4%
	27,773	100% (29)

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This is an average normal distribution for the forests of the region. The forests of the Port of Klaipeda which cover the sand dunes of the Kuronia Peninsula included 2,640 hectares, chiefly pine (Pinus Maritima).(30)

e. Relative forest ages were:

	Young stands	Middle Age Stands	Ripe Stands	Total
1922	283,839 hectares	210,866 hectares	260,749 hectares	755,484 hectares
	38%	28%	34%	100%
1937	350,266 hectares	189,572 hectares	189,115 hectares	728,913 hectares
	48%	26%	26%	100%(31)

The comparison shows clearly that young stands were increasing (10%) but that the older trees were being cut heavily.

f. The cutting cycles used in the state forests were:

Hoary Alder	30 years
Birch, Aspen and Northern Alder	60 years
Spruce	80-100 years
Pine	100-120 years
Ash and Beech	100 years
Oak	160 years

In 1937, the following cutting cycles were applied:

Cycles	Hectares of Forest	%
60 years	65,602	9
80 years	313,433	43
100 years	204,096	28
120 years	138,493	19
160 years	7,289	1
Average - 92	728,913	100

The average age of a tree in the state forests was 48 years.(32)

g. Comparing this cutting rate with what the best rate should be we see:

	Normal		1937	
1-20 years	165,038 hectares	22.6%	229,693 hectares	31.4%
21-40 years	165,038 hectares	22.6%	148,732 hectares	20.4%
41-60 years	165,038 hectares	22.6%	115,224 hectares	16.0%
(Continued)				

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	Normal		1937	
(Continued)				
61-80 years	143,171 hectares	19.7%	112,733 hectares	15.4%
81-100 years	64,813 hectares	9.0%	74,183 hectares	10.2%
101-120 years	29,999 hectares	3.3%	32,119 hectares	4.4%
120 & over years	1,822 hectares	0.2%	16,229 hectares	2.2%
	728,913	100%	728,913	100%

The table shows that the situation in the state forests was not too bad and that ripe stands were abundant. These figures are from official sources.(33) The same source shows that the timber stock in the state forests in 1937 equalled 90,000,000 festmeters, and estimates that 20,000,000 festmeters remained in the private forests, a total of 110,000,000 festmeters.(34) The annual increment was figured at 3,000,000 festmeters in the state forests, and 700,000 festmeters in the private forests. The peasant forests were supposed to grow 400,000 festmeters per year giving a total for the country, excluding Klaipeda, of 4,100,000 festmeters. The annual normal cutting area was 10,000 hectares of state forest.

h. In 1931 when the state forests had been about half surveyed, the distribution of the forests by soil quality was as follows:

First Quality Soils (best)	64,602 hectares	8%
Second " "	414,249 hectares	54%
Third " "	232,978 hectares	30%
Fourth " "	38,839 hectares	5%
Fifth " " (poorest)	20,072 hectares	3%
	770,740	100%(35)

It can be seen that most of the forests grew on second or third quality soils. Forest density differed as follows:

Quality	Density	Hectares	Percentage
Best	100%	2,365	0.3
	90	2,376	3.5
	80	102,855	15.3
Average	70	163,378	24.3
	60	153,843	22.9
	50	145,697	21.7
Poor	40	56,249	8.4
	30	23,938	3.6
Totals (average density)	62%	672,085	100%

i. The average yield on a hectare of state forest land in 1931 depending on the predominant tree type was:

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Pine	134 festmeters
Spruce	184 festmeters
Oak	190 festmeters
Ash	164 festmeters
Beech	222 festmeters
Birch	86 festmeters
Northern Alder	121 festmeters
Aspen	117 festmeters
Hoary Alder	47 festmeters
Average	140.5(36)

j. The forests were mainly pure stands of approximately equal age. This resulted from clear-cutting practices and the calamities of nature which destroyed large areas simultaneously. The forests were unlike either virgin or cultured forests but were in a continuous state of recovery from sporadic devastation by man and nature.

k. The common picture of the Lithuanian forests is a mosaic of ripe, middle aged, or young stands; interrupted by clear-cut strips or plots and rivers, and criss-crossed by broad public roads and narrow forest lanes and paths. Large, equal age areas are rare. /See end of report for availability of a sketch of the "Stand plan of the Svendriai Range". This typical range, located in the Siauliai forestry district of northern Lithuania, is in a moist portion of the northern plains, and has suffered from bad management./

4. Criticism of Official Lithuanian Statistics

a. In considering the data given in the foregoing and the following, it should be realized that official Lithuanian statistics were optimistic. There was a desire to hide the over-exploitation of the forests which occurred after 1932-1933 to bolster the weak national budget.(37) There was a tendency to try to show a greater productivity and a higher forest density than actually existed. While state and private forests had been surveyed and were accurately known, the amount and quality of peasant woodlands were always questionable. The figure of 102,898 hectares was given, but it was only an approximation and these lands were never surveyed or measured.(38) Their production was very low (German experts estimated no more than 1 festmeter per hectare).(39) Official statistics show it, however, as 4 festmeters per hectare, about the same as in the state forests.(40) This figure is inaccurate and misleading. When the peasant forests are included in figuring forest density, the result reduces the relative forest density considerably (See paragraph B, 3. b.).

b. The data given for forest yield is generally accurate except the figures for average yearly increment. J. Vilcinskas gives the average age of stands in the forest in 1931 as 48 years.(41) (See paragraph B, 3. f.). Official sources give it as 46 years.(42) These are accurate figures which should have allowed an annual cutting harvest of approximately 2,000,000 festmeters. The forestry department ignored these figures, however, and stated that 3,000,000 festmeters could be cut. This means that all Lithuanian forests could be cut in thirty years (90,000,000 festmeters divided by 30 years) without touching the capital volume which is worse.(43)

c. There were many differences of opinion expressed concerning increment, depending upon whether the forester was pessimistic or optimistic. Thus, in 1922, the head forester improvised forest stand volume tables for Lithuania by averaging German and Russian data. The results indicated an increment of 5-5.5 festmeters per hectare (5.5%), or considering average timber stock density to be 65%, of 3.25 festmeters per hectare.(44)

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The leader of the management plan division of the Lithuanian state forests, J. Vilcinskas, figured in 1931 an increment of 3.4-3.5 festmeters.(45) Official sources gave it at 4 festmeters.(46) More pessimistic sources reckoned it much lower. The manager of the forest department in 1925, M. Vaitkus, thought it was only about 1,800,000 festmeters or about 2.5 festmeters per hectare.(47) The estimates differed depending upon the way the volume tables were used. The improvised tables were used until 1932. They were found to be misleading and so the German tables came into use in most cases except for evergreen and soft deciduous trees where the Russian tables were consulted.(48) Neither was suitable for Lithuania, since the German tables reflected intensive use and intensive care of young stands and the Russian just the opposite. This problem and the resulting disputes led to a program to compose Lithuanian volume tables but it was never completed.(49) Application of the Russian tables to the Lithuanian forests under Czarist rule resulted in good stands with a high percentage of ripe wood. Use of the German tables without German methods under the Republic destroyed the principle of sustained yield and resulted in far too heavy cutting. By 1935, ripe stands were in short supply; by 1944 the situation was critical, and in 1950 ripe stands made up only 6% of all the forest area.(50)

d. The most acceptable rate of annual cutting was that developed by Vilcinskas, who was head of the management Plan Division of the National Forests and Professor of Forest Surveying at the University of Vilno from 1941-1944. In 1931 he established a cutting rate of 10,000 hectares per year and 1,940,000 festmeters.(51) Forest Department experience indicated an annual supply of 500,000-600,000 festmeters of dead wood so the annual cutting rate didn't exceed 2,500,000 festmeters in total, 3 festmeters per hectare, or 2.8%(52) These are the most accurate estimates.

e. The average forest area per person was given as 0.36 hectares in 1938 (See paragraph B, 3. .). by official sources.(53) The estimated supply in festmeters per inhabitant (F.I.Y.) varied from 1.5-2.0.(54) The estimates were too high because of over-estimates of peasant and private forest production. The correct figures should be approximately 1.1 (F.I.Y.) /author/ /See end of report for availability of a sketch map of the wood supply of Lithuania./

5. Forest Distribution

In 1937, the state forests were distributed in ranges of various size as follows:

to 25	hectares	541	1%
25-100	hectares	908	6%
100-500	hectares	778	20%
500-1,000	hectares	144	12%
1,000-10,000	hectares	154	43%
10,000 and up	hectares	7	18%
		2,532	100%

The largest single range was the Kazlu-Rudos in Marijampole and Sakiu counties.(55) The ranges had various shapes and were interrupted by meadowland, farmland and villages. Distribution was not uniform. Greatest density (22%) was in Trakai and Marijampole Counties. The lowest density was in Vilkaviskis County (5.3%).(56) Thus, the inhabitants of some regions were better supplied than those in others. /See paragraph B., 4. e. for availability of a sketch showing this factor very clearly./ In Marijampole, Trakai, Sakiu, and Zarasai Counties, the forests sometimes accumulated a considerable amount of low value wood, especially dead wood and wood of small dimensions. There was little demand for it in these areas and frequently it spoiled in the forest.(57) Supposedly about 200,000 festmeters were lost in this way annually(58), but actually far more was lost.(59)

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6. Accessibility of the Forests

The greatest problem in the Lithuanian forests, particularly the spruce and softwood forests, is the presence of sloughs which contain water almost on a year around basis. They are less troublesome in winter when they are frozen over, but cause a great deal of lengthy detouring during the other seasons of the year. The terrain in the forests is not very rugged except for a few hilly areas in eastern Lithuania. The most remote forests are no more than 10 kilometers from population centers or 20 kilometers from a forest master's headquarters. The foresters and guards travel readily in the forests by horse or bicycle (introduced in the 1930's).

7. Changes in the State Forest Area

a. The state forest area fluctuated steadily from year to year. For example:

	1920	873,555 hectares
	1925	843,129 hectares
	1930	896,059 hectares
	1935	814,544 hectares
	1937	870,767 hectares

These changes in area occurred primarily in the non-forest (meadows, etc.) area of the state holdings. The pure forest areas did not fluctuate so markedly. For example.

	1925	759,957 hectares
	1930	755,663 hectares
	1935	739,694 hectares
	1937	728,913 hectares

There were some additional changes in 1938 and 1939 and the general trend in forest area was downward. There was no essential change in the forest density.(60)

b. The largest changes occurred from 1926-1935 when the peasants were relocated on individual farmsteads(a total of 1,700,000 hectares).(61) Prior to the relocation, the peasants had grown their own woodlands and even small forests on the farthest corners and poorest soils of their village holdings. When the land was divided up, the peasants cut the wood before they moved and even cut the orchards if the new owner was unwilling to pay for them. By this means, 50% of all the peasant forests were cut down and the average forest density of Lithuania declined to about 15.5% in 1939.(62) This eased the wood shortage for a few years but after the peasants were established and their standard of living began to rise, their demand for wood increased sharply and the shortage was even more acute. The wood auctions held to supply the peasant's demands were very wild affairs and even violent. The Government realized the seriousness of the situation and tried to increase wood imports. Prices rose considerably. The situation became serious even as early as 1930 because of the large number of small forests which had been expropriated from private owners and given to landless peasants and veteran volunteers of the Lithuanian Army. About 500,000 hectares of land were thus expropriated and distributed, 10-15% of which (about 50,000 hectares) were in forest as woodland. Thus by 1937, forest density had dropped to 16.7% (according to official sources) from 20% (1911) and in reality was even lower. /See above./(63)

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8. Administration (64)

a. The Lithuanian Government followed the Russian example in setting-up its forestry administration. The Ministry of Agriculture was primarily responsible for forest policy and its directives were carried out by one of its divisions, the Department of Forestry.

b. In the mid-1930's the position of Vice Minister in Charge of Forestry was established. This minister was always a trained forester. All subordinate officials were hired or discharged by the Minister of Agriculture on the advice of the Director of Forestry. They were all "civil service" employees. The Forestry Department had the same duties and problems as the former Russian administration. Its worst shortage was professional manpower. As a result of the withdrawals of first the Russian foresters and then the Germans, the forests were deserted. Russian policy had been to use Russian-born foresters in occupied areas. The few trained Lithuanian foresters were forced to work away from the home. Most were transported to the far northern forests. They were areas with "extensive" rather than "intensive" forest economies and thus, the experience the Lithuanians gained was not very applicable to conditions in their homeland.

c. Headquarters of the Forestry Department were in Kaunas. /See end of report for availability of a chart of the administrative divisions of the forest department./ The Director of the Department was appointed by the President on recommendation of the Minister of Agriculture. He was responsible for execution of forestry policies. He held tight, centralized control over the department. Every outgoing letter bore his signature. He headed all commissions, directed the activity of his personnel and represented the department in outside business.

d. A Vice Director was in charge of forest exploitation, manufacturing and commerce and was responsible in the director's absence. The chief inspector headed a division responsible for drafting forest work plans and was third man in the chain of authority. Forest inspectors controlled the activity of the forest masters in executing forestry policy.

e. The Forest Economy Division was responsible for reforestation, nurseries, drainage, construction (roads, bridges, dwellings, etc.), use of non-forested areas, forest taxes, conservation, parks and preserves and hunting. Its personnel included the referee, two junior foresters, a hunting inspector (game warden), and two administrative officials.

f. The forest Management Division was led by a referee, with two junior foresters, a draftsmen and some administrative personnel. Its responsibilities included forest management; changes in forest area (use); abolition of traditional rights (of entry, etc.); renting, buying, or selling of forest property; organization of the local forestry units; executing forestry policy; drafting forest work plan; and supervision of private forests.

g. The Forest Evaluation Division had three branches which were in charge of forest evaluation (determination of type); cutting practices and determination of available timber quantities; and reforestation. A chief inspector directed the division. Each branch was led by a chief evaluator, 2 junior evaluators, five surveyors, and some additional personnel.

h. Other administrative divisions included one in charge of statistics (a referee, a senior forest master, a junior forest master, and a clerk) and statistical publications, and a general secretarial and employment office with the usual duties of such offices. The Forest Exploitation Division set annual cutting rates, surveyed forest strips to be cut, planned timber production and fabrication according to demand, and was in charge of timber transportation, furnishing of signs and tools, and naval stores and chemical production. The Commercial Division directed sales of wood and its supply to state enterprises, plus all the normal business and contractual agreements. It followed the foreign market fluctuations and set domestic prices, and it controlled state sawmills

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and the distribution of fuel wood to cities and other areas. The Division in charge of peat production also controlled domestic fishing waters. An accounts Division kept the necessary records and set-up the budget. A Judicial Division handled the legal matters. Altogether there were over 100 people assigned to the Central Forestry Administration from 1936-1938. The Evaluation Division had an almost autonomous position in the Department and worked independently of the Department. /See end of report for availability of a photograph of the Headquarters of the Forestry Department in Kaumas./(65)

i. Auxiliary institutions were set-up from time to time to aid and advise the Forestry Department; the Forest Council was an organization of professional foresters appointed by the Ministry of Agriculture, but their resolutions were not binding on the department; the Forest Conservation Commission was made up of Department employees for purposes of supervising private forests; the Research Commission was a non-paid group headed by the Department Director which investigated ways of improving the level of professional forestry in Lithuania and other major policy problems (e.g. reforestation, forest types, conservation); the Forest Laws Commission discussed new codes for the forests; the Guard Security Office used deductions from the Guard's (non-civil service) pay to set up a health insurance plan. After 1938, all guards were civil service and the office acted as a small loan office Forest master conferences were called each year to discuss local problems (particularly exploitation).

j. The country was divided into areas directed by a forest master and each area was sub-divided into 4-10 forestry districts, headed by a forest ranger. These districts were in turn divided into circuits, each circuit being in charge of a guard. The forest master was usually a college educated professional. He was responsible for his area and directed the work done in it. He had an aid (generally a graduate of a forestry technical school) who assisted him, plus as many as 10 other administrative assistants. The rangers usually were graduates of the forest technical school and had additional practical experience. They supervised the guards and all forestry work which was conducted in their area. Range riders assisted the forest rangers, mainly in supervising the guards and temporary personnel hired for logging, transport, etc. The range-riders mainly had public school educations, as did the guard force. The guard force was divided between the numerous forest guards and a second category, forest watchers, who were employed to guard small isolated forest areas at less remuneration. Clerks and foremen of labor gangs were not included under the civil service system. The labor force was recruited from the peasants who were idle in winter. Labor was always sufficient. About 50,000 men were employed each year. They supplied the transportation used. The personnel employed by the Forestry Department from 1936-1938 was divided as follows:

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Civil Service											Non-Civil Service				
Year	Forest Master	Forest Master Aids	Office Worker	Forest Ranger	Range Rider	Forest Guards	Forest Watcher	Watch-men	Total	Foremen	Checker	Watch-men	Laborers	Total	COM-BINED TOTAL
1936	42	35	163	378	182	2,387	-	1	3,188	256	129	210	42,595	43,190	46,378
1937	42	36	163	372	173	2,300	-	1	3,087	236	144	192	47,502	48,074	51,161
1938	45	31	170	377	147	1,445	477	1	2,663	259	138	179	46,060	46,636	49,299

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k. Forest inspectors were charged with checking the activities of the various branches of the Department, particularly the local units. Inspection of the central headquarters was rare but occasionally the records and book-keeping were subjected to check. In general, the inspections were hasty and inadequate. More serious and thorough accounting inspections were made, however, by representatives of the ministry of State Control which watched over all economic activities of the State. Purely forestry practices were checked only casually. The forest ranger's activities were most closely scrutinized by the forest masters' aids and there was at least one annual inspection of their ranges. All of these individuals, however, were also checked by the officials of the Ministry of State Control. The net effect of the system was rather burdensome.

9. The Development of Forestry Manpower

No skilled, professional personnel remained after the Russian withdrawal in 1915. Only the forest guard and a few range riders, clerks and private forest employees were available in 1918. They were totally inadequate and unable to continue the work of the Russians and Germans. Almost all of the educated foresters (primarily Poles) had been forced to work in Russia proper, and remained there during the war. In 1918, there were 16 educated professional foresters in Lithuania. By 1938, there were 45. As their number grew, the size of forestry administrative units declined. In 1922, an average forest master district was 26,000 hectares, a forestry district 3,100 hectares, and a single guard's area 250 hectares. In 1938, the number of individuals and the areas controlled by them were:

Forest masters	45	16,000 hectares
Forest rangers	345	2,100 hectares
Forest guard	1,950	370 hectares

The number of forest rangers grew steadily from 68 in 1919 to the 345 in 1938. The largest jump in numbers came in 1925 when the first class graduated from the new forest school. The number of range riders varied from 113 in 1924 to 293 in 1935 to 147 in 1938. Their number increased at first and then tended to decrease as more forest rangers became available. The number of forest guards, after an initial post-war jump from 945 (1919) to 2,529 (1921) declined until by 1938 there were only 1,950. The tendency was to cut down the number of guards and the size of the forest units and increase the number of better trained forest rangers. The number of logging foremen grew as state logging operations expanded. In 1931, there were 178 and this number grew to 607 by 1936. Watchmen were also hired (1-3 in each forest master area) to guard piles of timber and lumber in storage or waiting transit.

10. Participation of Ethnic Groups in the Administration

There were very few Lithuanian intellectuals in 1918-1919. Lithuanian culture and self-determination had arisen very late. The mass of Lithuanians were medium and small farmers, and the few educated young men were in the armed forces. Administrative positions were mainly held by Lithuanian citizens of Polish or Russian origin, particularly in the railroad and forestry departments. The Poles in the forestry department mainly came from the former (Polish) private forests which had been expropriated by the state, and they were primarily of low rank. As nationally minded Lithuanians began to graduate from training facilities, they began to compete for the positions held by the other ethnic groups. A sharp fight for the positions lasted until the end of the Republic. The Slavic element of higher rank adjusted to the new regime (1926-1940) by denying their previous nationality, always speaking Lithuanian, etc. The struggle for position and the jealousies thus aroused were reflected in a lack of progress in forestry (silviculture).

11. Administrative Policies of the Republic

The democratic government (1918-1926) could do little to improve the administration of the forests because of the shortage of professional personnel. It was forced to staff the forestry department with whatever manpower was available. There was much graft and corruption and while many persons were fired, few were jailed, and more malefactors were hired to take the place of those who left. There were not enough good people in the administration and jobs were filled by incompetents and adventurers. The situation was worsened by the political tactic of attacking the forest management and promising more wood to the peasants.

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As a result, the foresters were hated by the people, and in 1925 it was impossible to fill the vacancy in the job of Forest Department Director. The nationalist dictatorship brought more stability to the country. Officials of the Forestry Administration, found it possible to work in a quieter, saner atmosphere. The government policy became one of elevating young, trained people, and removing older, uneducated, unsuitable and non-Lithuanian officials. In the Forestry Department, however, non-Lithuanians were able to retain the top jobs and as a result, the department was subjected to internal dissension. The progress of forestry was hindered, but the dictatorship was too busy with other matters to be very much concerned.

12. The Working Conditions and System

a. The centralized nature of the forestry department caused a tremendous amount of paper work and bookkeeping, especially in the later years of the republic when logging became primarily a state enterprise. A forest master had 6-7 assistants in summer and 10-12 in the busy winter months. The forest rangers also needed assistants to handle paper work. Most of their work was spent on logging direction, judicial proceedings, and control of the guard. The guards watched over their forests, helped to inventory the harvested timber, supervised its transportation, sometimes filled in as a clerk in the ranger's office, and appeared as witnesses in court proceedings. Much overtime was put in during the busy winter months. Official hours were 0800-1400, but the work went on as long as necessary. No overtime was paid to civil service employees, but bonuses were paid for extra quantities of harvested and transported timber.

b. The central administration was composed entirely of administrative personnel with the exception of a few professionals whose duties were to inspect the forests. The competition and dissension of the situation caused an atmosphere of tension. The same was true in the local offices, but to a lesser extent. Pressure was put on the employees to support the Nationalist Party. In all areas of the forestry administration, the effort of superior officials to shift responsibility to underlings was evident.

13. Autonomous Institutions

a. While the administration was very centralized, there were some signs of decentralization and of division of responsibility. This had been the case in Russia where some remote areas (e.g. The Amur Province) had been given certain authorities and responsibilities; [illegible] The Lithuanian Division of Evaluation worked fairly autonomously.(66) All commissions were headed by the director of the department and he personally supervised the work of his immediate subordinates. The same system was true all the way through the department. Eventually the pressure of business forced the director to divide his responsibilities somewhat, but this was not according to the regulations. The annual meetings of the forest masters in Kaunas were patterned after the Russian example but they were held only to pass on decisions already made by the central administration. The forest masters' advice was rarely followed.

14. Salaries

a. Civil Service appointees were paid the following salaries:(67)

Civil Service Category	Position	Salary
XVI	Director	900 Litai per month
XV	Vice-Director	800 " " "
XV	Inspectors	800 " " "
XIII	Senior Referees	600 " " "
XII	Junior "	540 " " "
XIII	Senior Forest Masters	600 " " "
X	Junior " "	380 " " "
IX	Forest Rangers (I)	340 " " "
VIII	" " (II)	300 " " "
VII	" " (III)	280 " " "
XI	Senior Surveyors	450 " " "
XI	Office Manager (employment)	450 " " "

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Civil Service Category (Cont'd.)	Position	Salary
IX	Secretary	340 Litai per month
VI	Draftsman	240 " " "
VI	Clerks	240 " " "
VII	Senior Typists	280 " " "
VI	Junior "	240 " " "
VI	Maintenance Men	240 " " "
X	Senior Supervisors (Peat Prod.)	380 " " "
IX	Junior Supervisors (Peat Prod.)	340 " " "
X	Fishery Instructor	380 " " "
XII	Dir. of Bookkeeping	540 " " "
X	Senior Bookkeeper	380 " " "
IX	Junior "	340 " " "
VIII	Assistant "	300 " " "
II	Dispatcher	160 " " "
I	Janitor	150 " " "

b. The evaluation service salaries were:

Civil Service Category	Position	Salary
XIII	Chief Evaluator	600 Litai per month
XI	Evaluator	450 " " "
X	Surveyor	380 " " "

c. The local units were paid as follows:

Civil Service Category	Position	Salary
XIV	Inspector	700 Litai per month
XII	Forest Master (I)	540 " " "
XI	" " (II)	450 " " "
X	" " Assist.	380 " " "
VIII	Bookkeeper	300 " " "
VIII	Secretary	300 " " "
V	Clerk	200 " " "
IX	Ranger (I)	340 " " "
VIII	" (II)	300 " " "
VII	" (III)	280 " " "
V	" (IV)	200 " " "
III	Range Rider	170 " " "
I	Guard	150 " " "

d. All personnel in the Alytus District were ranked one category higher because the district was used for training purposes. Salaries of officials in the Forest Technical School in Alytus were:

Civil Service Category	Position	Salary
XIV	Director	700 Litai per month
XII	Teacher (Coll. educ.)	540 " " "
XI	" (no college)	450 " " "
VI	Clerk	240 " " "

After 1932, deductions of 10-20% were made from the field salaries in order to balance the budget. Deductions from salaries of personnel based in cities were less. After each three years of service a 10% raise was granted and additional payments were made depending on the number of children an employee had. Supplements in the form of wood (from 7-30 festmeters a year)(68) and farmland (6-15 hectares)(69) were also given. A total of 19,500 hectares was used by forestry personnel each year. Some personnel used their land personally, but most of the lower ranking single personnel rented it out. Value of the land varied considerably and its allotment was a further cause of competition and jealousy. The land had great economic importance to the forestry personnel, especially in inflationary times when it was the only real compensation they received. Even in more stable times, it was valuable and many local officials paid

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more attention to farming than to their duties. Their forestry salaries alone were insufficient to maintain a proper standard of living.(70)

e. Other compensation included free dwellings and buildings, many of which had been expropriated from former forest owners. Most were in bad condition. From 1922 to 1937, from 1,141 to 1,568 state-owned houses were used by forestry personnel and from 2,377 to 3,847 other buildings. The number decreased after 1930 as buildings became too old and decrepit to be livable. A few new ones (165 homes and 362 other buildings) were built and others were repaired during the period.(71)

f. While salaries were low, so were prices (prior to 1932, two litai = US$1.00; after 1932, 6 litai = US$1.00) and state officials did not live badly. Living expenses of a single person from 1936-39 were approximately 120-150 litai (US$20-25). The price structure in 1937 was as follows:

Rye	100 Kg	19.6 Litai
Wheat	" "	28.6 "
Wheat flour	" "	56.0 "
Potatoes	" "	5.0 "
1 draft horse	-	294.0 "
1 cow	-	157.0 "
Beef	" "	65.0 "
Pork	" "	140.0 "
Sugar	" "	100.0 "
Tobacco (poor quality)	" "	20.0 "
1 man's suit (wool)	-	80.0 "
Man's shoes	-	16.0 "
Fuel wood (1 festmeter)		9.0 "
Coal	1,000 "	81.0 "
Electricity - 1 KWH		1.12 "

g. The relative experience in years of work in the Forestry Department is shown as follows:

Years	To 5	5-10	10-15	15-20	20-25	25-30	Over 30	Total
1925	1,999	836	189	146	82	-	162	3,414
1930	1,459	1,256	326	113	91	68	91	3,404
1937	819	935	837	410	35	24	28	3,088

From 1925-37 administrative costs varied from 56%-75% of the forestry budget.

15. Evaluation and Management Planning(72)

a. The Evaluation Division worked autonomously under the direction of the chief inspector of the Forestry Department. It was faced with the necessity of drafting all new, work plans since the old plans had been taken away by the departing Russians and the war had brought on such great changes. The Lithuanian Government established short term (six months) courses for forest surveyors, and by 1922 the first two evaluation parties were able to go to work in the forests. They were each composed of a chief, a senior surveyor, two junior evaluators and four junior surveyors. This group grew to a total of three chiefs, six junior evaluators and 17 surveyors in 1924 and remained this size.

b. The teams followed a procedure of surveying boundaries, marking the corners of an area and laying out forest lanes. Plans of these areas were drawn and given to the junior evaluator who then described the types of stands and evaluated them (volume, growth, density, age, increment, annual production, type of reforestation and recommended cutting areas). His work was submitted to the Chief Evaluator, who led the party. His activities were defined in the spring before the work began by a special session of the Forest Council which laid out the scale of the work and the size of the ranges to be evaluated, and divided the work among the parties. Each party usually spent the spring, summer and fall in a single forest master's area (about 15,000-20,000 hectares) but some of the areas required 2-3 years of work. The work norm for one surveyor per season was 3,500 hectares. A junior evaluator was expected to direct and complete the work of three surveyors. In autumn, the parties would return to headquarters

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(Panevezys and Kaunas) to compile their field work and make their drawings. The finished work was submitted to the spring Forest Council for its approval and use in laying out the next year's work. The senior evaluators would have to appear before the council to explain and defend the result of their party's work. The whde system was patterned after the Russian example with certain modifications. The use of German and Russian volume tables has been discussed above.

c. By 1938, all state forests had been evaluated and were operated under work plans. A total of 842,420 hectares had been surveyed and evaluated from 1922-1938 at an average cost of 4.6 litai per hectare (3,862,940 litai total). In addition, secondary evaluation had been accomplished on 77,552 hectares (evaluation was supposed to be repeated every ten years).

d. It was the policy, along with the evaluation, of removing areas of private settlement in the state forests. The farmers thus dispossesed were compensated by grant of other forest or farmland.(73) In 1936, for example, 1,107 hectares of this area was exchanged for 1,033 hectares of state property. The evaluation effort was not perfect because the available personnel in the first years were poorly trained.(74) The secondary evaluation (10 years afterwards) found a great deal to be corrected and changed. The worst problem was the unsuitable volume tables.(75)

16. Forestry Education

a. The grave shortage of professional foresters at the end of the war, was discussed above. The first step to correct this was taken in 1921 when a technical forest course was opened in Panevezys.(76) The course included six months of class work and two months of practical work in the forests, and in 1924, it was lengthened to a year (9 months of theory and 3 months of forest training). In 1925, it became the technical Forestry School offering a two year course, but in 1926 it was closed. From 1921-26, it graduated 230 forestry technicians. While their professional level was low, they played an important role in Lithuanian forestry, particularly in the Forest Evaluation Division, and some of them became forest masters.

b. Since most of the forestry personnel were so poorly trained, a short summer course of 1½-2 months was set-up in Dotnava. From 1924-26, 141 persons took the course. Dotnava was also the site of a Technical School of Agriculture and Forestry which offered a four year course. Beginner students, not over 21 years of age, came to the school with an educational background approximately equivalent to a US elementary school graduate. A director, assistant and 20 teachers ran the school. Forestry students received a great deal of practice and training in laboratories and in a model forest master district. From 1919-27 when it closed, the school graduated 64 forest technicians of a higher professional level able to fill positions as forest masters and assistants.

c. The Technical Forestry School in Alytus was the successor of the earlier training facilities.(77) It was managed by a director and had three permanent teachers. The course lasted two years and the students (18-25 years old) had to have at least two years of high school training to be eligible for the training. From 1929 to 1938, the school graduated 264 persons. In 1939, it was moved to Vilno and graduated a class of 24. The school still exists in Vilno under Soviet rule. From 1927-40, the school's expenses were 1,152,857 Litai and its income was 52,247 Litai (313 graduates). It was the most important training facility for forestry personnel of the medium grades, and particularly of forest rangers. All of the schools described above gave an adequate background to persons at the technician level. While the persons sometimes got higher positions, particularly after the incorporation of Vilno in 1939, they did not have sufficient professional background for them.

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d. In 1922, the University of Lithuania set up a department of forestry in the agriculture faculty. This department was closed in 1924 when the College of Agriculture was established in Dotnava.(78) In Dotnava, the student received general training under a faculty of 20 professors and specific forestry training under 8 lecturers. The model forest master district which had served the former technical school became a training facility of the college. The course of instruction lasted 3½ years. There were a total of only 41 students, but they formed the skeleton of the professional leadership in Lithuanian forestry. The course closed in 1933 but was re-opened in 1938 when 25 graduates of the technical school in Alytus were admitted. Twenty five more entered in 1939, and 20 in 1940. Ten teachers and five assistants composed the faculty.(79) Almost all were graduates of the courses held in the college from 1928-33. /See end of report for availability of a picture of the College of Agriculture in Dotnava./

e. In 1938, Lithuania had 25 professional foresters who had received foreign training. Eight had been educated at the Forestry College in St Petersburg; 2 at Novoaleksandrya in Poland; 8 in Germany (Tharandt, Eberswalde, and Munich); 5 in Vienna; and 2 in Prague.

17. The Forestry Press

a. Until 1929, there was no journal which reported developments in Lithuanian forestry. The only articles which appeared were printed in Russian or Polish journals or in various economic magazines or newspapers. In 1929 the Association of Lithuanian Foresters began to issue the monthly forestry magazine, Musu Girios and in spite of financial difficulties, it lasted until 1940 and turned out 12,000 printed pages. It is today, the best single source of information about the period 1929-40.

b. Scientific books were rare and seldom original. From 1919-39, only 35 booklets and books were printed, and most of them were auxiliary guide books, price lists, indices of circulars and short information sheets. The most important publications were the "Annual Report" of the Forestry Department for 1938 and 1940; the "Book of Dendrology", 1938; and some writings of Professor P.Matulonis, Lithuania's outstanding scientist, including "Kiek Girioje Medziu Kirstina" "Sekline Medziapiute" and others. The books used in the teaching institutions were mainly Russian. The students born during the Czarist regime almost all knew some Russian and could use the texts without much difficulty. The instructors were mainly Russian educated and were used to the Russian texts. Younger students, born late in the Russian era or afterwards, did not know Russian. The Technical Forest School in Alytus had a valuable forestry library in German and Russian books but it was largely unused because the younger students had no foreign language ability. Their only access to professional materials was their lectures.

c. No research was conducted in the forests. A commission to discuss the establishment of a research program was set-up in 1936, but nothing was accomplished.

d. The Forestry Association established in 1929 was composed mainly of the younger foresters who banded together to protect their interests against the hierarachy of the Forestry Department. Its activities, other than some meetings in Kaunas and the publishing of Musu Girios were very limited.

e. Lithuanian forestry education produced only a few scientists of note. The first instructors were non-scientific, practical foresters hired on an emergency basis and without scientific inclination. Most of them were Polish gentry and were disliked by their students. Their efforts were obstructed and they worked in an atmosphere of tension. They could give little to their students. The situation was further complicated by the sharp political disputes which raged among the students and diverted their energies. In the forestry work which these students later did, there was little evidence of a national forestry tradition or philosophy. The same is still true in Soviet Lithuania, although not so in Soviet Latvia which has a real tradition.

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f. The short period of life of the Lithuanian Republic didn't offer sufficient time for a forestry program to stabilize. Until World War II, Lithuanian foresters were split politically and personally. There was no real forest policy, except to force out non-Lithuanian groups. Policy was largely in agricultural, not forestry hands. Criticism, even of economic policy, was not tolerated, and there was no movement for greater forestry autonomy. Public opinion, although given little attention by the government, was opposed to the over-cutting and over-exporting of timber.

18. National Parks -

Besides the few forest areas left in the cities as parks (Alytus 184 hectares, Kedainiai 31 hectares, Garzdai 7 hectares, Kaunas 334 hectares), the only national reservation or park was the 3,000 hectares (2,000 of swamp and 1,000 of lake) around Lake Zuvintas in Alytus County which was administered by Kaunas University as a bird refuge.

19. Conservation

a. The chaos and resultant timber misappropriations which occurred in the post-war years of 1918-19 have been discussed above. The few remaining forestry officials were powerless; lacking police authority and threatened by various irregular army formations. At least 700,000 to 1,000,000 festmeters of the best timber were cut from the state forests during the era, and some small forests disappeared altogether. While the guard force during and after the war was not efficient, it was vital to the management of the forests. In the late 1930's its numbers decreased but its efficiency steadily improved and timber thefts steadily declined. There were only 94 mounted guards and 945 forest guards in 1919; by 1925, the numbers had risen to 274 and 2,592; but by 1935, they had declined again to 175 and 2,425.

b. In 1919, 1,219 festmeters of wood valued at 41,870 Litai were registered as stolen. (The actual figures were huge but unknown.) In 1924, the figures rose to 21,538 festmeters worth 729,427 Litai; but by 1937, they had declined to 13,641 festmeters worth 59,188 Litai. These statistics indicate a trend but are not otherwise reliable, because they were originally compiled in Ost-marks which had collapsed, and were later translated to the more stable Litai for statistical purposes. As said above, the actual thefts in 1919 were much larger but official sources excuse the statistics given by claiming that no accurate figures were kept. From 1919-39, official sources said that there were 361,048 cases of theft in which 589,301 festmeters of wood worth 4,782,976 Litai were stolen.(80) These figures to be accurate should probably be tripled.(81)

c. For misappropriations, other corruption, and inefficiency, 872 forestry employees and officials were discharged in 1923, 849 in 1925, 250 in 1930, 213 in 1935, and 220 in 1937. Most of this number (1,717) were guards, but it also included 12 forest masters and 85 other officials. Total discharges for all causes from 1923-37 included 39 forest masters, 336 forest rangers, 335 mounted guards, 4,262 forest guards and 207 other officials.

d. Protection of the growing stands was afforded by the work plans under which the forests were managed. Forest fires contineud to be a problem, but because of the relatively small ranges and dense population, damages were not very important. From 1919-37, there were 1,884 forest fires which burned 15,270 hectares of pine forest with damages estimated at 1,000,615 Litai. From 25-39% of these were set by disgruntled peasants. This happened most often in the pine forests of Sakiu, Kazlu-Rudos, and Juris where letters of protest were often left at the scene of the conflagration.(82)

/See end of report for availability of a sketch of Lithuanian Pine Forest locations, the areas most susceptible to fire./ Average annual damages were 803 hectares valued at 52,664 Litai. The largest fire occured in 1934 and burned a 1,672 hectare tract valued at 881,087 Litai. 70% of the fires occurred in evergreen stands. Most fires

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occurred from the end of April through June, the driest months of the year, but they could occur any time from March to December. Most of the fires were soil fires. Peat bog fires also were prevalent. From 1930-38 there were 60 of these.

e. Common methods of protection against fire included 2 meter wide strips of overturned soil plowed at a distance of several meters from the forests between the forests and parallel railroad lines. These strips were broken every 100 yards by a strip of equal width running at right angles to the first. This practice was particularly common in the Jures, Kazlu-Rudos, and Klaipeda districts where rail lines run through the pine forests. Another common item of fire protection was the watch tower. There were 14 of them in 1938, located in all the larger forest ranges, and connected by telephone. They averaged from 25-31 meters in height. /See end of report for availability of a photograph of a typical watch tower, the one located in the Jures district./

f. In the summer, the guards in the pine forests confiscated pipes, cigarettes and matches from anyone passing through or along the roads. During the most dangerous periods of the year, special guards were employed for this purpose. The most helpful tools in suppressing forest fires, however, were the increased use of the telephone and the bicycle. In Klaipeda, the German led forestry administration used motorcycles. There was no use of airplanes and there were no special, auxiliary landing fields maintained.

g. Other fire prevention methods included thinning of young pine stands along roads and removal of litter and old grass for 2-3 meters on each side of a road and in forest lanes.(83) Fires were extinguished by the local population plus the army, when exceptionally large (1934) fires occurred.

h. The pressure for grazing land continued to cause heavy damage in the forests. Grazing stock in a state forest was illegal, but the small farmers were sometimes forced to it. There were 14,762 violations of this sort from 1919-35 with a resultant damage of 1,988,354 Litai. After 1936 the forests were better guarded against these violations and they decreased steadily. This step improved natural reforestation considerably. Violators, after 1935, could be assessed administrative fines and this helped ease the violations.

i. The extent of insect damage and its increase after the improper cutting of the war and post-war years has been discussed above. From 1919-39 about one third of all annual production was insect damaged, which led to a decrease in value of from 1/3 to 1/2. Insects in epidemic proportions were rare, but damage was severe, nonetheless. The May Bug continued to prevent large pine forest areas from reforesting (Kazlu-Rudos, Jures, Simonys and Jurbarkas) and in 1938, the nun moth caused great (11,000 festmeters) damage in the spruce forests of Tytuvenai. Another moth (Panolis Flamea) damaged 1,100 hectares of pine in 1922-23 and the Pine fly (Lophyrus Pini and Pallidus) damaged 3,970 hectares of pine in 1936. From 1924-37, insects destroyed a total of 6,222 hectares.(84) Principle defenses against the insects were bands of glue painted on trees (against the nun moth); special "lure" trees felled between infected areas to attract the insects; and removal of bark from felled trees and their stumps.

j. The most common fungi which caused severe damage to old stands, especially in grazed areas, were pine seedling needle blight (Lophodermium Pinastry), pine bole rot (Trametes Pini), and pine top flight (Peridermium Pini).(85) Spruce suffered, if aged and grown on poor quality soil, from spruce root rot (Fomes Annosus) and the rhizomus of the hat mushroom (Agaricus Melleus). Old birch and aspen suffered from white wood rot (Polyporus Bethulinus). Blue stain attacked pine in lumber yards and storage if it was improperly dried. The only defense against them was the prompt removal of diseased and dead trees from the forests.

k. Wind is the primary enemy of Lithuanian forests, especially in the western areas where spruce forests grow on shallow, poorly drained loams or clays. From 1924-37, 7,847,000 festmeters of timber were uprooted or broken off. 1924, 1930, 1936 and 1937 were the worst years. When vast quantities were

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destroyed such as in 1936 (18,939 hectares), it was difficult to prepare the wood for quick sale and its value dropped sharply.

l. Damage to the forests from snow was not measurable. Native stands were little affected and then only the young (20-30 years old) trees. Some foreign trees (maritime pine, jack pine and Polish Larch) suffered very greatly, because in Lithuania they did not form straight trunks. Total damage from all causes from 1919-37 was:

Forest fire	15,270 hectares	1,000,000 litas
Storm	41,351 "	?
Insect	6,222 "	?

20. Forest Exploitation

a. Methods of exploitation followed the Russian example completely. Logging was by the clear strip method. The strips extended for the length of the stand and varied in width from 50 (evergreen forests) to 100 (broad leaf stands) meters. 30-50 of the best trees per hectare were left in evergreen stands as seedlings. In spruce stands all trees were cut except the intermittent hardwoods because single spruce trees were subject to uprootings. Strips were cut from north to south and a cutting cycle began on the east boundaries of a range and advanced westward. Ripe strips were cut when the adjoining strips had sufficiently reforested.(86) /See end of report for availability of a photograph of a clear cut strip in the Priemai forest master district./

b. As a result of great domestic demand for wood and increased export demand for smaller dimensioned wood (pulp wood, etc.), cutting rates were lowered from the Russian standard as follows:

Pine	110 years
Spruce	90 "
Oak	160 "
Hardwoods	100 "
Birch, aspen, hoary alder	60 " (87)

c. About ten thousand hectares of forests were cut annually, a volume of about 3,000,000 festmeters.(88) This heavy cut resulted from over-optimistic estimates of annual production and caused some sharp contradictions in the data. The same source which was cited to justify the 3,000,000 festmeter cut stated in a different section that annual mean growth was only 1,765,000 festmeters. The average cutting cycle was 92 years;(89) the average tree age 47.9 years (90) and the total volume of the forests 90,000,000 festmeters, so annual mean growth was approximately 1,870,000 festmeters, not 3,000,000. Notwithstanding the figures, the Lithuanian government was forced by economic necessity to cut more timber than normal and not only because of over-optimistic plans.(91) Normal cut estimates (Russian and other less optimistic) called for 2,500,000 festmeters (including 600,000 of dead wood).(92)

d. The results of over-estimation were soon felt. While theoretically ripe stands were still abundant in 1937-39, actually they were in short supply.(93) As a rule, logging produced 10-15% less than had been estimated because of the improper methods and volume tables used. The official statistics on the quantities cut from 1918-39 are full of contradictions. Excuses were given that they were improperly recorded. The following table indicates some of the discrepancies which existed in official statistics:

	According to "Valstybes 1937 Statistikos Kalendoriys" (95)			According to L.M.D.M. 1946 (95)	
Year	Festmeters at stump	Festmeters manufactured	Total	Total Festmeters	Difference
1932	1,498,608	969,568	2,468,176	3,111,913	643,737
1933	2,901,382	1,038,513	3,228,895	3,637,106	408,211
1934	3,397,741	1,364,839	4,762,553	3,382,471	1,380,082
1935	3,480,875	1,559,009	5,039,882	3,291,981	1,747,901

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d. The results of over-estimation were soon felt. While theoretically ripe stands were still abundant in 1937-39, actually they were in short supply.(93) As a rule, logging produced 10-15% less than had been estimated because of the improper methods and volume tables used. The official statistics on the quantities cut from 1918-39 are full of contradictions. Excuses were given that they were improperly recorded.(94) The following table indicates some of the discrepancies which existed in official statistics:

	According to "Valstybes 1937 Statistikos Kalendoriys" (95)			According to L.M.D.M. 1940 (96)	
Year	Festmeters at stump	Festmeters manufactured	Total	Total Festmeters	Difference
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1933	2,901,382	1,038,513	3,228,895	3,537,106	308,211
1934	3,397,741	1,364,839	4,762,553	3,322,171	-1,440,384
1935	3,480,875	1,559,009	5,039,882	3,291,924	-1,747,958

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Both sets of the statistics above came from the Forestry Department.

e. In general, the cutting statistics of the department reflected lower cutting rates because dead wood (which existed in considerable quantities) was not included. After 1936, however, all wood suitable for sale was included. Official sources report that from 1919-39, 52,049,000 festmeters (including dead wood) were cut on 260,240 hectares, an average of 2,500,000 festmeters per year.(97) Actually, the rate was much higher because:

(1) The 3,000,000 festmeters cut in the private forests before they were expropriated were not included.(98)

(2) The 3,000,000 festmeters of prime timber stolen from 1918-19 were not included.

(3) At least 250,000 festmeters spoiled annually in areas with high forest and low population density.

(4) In 1920, 1921, 1922 and 1923 all old spruce stands infected by the bark beetle were cut. The figures for this cutting are not included in the estimates, supposedly because they were not registered.(99)

Taking the unrecorded cutting into consideration, it must be concluded that 60-65,000,000 festmeters of timber were cut from 1919-39 (overcutting by a supply normally cut in 4-5 years).(100) Some sources estimate an overcutting equal to eight years supply.(101)

f. Roughly a third of the annual production was dead wood. Thinning and clearing of this material began after 1925. Production of cord wood from this means in representative years included:

1925	45,000 festmeters
1930	63,000 "
1935	156,000 "
1937	352,000 "

Regular thinning was carried on in areas with low forest densities and high wood demands.(102) From 1925-37, 53,805 hectares were thinned, producing 13,229 festmeters of solid wood and 1,716,332 raum meters of cord wood, mainly thin saplings. This material was valued at 1,570,481 Litas and sold for 1,679,123 Litas.

g. To fulfill industrial demand, timber was sold, as in Russian times, at auction under verbal or written contracts. Wood was sold to the population in:

(1) Privilege Sales (just to peasants)
(a) in direct transactions at established prices;

(b) in direct transactions at 1/3-1/2 discount from established prices for persons whose buildings were damaged or destroyed during wartime;

(c) in direct transactions on a five year credit plan at low interest.

(2) Normal Sales
At auctions for credit or cash.

h. From 1923-37 timber valued at 410,376,426 Litas was sold.(103) The worst year was 1923 (18,957,139 Litas) and the best was 1937 (38,095,712 Litas). From 1919-37, 436,777,795 Litas were realized from timber sales. Of this amount, 85,681,994 Litas worth were sold for credit, 324,940,275 Litas worth for cash, and 26,155,436 Litas worth (primarily fuel) were assigned to state institutions without cash exchange. Wood use from 1934-37 was as follows:

Consumer	1934	1935	1936	1937
Population	1,000,000 F.M.	2,100,000 F.M.	2,600,000 F.M.	2,600,000 F.M.
Industry	800,000 "	700,000 "	900,000 "	600,000 "
State Institutions	250,000 "	200,000 "	250,000 "	200,000 "

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(Continued)

Consumer	1934	1935	1936	1937
Forest Dept.	100,000 F.M.	100,000 F.M.	150,000 F.M.	100,000 F.M.
Compensation for Expropriations	25,000 "	50,000 "	50,000 "	100,000 "
Public Inst. (churches, etc)	25,000 "	50,000 "	50,000 "	100,000 "
Total	300,000,000	3,200,000 "	4,000,000 "	3,700,000 "
Per person F.M.	62	1.3	1.6	1.5

i. From 1919-26, all timber from state forests was sold at the stump. The purchaser had to fell the tree, trim it, and transport it. In 1926-27 the Forestry Department began to fell a certain part of the production, trim it, and cut it into various sizes. The resulting products were either sold on the spot or hauled to concentration points for sale. The scale of this work increased and the state even began to deliver the wood to the purchasers. Fuel wood for the countryside was mainly sold at the stump, but that for the cities was delivered. By 1939 the state was planning to handle all felling, finishing and delivery but World War II began before the plan could be realized. The highest rate reached was 50% in 1937. (105)

j. The socialized timber production forced most of the Jewish merchants from the forests. This was considered to be a successful aspect of the program. In addition, there were advantages to the forests themselves. Control of the peasant labor became easier and the forests were kept in generally better condition. The new system also helped to improve the supply in areas of high demand and low forest density (Vilkaviskis and Joniskis). Relative use of wood products in areas of low supply and the increase in consumption caused by the socialization program are shown below:

Area	Period	Annual Average Logs	Fuel wood
Vilkauskis	1928-1939	3,750 festmeters	5,830 raunmeters
Joniskis	1935-1939	590 "	3,330 "
Kaunas	1931-1935	580 "	
	1936	20,500 "	
	1937	28,000 "	
	1938	30,000 "	

k. The state system also caused the beginnings of forest labor specialization, as in Germany. For example, men began to work only in one phase of forest production such as logging, hauling, trimming, clearing, reforestation or resin production. A program was initiated to provide housing for these laborers and to pay them partially with land as the regular forestry employees were.

l. Until 1926 there was a single price schedule for timber on the stump. This schedule varied considerably after 1936, but stabilized again in 1937 after a reduction in prices. Price varied, depending on the mean height of the stand and its distance from market. Pine was classified by six heights, spruce and hardwoods seven and softwoods by five. There were eight price level zones depending upon distance from market. Zone III was classified as 100% and others as follows:

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Grade I - 120%
Grade II - 110%
Grade III - 100%
Grade IV - 90%
etc.

As an example, in 1937 the prices of timber on the stump in a forest of class II height located in Zone III were:

Wood	20 cm diam. Aver. timber, pulp wood, etc.	30 cm diam. Logs for construction	50 cm diam saw logs
Pine	2.4 Lita	10.0 Lita	52.0 Lita
Spruce	2.25 "	8.8 "	42.0 "
Birch	2.0 "	7.0 "	38.0 "
N.Alder	2.0 "	9.0 "	45.0 "
Aspen	1.5 "	9.8 "	42.0 "
Oak	3.2 "	20.0 "	102.0 "

(106)

Fuel wood of the same dimensions brought 60% less than structural wood, and wood which could be used half for structural purposes and half for fuel brought 30% less. Dead wood was 20-30% cheaper.

m. The change of policy in 1926 necessitated a new price schedule for the assortments cut by the state. Examples of this price schedule applied to timber from Zone III were:

Type	Mid-diameter	Quality I	II	III	IV
Pine logs per fest-meter	8-15	8 Lita	7 Lita	7 Lita	6 Lita
	16-19	10 "	9 "	7 "	6 "
	20-25	17 "	13 "	10 "	6 "
	26-29	29 "	21 "	14 "	6 "
	40---	32 "	23 "	15 "	6 "
Spruce logs per fest-meters	8-15	8 "	7 "	6 "	5 "
	16-19	10 "	8 "	7 "	5 "
	20-25	14 "	11 "	8 "	5 "
	26-29	18 "	14 "	9 "	5 "
	30-39	24 "	18 "	11 "	5 "
	40---	27 "	20 "	12 "	5 "
Aspen and N.Alder Logs per fest-meters	8-15	6 "	6 "	5 "	4 "
	16 -19	7 "	6 "	5 "	4 "
	20-24	12 "	9 "	7 "	4 "
	25-30	23 "	17 "	10 "	4 "
	30---	30 "	21 "	13 "	4 "
Oak logs per fest-meters	8-15	10 "	9 "	9 "	8 "
	16-19	15 "	13 "	10 "	8 "
	20-24	26 "	20 "	14 "	8 "
	25-27	37 "	27 "	18 "	8 "
	28-35	50 "	36 "	22 "	8 "
	36-44	60 "	43 "	25 "	8 "
	45---	75 "	53 "	30 "	8 "
	50--- veneer blocks	100 "	-	-	-

(107)

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n. Prices on wood from private forests were 10-15% less than those on wood from state forests. Auction bids in state forests varied considerably depending on demand, present state of the economy and forest density of the various counties. The average bid in the year 1938-39 was 15% above the established price, and it varied from 0% in Marijampole to 62% in Kaunas.(108) The minor native industries bid much higher prices, up to 60% for timber on the stump (1936-37), 394% for structural wood (1936-37), and 19% for fuel wood (1937-38). Structural logs sold in 1937-38 for an average of 66% above the price schedule with a spread between a 10% higher bid in Taurage County and 87% higher in Marijampole. Average prices for one festmeter of items were:

Item	1934-35	1935-36	1936-37	1937-38
Pine and spruce logs at the stump	14.4 Litas	15.7 Litas	29.9 Litas	26.3 Litas
Floated timber at Kaunas	-	-	-	34.0 "
Aspen logs Klaipeda	39.0 "	45.5 "	46.2 "	45.1 "
Birch and N.Alder logs Klaipeda	-	49.9 "	44.1 "	37.2 "
Pulp wood	-	-	-	23.0 "

o. Export prices for one ton(109) of wood at Klaipeda in Litas were:

	1934	1935	1936	1937	1938
Fuel wood	24	31	24	14	12
Structural logs	46	57	59	63	89
Pulp wood	26	25	30	50	50
Boards & Planks	128	102	100	144	132
Cellulose	254	197	185	216	255
Match wood	525	506	488	413	303
Veneer	1,185	775	675	677	590

(110)

p. Domestic retail prices of fuel (cord) wood per Raummeter in Litas were:

	1937	1938	1939	1940
Birch	10.4	11.15	12.7	17.55
N.Alder	8.9	9.75	10.9	15.0
Pine	7.6	8.40	9.3	13.05
1 "ton" of peat	21.00	21.50	24.0	30.0
1 "ton" of coal	81.00	86.00	90.0	151.0

(111)

21. Auxiliary Production

a. Major auxiliary income producers in the forests were:

(1) the rental of farmland and meadows

(2) the sale of stumps and bark

(3) licenses to gather berries, nuts and mushrooms

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(4) rental of wood yards

(5) rental of clay and gravel pits

From 1922-37 this income totalled 7,396,200 Litas annually or an average 460,000 Litas a year.

b. Hunting rights were leased to responsible persons after 1921. From 1921 to 1937 a fee of 5-7 Litas was charged per hectare per year. After 1930, auctions were held to distribute hunting rights for three-year periods. In 1933 a total of 377,407 hectares of land were leased for hunting at an income of 57,669 Litas. The income from hunting leases ran:

1927-29	109,962 Litas
1930-32	173,000 "
1933-37	325,575 "

A special commission was set up in 1936 to regulate the hunting activities.

c. In 1937 Lithuania had 62,214 hectares of peat bog, 45,813 of which were under state control.(112) There were an estimated 2,058,426,000 cubic meters of peat located in swamps. There were 120 drained and accessible areas which totalled 5,641 hectares. In 1927 production was 276,144 cubic meters or 81,400 tons of dry peat. By 1938, this figure had risen to 180,000 tons. Mechanical production had risen to a ratio of 2:1 over hand production by 1938. Income from peat production averaged 85,223 Litas annually (total 852,228) from 1928-37.

22. Fisheries(113)
In 1938, Lithuania (according to official sources) had 58,000 hectares of lakes, 9,500 hectares of rivers, and 1,500 hectares of fish ponds for a total of 70,000 hectares.(114) The art of fishing was not highly advanced. Exclusive fishing rights to an area were rented to individuals (500-550) for 3-12 year periods. Fifteen per centof the area was not rented because it had been over-fished. There was little thought spent on conservation. Annual production was 350,000-400,000 Kg (5-7 Kg per hectare). Annual incomes ranged from 24,462 Litas in 1925 to 206,857 Litas in 1931. Following 1931 they declined steadily to 123,611 in 1937.

23. Reforestation(115)

a. As mentioned above natural reforestation progressed well in Lithuania if logging was by the selective cut method. When the clear cut system was introduced, natural reforestation declined and in some cases (Scotch pine) stopped completely. The few trees left on these areas for seed helped very little. On Norway pine areas, clear cuts were reforested by soft wood stands. On an average, natural reforestation took 10-15 years to begin and sometimes as long as 20 years. Early forest management plans were overly optimistic about natural reforestation and recommended it, but soon it was recognized that artificial reforestation was absolutely essential, particularly in Scotch pine areas.(116) Nurseries had long grown trees and bushes for landscaping and orchard purposes, but no research on reforestation had been done in them.

b. The annual cut was about 12,000 hectares(117) and there were about 50,000 hectares which had not reforested.(118) On at least half of the area cut annually, artificial reforestation was required. Russian and later Lithuanian policy was to promote the growth of the main species scotch pine, norway spruce and oak, so seedlings and seed of these trees were used in the artificial reforestation. Only 61 Kg of evergreen seeds were gathered in 1920 but by 1937 this collection had grown to 30,385 kg. From 1920-37 a total of 87 metric tons were collected. Interest in oak was secondary to that in the evergreens, but from 1934-37, 11,954 Kg of acorns were collected for seed. 49,485 Kg of softwood seeds were collected from 1920-37. Most of the seeds were directly planted, but results were poor and the planting of young nursery stock steadily increased. Nursery areas were enlarged and areas in the forests were set aside for this purpose. /See end of report for availability of a photograph showing peasants breaking the soil with mattocks for the reseeding of scotch pine in the Jures Forest District./

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c. Spring (April and May) was the main seeding and planting season, but the dry weather frequently spoiled the work and necessitated reseeding. Peasant labor (mainly young men) was plentiful. It was supervised by the guard force and minor forestry officials. There was no mechanical planting. The soil was turned in a single plough furrow or with mattocks. Nursery production of seedling trees totaled 1,258,097 from 1928-37.(119) After seeding or planting, no special care was taken of the plots. In many cases they were destroyed by the dryness, insects or hardier growth and the work had to be done over. Research on the vitality and success of the reforestation was neglected.

d. From 1919-39, 260,240 hectares of timber were cut and 56,000 (22%) were reseeded or planted. About 10,000 hectares (of the 56,000)(120) were subsequently replanted. Approximately 200,000 Litas were spent annually between 1922-37 on reforestation. Amounts spent for seeding and planting were low and steadily decreased so substantial results could not be expected. Appropriations for reforestation were far too low. A serious approach to the problem was not made until 1937 when a new reforestation law was passed. It established a foundation which was supported by a 3% allotment from the Department's annual income and from additional small incomes from the sale of seeds and seedlings. By 1939 the foundations budget was 1,052,700 Litas of which 880,000 were used for reforestation and 50,000 for drainage.(121) The work of the foundation gave promise of improving the reforestation effort considerably.

e. In Lithuania in 1939 there were 6,559 hectares of sandy soil subject to wind erosion which had been effectively stabilized by reforestation; 5,559 hectares which were partially stabilized, and 2,035 hectares which were still unstabilized and shifting; a total of 14,188 hectares. Of this amount 5,267 hectares were used as farmland and 4,619 as pastureland. 4,302 hectares, of which 2,826 were unstabilized and shifting, were not used. Most of these areas were in Alytus and Lazdijai (Seinai) Counties in the valleys of the Nemunas and Merkys Rivers. The land had been over-exploited, over-cut and devastated by fires, and was mainly under peasant control. As a result, their proper reforestation was difficult. The foundation planned to buy these areas in order to ensure their reforestation. /See end of report for availability of a photograph of reforestation (scotch pine) of the sand dunes near Palanga on the Baltic Coast./ In 1939, the state owned 308 hectares around Palanga and Sventoji (Krelinga forestry district), 246 hectares in Kaunas County, 208 in Lasdijai County, and 903 hectares in other areas which had been reforested or required reforestation to control shifting sands. 5,635 hectares of dunes were planted from 1921-37.

f. The Russians had tried to reforest the Baltic shore dunes several times after 1830 but each attempt failed. The whole length of the Lithuanian Baltic coast was shifting sand dunes in 1918. Initial steps (in 1922) to reforest them consisted of some poorly planned planting of willow cuttings. In 1924 some of the hollows were covered with juniper cuttings and one hectare of scotch pine was planted. In 1925 the first work plan was drawn for the area around the town of Palanga. A few areas were planted and fenced for their protection. From 1931-32 plans were drawn for all the area of dunes between Palanga and Sventoji. Work in the Sventoji area began in 1936. In 1939 the first thinning of the plantings was accomplished and 140 hectares were planted at Palanga and 40 at Sventoji (23,000 pines per hectare). Each plant was fertilized with humus and results were very good. Expenses were about 150 Litas per hectare and were justified by the improved yield (other reforestation costing 50 Litas per hectare had done poorly). The varieties of pine planted included pinus sylvestris (scotch pine), pinus maritima (mountain pine), and pinus banksiana. Up to 1939 about 180 hectares of dune (60% of those in the area) were reforested.

24. Thinning

The amount of thinning accomplished is a measure of the amount of care a forest stand is given. A lack of manpower and funds limited any thinning activities until the shortage of wood forced the department to turn its attention to thinning and cleaning the forests in order to get more wood (particularly fuel). 53,805 hectares were thinned or cleared from 1925-39,

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producing 13,229 festmeters of solid wood and 1,716,332 raum meters of cord wood.(122) This production sold for 1,679,123 Litas. Most of the work was done by the purchasers, who cut the wood and then paid for it after its value was determined. Most of this production was in areas of low forest density. The thinning was not adequate, however, because each year 600-650,000 festmeters of dead wood (valued about 25% less) were harvested in areas of higher forest density, even in the Kaunas region.

25. Investments

a. In addition to the investments in educational institutions (see paragraph 16) a relatively large amount of money was spent on road and bridge maintenance and construction, particularly from 1925-31. From 1922-37 a total of 11,443,130 Litas were spent for these latter purposes. Unless kept in good repair, the roads and bridges were unable to withstand the 5-10 ton loads carried over them in summer and mid-winter, and were worthless in spring and autumn. World War II tank movements virtually destroyed not only the improved public roads but the crushed stone highways as well.

b. Telephones were of great use in the forests and by 1939, 100% of the forest masters had them (plus an extension to their quarters), 40% of the rangers, and 10% of the guards (in areas where fires were a danger).(123)

c. Income (65% from sale of wood and wood products), expenses (65% from salaries), and profits of the forests were as follows:

Date	Cut Festmeters	Total Income Litas	Total expenses Litas	Profit Litas	Area of seasonal forests hectares	Profit from 1 hectare of forest area
1919	431,413	5,543,258	1,960,490	3,582,768	309,000	11.6
1920	699,739	4,880,072	1,029,940	3,850,132	366,467	10.5
1921	1,250,575	9,293,150	1,275,958	8,017,192	736,754	10.9
1922	1,655,281	8,260,929	1,292,960	6,967,969	846,390	8.2
1923	2,191,118	19,956,405	5,989,611	13,969,794	862,799	16.2
1924	1,381,159	31,737,034	5,290,667	26,446,367	863,129	30.6
1925	1,956,926	28,977,818	8,005,393	20,972,425	843,129	24.9
1926	1,435,105	21,640,769	7,750,820	13,889,949	848,857	16.4
1927	2,395,100	32,389,992	7,762,394	24,627,598	869,844	28.3
1928	2,682,683	39,633,344	9,795,500	29,867,844	893,849	33.4
1929	2,489,453	38,675,078	8,474,540	30,200,538	900,348	33.5
1930	2,159,061	33,828,863	9,193,668	24,635,195	896,059	27.5
1931	2,664,825	30,644,150	9,077,998	21,566,152	886,012	24.3
1932	2,505,711	20,106,248	8,225,862	11,880,386	887,598	13.4
1933	3,275,232	21,818,733	7,773,790	14,044,943	879,316	15.9
1934	2,770,829	25,994,722	7,873,151	18,121,571	878,568	20.6
1935	2,892,979	19,612,725	7,487,640	12,125,085	874,555	13.9
1936	3,999,022	29,512,323	7,742,387	21,769,936	874,389	24.9
1937	3,782,386	36,720,320	8,529,266	28,191,054	870,767	32.4
Average		24,171,522	6,554,317	17,617,205		20.9

26. The Private Forests

a. In 1918, 60% of the forests in Lithuania were owned by the gentry. Subsequent political platforms of all Lithuanian (ethnic) parties were based on land reform and subordination of the minorities. In 1919, use of the private forests was restricted because it was not yet feasible to expropriate them. The state supervised them but the owners retained temporary possession and made use of the opportunity to strip the forests. In 1922, (Law of Land Reform) forests over 25 hectares were expropriated. Private owners retained approximately 2,000 units (59,134 hectares). In 1938, there remained 57,736 hectares of private forests owned by Lithuanians and 1,398 hectares owned by foreigners. The Law of Land Reform forced foreigners to sell their properties (6,790 hectares of forest owned in 1922). That still owned by foreigners in 1938 was guarded and used by the state which gave the profits to the owners. The Russian Law of Forest Preservation (1888) remained in effect (though not strictly applied) until 1926 when a new law put private forests under direct state control. A special commission was established to administer them.(125)

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b. Private forests were always less productive than state forests.(126) The best remaining private stands were only middle aged and consequently, yield was far below state forests (approximately 70% of the state forest yield or 2-2.25 festmeters per hectare.)(127)

c. The few remnants of the private forests which remained in the hands of individuals (no more than 25 hectare plots) were no longer managed progressively in any way. The only guard forces were the agricultural workers of the estate. The local forest guard managed the forest for the government under supervision of the forest ranger and forest master. The owner was responsible for the property and could take only the timber allotted to him by the government. While state forests were difficult to guard, it was even harder to effectively police the private holdings. Private owners, in former times, had sometimes managed their forests very well, but this was no longer the case. Only the better private forests had work plans and there were no special provisions for fighting disease and other forest enemies. The people were unwilling to fight fires in the private forests and had to be forced to this duty in the state forests.

d. The unfortunate predicament of the private owners caused a great many private forest owners to attempt to get rid of their possessions. The populace demanded even more land reform and the seizing of even more land from the gentry. Prior to 1922 (the Land Reform Act) the owners had tried to cut and sell as much of their wood as possible. A 1919 law had restricted this but lack of personnel had made it impossible to enforce. Under the Russian Forest Preservation Law of 1888, an owner could get permission to cut ten years supply at one time. Official sources do not record how much was cut from 1919-22, but unofficial sources estimate approximately 3,000,000 festmeters(128) and it probably was much more.(129) After 1922, most of the owners of the forest remnants, afraid of new expropriations and pressed for funds found excuses to cut additional rates. As a result they had very little timber of value left. The stern measures of the government (in 1926) to control the remaining timber were too late. The forestry administration had great difficulties with the owners after 1926 as they sought permission to convert even more forest to agriculture. Official sources state that in 1938 two-thirds of the remnants forests were cut far beyond the normal rate and were being naturally reforested by soft wood stands.(130) The normal cutting rate for the private forests was three festmeters per hectare or a total of 75 festmeters, just about enough for the estate's own use and insufficient for sale. The owners considerably increased their livestock (particularly swine) and as a result needed even more wood, especially fuel. One 80 hectare estate ordinarily used 70-80 festmeters of wood annually. From 1925-37, 179,365 festmeters of timber were unlawfully cut in the private forests, mainly by the owners themselves. There were 898 convictions and 1683 court cases resulting from these violations and an estimated 1,614,763 Litai were paid in damages. By 1939, the private forests were not a factor in the national income and served only to supply the needs of the estates themselves. Their auxiliary production was negligible and grazing was not allowed in them. Cutting was selective and theoretically only followed permission of the forest master and designation of the trees to be cut by the forest ranger. The latter inspected the forest yearly and reported any illegal cutting.

e. Since selective cutting helped natural reforestation, the best natural reforestation occured in private forests, although official sources stated otherwise.(131) Artificial reforestation was forced on the private forest owners by the Law of Reforestation of 1937. The state provided the manpower for this but the owner had to pay for it.(132) The owners were not interested in the future of these forests and would have been happy to cut them all down. In general, the remnant estates were split into 20-30 hectare plots (divided by the owners among their kin to avoid expropriation) and their forests were in bad shape (young-to-middle aged with very light density. They were fast declining to the condition of the better peasant forests and woodlands.

27. The Peasant Forests

a. There were no considerable changes in the peasant forests after 1914. Their area was never definitely determined and they were not under

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control. Reforestation from sprouts proceeded well in abandoned or unused areas of peasant property and some remote areas adjacent to state or private forests regenerated naturally from seeds. These areas were used for grazing and cattle and rooting pigs (especially) helped keep these areas clean, free from harmful soil larvae, and receptive to seeds. Reforestation, therefore, was not a problem except in sandy areas where over-cutting had promoted erosion.

b. The peasant forests were always very light in density and produced no more than 1-1.25 festmeters per hectare per year (in spite of higher official estimates)(133) of inferior products such as brush and saplings, useful only for fuel. In addition to old buildings, fences, etc., brush was the principal fuel used by the peasants. Their fuel demands were satisfied in part by peat and some stolen wood and the peasants bought very little fuel for their own use from the state forests until the late 1930's. The state's entry into active logging and transportation succeeded in cutting down wood thefts, however, and caused legal peasant demand to rise considerably. One factor easing peasant demand was the considerable amount of timber cleared away to convert land to agricultural use following the Land Reform Act and subsequent resettlement of the peasants. This was only temporary relief, however, and it was followed by a more acute shortage and violent peasant agitation. The result gave state forest production even more importance than it had had previously.

28. Conclusions

From 1918-39 forest density decreased considerably. All but remnants of the forests of non-Lithuanian ethnic groups were expropriated and the Polish influence in Lithuanian forestry was largely removed. The private forest remnants were kept from devastation only by severe government measures and the peasants' forests, after effects of the land reform, remained in a development stage and was severely hampered by tensions and friction among its staff. This prevented the normal evolution of a Lithuanian silviculture and its progress was sporadic. Forestry legislation did not progress and no new Forestry Code was drawn. Forestry planning was too optimistic, recommending overly high cutting rates and lower cycles, and overestimating the progress of natural reforestation. Control of the forests, from a weak beginning, progressed to a tight system reducing timber thefts and other violations. Natural and artificial reforestation of the desirable trees failed. A serious program of artificial reforestation did not begin until 1937. Investments in the forests were inadequate. The twenty-year life of the Republic was too short to recognize and solve the economic and political problems which presented themselves and the Lithuanian effort suffered badly in comparison with the previous Russian work. Main reasons for this were the state's policies of consolidating the country's economy and promoting an extensive forestry economy and over-exploitation in order to balance its budget.

C. The Wood Economy--Utilization

1. Supply and Demand

a. The significance of wood in the Lithuanian economy has been discussed above. By the 20th Century it was enormously important and the increasing population and standard of living and the decreasing forest density made a proper forest economy of vital importance. By the late 1930's, 85% of Lithuania's wood production was consumed domestically and only 15% was available for export.(134) Good timber could be readily sold at any time.

b. In 1890, there had existed an approximate average equilibrium in supply and demand, except in certain areas where forests were sparse (e.g. Telsiai and Vilkaviskis). Substitute materials helped to save wood somewhat, but in the Lithuanian Republic requirements were still about 2 F.I.Y.(135) The following amounts of wood were consumed by the population in two representative years.

Year	Structural wood	Fuel wood	Total
1923	1,085,000 Festmeters	3,255,000 Festmeters	4,340,000 Festmeters
1937	1,275,000 "	3,825,000 "	5,100,000 "

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In addition to the normal consumer demands, there were "artificial" demands by business interests. In periods of high prices, the peasants bought at privilege sales (lower prices) in the state forests and re-sold the timber at a profit. This was true only during these high price eras and not when export and domestic prices were equal (1935).(136) In 1937-39 rising western prices caused much timber trading of this sort, in violation of the spirit of the privilege sales.

c. Small industries such as dairies, brickkilns, and sawmills consumed large quantities of wood as fuel. (Larger industries used coal.) Their demand for wood varied, however, according to the level of the economy. In 1937, the small industries consumed 200,000 festmeters, mainly for fuel.(137) The demands of the wood industry for export were largely for structural wood. This industry's volume in 1918-39 was only about half of the pre-war level. The industry consumed about 830,000 festmeters of rough timber in 1937 (170,000 festmeters were imported from Russia). The demands of industry for wood had great economic and political importance and were an additional source of political turmoil.

d. In its struggle to build a national economy, the Lithuanian Government's policy was to supply domestic needs by building up a strong national agricultural base and by maintaining Lithuanian industries. Exports of manufactured and semi-manufactured goods were promoted. In the wood industries, many of the individual enterprises were idle and their workers unemployed, so the export of rough timber was not encouraged. Forced by heavy demand and an inadequate wood economy, the government set arbitrary limits for wood consumption based on estimated production. In 1937 these were:(138)

(1)	Internal demand - structural wood	520,000	Festmeters
(2)	Special structural wood	18,550	"
(3)	Industrial for export	660,500	"
(4)	Fuel wood		
	Population	4,000,000	"
	Small Industry	200,000	"
(5)	Production Losses	260,000	"
		5,659,050	"

Production in 1937 was:

(1)	State Forests	3,492,000	"
(2)	Private Forests	550,000	"
(3)	Imports	- 160,000	"
		4,202,000	"(139)

The figure shown for the private forests was an estimate applied to all peasant and farmer gentry forests. It was exaggerated. It can be seen that the forests produced 1,457,050 festmeters less than the allotted consumption. This had to be made up from marginal wood supplies such as orchards, old buildings and fences, brushwood and peat. Unofficially, thefts of wood from the forests also contributed to making up the deficit. A great deal of dead wood was taken by the peasants as they collected brush, but it was not even considered in computing the estimated quantities stolen. As said above, the rule followed was that no more than 10% of the real thefts were discovered and their perpetrators punished.(140)

2. Imports

a. From 1919-39, Lithuania and Poland had no diplomatic relations. The huge pre-war and wartime shipments of wood ceased and Lithuania found itself with a wood industry which it could not supply with raw timber. Klaipeda suffered most (50% idle), and the Lithuanian Government of Tilsit in Germany was hampered as its wood supplies from Russia were cut off. In 1925, the Lithuanian Government tried to open the Nemunas to Polish timber rafts but was forced to retreat because of the sharp opposition of Lithuanian nationalists, and the negotiations failed.(141)

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b. The next step was taken by the state commission, "Medzio Sindikatas", which bought an average of 170,000 festmeters of wood annually (1931-39) from the USSR.(142) While this deal was partially politically inspired (to counter the rising influence of Nazi Germany and its demands for the return of Klaipeda), it did produce raw material for the idle mills of Klaipeda and a profit of 20,000,000 Litas. In 1939 after relations with Poland were established, 90,000 festmeters of timber were purchased but the transaction was interrupted by the war.(143)

c. As Lithuania became a wood-deficient country, government policy was to import timber; to encourage wood saving by peat production, brick construction, cement production and economy of the use of wood for fuel (more efficient stoves); and to stimulate native production and export of wood products and lumber.

3. Wood Substitutes

a. Among the substitutes which came into use for fuel wood were pine (1938-39), stump wood and the litter from thinning and cleaning the forests. This occurred largely in areas of low forest density. The cords of pine wood (23,872 raummeters in all) were produced for 3.5 Litas each by the state and sold in the forests for 4 Litas. The price of a cord of fuel wood in the forest ranged from 4-8 Litas; but sold in the cities for as much as 20 Litas. Because of these prices, small industries willingly bought less expensive stump wood for sale.(144)

b. The fuel value of a ton (1,000 Kg) of Lithuania-cut dry peat was equal to 1.1 raummeters of cord wood.(145) The use of peat was unpopular, however, and its production lagged unless actively stimulated by the government. Representative production equalled:

Year	Hand cut	Machine cut	Total
1926	50,000 tons	21,000 tons	71,000 tons
1930	55,000 "	32,000 "	87,000 "
1935	60,000 "	45,000 "	106,000 "
1938	70,000 "	110,000 "	180,000 "

It can be seen that mechanical production sharply increased in 1938. As a result, peat substituted for about 200,000 raummeters of fuel wood in 1938. While peat bogs are fairly extensive in Lithuania (80,000 hectares, total stock of 250,000,000 cubic meters), peat production is expensive and hazardous (if frozen when not sufficiently dry, the peat is spoiled) and is therefore not of lasting importance in the Lithuanian economy.

c. There were no domestic coal supplies in Lithuania. Coal was imported from England and from Poland. It was used mainly by the railroads and larger industries, and to heat the larger city buildings. Imports in three representative years equalled:

Year	Total Tons	Value - Litas	Tons Used by Railroads	%
1934	227,954	6,789,600	62,723	27.4
1935	220,443	6,047,400	53,413	24.1
1938	281,773	9,933,400	79,774	28.3

The coal import of 1938 took the place of approximately 1,000,000 raummeters of cordwood. The railroads had been forced to use mainly wood as fuel from 1919-22 which made a great drain on the available fuel wood supplies.

d. Oil was used by aviation, railroads and industry, and by the population for illumination. Imports in four representative years were:

Year	Tons	Total Value (Litas)
1928	31,414	9,700,000
1930	39,250	11,400,000 (Continued)

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Year (Continued)	Tons	Total Value (Litas)
1935	38,136	6,200,000
1937	46,188	6,700,000 (146)

As evidenced by the table, oil imports were steadily rising until interrupted by World War II.

e. Electricity was used only in the cities and in the larger towns. Very few smaller towns had electricity in 1939. Electricity production in three representative years was:

Year	KW Hours	Value (Litas)
1931	18,700,000	12,500,000
1935	25,700,000	12,068,000
1937	35,600,000	15,172,000

While production rose steadily, the rise was slow and retarded by the expense which limited industrial use. Thus, in 1931 the electric generators of Lithuania were capable of producing 18,176 horsepower; in 1935, 31,142 horsepower; and in 1937, 45,327 horsepower.(147)

f. The state subsidized production of bricks by providing adequate fuel supplies at a discount. The figures for this production in three representative years show a slow rise:

Year	No. of Kilns	Laborers	Production
1927	69	970	?
1931	74	1,703	54,400,000 bricks
1937	73	2,082	60,700,000 "

Production, although it increased, was insufficient to supply the demand (approximately 550,000,000 bricks per year) and some bricks were imported from Latvia and Germany.(148) Bricks were rarely available to the rural population. Their main construction material was, and will remain for a long while, wood because it is less expensive than brick and easy to erect, repair and transport.

g. The first Lithuanian cement plant was not under production until 1940. Before then, all cement was imported. Imports in representative years were:

Year	Tons	Value (Litas)
1928	46,902	4,700,000
1930	63,526	5,800,000
1935	57,958	2,300,000
1937	95,744	4,300,000

The lack of cement was a primary obstacle to brick production.(149)

h. The various substitutes for wood discussed above were not particularly significant in the Lithuanian economy and their use could not rise particularly because of the country's low standard of living and undeveloped industrial base. As the population increased, wood demand also increased.

4. The Assortment

a. The techniques of logging did not change. Changes in the assortment produced resulted from changes in demand of the export market. The domestic market consumed the same products as before. The following products were produced for export:(150)

(1) Pine saw logs - 3 quality classes, 4 meters long and up, 20 centimeters and up in diameter

(2) Spruce saw logs - 3 quality classes, 4.5 meters long and up, not less than 18 centimeters in diameter; (there was a 4th class of wood used for fuel. The 3rd and 4th classes were used domestically and were sometimes produced from dead or uprooted timber.)

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(3) Aspen logs (for match production) - 2 quality classes, 1.2 meters long and up, approximately 25 cm in diameter

(4) Birch and northern alder logs (for veneer) - 2 quality classes, 2.7 meters long and up, approximately 25 cm in diameter

(5) Pine and spruce posts - length and thickness varied from 7-12 meters and 16.24 cm

(6) Spruce pulpwood - 2 quality classes, included all spruce timber below 22 centimeters in diameter at chest height (occasionally up to 28 cm), 1-2 meters long, bark removed

(7) Aspen pulpwood - 1 quality class, with specifications as for spruce pulpwood

(8) Pine or oak "sleepers" (ties) - for narrow or normal gauge railroad lines

(9) Spruce and pine piles - 3 quality classes, 7-10 meters long and 7-14 cm in diameter at a point 1 meter above the ground

(10) Pine or oak ties - 2.6-2.65 meters long, 220-240 mm wide 150-160 mm thick.

b. Production of these products from 1927-37 by the state in the state forests was:

Logs	Festmeters
Pine saw	2,064,750
Spruce saw	1,179,140
Oak	187,029
Birch	33,370
Aspen	115,202
Ash and other for pilings	64,169
Total	3,830,735
Other	
Mine props	33,369
Shingle cordwood	99,818
Pulpwood	1,179,342
Short posts	71,584
Pilings	105,076
Fuel cord wood	3,953,752
Brush and salvage	442,377
Ties	112,925
Miscellaneous	179,920
Total	6,178,163
Combined Total	10,008,898 (151)

c. Compensation for the work of forming the assortments varied according to the varying economic level of the country. At the lowest point (1933) they were:

(1) To form 1 festmeter of spruce or pine log - 0.5-0.8 Litas

(2) To form 1 festmeter of softwood log - 0.8 - 1.2 Litas

(3) To form 1 raummeter of pulpwood - 1.5 - 2.0 Litas

(4) To form 1 raummeter of fuel wood - 0.6 - 1.2 Litas

(5) To re-pile or move cord wood - 0.15 - 0.25 Litas

(6) To form 1 piling - 0.03 - 0.08 Litas (152)

5. Transportation

a. Transportation in the forests did not change. It was still provided by the peasants with their horse-drawn sleds. They also continued to deliver the fuel and structural wood to the cities. The city of Vilnois' wood

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supply was 60% supplied by peasant carts and sleds.(153) During both wars when free traffic was interrupted, the flow of wood to the cities almost ceased with serious consequences for the city dwellers. The cities were also served by wood merchants who catered to the larger establishments and the wealthier citizens. The peasants' wood was cheapest because frequently it had been stolen. The time of greatest need for wood, the winter, was also the time when it was most easily transported by sled. Distances of 20-30 Km in wintertime were not difficult.

b. There was no uniform price for transportation. In the cities it cost 4-5 Litai to transport one festmeter 4-5 Km. In the forests, transportation costs were included in the cost of the wood and were difficult to accurately measure. The peasants, for their work in transporting wood were paid:

Distance	For 1 Festmeter of logs	For 1 Raummeter of Cordwood
to 1 Km	1.25-1.5 Litai	to 1.20 Litai
1-2.5 "	to 2.25 "	to 1.85 "
2.5-5 "	to 3.0 "	to 2.4 "
5-10 "	to 5.0 "	to 4.0 "
10-14 "	to 6.0 "	to 4.8 "

For transporting logs, the charges were 20% higher.

c. The total length of the railroads during the Republic was 1,778 Km.(154) 1,230 Km were normal gauge and 548 Km were narrow gauge. The railroad (normal gauge) from Siauliai to Kretinga via Telsiai built in 1931-32 was of particular importance because it provided a connection (71 Km long) between Klaipeda and the inland areas. In 1938, there were a total of 4,351 freight cars in Lithuania. The various types used in wood transport had capacities of 15, 16.5, 20, 31.5, 34.5 and 36 tons. Railroad capacity in four representative years was:

Year	Tons per Year	Monthly Average Tons per Km
1929	2,079,000	28.3
1930	1,993,000	28.0
1935	2,000,000	24.7
1937	2,352,000	26.3

d. Wood was one of the most important items carried by the railroads. The total in metric tons of important products carried in three representative years included:

Year	Wood	Corn	Fertilizer	Coal
1929	609,700	198,400	139,900	115,000
1935	447,100	295,200	100,300	108,800
1937	639,200	81,500	130,500	153,100

Freight capacities in metric tons of three important railroads terminals in three representative years were:

Year	Klaipeda	Kaunas	Obeliai
1929	473,100	419,200	425,400
1935	795,300	401,800	260,800
1937	823,300	513,800	213,800

After the agreement was made in 1931 to import timber from the USSR each year, the railroads assumed new importance in the wood industry. The Soviet timber was largely delivered by ship (103,594 festmeters - 1933, to 216,114 - 1936) and some by rail over the Kretinga-Telsiai-Siaulia-Obeliai line. While rail transport of wood prior to World War I was negligible compared to the amount delivered by rafting, it was many times more important than rafting during the Republic. The price schedule for all transport was divided into classes. Wood products were classed from Class 8-12. Class 12 wood had the highest value to

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the Lithuanian economy. The prices (Litas) for 100 Kg of wood carried 1 KM in a 15 ton railroad car in 1927 were:

Class	Up to 50 KM	51-100 KM	101-150 Km	151-200 KM	201-300 KM	Over 300 KM
VIII (Staves, Shingles, cork, bark)	1.5	1.35	1.22	1.10	0.88	0.71
IX (Batten, Ties)	1.2	1.08	0.98	0.88	0.71	0.57
X (Raw timber, posts, pulpwood	0.9	0.81	0.73	0.66	0.54	0.44
XI (Fuel wood, lumber)	0.6	0.54	0.49	0.45	0.30	0.29
XII	0.4	0.36	0.33	0.30	0.27	0.29(154-A)

The cost of transporting a 15 ton box car of raw timber from the farthest railroad station, Alytus, to Klaipeda (via Sestokai, Kazlu-Kudos, Kaunas, Siauliai, and Kretinga - 380 KM) was about 300 Litas or 15 Litas per festmeter. The railroads were particularly important in wood transport after 1933 when prices to transport lumber were lowered 27% for lumber and 40% for rough timber. /See end of report for availability of a sketch of the "approximate scheme of timber circulation in Lithuania in 1935" and a photograph of workers loading timber into railroad cars in the Kazlu-Rudos area./

e. The amounts of wood transported by truck cut into the railroads' volume very little and increased very slowly:

1929	309 tons
1930	431 "
1935	322 "
1936	393 "
1936	564 "(155)

f. The volume of rafting, as indicated above, dropped sharply from 1918-39. The most important rivers (2,774.3 Km of water navigable by rafts)(156) were the Nemunas above Merkine (the Polish border was closed) the Vilija from Paneriai, the Jura, the Minija, and the Nemunelis. Rafting in three representative years totalled:

1931	206,669 Festmeter
1935	441,396 "
1937	468,966 "

In 1937, the state rafted 240,000 festmeters of the total to Klaipeda. The balance was floated by private interests. About 150-200,000 festmeters was German wood in transit via the Nemunas River from Klaipeda to the German towns of Tilsit and Ragnit. In 1935 (a year of low costs) it cost 0.45 Litas to raft 1 festmeter of timber from Kaunas to Viesvile, 0.35 Litas from Kaunas to Smalininkai, and 1.57 from Smalininkai to Klaipeda. Costs had been 20% higher in 1934.(157) /See end of report for availability of a photograph of floating timber on the Vilija River in 1940./

6. Labor

a. The only "professional" laborers in Lithuania were those in the cities of Kaunas, Panevezys, Siauliai, etc., who worked in industry. Their employment was uncertain because of the primitive, impermanent character of Lithuanian industry. Only a few industries retained a year around staff of permanent workers (for the most part foremen, machinists, mechanics and other skilled workers). Other workers were employed on a seasonal basis, working if labor was needed and depending upon small gardens for a good part of their sustenance. They would take any available part-time work or attempt to make money dealing in second hand items. The main group was the peasant-farmer population which was available as labor on a seasonal basis (winter). Unemployment was much higher than the government would admit and, as a result, there was considerable emigration from the country (first to the US and then after World War I to Brazil and Argentina) until the government put a stop to it by means of severe restrictions.

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b. The number of workers employed in logging operations varied, depending upon the volume of planned cutting. In 1935, for example, plans were made to cut 2,423,000 festmeters of timber and to form and shape about 1,430,000 festmeters of this. 11,130 laborers and 16,000 horse cart drivers were employed for this purpose. 150 foremen, 80 clerks, and 165 watchmen made up the rest of the force.(158) The abundant mass of city and peasant laborers were unskilled and poorly paid. The only organized, professional labor group was in Klaipeda. It had been formed under the former German administration. The city workers had nominal labor organizations of a sort which were targets for Communist penetration.- /See end of report for the availability of a photograph of peasant laborers stripping the bark from pulpwood in the Kazlu-Rudos forestry district./

c. The government was forced to take action to counter Communist penetration of the labor groups. The economic crisis of the 30's, the authoritarian nature of the government and the low living standards provided a fertile field for Communism. The legislative steps taken were largely of an emergency nature; in 1919 an eight-hour work day was introduced and an unemployment compensation law was passed. In the same year a special law pertaining to laborers on farming estates of 80 hectares or more (also a target of the Communists) was passed which provided for medical care, care for widows and orphans, pensions and unemployment compensation.

d. In 1925, a law was passed requiring inspection and control of working conditions, including those in the wood industries. At the same time, a state employment office was opened, and in 1926 a commission was organized to plan public works to absorb the unemployed. An accident insurance act was passed in 1936 which covered industrial construction and forest workers. By 1938, 82,000 people were insured under the plan. A minimum wage law passed in 1933 and a life insurance plan was introduced (financed by a deduction of 2.25% of the employees' wages and matched with an equal amount by the employer). In 1936, a state labor commission was established to consider all problems involving labor. In spite of all of these measures, however, the low standard of living kept the government's policy from being effective.

e. The best paid workers were those in state and municipal offices. While their wages and standard of living were low, they still managed to live better than the workers or peasants. Their jobs were considered to be very desirable. The peasant farmers averaged an income of 12.5 Litas per year from 1 hectare of land from 1932-36. After 1936, this income increased to 30-34 Litas. A farm hand, from 1933-37, earned 237 Litas a year plus supplements in the form of clothing and board. In 1938, the farm hand earned 310 Litas and a woman farm worker 243. Part-time farm workers (10-12 hour day) made 2.4 Litas a day in spring (planting) and 3.3 Litas in the fall (harvest). Women workers earned 30% less.(159) These wages were low but labor was abundant and there was competition for every available position. The economic plight of the rural workers was worse in the eastern part of the country with its poor, sandy soil. During the late 1930's there was considerable seasonal (summer) emigration to more prosperous Latvia and Germany.

f. Industrial workers received the following wages for an eight-hour day in four representative years:

Male Year	Skilled	Unskilled	Female	Cost of Living Index (1929 = 100%)
1930	11.6 Litas	7.2 Litas	4.5 Litas	89%
1933	9.55 "	5.55 "	3.75 "	61%
1936	8.25 "	5.05 "	3.45 "	51%
1938	9.1 "	5.45 "	3.9 "	57%

(160)

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Highest wages were paid in Klaipeda and next highest in Kaunas. Lowest wages were paid in the rural areas and in the wood industry. A skilled worker could support a family of six, but an unskilled worker had difficulty supporting two persons.(161)

g. Unemployment was always a problem, especially in the wood industry which had seasonal peaks and valleys. Permanent employment in Lithuanian industry in three representative years was:

Year	All Industry	Wood Industry
1930	22,496	(1931) 4,308
1935	27,370	-
1937	36,593	5,346(162)

In the winter of 1938, there were 5,300 unemployed industrial workers, including 3,500 in the Klaipeda and Kaunas areas alone. The summer of 1938 had seen only 1,800 unemployed; 1,000 in Klaipeda and Kaunas. Actually, unemployment was much greater, but the heavy emigration eased the pressure. From 1923-25, there was a mass exodus of persons to South America, but it ended when these countries refused to accept any more immigrants.

h. The mass of workers were largely unskilled, particularly in the rural areas. Most skilled workers had been trained as apprentices. Professional trade schools, mainly agricultural, were not established until the late 1920's. In 1927, four schools had 168 students and in 1938 there were 13 schools with 1872 students. There was great interest in attending these schools.

7. Industry

a. The late industrialization of Russia (and Lithuania) was the result of the late abandonment of serf labor (1861). The serfs were self-sufficient, had little buying power and purchased only a few necessary items such as salt, nails, etc. Since ancient times, a few cottage industries in Lithuania had produced a small surplus for sale. Their production of such items as wooden tools, containers, leather goods, barrels, wheels, shingles, wooden shoes and pipes continued through 1939. Some of the hand craftsmen were very skillful house builders and adept with the pit-saw. The house building trade was one of the most important during the 18th century and continued to be important through 1939. Most of the residences in Kaunas (the new part) were built by such hand craftsmen.

b. As a result of the factors described above, the few larger pre-World War I industries which developed had to depend upon exports. Thus, almost all lumber production was exported to central and southern Russia. The undeveloped state of this industry was also caused in part by the country's geographic proximity to rising, aggressive Germany. The Russians were afraid to invest in an area which could be so easily overrun by the Germans. In addition, the Germans blocked lumber exports by a prohibitive tariff, their control of the outlet of the Nemunas, and their control of the only good natural port (Klaipeda). The Russian Venta-Dubysa Canal project which would have by-passed Klaipeda and made Kaunas a lumber manufacturing center was interrupted by World War I.(163) The addition of Klaipeda in 1923 gave Lithuania, for the first time, a satisfactory lumber and cellulose industry but it could not sufficiently supply it from its own forests.

c. The industrial establishment in the Lithuanian Republic was as follows:

Year	Total No. of Establishments	No. of Establishments with more than 5 employees	No. of Women Employed	Total work-days of women	Industrial Activity (1931 = 100%)
1928	5,742	1,039	18,930	-	-
1930	5,842	1,051	19,334	-	

(Continued)

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(Continued) Year	Total No. of Establishments	No. of Establishments with more than 5 employees	No. of Women Employed	Total work-days of women	Industrial Activity (1931 = 100%)
1934	5,710	1,118	22,282	527,244	104.4%
1935	11,904*	1,136	22,344	584,958	115.8%
1938	15,214	1,247	31,689	775,984	153.7%(1937)

(*The sharp rise in 1935 is explained by the inclusion of small shops and trades in the industrial statistics.)

d. Mechanization in Lithuanian industry was as follows:

Year	No. of Establish-ments	Auto-motive Power	Steam Engine	Electric Motor	Total	Industrial Activity
1931	1,049	747	51,862	18,176	70,038	100% (Base Year)
1935	1,136	842	74,207	79,830	105,349	150.4%
1937	1,247	946	31,142	45,327	125,157	178.7%

e. The wood industry in the Republic of Lithuania included:

Enterprises	1927 Number	1927 Workers	1937 Number	1937 Workers	HorsePower
Sawmills	131	2,731	139	3,548	11,861)
Veneer and Ply-wood mfg.	-	-	3	846	)
Furniture Prod.	43	488	64	658	1,325)
Other Minor Produces	11	227	13	294	)
Cellulose Plants	5	1,133	4	1,180	21,675
Wrapping Paper & Cardboard mfg.	9	284	18	371	128

Most of the wood industry installations were located in Klaipeda and some in Kaunas with the rest scattered through the rural areas. The following table shows the number of major, permanent installations in Kaunas and Klaipeda:

Enterprises	Total No.	Total Workers	Kaunas No.	Kaunas Workers	Klaipeda No.	Klaipeda Workers
Sawmills	88	2,165	20	530	15	982
Veneer and Ply-wood mfg. shops	3	627	1	23	2	604
Cellulose and Paper Plants	4	925	1	136	1	734
Match Plants	2	174	1	35	1	139
Other	63	755	29	374	13	144
Total	160	4,644	52	1,098	32	2,603

(163A)

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f. The wood industry's production in three representative years was:

Products	1931	1935	1937
Lumber (festmeters)	256.5	294.7	335.7
Plywood and veneer (Sq. M)	5,900.0	9,800.0	12,400.
Match wood (tons)	-	2,269.0	2,614.0
Cellulose (tons)	39,300.0	53,957.0	66,101.0
Paper (tons)	2,800.0	6,921.0	8,922.0
Cardboard (tons)	-	844.0	943.0

g. Gross income in these years was:

Product	1931	1935	1937
Lumber, plywood, and match production	32,669,000 Litai	24,212,000 Litai	38,745,000 Litai
Cellulose, paper, cardboard, and printed products	29,631,000 "	23,739,000 "	35,807,000 "
Total wood industry income	62,300,000 "	47,951,000 "	74,552,000 "
Total income all industry	301,174,000 "	239,764,000 "	349,714,000 "

(164)

h. The figures given above do not represent the true capacity of the Lithuanian wood industry. It was really much higher. As early as 1906, the Klaipeda wood industries were consuming about 600,000 festmeters of raw material each year and were capable of more than doubling this.(165) 3,500 workers were employed by these industries in 1906, but only 2,603 in 1937. The Kaunas-Jonava area had an annual estimated consumption capacity of 200,000 restmeters and the rest of Lithuania (excluding Klaipeda) of 100,000. Thus the normal production of all Lithuanian wood industries required 900,000 festmeters of raw material each year (about 1,500,000 festmeters of growing timber on the stump). This requirement could easily have been doubled if the supply was sufficiently abundant, but the Lithuanian forests were not sufficient. Many of the individual enterprises were idle.

i. There were many small saw mills distributed throughout Lithuania producing for domestic consumption. They usually consisted of a single saw frame with a circular saw powered by an obsolete steam locomotive. Corn mills were sometimes operated in connection with them (69 of this type in 1924).(166) There were about 500 saw mills in 1919 but only 271 in 1924, 200 of which were the small type.(167) The number continued to fall (particularly in 1932) and in 1937, there were only 88 employing 2,165 men. Most of these were larger, more important installations, and by 1939 they were obsolete and worn out. Some of the mills located in Kaunas produced partly for export, but most of their product was consumed in Kaunas. They were of the larger type (1-3 frames) with circular saws. Only a few had lumber kilns. Their frames were usually of obsolete German or English manufacture which worked very slowly but, nevertheless, did a good job. Normal yearly production of the mills in the Kaunas area (one shift) was 5-10,000 festmeters of lumber. There were no serious investments to improve them during the period. Most of the mills producing only for export were in the Klaipeda area. They had first been wind-driven but by 1899 all were run by steam power.(168) The typical Klaipeda mill had a double frame, a single frame, a double circular saw, and 2-3 single circular saws.(169) There were 30 of these mills in 1914, but only 10 from 1931-38. They produced an average of 30,000 festmeters of lumber a year. They consumed 800,000 festmeters of Lithuanian and 2,100,000 of imported Russian timber from 1931-38. As stated above, in 1939, these mills were outmoded. Their frames had been installed in the late

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1850's, designed for heavy timber of large dimensions. The blades were heavy and cut slowly. In the late 1850's the average timber was 20-25 meters long and 50-60 cm in diameter in the middle. By 1906, timber of this size was rare, and by 1934 the average middle diameter was only 31 cm; and in 1937 only 27 cm. The Soviet timber brought to Klaipeda from 1931-39 only averaged 22 cm. There is no more timber of the larger dimensions around Klaipeda either in East Prussia, Lithuania or Poland.(170) /See end of report for availability of a photograph of "mast timber" of larger dimensions in Vilnius County./ Almost all of the mills in Klaipeda had facilities for loading freighters. Lumber produced in Klaipeda frequently developed blue stain because of the damp coastal climate and the lack of lumber kilns to properly dry the product. As a result, by the time the exported lumber was delivered, its price had frequently fallen.

j. The saw mill industry was badly hurt by the political circumstances which interrupted the free flow of timber and made the mills dependent on the supply from the state forests. Only the best survived the crisis of 1932. Some of the mills owned by non-Lithuanians were put under contract by the forestry department for the production, on commission, of lumber from the timber furnished by the department. Nine mills owned by Germans and Jews worked under these agreements from 1931-37, three in Kaunas and six in Klaipeda. They received the following amount of timber and produced the following amount of lumber from it:

	Timber Received	Lumber Produced
Pine	610,403 festmeters	(447,909 cubic meters
Spruce	213,388 "	(
Oak	71,236 "	31,268 " "
Total	895,027 "	479,177 " "
Other lumber products of lower value	-	149,775 " "
Total Lumber	-	628,942 " "

All but 82,574 cubic meters of this production was sold by 1938. The government's share of the profits was 16,364,524 Litai or an average annual income of 2,335,218. It achieved virtual control of the mills by the addition of Lithuanians to their staffs. In 1937, the government bought the first mill which had been brought under this agreement, the Viesvile Lumber Company, which had a production of 40-45,000 festmeters a year and a potential of 80,000 (200-300 laborers.)(171) /See end of report for availability of a photograph of the Viesvile Lumber Company's yard./ In other industries not owned by Lithuanians, the Government bought stock. For example:

Lietmedis sawmill, Kaunas	100%
Appelhagen Joint Stock Company, Klaipeda	20%
Lumber Syndicate, Klaipeda	76%
Bisdon & Sons Plywood Company, Klaipeda	99.4%

k. The government profited nicely from the timber imported from the USSR. Four and sometimes nine Klaipeda mills worked on the Soviet timber and produced an average 93,400 cubic meters of lumber annually. Most of it was exported to England where it was considered very desirable. The net profit to the government was 21,000,000 Litai (3,000,000 annually), more than the total of all profit from domestic timber production. A typical assortment was that prepared in the Viesvile Mill for export to Germany:

Pine Lumber (Redwood)		1934	1935
Best 4-5 meter blocks, not edged	1st & 2nd quality	5.63%	3.43%
	3rd quality	0.04%	0.55%
Boards (no knots, not edged)	-	0.12%	-
Boards (no knots, plain edge)	-	12.29%	12.78%
Boards	1st & 2nd quality	2.6%	3.42% (Cont'd.)

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(Cont'd.)

Pine Lumber (Redwood)		1934	1935
Battens	1st & 2nd quality	0.11%	1.32%
Boards (unassorted)	-	5.44%	5.58%
Battens "	"	13.33%	20.95%
Boards	4th quality	17.67%	14.8%
Battens	4th quality	19.05%	20.4%
Beams	1st quality	5.16%	4.56%
Beams	2nd quality	2.13%	0.72%
Semi sleepers (ties)	-	13.8%	9.02%
Beams (smaller)	-	1.98%	0.22%
Miscellaneous	5th quality	0.65%	2.25%
Total	-	100%	100%
Cubic meters	-	18,093.97	17.505.82

Spruce Lumber		1934	1935
Boards (unassorted)	-	20.67%	14.21%
Battens "	-	27.61%	41.27%
Boards	4th quality	30.93%	29.73%
Battens	4th quality	20.79%	14.79%
Total	-	100%	100%
Cubic meters	-	7,792.72	5,970.15

The work plans called for a supply of timber to the mill of:

		1934	1935
Pine Logs	1st quality	41.71%	35.9%
" "	2nd "	27.87%	38.77%
" "	3rd "	-	0.26%
Spruce Logs	1st "	17.85%	9.91%
" "	2nd "	12.47%	15.03%
" "	3rd "	0.10%	0.13%
		100%	100%
Cubic meters	-	45,419.59	40,555.32

Approximately the same relationship of raw timber to lumber produced held true in other mills also.

1. It can be seen from the data and comparisons provided above that the timber provided by the state was of high value. The percentage of low quality timber was not high and thus, the ratio of lumber produced to timber furnished was good. From 1931-37, 895,072 festmeters of timber were delivered to the nine mills and 628,942 cubic meters of lumber were

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produced (about 70%). As a rule, an average of 60-62% of the total timber volume was produced in lumber.(173) Only 53% of the production was suitable for export (479.167 cubic meters).

m. The Forestry Department realized 14.4 Litai for a festmeter of evergreen timber in 1935 and 15.5 in 1936.(174) The gross income from the same timber after conversion into lumber at one of the commission sawmills was 29.2 Litai in 1934, and 27.4 in 1935. The 894,027 festmeters of raw timber used in these mills from 1931-37 brought the Department 16,346,524 Litai or about 18.2 Litai per festmeter.

n. Lumber prices were quite variable. In 1936, the Soviet price list for exported lumber as expressed in English shillings per 1 standard (approximately 4.5 cubic meters) cif London for price lists I and II (approximately January and August) was:

	List I	List II
Pine Lumber (unassorted) (2"-4" X 7")	232.5	275.0
Boards (1-7/4 X 7")	270.0	325.0
Pine Lumber (IV Class) (7" wide)	202.5	247.5
Boards (7" wide)	182.5	230.0
Spruce Lumber (unassorted) (7" wide)	197.5	237.5
Spruce Lumber (IV Class) (7" wide) Deals & Battens	182.5	220.0
Boards (7" wide)	172.5	220.0 (174A)

Average prices paid for 1 standard of Lithuanian lumber in English shillings were:

	1930	1934	1935
Deals, Battens, Boards	452	341	280 (174B)

o. The Plywood Industry(175)

(1) The first plywood factory was started in Klaipeda in 1898. It was reopened in 1923 after World War I by the Joint Stock Company for Wood Manufacturing. The same company opened another plant in 1929. In 1935, the company went bankrupt and was taken over by the state. In 1937, the state invested 700,000 Litai to restore the business. The plants used birch, northern alder, and some low quality spruce and pine. About three times as much northern alder as birch was used. In 1936, first quality logs of these woods cost 56 Litai per festmeter and second quality cost 32 Litai. The two plants annually produced 36,000 festmeters of timber. Another, in Kaunas, produced only 1,000 festmeters. The three employed 650 laborers in 1937 (385 were women). Plywood production in three representative years was:

1931	5,936 cubic meters
1935	9,615 " "
1937	12,286 " "

(2) The plywood produced was from 0.8-20 mm thick and in sheets 3,050 x 1,525 mm. The surface was of northern alder. About 30% of the raw timber volume was turned out in plywood. 95% of the product was exported, about 70% to England and the Scandinavian countries. A ton of plywood (about four festmeters of raw timber) sold for:

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1930	1,912 Litas
1934	1,185 "
1935	775 " (176)

The demand for plywood steadily increased even though the price went down. In 1936, transforming 1 festmeter of raw timber into plywood produced a 26% gross income.

p. The Matchwood Industry

(1) The raw material for matchwood was aspen. There were two plants, one in Klaipeda and another in Kaunas. The Klaipeda plant with 139 laborers produced only for export. (The demand for aspen logs and matchwood was so great that it paid to buy them in Lithuania and to ship them as far as Shanghai and China.) The plant in Kaunas, a monopoly sold by the Lithuanian government to Kreiger and Company of Sweden, produced for domestic demand and employed 35 workers. Together, the plants consumed about 20,000 festmeters per year. Both were fairly modern. In 1932, 2,578 cubic meters (1,000 tons) were exported; in 1935, 6,347 cubic meters (2,300 tons) and in 1937, 7,045 cubic meters (2,500 tons).

(2) The raw material prices for aspen logs at the freight station in 1936 were 70 Litas per festmeter for first quality and 40 Litas or less for second.(177) The price of one ton of match straw was:

1933	534 Litas
1934	525 "
1935	506 " (178)

Though the demand for match straw was steadily brisk, demand slowly went down.

q. The Furniture Industry

As Lithuania recovered from the war after 1920, furniture manufacturing increased. Most of the shops were of the cottage industry type and were located in Kaunas and Jonava. In 1938 about 700 persons were employed in furniture manufacturing. Annual production was worth about 3,000,000 Litas.(179) Hardwood (oak, ash, birch, northern alder) was the primary raw material. Cheaper furniture was made from pine. Most of the furniture was solid, but veneer production (oak and mahoghany) was brisk (Japanese-Korean). The veneer was imported via England. The product turned out was of good quality but for domestic consumption only. Steel furniture was not in use.

r. Prefabricated Home Production

Construction of prefabricated buildings was well developed around Kaunas after 1922. Skilled workmen (primarily Russian) constructed small (100 sq. meters, or two story - 200 sq. meters) buildings which they sold in the city. No fewer than 150-200 of these homes were built each year at a price of 3,000-5,000 Litas each delivered.

s. The Chemical Industries

(1) The only cellulose plant was located in Klaipeda.(180) In 1937, it employed 734 workers, consumed daily about 1,000 festmeters of Norway Spruce pulpwood and annually produced about 50,000 tons of cellulose. The by-product, methyl alcohol, was disposed of in the Bay of Kuronia. The plant was run on private German capital and had an adequate source of supply from the forests of the immediate area. The plant was kept in good condition and steadily modernized. It exported:

1930	53,898 tons	32,619,000 Litas
1935	52,890 "	10,307,000 "
1937	68,622 "	14,822,000 " (181)

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Its raw materials (spruce logs) cost:

1930	1 ton	(2 festmeters)	60 Litas
1934	1 ton	(2 festmeters)	26 Litas
1935	1 ton	(2 festmeters)	25 Litas (182)

Main competition came from Sweden, Finland and Latvia. The major customers were England, the Netherlands and Germany, and the Lithuanian production had a good reputation.

(2) Lithuania had to import paper through 1937, but a paper mill was constructed at a cost of 7,500,000 Litas in Kaunas (suburb of Petrasiunai) in 1933 and cut the imports considerably. (183) Imports ran:

1928	5,064 tons	7,000,000 Litas
1930	5,499 tons	7,500,000 Litas
1933	2,613 tons	2,800,000 Litas
1935	1,519 tons	1,900,000 Litas
1937	1,993 tons	2,600,000 Litas

The annual raw material (spruce pulp) consumption of the new plant was about 7,000 raumeters. 80 persons worked two shifts, producing 5-6 tons of wrapping paper each day. In addition, the plant produced writing paper and newsprint by combining 30% cellulose and 70% wood pulp mass. 13-15 tons of this material were produced daily (4,000 tons per year). The qualified personnel were primarily Estonians (nine). The permanent workers earned .4-2.0 Litas an hour in 1933. By 1938, the plant supplied all domestic paper demands. /See end of reportfor availability of a photostat of a photograph of the paper mill in Petrasiunai. The photostat is of poor quality./

(3) The two cardboard shops in Lithuania had 45 employees. Their product was for domestic use only and was made from pine cord wood. 830 tons were produced in 1934, 848 in 1935 and 943 in 1937. The value of a ton in 1930 was 691 Litas, in 1934, 510 Litas and in 1935, 400 Litas. Paper produced by mixing cellulose and cardboard mass brought about the same price. (184)

(4) Resin was produced from live Scotch pine trees under the direction of the Forestry Department in the state forests only. In 1937, 200 people were employed for this purpose. A single tree gave 1.1-1.47 Kg of resin per year. It cost 0.3-0.47 Litas to top this production. By 1939, 273,000 trees were being tapped for resin and in 1939 production had reached 242,288 Kg. (185)

(5) Colophonium was an important item in the native brewing industry. The most useful was that produced from the North American balsam. An average of 166 tons (91,000 tons total) was imported annually from 1930-37. In 1937, only 28 tons were imported, however, and after that domestic production supplied all the demand. A colophonium and turpentine plant was built in Alytus in 1935 at a cost of 65,721 Litas. During the production season (August to late December) 4-4,500 Kg of resins could be refined each day (450-500,000 Kg each production season) by the plants 12 employees. Production figures for two representative years were:

Years	Tons of Raw Resin Used	Production Turpentine Kg	%	Colophonium Kg	%	Total Kg	%of Raw tons
1936	226.7	32,949	14.5	151,074	69.4	190,043	83.9
1937	184.0	24,669	13.4	126,710	68.9	151,379	82.3

The turpentine produced included first quality (89.6%), second (7.0%), and third (3.4%). The colophonium quality was quite similar. The production in 1936 brought a net income of 18,643.94 Litas. In 1936 and 1937, turpentine sold from 1.05-1.50 Litas per Kg and colophonium from 0.45-0.80 Litas per Kg depending on quality.

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(6) Gasoline was extremely expensive in Lithuania because of a high import tariff. From 1937-40, 1 liter of benzine cost from 0.97-1.2 Litas (US$.76-.94 a gallon).(186) In the late 1930's, a mixture of ethyl alcohol and benzine could be bought for a little less. As a result of the expense of fuel, by 1937 Lithuania had only 564 trucks (mainly 5-10 ton capacity).(187) Charcoal was used as a liquid fuel substitute on some of these trucks. Its use was introduced from Germany and the demand for it increased steadily. In 1937 there were only two primitive facilities to manufacture charcoal, but in that year two portable charcoal ovens were imported from France and set up in Kaunas. Each could produce 1/2 ton of charcoal daily (35 shifts) from oak lumber waste. One raum meter of oak produced 95 Kg of charcoal. The production of 1 Kg cost 0.2 Litas; production of 1,000 Kg cost:

Material (10 raummeters)	90.0	Litas
Labor	46.5	"
Electricity	5.0	"
Amortization, repairs, admin.	54.5	"
	196.0	"

t. The investment in joint stock companies in Lithuania slowly increased from 1931-37:

Year	Companies	Total Capital	Foreign Capital Included
1931	69	89,794,000 Litas	32,433,000
1933	84	98,675,000 "	34,733,000
1935	84	105,465,000 "	45,207,000
1937	88	110,883,000 "	47,969,000(188)

Foreign capital made up as much as 43% of the capital of these companies and was represented mainly by electricity (Belgium), paper (Sweden), and chemistry (Germany and the Netherlands). The Lithuanian government had about 15,000,000 Litas invested, enough to control a few of the individual native companies. Its investments tended to increase while private investments remained about the same. Investment by Joint Stock companies in the Lithuanian wood industry alone was:

Year	Companies	Amount
1930	5	2,062,000
1931	7	3,162,000
1933	7	3,662,000
1935	7	3,662,000
1937	7	3,185,000

There was a decided increase in invested capital in the wood industries from 1929-30, caused by the Krieger Company's (Swedish) plan to build a paper mill, and government investments in the sawmills.

u. Conclusions Concerning the Wood Industries

(1) The creation of the Lithuanian Republic damaged the existing wood industries severely because of the political frictions which arose with neighboring countries and the closing of the Nemunas to timber traffic. Domestic industry in the Kaunas-Jonava area did not suffer as badly as the Klaipeda area because the Kaunas-Jonava production was not highly developed and internal timber supplies were sufficient for its needs. The Klaipeda area, however, was badly crippled and did not recover until the flow of imported Soviet timber somewhat eased its problems.

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The wood industry centers remaining in East Prussia (Tilsit, Koeningsberg, etc.) were hurt as badly and were forced to import from Sweden, Finland and even Argentina.

(2) The sawmill industry was in bad condition, outmoded and worn out. Large investments were needed to renovate and modernize it. Private enterprise, cut off from a steady timber supply and discriminated against by the political policies of the Lithuanian government (1926-39), could not afford the necessary investments. Only the government could afford them, and so, slowly but surely the saw mills became socialized. The policy of driving out the non-Lithuanians was fairly successful. By 1939, the industry, while still vital, was slowed very much but production, quantitatively and qualitatively, was very important to the Republic.

(3) The cellulose industry was run by foreign (German) capital, had firmly established markets and financially withstood the economic crises quite well. In the late 1930's, its production was especially brisk, its equipment modern, and it was in every way an efficient, profitable enterprise. Its export was an important item in Lithuanian foreign trade balance.

(4) Plywood was the least successful of the wood industry products. The industry went bankrupt in the 1930's and the government took it over. Raw material was in sufficient supply, production was good, and after government control was assumed, the product sold readily.

(5) All wood industries producing for export were capable of about doubling their production. The backbone of these industries was the Klaipeda area and its loss to Lithuania in 1939 was a severe blow to the wood industry of the country.

8. Commerce

a. The Domestic Wood Trade

The details of the domestic wood trade have been adequately described above. From 1919-26, almost all wood trade (domestic and foreign) was in the hands of Jewish merchants, but the authoritarian government of the later years took over most of this trade (particularly the export trade). The Forestry Department's sales were handled from Kaunas and by the local forest administration. In spite of the government intervention many private dealers remained in business although the number tended to decline (488 in 1929; 383 in 1937).

b. Foreign Trade

There were a few direct sales agreements between foreign buyers and Lithuanians, but generally export wood products were handled by brokers for commissions of 2-2.5%. Sales were generally made in the fall for spring delivery (f.o.b.). Payment was made after the ships cleared the shipping port. The exported wood products were classified and valued by Klaipeda (Memel) regulations, but in most cases the importing countries re-classified them after arrival according to their own regulations.(189)

c. Tariffs and Trade Policy

In addition to regular tariffs, the Lithuanian government levied an additional 20% on imports from countries which had no diplomatic relations with Lithuania. Almost all imported goods (except raw timber) were subject to duty as well as many exported items (including wood products). Returns from customs duties accounted for 18-19% of the Lithuanian Government's income. The economic crisis of 1932 forced Lithuania to follow the lead of other countries in introducing an import licensing system. By 1934, 85% of the items in the tariff list were licensed. In 1935, closer controls and regulations were introduced and Lithuania made trade agreements with 21 countries. Preferential tariffs were granted to the UK, France, Latvia and Estonia. The tariff rates for lumber and wood products were:(190)

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	Exports	1922	1924	1927	1929
1.	Lumber and mfg. wooden products (1 festmeter)	10 Litas	7 Litas	- Litas	- Litas
2.	Ties (1 festmeter)	20 "	same	same	-
3.	Pine and spruce timber (1 festmeters)	25 "	8 Litas	-	4 "
4.	Pulpwood (1 festmeter)	5 "	3 "	6 Litas	3 "
5.	Mine props (1 festmeter)	5 "	3 "	6 "	3 "
6.	Hardwood Timber (1 festmeter)	30 "	8 "	-	4 "
7.	Fuel wood (1 festmeter)	5 "	2 "	-	-
8.	Soft wood timber (birch and alder) (1 festmeter)	20 "	8 "	-	4 "
9.	Match wood (100 Kg)	0.15 "	-	-	-
10.	Wooden nails (100 Kg)	0.40 "	-	-	-
11.	Hoops (each)	0.04 "	-	-	-
12.	Shingles (60)	0.1 "	-	-	-
13.	Spruce bark (100 Kg)	0.13 "	-	-	-

	Imports(191)	1922	1924	1927	1929
1.	Rough timber	none	-	-	-
2.	Lumber or hewed wood (1 Kg)	"	0.02 Litas	-	-
3.	Veneer (1 Kg)	"	0.10 "	-	-
4.	Cork bark (1 Kg)	"	none	-	-
5.	Mfg. goods (painted), stoves, shingles (1 Kg)	"	0.15-0.20 Litas	-	-
6.	Cork products (1 Kg)	"	0.6 "	-	-
7.	Corks (1 Kg)	"	1.5 "	-	-
8.	Painted mfg. goods (1 Kg)	"	0.4 "	-	-
9.	Wooden furniture (plain) (1 Kg)	"	1.5 "	-	-
10.	Upholstered furniture (1 Kg)	"	5.0 "	-	-
11.	Other upholstered items (1 Kg)	"	2.5 "	-	-

The import duties were designed to protect Lithuanian producers against cheaper foreign production. The export duties were economically senseless, especially in the case of lumber and other wood products. The duties on exported lumber were designed to force more home manufacturing.

d. Exports(192)

(1) Exports were important in the Lithuanian economy, particularly exports of timber, lumber and wood products as seen below:

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Year	Value of All Exports (Litas)	Wood and Wood Products		
		Tons	Value (Litas)	% of Total
1928	256,900,000	321,222	72,743,000	28
1930	333,700,000	327,907	74,166,000	22
1932	189,100,000	194,322	36,168,000	19
1934	147,200,000	392,141	42,516,000	29
1936	190,500,000	299,071	33,347,000	18
1937	208,300,000	364,113	50,333,000	24

It can be seen that Lithuanian exports fell very sharply during the economic crisis and that, while the situation was improved in 1937, prices were still 30% below the pre-depression level.

(2) Lithuania exported the following wood assortment in 1937:

Timber	Tons	Value (Litas)
Fuel wood	767	10,000
Pulpwood	71,094	3,558,000
Oak	4,788	506,000
Aspen	21,352	1,774,000
Pine	8,403	228,000
Spruce	4,665	210,000
Miscellaneous	17,610	1,160,000
Total	128,679	7,446,000
Semi-manufactured Products		
Boards	64,612	9,685,000
Battens	50,391	6,847,000
Other Lumber	38,610	5,540,000
Cellulose	68,622	14,822,000
Total	222,235	36,894,000
Fully Fabricated Products		
Plywood	6,250	4,230,000
Match wood	2,534	1,047,000
Paper and Cardboard	114	46,000
Furniture	4,301	670,000
Total	13,199	5,993,000
Grand Total	364,113	50,333,000

(3) The most important importers of Lithuanian wood products were the UK and Germany.(193) From 1933-37, the following were exported to the two:

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	U K		Germany	
	% of Total Exports	% of Total Value	% of Total Exports	% of Total Value
Raw timber and other materials	10	4	89	52
Semi-fabricated wood	84	72	10	37
Fabricated Products	6	24	1	11

e. Imports(194)

Lithuanian imports and the importance of wood imports is shown below:

Year	Value of all Imports (Litai)	Wood Imports		
		Tons	Value (Litai)	% of Total
1928	291,100,000	18,289	8,540,000	3
1930	312,400,000	14,273	9,941,000	3
1932	166,900,000	21,844	5,652,000	3
1934	138,700,000	17,112	3,168,000	2
1936	156,000,000	148,488	6,936,000	4
1937	212,600,000	151,025	7,431,000	3

It can be seen that wood products were an insignificant import item. Of those wood products imported, the following were most important:

	1934	1937
Raw timber	14,503 tons	147,375 tons
Pulpwood	1,708 "	1,993 "
Fabricated wood	732 "	1,629 "
Colophonium	169 "	28 "
Totals	17,112 "	151,025 "

The difference in imports between the two years lies in the large amounts of timber imported from the USSR (average 170,000 festmeters annually) and a large rise in pulp wood in transit through Klaipeda along the Nemunas to Tilsit in East Prussia.

****

FOOTNOTES

PART II, CHAPTER III, A

(1) Pakstas, K, "Lietuvos Plotas ir Jyventogai", Draugas, 1951, p. 259

(2) Ibid

(3) "Lietuvos Misku Departamenti Metrastis", 1938, p. 9 (hereafter LMDM).

(4) Maciuka, B, "Lithuania in the Past 30 Years", 1955, p. 16

(5) Ibid, p. 17

(6) Ibid, p. 14

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(7) Mortensen, "Litauen", 1927, p. 11, Wielhorski, w, "Litwa," 1932, p. 9

(8) Ibid

(9) Mortensen, p. 54

(10) Maciuka, 1955, p. 16

(11) Pakstas, K, 1951, N 259, p. 315

(12) "Zemes UK 10 Statistika", 1948, p. 10

(13) Ibid

(14) ZU Statistika, 1948, p. 91

(15) "Lietuvo UK 10 Paskutinis Desimtmetis", Kaunas, 1938

(16) Ibid, p. 15, 17

(17) Ibid, p. 67 and 72

(18) Z.U. Statistika, 1948, p. 30

(19) LMDM, 1930, p. 31

(20) "Zemes Reformas Istatymas", Articles 2, 6, 58-59

(21) LMDM, 1938, p. 112

(22) Ibid, p. 1

(23) Ibid, p. 28

(24) Ibid, p. 11

(25) Ibid, p. 99

(26) Ibid, p. 17

(27) Ibid, p. 6

(28) Ibid, p. 6

(29) Ibid

(30) Ibid

(31) Ibid, p. 19

(32) Vilcinskas, J, "musu Girios", 1931, p. 322

(33) L M De/M, 1940

(34) Ibid, p. 20

(35) Vilcinskas, "Musu Girios", 1931, p. 319

(36) Ibid, p. 315, 322

(37) Krudavicius, M, "Vartis", 1954, p. 50, Rukuiza, A., "Girios Aidas", 1952, N 1 - 2, p. 4

(38) Buchholz, E. - "Mitteilungen", 1948, p. 3, footnote 1

(39) Ibid

(40) LMDM, 1940, p. 20

(41) Vilcinskas "Musu Girios", 1931, p. 322

(42) LMDM, 1940, p. 19

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(43) Mortensen, 1947, author

(44) Matulionis, P., "Visa Lietuva", 1922

(45) Vilcinskas, "Musu Girios", 1931, p. 224

(46) LMDM, 1940, p. 20

(47) This figure was probably arrived at without considering the deadwood which made up a large part of the yearly harvest - author.

(48) "Miskininku Kalendorius", 1941

(49) Rubikas, A., "Musu Girios", 1936, p. 28

(50) Matulionis, A., "Lesnoye Khozioistvo Sovietskoy Litvy", 1950, p. 18

(51) Vilcinskas, "Musu Girios" 1931, No. 5, p. 328

(52) Ibid

(53) LMDM, 1937, p. 9

(54) Vilcinskas, "Musu Girios", 1936, p. 409

(55) LMDM, 1940, p. 18

(56) Ibid, 1937, p. 9

(57) Vilcinskas,"Musu Girios", 1938, p. 489, 490

(58) "Apie Medzio Exporta", "Musu Girios, 1933, p. 477

(59) Author's opinion

(60) Ibid

(61) "Z U Statistika", 1948, p. 9

(62) Ibid

(63) LMDM, 1938, p. 9

(64) The source of this entire section is LMDM, 1940, p. 6-14

(65) LMDM, 1940, p. 9

(66) Nekhoroshev, "Lesnoye Delo", 1916, p. 18, Surozh, III/164

(67) "Vyriausybes Zinios", 1924, N 165

(68) Musu Girios, 1936, p. 69

(69) LMDM, 1940, p. 36

(70) Z U Statistika, 1948

(71) LMDM, p. 37-38

(72) LMDM, 1918-38, p. 22

(73) LMDM, 1940, p. 25

(74) Ibid, 24

(75) Author's experience

(76) LMDM, 1940, p. 14

(77) Ibid, p. 16, Juodakis, J., "Metu Vidurinei Misku Mokyklai", "Musy Girios", 1943, p. 64

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(78) LMDM, 1940, p. 16

(79) "Musu Girios", 1943, p. 96

(80) Rauktys, M., "Girios/Aidas", 1951, N 3-4, p. 1

(81) It was a practical rule that only 10% of the misappropriations were discovered and reported - author

(82) "Musu Girios", 1935, p. 239

(83) "Circular N 14201, 1934, V II. 3 in "Musu Girios", 1934, p. 400

(84) LMDM, 1940, p. 78

(85) Ibid, Rauktys, 1951, N 3-4, p. 6

(86) In practice, proper reforestation was not always reached before adjoining strips were cut - author

(87) Vilcinskas, Musy Girios, 1931, N 5, p. 328

(88) LMDM, 1940, p. 20

(89) Ibid, 1940, p. 19

(90) Vilcinskas, "Musu Girios", 1931, N. 5, p. 322

(91) LMDM, 1940, p. 46, Jameikis, M., "Misku Deportancento", Musu Girio Milzinzi", 1950, p. 41

(92) Gureckas, M., Ind Vasilauskas, A., "Medzio Promone Lietuvo", 1953, p. 11

(93) Kubilias, A., "Lietuvos Ukeo Perspectyuos", 1930, p. 49

(94) LMDM, 1940, p. 46

(95) Ibid, p. 144

(96) Ibid, p. 46

(97) Matulionis, A., "Lesnoye Khoziaisturo Sovietskoy Litvy", 1950, p. 9

(98) Kubilius, 1930, p. 49

(99) Author

(100) Ibid

(101) "Musu Girios", 1940, p. 8-9, p. 408

(102) LMDM, 1940, p. 7

(103) Ibid, p. 70

(104) LMDM, 1940, p. 71

(105) Jameikis, 1950, p. 42

(106) "Miskininku Kalendanis," 1938, p. 51

(107) Ibid

(108) Viliusis, G, "Musu Girios", 1940, p. 550

(109) One ton of structural wood = 1.67 festmeters;
" " " rough timber and soft wood = 1.50 festmeters;
" " " pulpwood = 2.00 festmeters;
" " " lumber = 2.78 festmeters;
" " " paper = 2.6 festmeters;
Skerys, A., "Entwicklung und Umfang", 1947, p. 156

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(110) Jameikis, "Musu Girios", 1939, p. 153

(111) "Z U Statistika," 1948, p. 214

(112) LMDM, 1940, 92-93

(113) Ibid, p. 95

(114) These estimates are far too low - author

(115) LMDM, p. 80

(116) Matulionis, P., 1922

(117) Matulionis, A., 1950, p. 10

(118) LMDM, 1940, p. 81

(119) Ibid, 1940, p. 90

(120) Matulionis, A., 1950, p. 20

(121) Kuprionis, T., "Musu Girios", 1939, p. 156

(122) LMDM, 1940, p. 47, 113

(123) Ibid, p. 97

(124) Ibid, p. 126

(125) Ibid, p. 32

(126) Ibid

(127) Author

(128) Kubilius, A. K., "Lietuvos ukoi Perspektyvos", Kaunas, 1930, p. 175

(129) Author

(130) LMDM, 1940, p. 32

(131) Ibid

(132) Ibid

(133) Ibid, p. 20

(134) Viliusis, J., 1940, p. 551

(135) Festmeters per inhabitant per year

(136) Viliusis, 1940, p. 546

(137) Ibid, p. 486

(138) Ibid

(139) Ibid, p. 489

(140) Author

(141) "Pirmas Nepriklausomybes Desimtmetis", 1955, p. 170

(142) LMDM, 1940, p. 54

(143) Vasiliauskas, A.,"Musu Girios", 19401, N 1, p. 3

(144) Vilusius, 1940, p. 554

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(145) Ibid, p. 486

(146) "Lietuvos Paskutinysis ukio Desimtmetis", 1938, p. 80, (hereafter LPUD)

(147) Ibid

(148) Viliusis, "Musu Girios", 1940, p. 56

(149) LPUD, 1938, p. 12

(150) "Technikines Medziagai Gaminti Salygos", "Musu Girios", 1933, p. 430

(151) LMDM, 1940, p. 49

(152) Jameikis, M., "Musu Girios", 1935, p. 455, 513; and 1933, p. 439

(153) "Musu Girios", 1936, p. 560

(154) "Lictuvos Placiuju Gelezinkeliu Tarifas", 1927, p. V

(155) LMDM, 1938, p. 120

(156) Ibid, p. 125

(157) "Musu Girios", 1935, p. 297

(158) Kuprionis, "Musu Girios", 1935, p. 650

(159) Maciuka, "Lithuania in the Past 30 Years", 1955, p. 305

(160) Ibid

(161) Ibid, p. 308

(162) LPUD, 1938, p. 41

(163) Marchet, J., "Holzhandel Nordiutschlands", 1908, p. 12

(163-a) Skerys, A., 1948, p. 42, The figures do not coincide with earlier tables because they do not include smaller installations.

(164) LPUD, 1938, p. 20

(165) Marchet, p. 22

(166) Gureckas, M., Vasiliauskas, A., "Medzio Promone Lietuvoje", 1953, p. 25

(167) Ibid, p. 25

(168) Ibid, p. 20

(169) Ibid

(170) Marchet, J., p. 11

(171) LMDM, 1940, p. 55

(172) Matigosaitis, N., "Medziu Promones akc. B-VE. Viesvile", "Musu Girios", 1936, p. 434

(173) Author

(174) Jameikis, "Musu Girios", 1936, p. 23

(174-a) Vasiliauskas, "Musu Girios", 1936, p. 587

(174-b) Jameikis, "Musu Girios", 1936, p. 140

(175) Skerys, 1947, p. 54, LMDM, 1940, p. 53, 58-59

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(176) Jameikis, "Musu Girios", 1936, p. 137

(177) Ibid, p. 27

(178) Ibid, p. 137

(179) Skerys, 1947, p. 56

(180) Ibid, p. 41

(181) LMDM, 1940, p. 116

(182) Jimeikis, "Musu Girios" 1935, p. 140

(183) LPUD, 1938, p. 81

(184) Kuprionis, J., "Musu Girios", 1933, p. 23, LPUD, 1938, p. 44

(185) Skerys, 1947, p. 60-61

(186) Musteikis, "LZU Statistika", 1948, p. 211

(187) LPUD, 1938, p. 120

(188) Ibid, 1938, p. 30-32

(189) Ibid, p. 59-66

(190) "Vyriausybes Zinios", N 296, 1929; N 252, 1923; N 144, 1923; N 173, 1924

(191) Ibid, 1924, No. 154, Vol. 2

(192) LPUD, 1938, p. 76-78, LMDM, 1940, 115-117

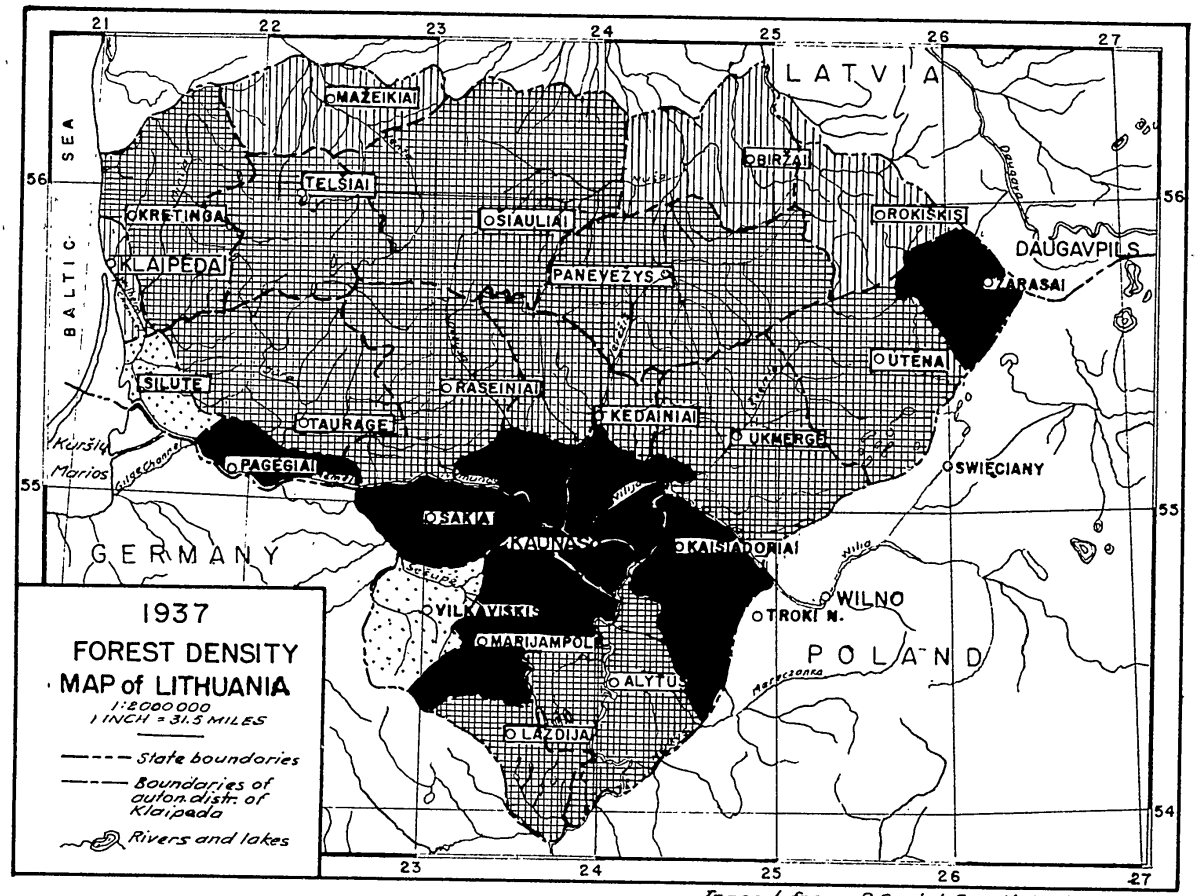
(193) LMDM, 1940, p. 73

(194) LPUD, 1938, p. 67; LMDM, 1940, p. 117

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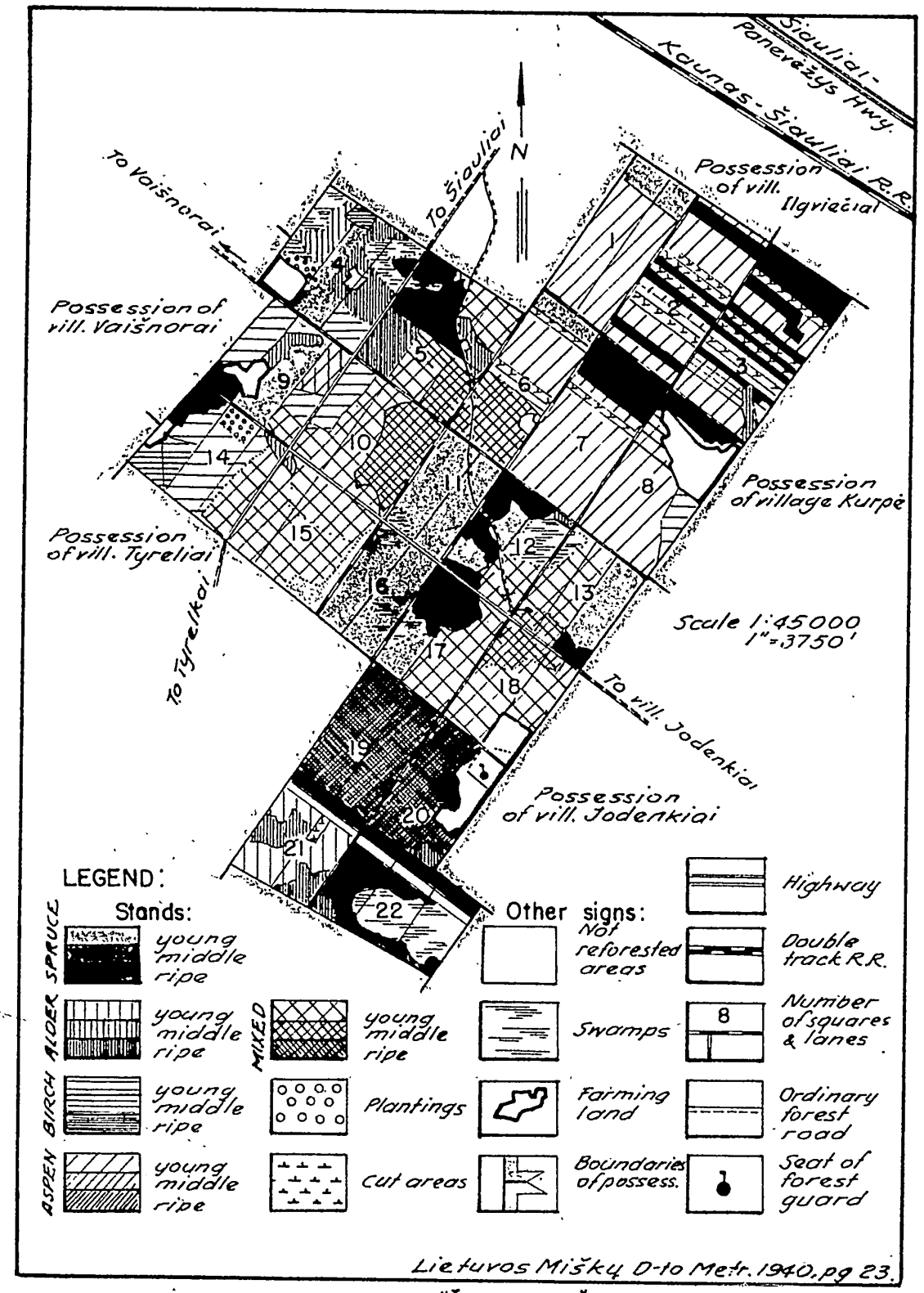
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#21



Lietuvos Mišku O-to Metr. 1940. pg 23.

STAND PLAN OF "ŠVENDRIAI" RANGE

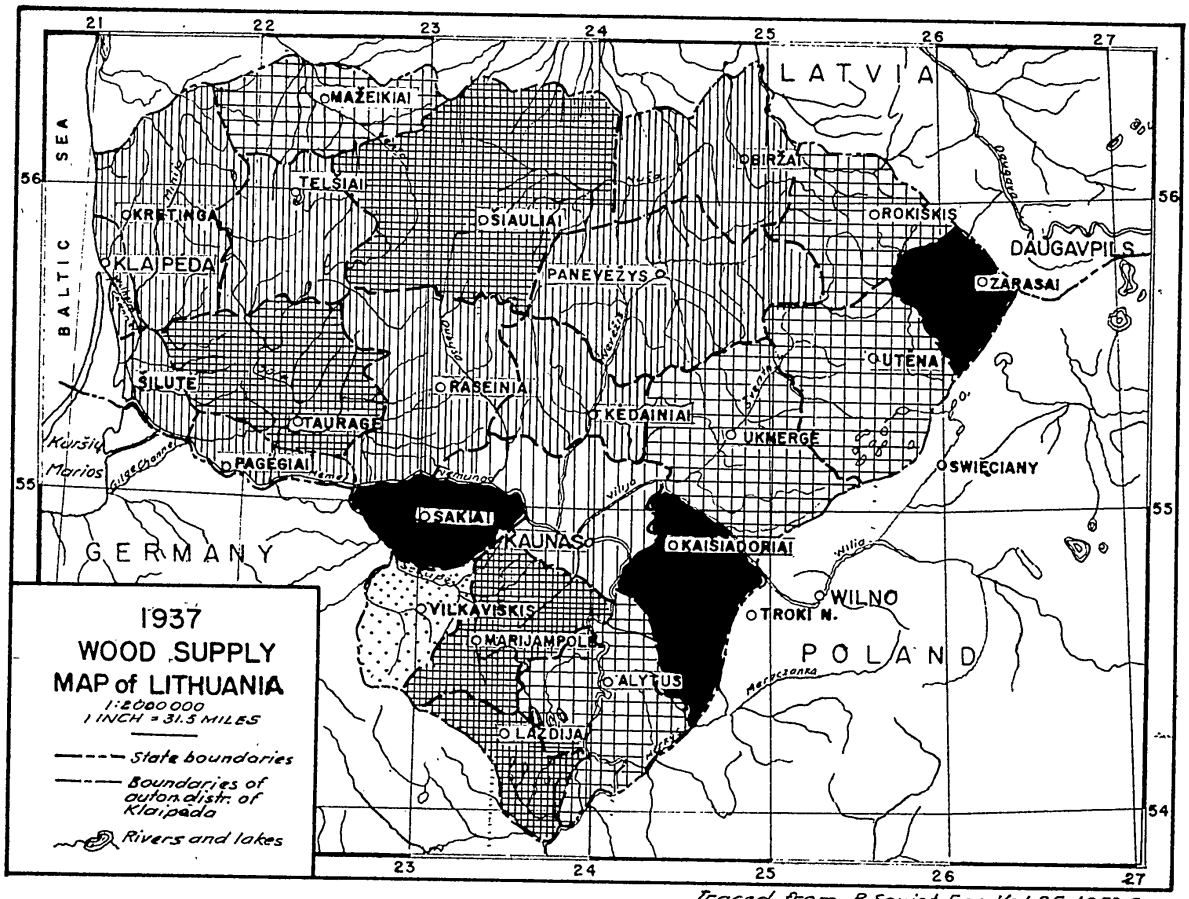
Area 1287.7 ha.

(Forest master district Šiauliai., Survey 1930)

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#22



1937
WOOD SUPPLY
MAP of LITHUANIA
1:2000000
1 INCH = 31.5 MILES

——— State boundaries
——— Boundaries of autonom. distr. of Klaipeda
Rivers and lakes

LEGEND:
0-.60
.61-.80
.81-1.00
1.01-1.20
1.21-1.40
1.41 — and more
Festmetres (cub. metres) per inhabitant and year

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~~2050~~ 404

#23

45MN USSR LITHUANIAN SSR KAUNAS 54 54 N 23 54 E

50X1-HUM



Forest Department head quarter in Kaunas

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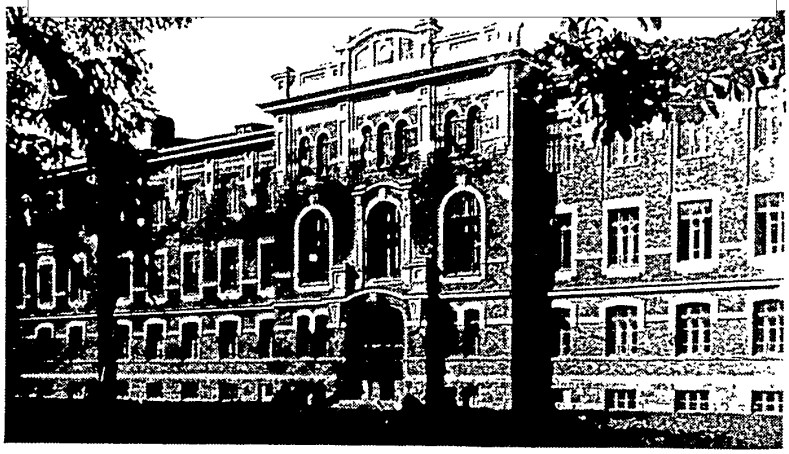
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~~34200~~ 4214

#24

45MN USSR LITHUANIAN SSR DOTNUVA 55 42 N 23 54 E

50X1-HUM

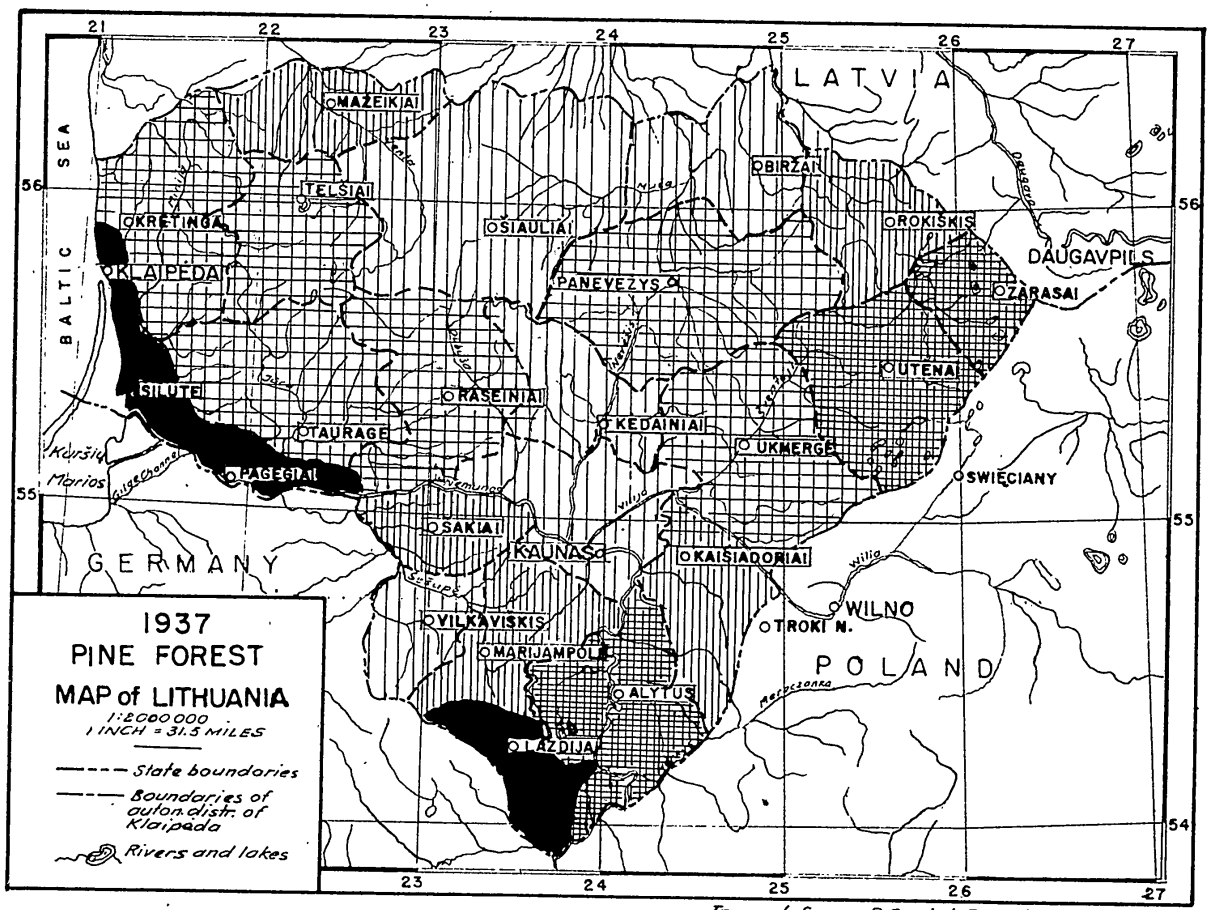


agricultural
Sec. College in Dotnuva

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#25



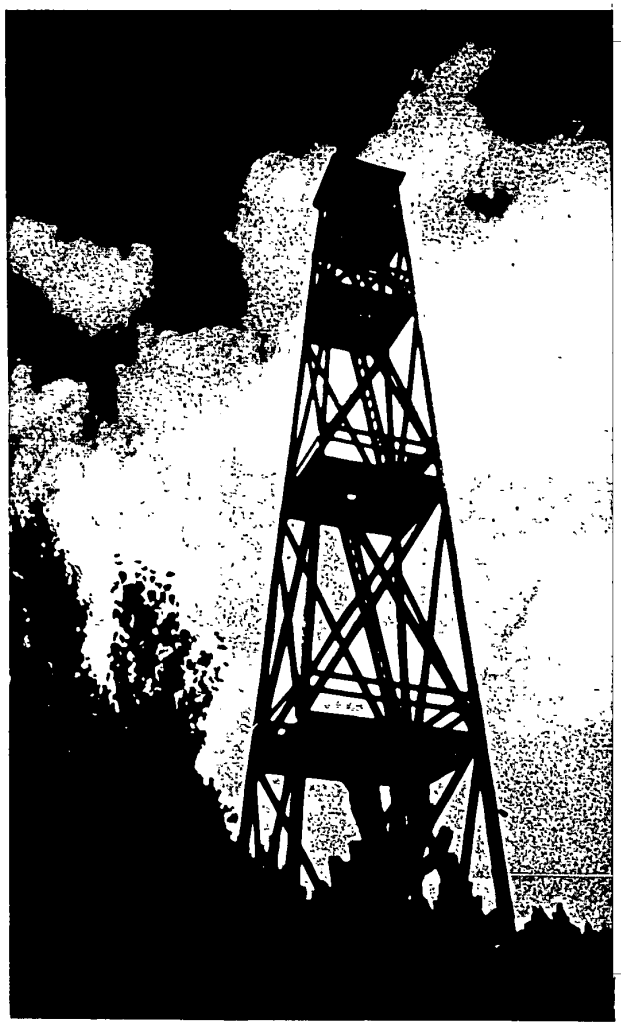
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H57

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45MN USSR LITHUANIAN SSR

#26

The forest fire watch tower in forest master district of Jurė. (1942)

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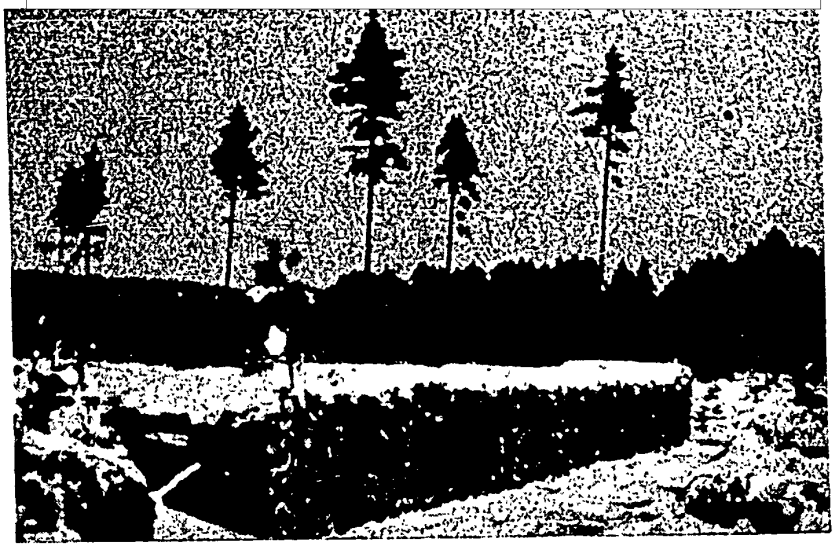
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#27

45MN USSR LITHUANIAN SSR
"CLEAR-CUT" STRIP IN PRIENAI FOREST DISTRICT.

50X1-HUM



Clear cut in forest master district Prienai.

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#28

45MN USSR LITHUANIAN SSR

PEASANTS PREPARING AREA FOR SCOTCH PINE SEEDING IN JURE

50X1-HUM



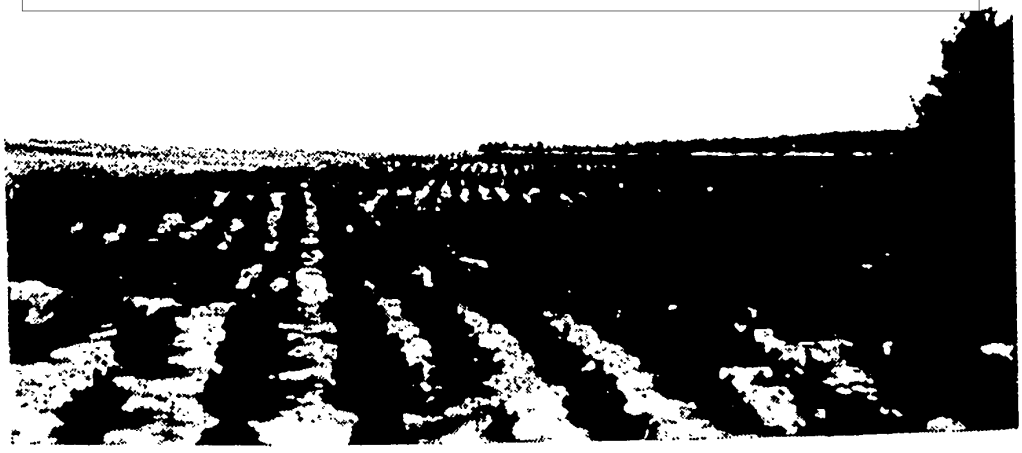
The seeding of scotch pine
in for. mast. distr. # Jure

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#29

45MN USSR LITHUANIAN SSR PALANGA (NR) 55 55 N 21 04 E
REFORESTATION OF SAND DUNES ALONG BALTIC COAST.

50X1-HUM

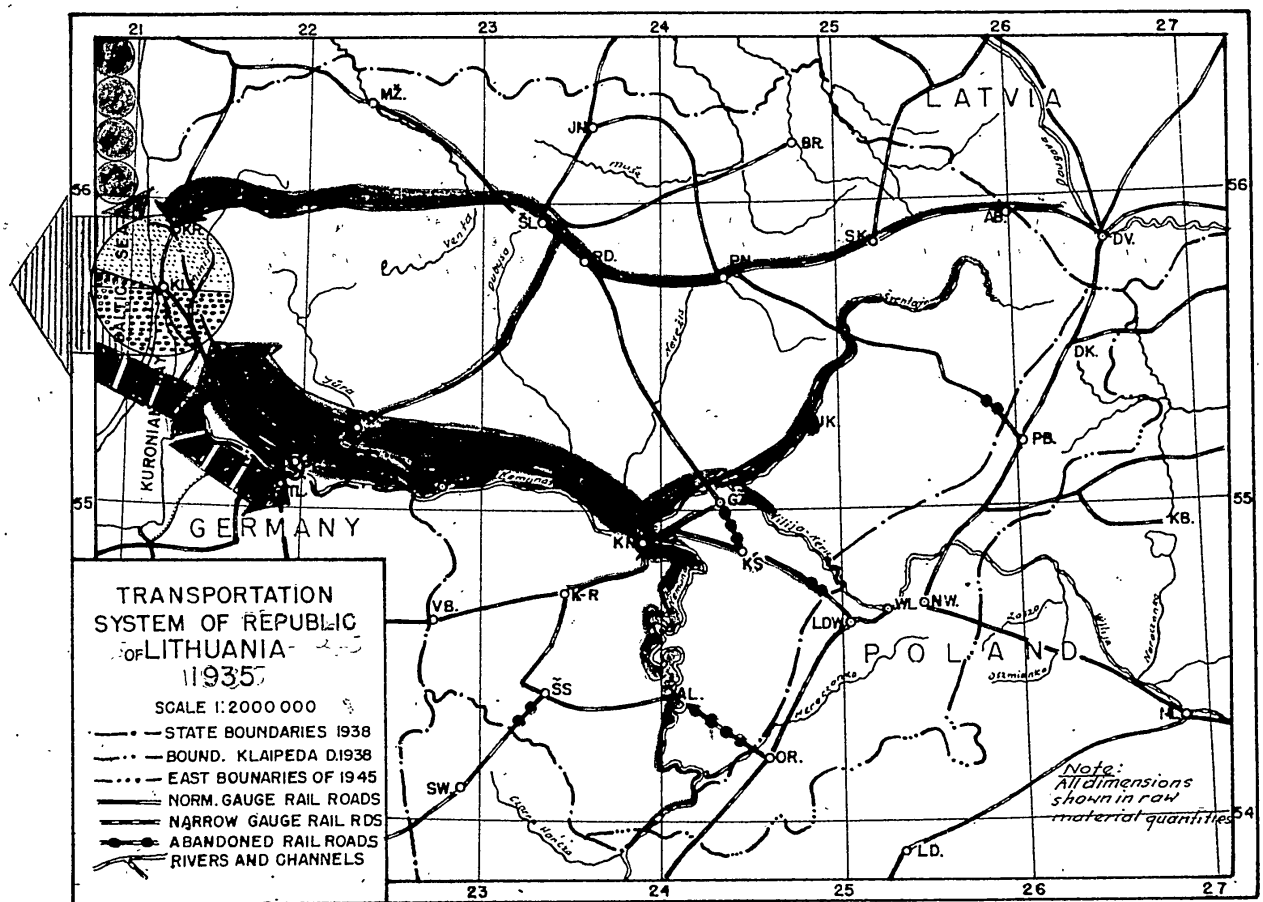


The reforestation of sand dunes around Polanga on the Baltic Sea shore.

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#30



APPROXIMATE SCHEME OF TIMBER CIRCULATION IN LITHUANIA IN 1935

Sources: M. Jameikis. Rasty transportas. 1935. M.G. pg. 296
Paskutinysis Lieturos ukio deklinimetis 1938, pg 124 ir 128
A. Skerys. Entwicklung..... 1947, pg. 39.

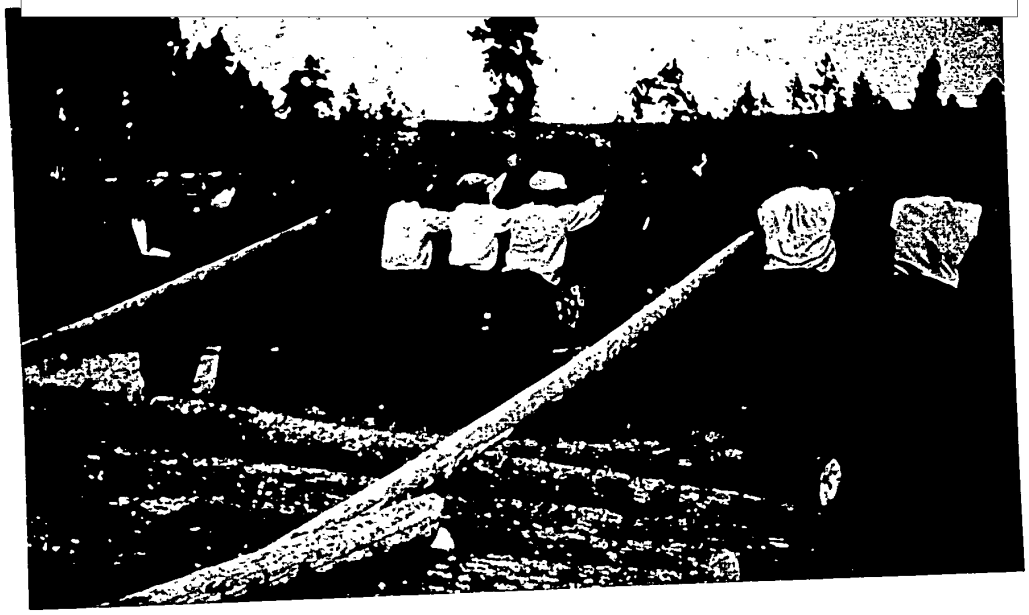
513

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#31

45MN USSR LITHUANIAN SSR
WORKERS LOADING TIMBER IN KAZLU-RUDOS



50X1-HUM

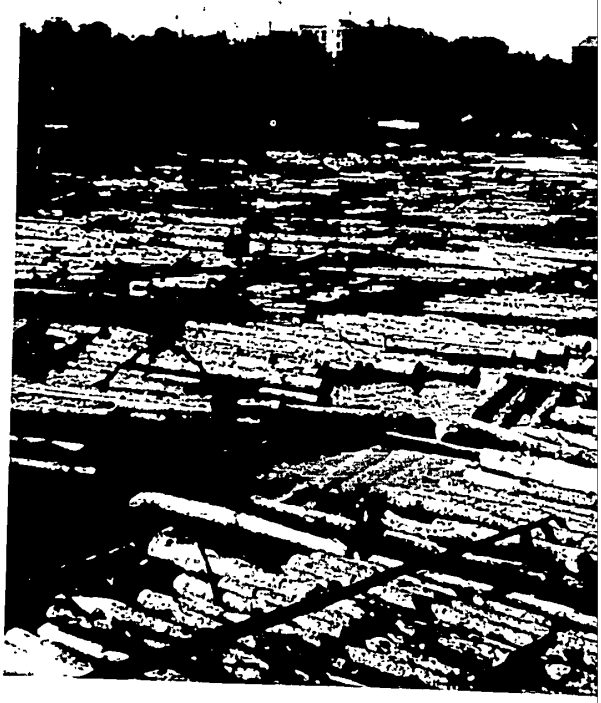
The shipping of timber in Forest master. dis trict Kazlu-Ruda

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#32.



45MN USSR LITHUANIAN SSR
FLOATING OF TIMBER ON VILIYA RIVER.
PHOTO #32

50X1-HUM

Floating of timber on Vilia - Neris

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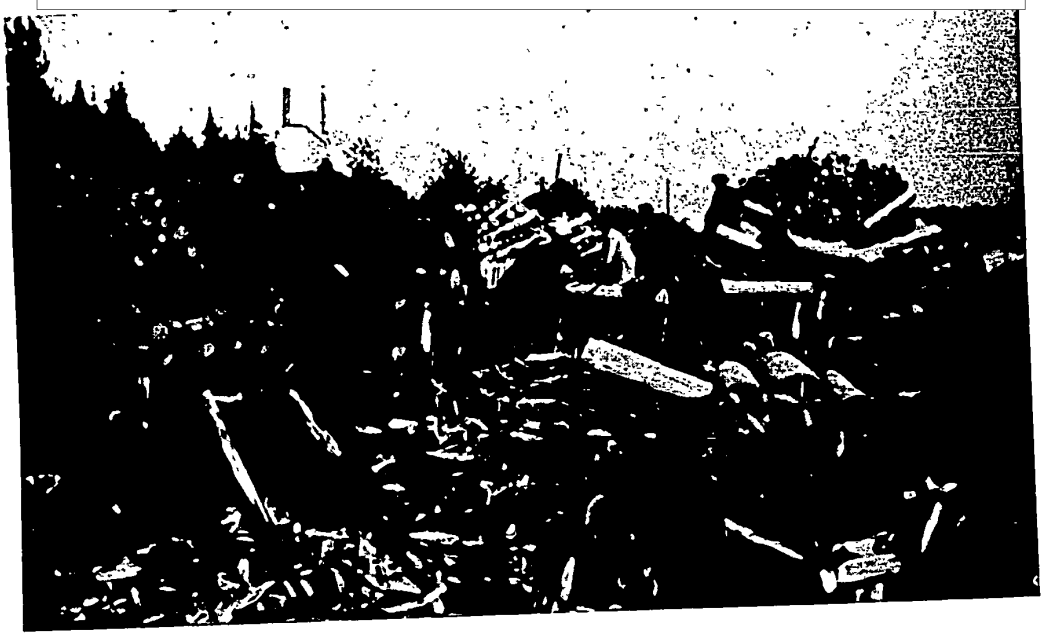
4 pages - 552

#33

45MN USSR LITHUANIAN SSR

WORKERS STRIPPING BARK FROM PULP WOOD IN KAZLU-RUDOS DISTRICT.

50X1-HUM



Removing of bark from pulp wood in forest master district Kazly-Ruda

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45MN USSR LITHUANIAN SSR

50X1-HUM



The mast timber in county of Vilno.

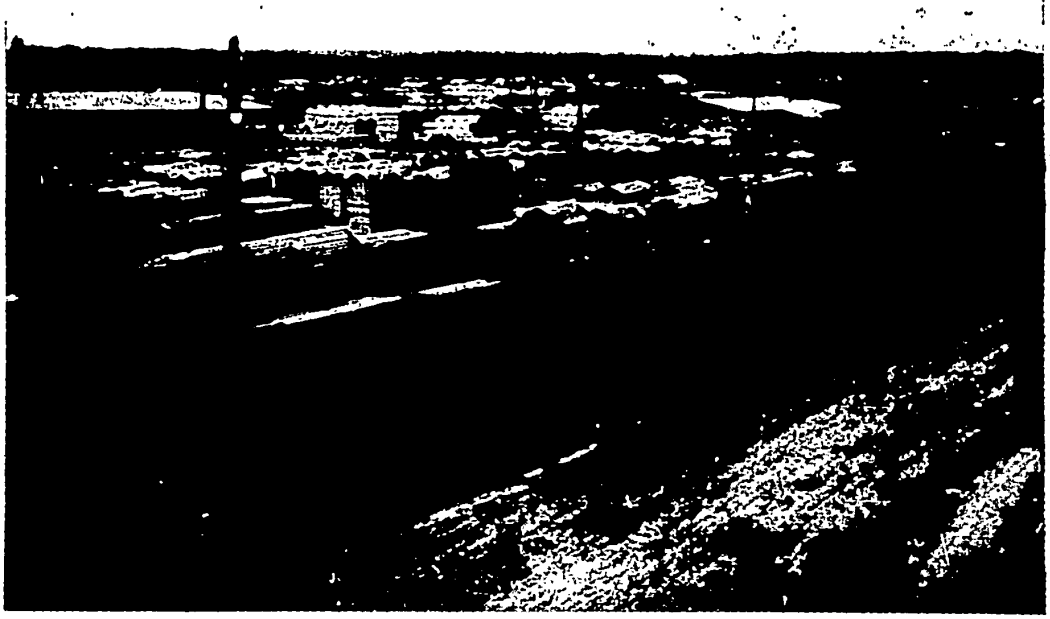
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50X1-HUM

45MN USSR LITHUANIAN SSR VIESVILE 55 03 N 22 24 E
LUMBERYARD.

50X1-HUM



Luber yard of " Timber Industry Co
in Viesvilé

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50X1-HUM

CHAPTER IV. LITHUANIA, 1939-40

A. The Loss of Klaipeda

1. In March 1939, Nazi Germany reoccupied the Klaipeda area without meeting opposition and proclaimed it part of the third Reich. Lithuania lost 2,842 sq. km. of territory and 150,000 people.(1) The loss of the ice-free port of Klaipeda with its Nemunas River outlet was as important as the loss of the area and made Lithuania dependent upon Germany for access to the port through which most of its exports flowed (Germany left a small free zone for Lithuanian exports to pass through). The loss of the huge investments made by the Lithuanian Government in the Klaipeda area was also severe.

2. The Klaipeda area included about 47,000 hectares of forest divided into three forest master districts which had been continuously managed according to the German style of forestry. The Lithuanian forestry regulations had not been applied in them and the loss of Klaipeda, therefore, did not affect Lithuanian forestry practices. Actual loss (over 55% of the wood industry) included 15 saw mills (987 employees), 2 plywood shops (604 employees), one paper mill (734 employees), one match shop (139 employees), and 10 other establishments (127 employees).(2) These losses included most of Lithuania's heavy (export) wood industry. All that remained were the few large saw mills in Kaunas and the small local industries. The wood and lumber stock on hand in Klaipeda was left to the Lithuanian Government and it was permitted to sell it. The bulk of Lithuanian wood exports immediately changed from manufactured goods to rough timber (primarily pulpwood for the cellulose plants in Tilsit and Klaipeda).

B. The Annexation of Vilno

1. (a) After the defeat and partition of Poland between Germany and the USSR, Lithuania received a portion of the Voyevodship of Vilno from the USSR. This was the result of the Soviet Lithuanian Pact of 10 October, 1939. The area received included 6,655.5 sq. km. and 424,700 people.(3) The city of Vilno alone had 209,442 people. The Lithuanian administrative system was introduced. The Lithuanian territory now had 59,731 sq. km. and 3,032,864 people. The newly annexed portion was heavily overpopulated, its soils were very poor (sandy and swampy), the standard of living was low, and the general economic situation was poor. The one month Soviet occupation had stripped the vital resources of the area pretty thoroughly, including deportation of skilled manpower and intellectuals to Siberia.

   (b) Lithuania immediately applied its Land Reform Act to Vilno, and all forests over 25 hectares were seized by the state. 49,616 hectares (of a total of 64,494) were expropriated from 253 estates (of a total of 358), 77% of the total. Peasant possessions were left untouched and former Polish forests were simply incorporated into the Lithuanian State Forest System. Land use in this area in 1831 had been:

Agricultural land

arable land	-	1,065,000	hectares	(39.1%)
gardens & orchards	-	53,000	"	(1.9%)
meadows	-	538,000	"	(12.4%)
pasture	-	297,000	"	(10.9%)
forests	-	525,000	"	(19.3%)
other uses	-	448,000	"	(16.4%)
Total Area	-	2,726,000	"	100.0%(4)

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(c) The forest areas of the portion of Vilno given to Lithuania in 1939 included 142,340 hectares, or 21.2% of this total, 59,714 hectares (42%) were state forests and 82,626 (58%) were private forest.(5) The ranges were distributed by size as follows:

Less than 30 hectares -	9,160	hectares
30-500 hectares	81,026	"
500 & up hectares	52,154	"
	142,340	"

The largest areas of solid forest were south and north of the city of Vilno. They were largely state forests.

(d) The Vilno forests included:

Type	State Forests		Private Forests	
	Hectares -	%	Hectares -	%
Pine	37,200	62	52,300	63
Spruce	8,400	14	13,300	16
Oak	600	1		
Birch	9,000	16	11,000	12
Northern Alder	3,914	7	6,126	9
	59,714	100	82,626	100 (6)

(e) The expropriated private forests were divided by age as follows:

Type	Young Hectares	%	Middle Age Hectares	%	Ripe Hectares	%	Total	%
Pine	16,866.8	52.0	12,219.7	38	3,027.7	10	32,114.2	100
Spruce	2,315.2	37.3	2,175.3	35.1	1,698.5	26.6	6,187.0	100
Birch Alder & Aspen	2,303.7	41.2	1,578.4	33.0	899.8	25.8	4,781.9	100
Other	20.0	12	58.2	35	83.4	53	1,616	100
Total	21,515.7		16,031.6		5,709.4		43,246.7 (7)	

(f) The State forests were in better shape. They yielded an estimated 210,000 festmeters of timber each year.(8) Polish sources placed it even higher, 300,000 festmeters per year, or three per hectare.(9) The private forest yield was about 1-1.5 festmeters per hectare. Many of the Vilno forests had been devastated by fire during World War I, grew on poor soils, and had been decimated by timber thefts from 1918-1919.(10) Therefore, they were quite light in growth. Exploitation of three festmeters per hectare was too heavy. From 1937-1939, an annual average of 211,000 festmeters were cut on 767 hectares, or 2.75 festmeters per hectare. In general, the Vilno forests were similar to those in Lithuania.

2. Status of Polish Forestry and Forestry in the Vilno Area

(a) The Vilno forests had been managed by the Forest Directory in Warsaw, a part of the Polish Ministry of Agriculture and Land Reform. The Directory included a Forestry Research Institute; divisions of wood production, by-products, use and realization, and organization and control; and judicial, financial, technical and employment bureaus. There were nine territorial units, among them the Vilno territory. Each had an administrative system similar, though on a smaller scale, to the main Directory. The Vilno area, in addition to the divisions and bureaus mentioned above, had a Fisheries Bureau and a Division of Forest Protection. The forestry offices of the Vilno area employed 129 civil

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service and 97 temporary employees.(11) There were 41 forest master districts in the whole Vilno area and 198 forest ranger districts. Each of the latter had 3-5 guards.(12) A forest master district consisted of 11-12,000 hectares; a forest ranger district 2,300-2,500 hectares; and a forest guard's territory 500-600 hectares.

(b) All officials of the Polish Forestry Service down through the forest masters were college educated professionals. Some of the forest rangers had had professional training and all were given periodic training courses. In general, the level of education and forestry was higher than that in Lithuania or Russia. All of the forest guards were literate. Most had elementary school educations and additional special forestry training. The Polish Forestry Directory demanded more of its personnel than the Lithuanian Forestry Department, and maintained closer control over them. Each territorial office had a special representative of the state control department to watch over its activities.

(c) The Polish foresters were paid much the same as the Lithuanians. The supplements to their pay were about the same, but their housing was better. Every forest guard had a farmstead and many of the buildings were new and had sanitary facilities. The homes of the rangers and forest masters were somewhat better than those of the guards and some of the newer ones included water pumps and septic tanks. In spite of the improvement over the Lithuanian standard, however, Polish foresters were poorly paid and corruption was a problem, just as it was in Lithuania.

(d) Like other states formed after World War I, Poland included within its boundaries portions of many former nations. Each portion was subject to its own laws. In areas which had long been Polish, the code of Napoleon was in use but the eastern areas were under Russian laws; the southern under Austrian; and the northwest, under Prussian. The Polish areas which had been under Russian rule before World War I had for a long while (since 1795) retained Polish customs and administration. After 1890, however, the Russians had started to replace the Poles with Russians and had introduced the Russian Forestry Code. By World War I, the change-over had been completed. After the war when Poland reassumed control of these areas, it introduced a uniform forest code throughout all its territory. It was the only newly formed state which did so.(13) General forestry laws were passed in 1924 and 1936.(14) The latter liberalized the forestry codes, decentralizing the forestry administration somewhat and separating its budget from the state budget. The result were very good. Reforestation and construction progressed rapidly and forestry officials received more freedom of action and more responsibility.

(e) Polish forestry had long had a more adequate supply of literature than the Lithuanians had. The forestry magazine "Sylwan" was published in Lvov from 1888-1939, and there were several other professional publications from 1919-1939, some of which were of a high professional level. From 1919-39, about 1216 graduate theses and 32 senior research works were published.(15)

(f) The forestry division of the agricultural college at Pulawy, established in 1869, had done some applied research in Polish state forests and published some research works.(16) After 1924, the work began again (after being interrupted by World War I), and in 1934 a regular research institution was set-up. From 1934-1939 this institution published 32 useful books on forestry.(17) The several forestry colleges did parallel research and the Poles Paczoski, Sokolowski, Tyszkiewcz, and Szafer, did work of sufficient merit to win recognition in western Europe. In general, Polish forestry was more dynamic, intensive and agressive than Lithuanian forestry.

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3. Forest Planning and Conservation in Vilno

(a) All state and larger private forests of the Vilno area were operated under regular work plans. The plans operated well in the state forests but failed in the private forests because the owners were foreed by economic necessity to find excuses to cut their timber. Thus in 1939, the state forests were in fairly good condition, except for small areas which were devastated during the brief Russian occupation of 1939, but the private forests were in bad condition. The Vilno peasant forests were no better than those in Lithuania. A forest preservation law, similar to the one in Lithuania, applied to the state and larger private forests. The forestry act of 1936 provided funds for purchasing devastated areas and reforesting them. The administration received so many offers of plots for sale that it was unable to buy them all.

(b) Timber thefts, which broke out at any sign of a weakness in the regime, were suppressed by a tightly controlled, expensive system employing numerous guards. The pressure on the forests was complicated by overpopulation of a poor area whose forests were sparse and light anyway. Every person in the rural areas depended on the forests for some part of his living, legally or otherwise.

(c) Forest fires were a regular occurrence and caused great damage because the forests were mainly pine. One of the reasons for the high number of guards was the fire danger. Grazing in the forests was always allowed because of the poverty of the native population and it was difficult to keep the animals away from the young tree stands. Grazing also increased the fire hazard.

(d) The campaign against insects was more progressive than it was in Lithuania. Every autumn each forest ranger was obligated to search his range for signs of harmful insects. When danger existed, special parties were sent to fight it. Diseased trees were cut down. Wide research and special cutting was used to eliminate the fungi Trametes Pini and Agaricus Meleus.

4. Exploitation of the Vilno Forests

(a) The Vilno forests had normally been subjected to clear cutting but selective cutting was employed to remove dead timber and in healthy mature stands to encourage natural reforestation. All cutting was done as the result of workplans. The forests were regularly cleaned and thinned. From 1936-39, 280,000 festmeters of structural timber and 20,000 of fuel wood were cut annually in the whole Vilno area (not the smaller portion taken over by Lithuania). Of this amount, cleaning on 1,835 hectares produced 2,694 festmeters of structural wood and 6,650 of fuel wood, and thinning on 8,392 hectares produced 87,436 festmeters of structural wood and 10,287 of wood suitable for other, minor purposes.(18) While overcutting was the rule, it was not employed to the same extent as in Lithuania. After Lithuania took over the Vilno Area, the Lithuanians exploited the Vilno forests to a greater degree than their own, because the Vilno forests contained more mature timber than the Lithuanian forests did.

(b) The entire operation, logging, sale, etc. in the Vilno state forests had been in charge of the state as a result of the 1936 forestry act. Wood was not sold at the stump in the state forests, only in the private forests. All timber was sold at public auction. None was made available for state institutions without charge. There was only one price list and the price was set low.

(c) State forests were divided into six zones according to their accessibility to transportation or distance from market. The first zone was close to a city, floating river, or railroad; the 6th zone was located farther than 30 km from one of these features. Prices varied as seen below. One festmeter of pine timber of the third quality class (there were 5 classes) with a mean diameter of 25-29 cm cost:

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Zone 1 - 13 zlotys
" 2 - 12 "
" 3 - 12 "
" 4 - 11 "
" 5 - 10 "
" 6 - 9 "

Lithuanian prices for the same timber were approximately twice as much.

5. Reforestation in the Vilno Area(19)

The Polish forestry directory was greatly interested in reforestation. Special mature stands (primarily pine, but also oak, spruce and some deciduous trees) producing the best seeds were selected and protected.(20) The following was accomplished from 1936-1939:

	Total Hectares					Costs
	Seeded	Planted	Naturally Reforested	Filled In	Total	Zlotys
1936-37	274.06	1,347.90	126.65	1,747.61	3156.37	197,677
1937-38	237.33	1,336.67	117.01	1,309.27	3000.28	207,581
1938-39	291.79	1,465.73	55.28	1,019.52	2832.32	225,461
Total	803.18	4,150.30	297.94	3,746.55	8997.97	630,719

The percentage of area naturally reforested was remarkably low but this is typical of pine forests under clear cutting practices. Artificial reforestation progressed well. Costs per hectare for seeding were 56 zlotys, for planting 52 zlotys, and for filling in (secondary planting) 42 zlotys. Lithuanian expenses for artificial reforestation were much lower, but results were much worse. The Poles used only native trees in their reforestation efforts. There were numerous nurseries and seed production facilities and reforestation was done on an intensive basis.

6. Investments in the Vilno Forests

The condition of roads and bridges in the Polish forest areas was far below that of those in Lithuania. Most of the bridges were wooden. The plans prepared for the Polish forests, however, were more realistic than those for the Lithuanian forests. They did not overestimate the yields and they brought reasonably good results. Much more was spent by the Poles than the Lithuanians on housing for forestry personnel. After 1936, all Polish forestry expenditures increased. Heavy investments from 1936-1938 led the way on a program which was designed to continue through 1946 and restore the state forest to a condition wherein they would yield a "normal" forest crop.(21) It was a healthy program and should have produced good results.

7. Private Forests in the Vilno Area

The private forest economy in Poland was much like that in Lithuania. The private holdings were declining in size and the forests were badly depleted. The owners were eager to sell their forests, but the only willing buyer was the state which paid very little. After funds for purchase were made available in 1936, the land parcels offered for sale were so numerous that the state could set its own terms. The timber in the smaller plots was of little use except as fuel. In general, the private forests reforested well naturally from the sprouts.

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8. The Wood Economy of the Vilno Area

(a) Lithuania was able to cut 280,000 festmeters of coarse (over 5 cm in diameter) material and 20,000 festmeters of small (under 5 cm) material per year from the state forests in the Vilno area it annexed. In addition, it cut 150,000 festmeters of timber in the expropriated private forest areas. This, plus the additional production of the tracts remaining in private hands, totalled a maximum 500,000 festmeters per year, worth 5,000,000 litas.(22)

(b) The people of the Vilno area annexed by Lithuania were extremely poor because of the overpopulation (425,000 on 6,655 sq km - 64 per sq km), poor soil, and lack of industry. Their living standard was much lower than that in Lithuania. Wood was in great demand and substitutes were scarce. Vilno city annually used 150,000 metric tons and all industry in the whole Vilno area, 15,000 tons of coal for fuel, plus 75,505 tons of fuel wood.(23) The demand for fuel wood was not less than two festmeters per person per year.(24) The city of Vilno alone needed 335,000 festmeters of fuel wood each year. The country people (735,000) required approximately 500,000 festmeters, a total of 835,000 festmeters per year. In addition, the wood industry needed 250,000 festmeters of structural wood, a grand total of 1,000,000 festmeters per year. The area needed, in other words, twice as much wood as it produced. The shortage, especially during World War II, was severe.

9. The Wood Industry

(a) The Vilno wood industry was always more highly developed than the Lithuanian wood industry. One reason for this was that its timber supply was more valuable. In 1937, the entire Vilno area had the following industry:

Type	No	Workers	Annual Workdays	Average - Gross Income -	Zlotys	Total Annual Budget Zlotys
Paper Mills	9	863	250,300	580,200	145,600	4,281,200
Paper Mfg. Shops	6	246	60,400	507,000	85,800	910,200
Total	15	1109	310,800	1,088,000	231,400	5,194,400
Sawmills	59	913	231,200	669,600	134,500	5,366,700
Plywood	2	567	159,000	390,600	60,500	2,372,000
Veneer & Furniture	2	25	5,800	25,100	-	- 132,500
Total	63	1626	425,400	1,162,100	209,000	8,236,400

(b) In the same year, the whole Vilno wood industry consumed:

Type	No	Consumption Tons	Consumption Festmeters	Value of the Consumption
Chemical Industry				
Charcoal)		473	1419	40,000
Tar)	5	218	2180	29,000
Turpentine)		76	760	35,000
Total	5	767	4359	104,000

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Type	No	Consumption Tons	Consumption Festmeters	Value of the Consumption
Paper Industry				
Paper Mills & Crdb.	9	9633	25,046	3,616,000
Paper Mfg. Shop	6	1591	4,137	571,000
Total	15	10,952	29,183	4,771,000
Sawmills and Container Mfg Shops	163		219,607	4,604,000
Wood Fuel Consumers	517	75,505	151,010	1,510,000
Grand Total			404,159	10,989,000

(c) In 1937, the 50 sawmills in the whole Vilno area consumed 219,607 festmeters of raw timber valued at 4,604,000 zlotys and produced 141,252 festmeters of manufactured lumber (64%) valued at 7,803,000 zlotys.(25) The lumber produced was:

Beams and battens	- 31,678 festmeters	1,784,000 zlotys
Boards	- 102,805 "	5,608,000 "
Planks	- 6,634 "	398,200 "

(d) The 6,655 sq km of the Vilno area given to Lithuania in 1939 included most of the Vilno wood industry, 90% (55 enterprises with 1,016 employees) of which was located in the city of Vilno. Lithuania also acquired 67 other small enterprises in the countryside with maximum consumption capacity of 181,000 festmeters.(26)

(e) The Vilno area had had a very active wood industry even in 1918.(27) By 1939, however, most of the saw mills (in particular) needed essential renovation and repair. There were nine sawmills in Vilno city with 18 saw frames. Seven of the mills had planing shops, each one had a circular saw and one had a modern carpenter shop. All of the mills were located on the banks of the Vilija River and received raw timber from rafts on the river. Most of them had mechanical handling facilities to handle the timber. Some had railroad sidings as well. The nine consumed 54,000 festmeters in 1939 but had a capacity of 130-140,000 festmeters. The other 40 mills had a capacity of 180-200,000 festmeters. All Vilno production was for home consumption. There was no export trade because Gdynia, the nearest Polish port was too far away.

(f) The wood industry in the whole Vilno area was powered as follows in 1936:

Type	No	Mechanical	Steam		Water		Electricity	
		NO	No	Hp	No	Hp	No	Hp
Paper Industry	14	14	10	930	14	4055	3	620
Wodd Industry	57	48	52	2535	6	335	37	224
Sawmills Only	44	41	42	2082	4	114	-	2196

(28)

The paper industry was run by water power but had some steam power and electricity too. The wood industry was largely run by steam power with electricity of importance, particularly in the saw mills. Most of the Polis wood industries were privately owned, but after 1936, state enterprises

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were established in competition. In the Vilno area a state sawmill was set-up in Jeziory but it was not included in the area annexed by Lithuania.

(g) Wood industry workers in Vilno city had been paid (daily in zlotys):

Worker	1930	1933	1937
Carpenter	7.98	4.04	3.75
Black Smith	5.00	4.04	3.32
Sawmill Worker (Experienced)	8.20	5.46	5.52
Sawmill Worker (Inexperienced)	5.15	3.05	3.22
Timber Hauler	6.18	3.93	4.00

The salaries were comparable to those being paid in Lithuania (in Litai).

10. Commerce in the Vilno Area

(a) The commercial system was similar to that in Lithuania. The state forestry directory was the largest merchant. Private timber and lumber traders included forest owners, industrial enterprises (which maintained large storage yards), and dealers in fuel wood (most located in Vilno city). In 1940 when the Soviets took over Lithuania, they nationalized 16 separate fuel and timber fuel wood enterprises which collectively delivered 155,000 festmeters of fuel wood annually to Vilno City.(29) In addition to private fuel wood deliveries the state itself delivered huge quantities of fuel to state offices and institutions. Fuel prices averaged 10-15 zlotys per festmeter in 1939.

C. Status of Lithuanian Forestry in 1940

1. The Situation in Brief

(a) The loss of the important Klaipeda wood industry and port dealt a severe blow to Lithuanian forestry and made it largely dependent upon Germany. The promising wood export trade reverted to the status of the pre-World War I days. While the Germans allowed a free zone in Klaipeda for Lithuanian exports, other restrictions made its use impossible.

(b) The political situation was very insecure. Soviet troops were garrisoned in Lithuania, capable of seizing the country at any time, but the totalitarian nationalist government had been mellowed somewhat by the establishment of a coalition cabinet. A strong campaign was begun in the Vilno area to counter Polish influences, and Lithuanian policies were introduced.

(c) The economic situation was favorable. The budget was balanced as a result of a large pre war trade which was built up with the USSR, Germany and England. The loss of the Klaipeda population was countered by the addition of Vilno and Lithuania had 3,283,000 persons living on 65,197 sq km (50 per sq km).

2. The Forest Economy

(a) Forestry and land use legislation remained conservative and unchanged. Over-cutting continued in the state forests. In most areas, ripe timber was scarce and in some places there was none worth harvesting. The Vilno state forests were somewhat better, and some ripe timber remained. Private forests in that area were severely damaged, however.

(b) In all of Lithuania, there were 996,598 hectares of forest area, divided as follows:

Pure Forest	803,206 hectares,	80.6%
Cut-over Strips	45,587 "	4.6%
Other non-Forested Areas	38,250 "	3.8%

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Meadows	17,382 hectares	1.7%
Farmland	14,642 "	1.5%
Swamps	67,356 "	6.8%
Roads & Lakes	10,175 "	1.0%
		100%

The forestry department administered an area equal to 16.7% of Lithuanian territory. 15% of this total Lithuanian territory was pure forest.(30) The pure forest areas including the cut-over strips and other non-forested areas were divided as follows:

Pine Forests	367,294 hectares
Spruce Forests	278,955 "
Birch Forests	97,553 "
Aspen Forests	58,039 "
Northern Alder Forests	53,455 "
Hoary Alder Forests	11,164 "
Oak Forests	1,569 "
Other Forests	9,114 "

By age, the forests were divided:

Forest	Young	Middle Age	Ripe
Pine	52%	33.4%	14.6%
Spruce	35.3	31.1	33.6
Deciduous	41.3	31.2	27.5

(c) The large areas of soft deciduous forest indicated how unsuccessful the reforestation program had been. They were only temporary, and would ordinarily be succeeded in 10-20 years by the original evergreen stands. The interim unproductive period, however, was a severe blow to the forest economy and to the principle of sustained yield. The situation was much worse than official sources indicated.

(d) Lithuanian geographic sub-divisions were altered somewhat after the annexation of Vilno as shown in the following chart:

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Lithuanian Counties	Prior to Oct '39			Following Oct '39			Difference in Area	
	County Area Km 2	Forest Area Hectares	%	County Area Km 2	Forest Area Hectares	%	County Area Km 2	Forest Area Hectares
Alytus	227,300	46,797	16.8	316,600	59,329	18.7	≠ 39,300	≠ 12,532
Birzu	272,400	39,642	14.5	272,400	37,417	13.7	-	- 2,225
Kaunas	264,600	54,247	20.5	228,400	53,398	23.4	- 36,200	- 849
Kedainu	242,900	38,972	16.0	242,900	38,224	15.7	-	- 749
Kretinga	263,300	45,714	17.3	263,300	39,437	15.0	-	- 6,277
Marijampole	227,200	51,733	22.7	227,200	51,034	22.5	-	- 699
Mazeikiu	196,000	26,153	13.3	196,000	25,415	13.0	-	- 738
Panevezys	438,200	71,411	16.2	438,200	68,247	15.6	-	- 3,164
Raseiniu	304,800	46,739	15.3	304,800	48,091	15.8	-	≠ 1,352
Rokiskio	216,500	28,428	13.1	216,500	26,646	12.3	-	- 1,782
Seinu	124,900	23,663	18.9	124,900	25,012	20.0	-	≠ 1,349
Sakiu	176,000	37,484	21.3	176,000	35,385	20.1	-	- 2,099
Siauliai	604,200	105,114	17.4	604,200	101,887	16.9	-	- 3,227
Svencioniu	-	-	-	158,900	46,923	29.5	≠158,900	≠/46,923
Taurages	326,600	58,610	17.9	326,600	58,080	17.8	-	- 530
Telsiai	262,100	40,182	15.3	262,100	38,621	14.7	-	- 1,561
Trakai	214,100	48,177	22.5	367,100	96,610	26.3	≠153,000	≠ 48,433
Ukmerges	306,400	49,383	16.1	306,400	44,902	14.7	-	- 4,480
Utena	301,900	45,697	15.1	251,900	37,458	14.9	- 50,000	- 8,239
Vilkaviskis	131,600	7,049	5.3	131,600	7,219	5.5	-	≠ 170
Vilno	-	-	-	314,000	65,233	20.8	≠314,000	≠ 65,233
Zarasai	131,200	28,538	21.7	183,100	24,087	13.2	≠ 51,900	- 4,451
Total	5,282,200	893,733	16.9	5,973,100	1,028,655	17.2	≠630,900	≠134,932

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(e) The total volume of all the Lithuanian timber stock during this period was estimated to be 119,750,000 festmeters, an average of 135 festmeters per hectare of forest. Mean annual increment was estimated at 3,500,000 festmeters or 3.5%.(32) Annual cutting rates were set as follows:

State Forest			
Pine	1119 hectares	-	279,700 festmeters
Spruce	2763 "	-	828,900 "
Birch	778 "	-	155,600 "
Aspen	566 "	-	118,800 "
N. Alder	551 "	-	110,200 "
H. Alder	262 "	-	34,000 "
Oak	45 "	-	18,900 "
Ash	122 "	-	24,400" "
Vilno Forests			260,000 "
Private Forests			77,000 "
Thinning and Clearing			887,500 "
Total			2,785,000 "

Maturity was set at:

Soft Deciduous Forests	9%	-	60 years
Spruce	43%	-	80 "
Pine	27%	-	100 "
Oak and Pine	19%	-	120 "
Oak	2%	-	160 "

(f) There was a shortage of all professional forestry manpower (particularly college educated men). The annexation of Vilno made the shortage worse and many lower rank persons were elevated to higher positions. In 1940 there were 57 forest master districts (16,000 hectare average), 413 forest ranger districts, (2,246 hectare average), and 2,246 guard districts (472 hectare average).(33) In 1944, 22 of the 57 forest masters were not college educated. All the forests had work plans. Those in the private forests were simplified. Over-cutting, however, had brought the forests to the point of exhaustion. Ripewood was scarce and available only in remote areas (Zarasai, Utena) and in the Vilno area. Increasing demand caused a rising dependence upon cleaning, thinning and stump wood. Natural reforestation was unsatisfactory and produced the wrong types of new growth. Artificial reforestation was negligible and had just started to increase prior to the war.

(g) There were large investments in forest roads and bridges under a general policy of preparing them for possible war. This helped forestry very little, however, because of the shortage of timber. Additional expense was incurred in revising forest work plans. Investments in reforestation, research, and buildings continued small and inadequate. State policy continued to be exploitation of the forests in order to balance the state budget.

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3. The Wood Economy

(a) Production of wood products ran far behind demand, particularly after the annexation of Vilno. As early as 1937, public wood auctions were sometimes stormy and even violent. The amount of wood available annually for each Lithuanian was lower than for any of the countries surrounding Lithuania. In 1937 the wood industries consumed 380,039 festmeters, but in 1939 it was only 84,395 festmeters and in 1940 only 120-130,000. Peat production, supported by the state was on the rise.

(b) Most of Lithuania's vital wood industry was lost with Klaipeda. Rough timber (pulp wood and mine timber) was the primary wood export (300,000 festmeters in 1939-40) and the few remaining industries produced only for internal consumption. While prices and demand were up, private industry was unwilling to risk its own capital to increase its production because of the uncertain international situation, and preferred to work on state delivered timber on a commission basis.

(c) The state continued its virtual monopoly of the wood trade, along with a few small private merchants. The latter dealt largely in the small quantities of fuel wood available from clearing and thinning operations. There were 16 private traders in Kaunas and the same number in Vilno. There were also a few in Taurage, Trakai, Siauliai, and other county seats. (34)

(d) Labor continued to be abundant and cheap. A reservoir of unemployed labor was available in the cities. They were a politically troublesome group.

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Footnotes - Chapter IV

(1) "Tauta Budi", 1954, p 113

(2) Skerys, 1948

(3) Statistikos

(4) Ibid

(5) Ibid

(6) Ibid, p 20

(7) Jan Kauskas, "Musu Girios", 1940, p 71, 75

(8) Vilcinskas, "Musu Girios", 1939, p 483

(9) Ibid, p 557

(10) Bilder von Litauen, 1917, p 77

(11) "Kalendarz Lesny" 1937, p 45, 53

(12) Ibid

(13) Kalendarz Lesny p 26

(14) Ibid, p 11, 17

(15) Miklaszewski: Jan, "Praca Naukowa", 1938

(16) Surozh, 1908, II/142

(17) Miklaszwski, 1938, p 17

(18) Vilcinskas, "Musu Girios", 1939, p 559

(19) Ibid

(20) Author

(21) Ibid

(22) Vilcinskas, "Musu Girios", 1939, No 10, p 483

(23) "Statistikos Biulitenis", No 10 - 192, 1939, p 27

(24) Author

(25) "Statistikos Biulitenis" No - 192, p 24-25

(26) Gureckas & Vasiliauskas, "Medzio Promone Lictuvoj", 1953, p 17-18; Skerep, 1947, p 40-45

(27) Gureckas & Vasilianskas, p 27-28

(28) "Statitikos Biulitenis", p 27

(29) "Musu Girios", 1939, p 560

(30) "Mishkininku Kalendorius", 1941

(31) Ibid

(32) Author

(33) "Mishkininku Kalendorius", 1941

(34) "Lietuviu Archyuas", 1952, p 269

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CHAPTER V

The Soviet Occupation, 1940-41

A. The Situation in Brief

1. The Soviet occupation of 1940-41 had definite policies under which it operated; to restore old Russian-German boundaries, to incorporate Lithuania into the USSR, and to completely communize the economic and political structure of the Lithuanian state. Lithuania was brought under the direction of the Communist Party aided by the Red Army and Security police. A quiet but cruel reign of terror was instituted. Urban and county governments were appointed by Soviet-appointed committees which acted as instruments of Communist economic and political doctrine. The administrative divisions of the country were not altered. The censorship and single press system of the USSR were introduced.

2. In economic matters the Soviets moved more slowly than in political affairs, gradually introducing a semi-socialized system under which certain industries were supported and others discouraged. This policy was aided by the former trend toward state socialism under the Lithuanian Republic. Socialization of the railroads, the post office, telegraph and telephone, forestry, and distilling had already largely been completed or had been in progress. The most noticeable effect of the Soviet economic policy was the seizure of private property. All forests, even those as small as one hectare, were seized and small arable areas were given in exchange. By this measure, practically all forest land became state property. Owners of over 30 hectares of property lost all their property without compensation and it was divided among landless peasants. The best of the expropriated estates were made Sovkhozes. Land parcels under 30 hectares were left in the owner's possession, but taxed very heavily. There was no official policy combining these parcels into kolkhozes, but the high taxes were a prelude to such a policy.

3. All laws and regulations were flexible and could be strengthened or relaxed at the will of the administration. Laborers were given special treatment and elevated, in many cases, to high economic and political positions. Since most of these persons were uneducated and unused to positions of responsibility, however, they were unhappy in their new positions and were terrified of the Soviet Communists under whom they had to work. The peasant masses were affected the least by the new regime and were left largely alone.

4. The price structure was the weakest point in the new economic policy. Lithuanian prices could not be adjusted to ruble values and the price structure imposed was an artificial one. The value of the Soviet ruble was several times lower than the value of the Lithuanian litas. The litas was suspended and salaries were paid in an equivalent number of rubles (i.e. one ruble for one litas). As a result, purchasing power dropped sharply, although the wages of laborers and minor officials were raised somewhat (top salaries were cut to a maximum of 1,000 rubles per month). The fixed price system brought on a black market and a shortage of goods. Severe punishment and government propaganda did not alleviate the situation.

5. Administrative offices were left mainly intact, but their directors were replaced. Most professionals were left in their posts. Only the highest in rank or reputation were removed. In general, the Communists respected professional ability even though they surrounded the professionals with Communist officials and humiliating restrictions. The Lithuanian national police were completely replaced. Under the pressure of terror, all administrative offices worked long, hard hours of unpaid overtime. In every instance, the Communists fomented class hatreds; dividing the population into "enemies of the people" and the "peace-loving element" in order to better control the country.

B. The Status of the Soviet Forest Economy During the Period

1. Following World War I and the Bolshevik Revolution, the Soviet forest

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economy had been in a very bad condition. The high war-time consumption of wood and the post-war chaos had put a great load on the more easily accessible forests and caused a severe wood shortage in the sparsely forested regions of central and southern European Russia. In Central Russia and the Ukraine, the forests, which had earlier suffered most intensive cutting and were being rehabilitated, were again subjected to indiscriminate and improper cutting. The Ukraine suffered particularly under the German occupation of 1917 and, by the time of the German withdrawal, the Ukrainian forests were almost completely devastated. From 1914-24, the Ukrainian forest density dropped as much as 30%.(1) As a result, severe erosion occurred in certain areas and rivers became shallower.(2) The White Ruthenian forests were almost as badly treated as the Ukrainian forests, but the remote Siberian forests were almost untouched during the period. In 1916-18, under the chaotic conditions then present, no regular forest activities were possible. Many ranges were cut down, including trees which would not have matured for 40-60 years. Vast areas around Moscow and Leningrad were completely devastated. Lenin claimed that free access to the wood of these forests saved the Bolshevik Revolution.(3)

2. 1921-26 was a period of stabilization in Russian forestry. By 1926, the forests were under firm state control and their chaotic exploitation had been halted. A Forestry Code issued in 1923 contained many helpful general regulations which contributed to the ordering of the forest economy. Work plans were begun as early as 1923 in the central portions of European Russia. Cutting limits were set, but they were not generally followed. The First Five Year Plan, 1927-33, was distinguished by a conflict between professional foresters advocating the principle of sustained yield and the new aggressive Communist leaders who were anxious to exploit the forests in order to encourage collectivization of agriculture and industrialization, especially around Moscow and in the Ukraine. The latter group, of course, won.

3. In 1930, the People's Commissariat for Forest Industry was established to take the place of the former Forestry Department of the Ministry of Agriculture. The new Commissariat considered the forests as a wood-producing factory. The administrative forest units (combinations of former forest master districts) were called "lespromkhoz" and were placed under the direction of a Communist Party member, not necessarily a professional forester. The professionals became mere technicians with routine duties (reforestation, conservations, etc.). Scientific principles were abandoned. Timber was cut because it was accessible. As a result, there was severe danger of deforestation, and flood danger and erosion increased sharply. In 1932, a parallel institution, "Narkomles," was established with a mission to manage the forests along vital rivers according to scientific principles in order to protect the water sheds and control floods. Thus, there were two types of forests managed under different principles. The 1932-37 period was the most active period of reform in Soviet forestry.

4. The Second Five Year Plan (1933-37) was marked by an attempt to build up the wood industry and to increase exports (1930 was marked by Soviet dumping of wood products).(4) The industrialization aim of Russian forestry was stronger than the conservation trend. Increased demand, as a result of general Soviet industrialization, was unable to be supplied from the easily accessible forests, and a considerable shortage resulted. The inadequate Russian transportation system was unable to deliver timber from remote areas in adequate quantities. The severe results of deforestation (erosion, flood, etc.) began to be felt and the conservation policy along the rivers was expedited. A new law in 1936 eased the export situation and exports declined. This marked the triumph of professional forestry over the industrialization faction, and from this point forest exploitation in European Russia began to slow down. The wood shortage continued, however, as industrialization progressed.

C. The Status of the White Ruthenian and Ukrainian Forest Economics During the Period

1. The law of 1936 had divided Soviet forests into two areas: cultivated zones, and industrialization zones. The White Ruthenian and Ukrainian forests were included in the first zone, run under the sustained yield principle, and mainly exploited to satify local demands. The forests of both areas were in very bad condition and the forest economies were ruined. The Ukrainian industrialization and consequent increased wood demand had made the wood shortage especially severe. In White Ruthenia, natural production exceeded demand and it was able to export small amounts. In 1936, for example, its production was 5,168,000 fest-meters of timber and it was able to ship 2,137,000 festmeters (41.4%).(5) In the same year, the Moscow province produced 4,227,000

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festmeters and imported 12,704,000 (75%) and the Ukraine produced 1,870,000 festmeters and imported 10,888,000 (85.3%). Ukrainian wood consumption increased three times from 1912-36.(6)

2. Until 1938, the Ukrainian saw mills annually received about 800 thousand festmeters of timber from the White Ruthenian forests. This amount fulfilled only 20% of the Ukrainian demand. The balance had to be imported from the northern and western Siberian forests. The White Ruthenian timber production was as high as 11,000,000 festmeters annually until 1936, but, after it was transformed into a cultivated (water shed) forest zone, yearly production declined to 180,000 festmeters (1938). The decline in the White Ruthenian supply and the exhausted condition of the Russian and Ukrainian forests forced the Soviets to turn their attention to conquered portions of eastern Poland and the Baltic countries. The forests in these areas, though badly decimated, were in much better shape than the Russian forests.

D. The Lithuanian Forest Economy Under the Soviets

1. The Soviet occupation of Lithuania met no resistance and was accomplished smoothly within a few days. During the year in which the occupation lasted, all private forests were seized and placed in the state forest system. According to the very imperfect statistics of the time, there were 996,000 hectares of forest.(7) This included 70 thousand hectares of water area managed by the Ministry of Food Industry. The Lithuanian SSR organized by the Soviets included 59,602 sq km with 3,032,864 inhabitants. Forest density was estimated at 16.7%, 0.3 hectares per person and 1.05 F.I.Y., far below average demand. Official estimates of normal production were 2,785,000 festmeters per year.(8) The cutting ratio did not change. The forest stands were badly decimated. But in Vilno, and in Zarasai, Utena, and Trakai Counties ripe timber was still available in some quantity. The pine forests were overcut and light, the spruce forests in the west were exhausted, and 60 year old stands were already gone (the stands were overcut by 10-12 years).(9) There were no changes in logging techniques or methods (clear cut).

2. In the one year of the occupation, the Russians cut approximately 6,000,000 festmeters, two years' normal cutting. The army cut uncontrolled amounts in building defenses along the German border. The defense installations were largely of wood and additional large quantities were consumed as fuel and in road and bridge construction and repair.(10) The army alone cut about 2,500,000 festmeters, about half of which (10 thousand hectares) was cut simply to clear strips along the border or for airfields. As a result of the Russian cutting, general forest density dropped about 1%.

3. In former times, 70% of timber production was consumed as fuel and 30% by industry and export. In spite of the heavy Soviet cutting, however, the Lithuanian population received hardly any structural timber. Almost all of the Soviet production in Lithuania went to supply and build endless new institutions which were established by them. The peasants who were resettled on expropriated land were promised adequate wood supplies to establish themselves, but very little was delivered because the land reform was largely propaganda and collectivization was the end purpose. Fuel wood was in short supply during the occupation but adequate for the time.(11) There was little coal. Supplies promised from the Ukraine never arrived, although a small amount of Silesian coal arrived from Leningrad early in 1941.

4. While the Soviet forestry program had reached an advanced stage of its development by 1940, the Soviets were unable to apply the system to the Lithuanian forests and left the Lithuanian Forestry Department practically intact, especially in the local units. The few changes made included:

   a. The Forestry Department was separated from the Ministry of Agriculture and reorganized as the "Forest Authority." It followed the pattern on a smaller scale of the Soviet Commissariat of Wood Industry. In addition to the usual divisions, there were four other units which provided technical support, and three miscellaneous boards. The number of workers rose considerably, and more than 60% of them were non-professionals. /See end of report for availability of a sketch of the Soviet Lithuanian Forestry Administration of 1941./

   b. The system was further centralized and the details of organization, plus much investigation and inquiry, took many man hours. The official eight-hour day was insufficient and a great deal of unpaid overtime was needed.

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c. An attempt was made to follow Soviet forestry law (Lesnoi Kodeks), but, because the system was in development, circulars were issued constantly and were sometimes changed the same day they were issued.(12) All work was supervised or checked by Lithuanian Communists or Moscow representatives.

d. The chief change in the local units was the great increase in the amount of work required. Most Lithuanian state employees had been members of the Nationalist Party and were deeply engrossed in politics. This was especially true in the rural areas. These people were basically hostile to the Communists but could not be replaced because of the lack of personnel. The Communists squelched the effectiveness of the hostility somewhat by transferring the people to new locations but this wasted a great deal of time and effort. The increased demands on the forests and the new administrative procedures forced all personnel to work long, hard hours. Urgent projects were accomplished under threat of severe punishment.

e. Forestry officials were accountable not only to the central administration and their direct supervisors but to local Communist officials, whose interference considerably hampered their activities. In spite of all difficulties, however, huge amounts of work were accomplished. The shift to payment in rubles decreased the living standards of forestry officials 3-4 times. Their supplements in land, etc., became more important to them than ever before. In June 1941, just before the German invasion, there were mass repatriations of Germans (and Lithuanians) to Germany. About 30 forestry officials were included.

f. The only change in the forestry schools was in the leadership and in the attempt to build up a pro-Communist organization among the students. This was largely ineffectual. Most of the faculty and students were not Communist minded and, as a result, the forestry schools in Alytus and Vilno were anti-Communist. The educational standards, and number of students and faculty remained about the same. Research efforts did not change appreciably, but there was almost no application of research results to the forests. Research had never been particularly active and the Soviets did not do much to stimulate it. No serious work was published and even publication of Musu Girios was suspended after a few issues. The Association of Lithuanian Foresters was also dissolved. The only forestry articles which appeared were published in official papers. They were mainly for propaganda purposes. They condemned the former forest leadership and praised the Communist aims without listing details, definite goals, or projects.

5. The production of the large quantities of timber and wood products demanded by the Soviets was very difficult for the new Communist regime and was complicated by the hostility of the Lithuanian forestry officials. Basically, the new leaders accepted the old forestry systems except for increasing the cutting rate as much as two times. The overcutting was publicly recognized, but the administration promised to decrease the rate as soon as possible. The heaviest cutting was done in Vilno and eastern Lithuania proper. Pine and spruce logs (4 cm and up in mid diameter and 4 meters and up in length) were produced in four quality classes. Birch, northern alder, aspen, and oak (same diameter, from two meters up in length) were also produced in four quality classes. Fuel wood was produced in 1-2 meter lengths in two quality classes. Other production included:

Structural bolts (evergreen, alder, and aspen) of equal size
Mine props - various lengths, up to 25 cm in mid diameter
Pine and spruce stumps
Ties (pine)--for both normal and narrow gauge railroads
Beams (pine)--five meters and up--30 x 30 and up
Telegraph poles (pine and oak)--10 meters and up--20-25 cm in mid diameter
Boards--a by-product of tie production.(13)

6. Reforestation

a. The Soviets had little concern for the reforestation of Lithuania, but they issued a great deal of propaganda to advertise their supposed interest. The autumn reforestation work (seed collection, soil preparation, nursery expansion) was done according to old plans. A new plan existed calling for twice as much as the old yearly quota of reforestation work but it was not fulfilled. The Soviets announced plans for widespread introduction of the black poplar (populus nigra), but no new work was

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accomplished. The spring (1941) work was not accomplished in full because the peasants, badly paid and terrorized, made excuses to avoid the work. Reforestation was not allowed, of course, along the border strips which the forestry administration was forbidden to enter. It may be estimated that about one-half of the proposed reforestation was not fulfilled. Any work which was done was done badly, not in order to achieve good results, but to make a showing which could provide propaganda material. The methods and results were both unsatisfactory but on about the same scale as in earlier years.

b. Most of the talk about reforestation concerned plantings on unproductive soils and sand dunes, especially along the Baltic and in the Merkys River area. These projects to date have still not been accomplished. Nothing was planned concerning the establishment of entirely new forests or underbrush control, but a great deal of the latter was cut for fuel in northern Lithuania and in Marijampole and Vilkaviskis before the plan was even officially considered. Efforts were made to produce gum products by the introduction of the herb, cocksagyz, and the cultivation of the native shrubs, evonymus verrucosa and European and verrucosa spindle trees. (The latter, native to almost all the USSR as well as Lithuania, grow 10-15 ft high and have typical verrucose twigs. The root bark contains 25% of dry weight gutta-percha. The shrubs grow well in Lithuania on well-drained, loamy upland soils at the edge of forests, in forest lanes, and in clear-cut areas. They grow dispersed among other formations, not in pure stands, but their artificial reforestation is very possible.)

c. Another problem considered by the Communists was the restoration of the decimated oak forests in the Lithuanian uplands. There were four regions of optimum oak production in Europe: (1) Slavonia (formerly Austria-Hungary), (2) Volhynia (formerly in Poland), (3) Spessart (Germany), and (4) Lithuania. The Russians had studied the possibilities of oak production on the steppes and were very much interested in oak trees as pioneer reforestation material. Some stands were planted in the 19th Century.(14) In Lithuania oak was important for its protective value in Norway spruce stands and as a producer of veneer and naval timber.

7. Conservation

a. The Communists were seriously interested in preserving the forests in spite of the amount of overcutting performed. They immediately incorporated the expropriated private forests into the state forest system. The forest guard system worked fairly well since the guards were responsible for damage to their forests and the peasants were terrorized. The Soviets talked of saving the main forest areas, but proposed to follow the old Russian method of transforming the isolated, fragmentary forests which were hard to guard into agricultural land.

b. As said above, the peasants were too terrorized by the Soviet occupation to dare to steal much wood from the forests. As rumors of a Soviet-German war spread, however, wood thefts increased, especially around the cities which were more short of fuel. There were no extensive forest fires during the period of the occupation. The peasants, who ordinarily were the cause of most fires, were afraid to enter the forests and this kept fire danger at a minimum. There were no changes in the techniques of combating insects and fungi.

c. The severities of the Communist regime drove many elements of the population into hiding. These persons lived as they could, hiding in barns and sheds and travelling only by night and preferably in the forests. They were not organized and were not in active opposition to the regime. They only desired to remain hidden and to be left alone. The Communists were greatly concerned about their presence and the forest guards had strong orders to watch for them and to report their presence so that local police or NKVD units could hunt them down. Since some of the guards were not in sympathy with Communist rule, they did not always report the presence of fugitives and sometimes hid them in their own buildings. After the order was issued to deport Lithuanians to Siberia, the number of fugitives increased greatly. When the Soviet forces began to withdraw before the Germans, these fugitives formed bands and with other Lithuanian patriots attacked

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E. The Lithuanian Wood Economy Under the Soviets

1. Supply and Demand

a. As noted above, the Communists largely ignored the wood needs of the local population. There was a general shortage of all vital goods, and as a result, while the wood supply was short, the average demand rose to approximately two F.I.Y., or a total of 6,000,000 festmeters. Regulations against private enterprise stifled wood trade and transport. The result of all the Communist innovations was a supply of no more than one-half F.I.Y. or a total of 1,500,000 festmeters, about one-quarter of the demand. Prices rose on the black market to as much as 20-30 rubles for a raummeter of fuel wood. Severe restrictions and punishments did not succeed in stabilizing the situation and the shortages of fuel caused severe hardship during the winter of 1940-41.

b. The new Communist regime set up an endless number of new state enterprises which required large amounts of wood. Some of them issued requisitions for 10 times as much wood as they could consume. Those in the wood industry field worked two shifts and consumed about 1,200,000 festmeters (fuel included) of timber. There were proposals for exporting approximately 800 thousand festmeters, almost all to the Ukraine and White Ruthenia plus a little to complete old agreements with other European countries. Most of the usual export assortments were manufactured, but lack of labor and transport and overcutting caused most of the timber (about 75%) to be left in the forests where it was seized by the advancing Germans. The difficulties which the population had in getting wood were also experienced by the various wood industries. They could not depend upon scheduled deliveries, and there were serious shortage problems which led to tension, criticism, and even arrests and punishments in these industries.

c. The only agency which did not suffer from shortages of wood was the Red Army which had abundant transportation and did not hesitate to impress forced labor. The Red Army's logging operations were careless and a great deal of useful residual material was left to the Germans or the local populace when the Soviets retreated. In effect, most of the timber cut during the Soviet occupation never left the country because of the various transportation and other difficulties.

d. The estimated occupation production of 6,000,000 festmeters of timber was consumed approximately as follows:

(1) Red Army	2,500,000	festmeters
(2) Native populace	1,500,000	"
(3) Industry and other state institutions	1,200,000	"
(4) Export	800,000	"
TOTAL	6,000,000	"

(15)

2. Transportation

a. Local transportation of forest products continued to be supplied by the peasantry. Most of the peasants owned horses, wagons or carts, and tools. Under Soviet occupation, they were ordered to supply local transport and labor and coerced to this duty by threats and propaganda. No one refused the duty since in addition to the coercion, relatively high wages were paid and the workers were entitled to buy additional rations of wood. They were also allowed to purchase at official prices oats, hay, nails, and horse shoes, which had already disappeared from the open market. In spite of these inducements and threats, however, vast quantities of untransported wood remained in the forests because of the lack of available transport. Transportation costs were high because various state enterprises competed with each other for the available labor and equipment.

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a. As noted above, the Communists largely ignored the wood needs of the local population. There was a general shortage of all vital goods, and as a result, while the wood supply was short, the average demand rose to approximately two F.I.Y., or a total of 6,000,000 festmeters. Regulations against private enterprise stifled wood trade and transport. The result of all the Communist innovations was a supply of no more than one-half F.I.Y. or a total of 1,500,000 festmeters, about one-quarter of the demand. Prices rose on the black market to as much as 20-30 rubles for a raummeter of fuel wood. Severe restrictions and punishments did not succeed in stabilizing the situation and the shortages of fuel caused severe hardship during the winter of 1940-41.

b. The new Communist regime set up an endless number of new state enterprises which required large amounts of wood. Some of them issued requisitions for 10 times as much wood as they could consume. Those in the wood industry field worked two shifts and consumed about 1,200,000 festmeters (fuel included) of timber. There were proposals for exporting approximately 800 thousand festmeters, almost all to the Ukraine and White Ruthenia plus a little to complete old agreements with other European countries. Most of the usual export assortments were manufactured, but lack of labor and transport and overcutting caused most of the timber (about 75%) to be left in the forests where it was seized by the advancing Germans. The difficulties which the population had in getting wood were also experienced by the various wood industries. They could not depend upon scheduled deliveries, and there were serious shortage problems which led to tension, criticism, and even arrests and punishments in these industries.

c. The only agency which did not suffer from shortages of wood was the Red Army which had abundant transportation and did not hesitate to impress forced labor. The Red Army's logging operations were careless and a great deal of useful residual material was left to the Germans or the local populace when the Soviets retreated. In effect, most of the timber cut during the Soviet occupation never left the country because of the various transportation and other difficulties.

d. The estimated occupation production of 6,000,000 festmeters of timber was consumed approximately as follows:

(1) Red Army	2,500,000	festmeters
(2) Native populace	1,500,000	"
(3) Industry and other state institutions	1,200,000	"
(4) Export	800,000	"
TOTAL	6,000,000	"

(15)

2. Transportation

a. Local transportation of forest products continued to be supplied by the peasantry. Most of the peasants owned horses, wagons or carts, and tools. Under Soviet occupation, they were ordered to supply local transport and labor and coerced to this duty by threats and propaganda. No one refused the duty since in addition to the coercion, relatively high wages were paid and the workers were entitled to buy additional rations of wood. They were also allowed to purchase at official prices oats, hay, nails, and horse shoes, which had already disappeared from the open market. In spite of these inducements and threats, however, vast quantities of untransported wood remained in the forests because of the lack of available transport. Transportation costs were high because various state enterprises competed with each other for the available labor and equipment.

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b. Long distance transport in Lithuania was revolutionized under the Soviet occupation. Historically, wood and wood products had moved westward. Under the occupation, the flow was reversed. Because the rivers flow westward they were of little use for rafting timber. Some of the smaller rivers carried a little timber and the larger rivers were of use above Kaunas. A special bureau was established to control timber rafting. It was directed by professional foresters but its activities were hampered by a shortage of skilled raftsmen. Prior to the occupation, the raftsmen worked for private companies or worked as individuals for the Forestry Department. Under the occupation the raftsmen were forced to work under strict control. They were individualists, proud of their trade, and more than any other forestry group, they resented the Communist regime.

c. Railroads were forced to carry the bulk of the load in place of the rivers. Russian railroads always have been unsatisfactory and in Lithuania the available lines were even less adequate. They were converted to the Soviet wide guage and operated on an overloaded schedule under great pressure. Entire trains became lost in the resulting confusion and individual cars were frequently lost and sometimes looted of their contents. NKVD squads patrolled all important stations and special officials watched over the shipments and operations. Severe punishments were invoked when shipments were lost or delayed, but in spite of every measure the railroad operation was always unsatisfactory and large quantities of goods piled up at stations.

d. The Communists seized all private motor vehicles (730 trucks, mainly five-ton capacity in 1940).(16) No new vehicles, except army types, were brought into Lithuania. The forestry authority received about 30 of the trucks, in various stages of disrepair, and some driven by charcoal. Other state institutions also received trucks for their use and a number of unassigned trucks were placed in a motor pool which rented them out (even to private individuals). Fifty to sixty trucks were busy, mainly in Vilno and Kaunas, transporting fuel wood from railroad dumps to distribution points. The majority of fuel deliveries were still made, however, by cart. One objection to truck transportation was the large amount of loss by theft.

3. Labor and Wages

a. The peasantry continued to be the main source of logging labor under the occupation but they worked under conditions of force and duress. Wages were relatively high (10-20 rubles a day at winter piece-work rates), and additional fuel (and occasionally structural wood) rations were sold to the workers. Wages for the workers who loaded freight cars and handled timber were lower, only 6-10 rubles a day, an amount sufficient to keep the worker himself alive but not his family. General dissatisfaction with the wages led to a strike in 1940 which caused the forestry administration a great deal of trouble.

b. Soviet wage and price policies were originally based on the old Lithuanian standards, expressed in rubles rather than litas. The Labor Commissariat set wage and price policy and in many cases allowed wages to rise somewhat. Late in 1940 an official party arrived from Moscow to adjust wages and prices to conform to the standards of the USSR. In general, the prices of fats, leather goods, liquor, and manufactured goods were raised, sometimes quite considerably. Wages were raised very little and in some cases they dropped. These circumstances produced considerable dissatisfaction among the workers.(17) As a result of the strike among the timber workers, the Labor Commissariat raised wages somewhat, but the unhappiness continued. Intervention by the NKVD, however, restored "peace and order" and ringleaders of the strike were deported to Siberia. The forestry administration issued a great deal of propaganda following the disturbances, promising the peasants a new order. In order to keep the laborers happy, the administration temporarily paid some wage supplements in kind. For example, sawmill workers were given the litter and remnants for fuel and the transport workers were given additional fuel wood. Most of these supplements were placed on sale in the black market, causing additional trouble for the forestry administration.

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4. Industry

a. The Lithuanian wood industry was immediately seized by Soviet authorities, minutely inventoried, and placed under new management. Fantastic plans were drawn to revive the industry. Worn out machinery and installations were renovated and the industry was put on a two and three-shift basis. Requisitions for timber were tremendous, sometimes exceeding supply by 10 times. This was the result of the inexperience of the Communist functionaries and partially explains why so much timber was cut during the period. The situation in industry was similar to that in 1939 except that employment was 50-100% higher. Ordinary industry timber requirements were 200-300,000 festmeters. The Communists planned to consume 800,000-1,000,000 festmeters. The logging of this amount could be accomplished, but the short period of time during which sled roads were usable was not sufficient to bring all the timber out of the woods. The peasants would only work in wood transport in spring and summer if wages were set very high because these were the months in which they were busy with their own work. Even if it had been possible to bring all the timber out of the forests, however, the railroads would have been unable to deliver it further. Of the 1,200,000 festmeters requisitioned by the wood industry, probably no more than 400 thousand were ever received. (18)

b. The increased production directed by inexperienced management in many cases resulted in poor quality goods. The assortment manufactured did not change. In Klaipeda, which the Soviets had received under an agreement with Germany, the saw mill and plywood industry was nationalized and the owners were compensated by the German government. A special All-Union Commission, "Exportles," was responsible for fulfilling terms of unexpired contracts with western countries. Most exports went to the USSR proper (paper, cardboard, matches), part went to support other domestic industries, and a very small portion went to supply the population. Lithuanian wood industry production was of better quality than that of the USSR. Its quality products, shipped to the USSR, were exchanged in part for inferior Soviet goods of the same type.

c. In general, Soviet policy was to exploit Lithuania at the expense of Lithuania's standard of living. To cover its aims, the USSR issued propaganda explaining that the shortages were only temporary. No new wood industry installations of any consequence were established, and the available installations were renovated only so that they could be most fully exploited. Many of the oldest installations had to remain idle because they were of English or German make and spare parts to repair them did not exist in the USSR. Large foreign orders were placed for new machines but they were never delivered.

5. Commerce

a. Most numerous installations in wood commerce were fuel-wood yards. They, like all commercial enterprises, were seized by the new rulers of Lithuania. Under the occupation, the commercial enterprises were generally very inactive. The fuel yards, except those in the cities, were practically empty with almost no supply for the population. The yards were run by the forestry administration or occasionally by the urban authorities. Forest rangers sold some fuel in the forests according to instructions issued by the local Communist authorities. All prices were fixed and most commercial exchanges were simply bookkeeping transactions between one state enterprise and another. The only cash business was transacted by the population and it was very inactive. The people did not concern themselves with price, but only with the possibility of obtaining goods at any price.

b. Fuel prices (rubles) in December 1940 were:

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Assortment	Wood	Units	PRICES AT VARIOUS LOCATIONS			
			Forest	Transport Collection Yards	Riverside Receiving Yards	Retail Outlets
Fuel (1st Quality)	Birch & Hardwood	1 Raummeter	13.5	20.5	26.0	30.0
	N. Alder	"	12.0	17.5	19.5	24.0
	Pine	"	11.0	16.5	18.5	22.0
	Spruce	"	10.0	13.5	15.5	21.0
	Aspen	"	9.0	12.5	14.5	20.0
(2nd Quality)	Birch & Hardwood	"	9.0	17.5	23.0	27.0
	N. Alder	"	8.0	15.5	17.5	23.0
	Pine	"	7.7	14.5	16.5	21.0
	Spruce	"	7.0	12.0	14.0	19.0
	Aspen	"	6.7	11.0	13.0	18.0

(19)

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c. Timber prices (rubles) in December 1940 were:

Wood	Mid-Diam (Cm)	PRICES AT VARIOUS LOCATIONS															
		Forests				Transport Collection Yards				Riverside Receiving Yards				Retail Outlets			
		Quality				Quality				Quality				Quality			
		I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Pine	8-15	16	15	14	12	30	29	28	25.5	39	38	37	35	43	42	41	38.5
	26-29	39	30	22	13	53	44	36	26.5	62	53	45	36	66	57	49	39.5
	40-up	52	39	27	14	66	53	41	27.5	75	62	50	37	79	66	54	40.5
Spruce	8-15	16	15	13	11	30	29	27	24.5	39	38	36	34	43	42	40	37.5
	26-29	31	25	18	11.5	45	39	32	25	54	48	41	34.5	58	52	45	38
	40-	45	34	22	12	59	48	36	25.5	68	57	45	35	72	61	49	38.5
Birch	-19	18	17	16	15	40	39	38	37	52	51	50	48.5	57	56	55	53
	25-29	31	27	21	15.5	53	49	43	37.5	65	61	55	49	70	66	60	54
	30-up	45	36	25	16	67	58	47	38	79	70	59	49.5	84	75	64	54.5
Oak	8-15	21	20	20	18	43	42	42	40	57	58	55	54	63	62	62	60
	28-35	81	60	39	18.5	103	82	61	40.5	117	96	75	54.5	123	102	81	60.5
	45-up	119	86	51	19	141	108	73	41	155	122	87	55	161	128	93	61
Veneer blocks	50-up	156				178				192				198			

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d. Prices (rubles) of other assortments were:

Assortments	Wood	Quality	Units	PRICES AT VARIOUS LOCATIONS			
				Forests	Transport Collection Yards	Riverside Receiving Yards	Retail Outlets
Poles	All types	I	1 piece	1.5	26	3.4	3.7
		II	"	0.9	1.6	2.1	2.2
		III	"	0.5	0.9	1.2	1.3
Pulpwood	Spruce	I (With bark)	Raummeter	23	40	47	50
		II (" bark)	"	17.5	34.5	41	45
		I (cleaned perfectly)	"	26	43	50	53
		II (cleaned perfectly)	"	20.5	37.5	44	48
		I (normal)	"	24	41	48	51
		II (normal)	"	19	36	43	46
Mine timber	Aspen	with bark	"	14	31	38	41
		w/o bark	"	17	34	41	44
	Spruce & Pine	with bark	"	12.5	29.5	36.0	39.5
		normal	"	14.0	31	37.5	41
Shingles	Spruce		"	21	32	37.5	41.5
	Pine		"	19.5	30.5	36.0	40
	Alder		"	16	27	32.5	36.5
	Aspen		"	13	24	29.5	33.5
Structural bundles	Hardwood		"	15	26	31.5	35.5
	Alder		"	12	23	21.5	32.5
	Spruce		"	10.5	21.5	27	31
	Aspen		"	9.5	20.5	26	30
Ties	Pine	D, D^1, D^2, E, E^1, E^2	1 piece	5.5	8.0	9	10
		M, M^1, M^2	"	2.5	3.5	4	4.5
		M^3	"	3.5	5.0	6	6.5
		N, N^1, N^2	"	2.2	3.0	3.5	4
Telephone & telegraph poles	Spruce & Pine	w/o bark	1 F.M.	24.0	38.0	47	51
Stumps	All types		Raummeter	7.5	18.5	24	28
Boards (short, 2 mts long, 2.5")	Pine	I	1 cu meter	70	90	100	100
		II	"	50	70	80	90
Ties	Pine		1 piece	9.5	13.2	16	16.5
Poles	All types		"	0.25	0.5	0.70	0.80
Wagon Tongues	Birch		"	2.6	4.0	4.90	5.20
Timber	Pine		1 F.M.	59	81	93	98
Fuel wood		I	Raummeter		3.7		
		II	"			4.4	

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6. Export

a. The Soviets were unable to undertake an active program of wood export. The Lithuanian forests were insufficient to supply even the demands of the Ukraine. One item of importance to the Soviets was aspen wood for matchwood. The production of the Kaunas match factory was increased and its consumption of aspen timber increased from 700 to 10-1200 festmeters per year. Plans were made for cutting 10 thousand festmeters of aspen, the balance of which was to be shipped to White Ruthenia.(20) Birch timber above 30 cm mid-diameter at chest height was greatly prized for aircraft production, but birch was very scarce in Lithuania. Huge amounts (approximately 300 thousand raummeters) of spruce pulpwood were shipped to Germany to fulfill earlier contractual agreements. Large shipments of mine timber were prepared and shipped in part to the Ukraine. A few railroad ties were also exported, but most of this production was consumed within Lithuania in repair of the idle railroad line from Orany to Alytus.

b. Plans were proposed for an eventual export of about 800 thousand festmeters (400 thousand raummeters of pulpwood, 300 thousand festmeters of mine timber, and 100 thousand festmeters of evergreen and deciduous lumber).

F. Effects of the Soviet Occupation on Lithuania

1. There is no systematic, complete set of data for the period covered by the Soviet occupation. Many records were lost as a result of the German army advance during the summer of 1941 and that which remains is very inaccurate. The occupation was a period of feverish changeover from capitalism to Communism, which was never completed. In June 1941, the Lithuanian economy was still a mixture of capitalism and socialism.

2. In general, the occupation brought terror, suspicion, and forced labor, masked behind a screen of propaganda. On the economic scene, it brought high prices, low wages, the black market, and a general shortage of all goods. The Lithuanian people were told that they had sacrificed their former living standard for the advantages of living under the security of the Soviet system. The forests were robbed of valuable timber stocks for the benefit of other areas of the USSR (diminishing forest density by 1%). Under the occupation, transport failed; industry did not increase as greatly as desired; the domestic wood market was destroyed and a grave wood shortage developed; there was almost no cooperation between population and government; and the relationship was that of the conqueror ruling the conquered.

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FOOTNOTES

(1) Buchholz, E, "Wald und Forstrittschaft der Osten", 1943, p 77

(2) Ibid.

(3) Ibid.

(4) Ibid, p 80

(5) Ibid, p 125

(6) Ibid, p 136

(7) "Miskininu Kalendorius"

(8) Ibid, 1941, Par 8, 10

(9) Author

(10) Jameikis, "Lietuvos Giriu Milzinai", 1950

(11) Ibid, p 96

(12) Ibid.

(13) "Miskininku Kalendorius", 1941, p 81-86

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(14) Korevo, "Kovenskaya Gubernia", 1867

(15) Jameikis, 1950, p 90

(16) Z.U. Statistika, 1948, p 125

(17) Jameikis, 1950, p 90

(18) Author

(19) "Miskininku Kalendorius", 1941, par 84-86

(20) Jameikis, 1950

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PART II

CHAPTER VI

The Nazi Occupation, 1941-1944

A. The Situation in Brief

1. In their "Drang Nach Osten", Nazi Germany seized Lithuania with every intention of including it within an enlarged, victorious German nation. (Herr Von Ribbentrop in a speech in Riga in 1942, stated that the Baltic peoples would have to surrender their countries to Germans and that they would be resettled in territory behind the Kama River, a tributary of the Volga.) They followed a policy of splitting the ethnic groups within conquered countries, exterminating certain peoples (the Jews from 1941-44, the Poles from 1943-44) and trying to win the support of others (the Baltic peoples) as collaborators. Official propaganda promised post war compensation in line with accomplishments for anyone aiding the German war efforts. There were many eager to seize the opportunity of a new career (mainly young people educated under the pre-war dictatorships of the Baltic States and the strong pre-war influences of Nazism), and the Germans were successful in their devisive tactics. The new recruits assisted the Nazi authorities in establishing administrative bodies necessary to the smooth functioning of the occupation.

2. The Germans had suffered badly during World War I from antagonism among conquered populations and undertook to prevent this in World War II. They formed a dual administrative set-up in Lithuania consisting of an able top echelon of high-level, professional German officials which set economic and political policy; and a lower echelon of Lithuanian administrators who carried out details of the policy and actively conducted economic (and some minor political) affairs. In addition, there was a military administration which was responsible for maintaining supply lines to the advancing lines of combat. The military authorities had little contact with the civilian population until 1943-44 when German forces began withdrawing before the Soviet counter offensive.

3. The Germans left the administrative divisions of Lithuania unchanged. The entire "ost-land" (all the conquered area east of Germany) was ruled by a Reichkommissariat headquartered in Riga. Each state was directed by a Generalkommissariat which divided responsibilities within each state among district (gebiet) commissioners and city commissioners. The Generalkommissar for Lithuania was von Renteln, whose headquarters were in Kaunas. District commissioners were located in Kaunas, Vilno, and Siauliai, and there were city commissioners in Kaunas and Vilno. A special branch of the German administration was responsible for the forest and wood economy of Lithuania.

4. In addition to the civil administration, the Germans maintained a Gestapo organization in Lithuania which received orders directly from Berlin and operated independently of the rest of the administration but in close coordination. A Gestapo officer directed the German as well as the native police. There was a continuous state of martial law and the police had unrestricted powers of life or death.

5. The Lithuanian branch of the administration was established in the Spring of 1942. Its members were extreme Lithuanian rightists. Each division had a German advisor who more or less took the place of the former communist advisors who held office under the Soviet occupation. In general, the Germans did not change the communist administrative system, except for appointing new officials. The rights granted by the communists to expropriated farm land were not revoked by the Germans but the peasants were still considered the users, not the owners of such land. This made the anticipated seizure and colonization of all the land a simpler procedure.

6. The monetary system was adjusted so that 10 rubles = 1 Reichsmark. This further drained money from the economy and intensified the poverty. A price schedule was fixed, farmers were forced to make heavy contributions in kind, and a ration system was introduced for food, clothes, and shoes. The Germans

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were unable to supply necessary quantities of vital goods and thus, available rationed goods were very scarce. Meats and fats were rarely available. The diet consisted of bread, potatoes, and some vegetables. After 1942, only bread was available. The farmers were paid by the Germans with promises to supply tobacco, clothing, and shoes. The few goods which were delivered to Lithuania disappeared among the officials charged with responsibility for their delivery. The black market boomed, and for huge prices or barter almost anything could be obtaincd.

7. Forced labor was enforced for everyone by employment centers in every county seat and the bigger cities. Surplus laborers were deported to Germany. In spite of bad treatment and scarce goods however, the Lithuanians looked on the Germans as liberators. They were patient, hoping that the Germans would defeat the Soviets and then be defeated in turn.

B. The Forest Economy

1. The Forests

a. As said above, the Lithuanian' forest density decreased about one per cent as a result of the Soviet occupation. The Soviets completely deforested approximately an estimated 10,000 hectares, and another 5,000 hectares were clear or selectively logged. The forests were blocked with felled timber and the litter of logging operations, especially in those areas where the Red Army had been active.

b. Under German rule, the Lithuanian forestry administration made an attempt to encourage reforestation again. The total forest area, therefore, did not change very much, but mature timber was cut and the average age of the stands declined even more. Yield was established under the new conditions at 3,500,000 festmeters, or about 4 F.I.Y., a figure too high to be realistic. Production included 1,900,000 festmeters of live timber and 890,000 of dead wood or only 2,790,000 festmeters.

2. Property Relationships

During the occupation in 1943-44, some German colonization of Lithuania began. At this time some owners whose property had been expropriated but who had been permitted to remain on the land, were given their property back. The cases of this were rare, but served German propaganda designs aimed at keeping the Lithuanian population happy. Only Germans and Lithuanians had property returned under the plan and only when they had cooperated with the Germans by full tax and kind payments. The Germans hoped to encourage all Lithuanians to cooperate in hopes of receiving their property back after the war. No forest land was returned under the plan.

3. Forest Management

a. The place of the forestry administration in the occupation government was described above. The details of its structure did not differ significantly from the Soviet structure /see Chapter V, paragraph D, 5 (a) for availability of a chart of the Soviet Lithuanian Forestry Administration/ except that titles were changed to German. The whole organization was a composite of the old Lithuanian Republic Forestry Department and the Soviet communist forestry authority. There were 45 persons of higher rank (34 professionally educated) in the central administration and 88 of lower rank (clerks, typists, bookkeepers, etc.) The local Administrative units were staffed by nine inspectors (forestry professionals), 49 forestmasters (34 professionally educated), 413 forest rangers (most with a technical forestry school background), and 2246 forest guards. Each forestmaster district had four to six timber collection points staffed by one to three men.

b. All employees but those working in the collection yards were civil service employees. The old regulations continued to apply to them. They were still divided into 20 categories and their salaries were still very similar to those paid in 1938; except that they were paid in Reichsmarks which by 1944

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had practically no value. Salaries of forestry officials continued to include supplements of land plus premiums of fuel wood, servants, drivers, automobiles (for forest inspectors); uniforms, footwear, and large quantities of cheap whiskey. The depreciation of currency and the opportunity of officials to profit from the timber production brought about a considerable corruption which included even the German advisors and demoralized the entire administration. The whiskey supply completed the demoralization.

c. An eight-hour day and six-day week were introduced. Production was increased and additional clerical manpower was hired. The staff itself was already too large, however, and had too little work to do. The system of control was reorganized on the German decentralized system under which local units had greater responsibility. Confidence within the local units increased, but so did corruption. Officials had no political duties; only technical and administrative responsibilities. German official interference in the local units was rare, although as production failed to come up to requirements, it increased. The Germans could not maintain the pressure, however, because of their own demoralization and the grave threat of Soviet paratroops. The paratroops dropped into the forest areas as early as Spring 1942, and forestry activities were the first to be disrupted by their presence.

d. The paratroop formations linked up with the splintered remnants of Soviet army formations which had moved into the forests rather than surrender to the Germans and with other fugitives (primarily Jews). These troops were aided by Russian ethnic groups and supplied with weapons by the paratroops. By early 1943, many forest master districts in the eastern Vilno area were under control of the irregular formations. By Spring 1944, almost all the larger forest ranges of Lithuania were occupied by Soviet groups which the Germans were powerless to control. Their presence put an effective end to any forestry program. The forestry officials were the first to be driven from their posts or killed, and the abandoned forests were open to anyone who dared to go into them for wood.

e. The Germans did not basically change the laws and regulations under which the forests were operated. These regulations were outmoded, but 25 years of experience had established a fairly effective practical system which operated in spite of them. The few circulars of instruction issued during the period were of a technical, not a fundamental nature.

4. Relationship Between the Germans and the Forestry Department

a. As said above, the Germans' prime objective to win the war resulted in their tolerant attitude toward the Baltic peoples. The latter's attitude toward the Germans was that they were the lesser of two evils but they came to realize that they had little to hope for under German rule. The Lithuanian Forestry Department had several objectives under the Germans:

(1) to forestall deportation of Lithuanians (only) to Germany as forced labor;

(2) to save the forests as much as possible;

(3) and to reforest as much as possible.

b. The Germans tried to split the active, Nationalist inclined Lithuanian Association and to win a group of young Lithuanians to them who would work for a "New Europe" under German domination. They would have been successful except for the worsening military situation. This factor caused even their most devoted advocates to moderate their support and modify their dreams to the concept of an independent Lithuanian Republic under western support and protection. The Germans talked of the advantages to accrue to Lithuania under a German victory, but all the while, the Lithuanian Association was looking for soft spots in the German administration by means of which it could temper the German demands on Lithuanian resources. One of these soft spots was the concern of the Germans for the welfare of their families in Germany. They could be bribed with

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foods (especially fats) and, as a result, the number of forced laborers and the amount of goods delivered to Germany grew smaller. Wood production declined under the guise of many excuses (lack of equipment, Soviet paratroops, etc.), and bribes. In 1942, production quotas were fulfilled about 90 per cent and transportation quotas 78-80 per cent; in 1943, production was only 60 per cent; and in 1944, about 40 per cent. By the summer of 1944, all forestry activities were halted by the confusion of the times.

c. The policy of the Lithuanians profited as the German policy failed. Production of wood above regular field declined and while the forests were overcut, the situation did not become too desperate.

5. Education, Research, Press

a. The German policy of suppressing education in conquered areas was eased in the Baltic states and even the universities finally reopened in Lithuania. Forestry instruction at the University of Vilno, though severely restricted, was handled by a faculty of 11 higher rank personnel (docents up), 12 lecturers, and 12 assistants, until the German withdrawal in the summer of 1944. Forty-five students graduated in Forestry during the period. The quality of the graduates was somewhat below the average of 1924-1928, because of the war and the policy of the university to stay open even if it had to lower its standards. The students of the period were all quite active in politics.

b. Under the Germans, an attempt was made to revive forestry research. A special research sub-division of the Forestry Department was set up, but no real work was ever accomplished. Research at Vilno University was more active but on an individual basis without support. No research reports were published.

c. The Forest Technical School, transferred from Alytus to Vilno, was active all through the period and remains open to the present. It had a steadily increasing student body and graduated 56 students in 1939, 73 in 1947, and 73 in 1943.(1) The increasing number of graduates indicated the interest of the Forestry Administration in developing a proper forest economy. Many of the graduates; however, took more lucrative positions in other branches of the administration. The technical graduates, like the university graduates, were not well prepared as the students of former years had been.

d. There was a greatly increased demand for forestry professionals, particularly in the wood industry, where the former directors, mainly Jews, had been removed by the Germans. The requirements for technicians were about twice what the schools could produce and the German and Lithuanian officials actively promoted technical education.

e. The ex-members of the communist-closed Lithuanian Foresters' Associations who were officials of the Forestry Department, began to reissue the magazine "Musu Girios." Approximately 3000 copies appeared on an irregular schedule every three to four months.

f. In general, the progress in forestry was slow. One obstacle was the general apathy of Lithuanian science. The Latvians, for example, were and are today much more active in science than the Lithuanians. Even under Soviet rule, the progress of science in Lithuania is slow.

6. Conservation

a. The German onslaught against the Soviets was so swift that there was almost no interim period of anarchy between the two governments and consequently, no period when wholesale timber thefts were possible. In 1944, when armed irregular groups held the forests, however, timber was taken in large quantities. The Vilno forests suffered most heavily because they were first occupied by the guerilla groups and contained the most valuable timber. It is probable that one "normal" year's crop of timber (3,500,000 festmeters) was stolen during the occupation period.(2)

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b. The Germans were concerned about the dangers of forest fire and increased the number of guards, especially in eastern Lithuania. There were no changes in the techniques of fighting fires, insects, fungi, etc.

7. Exploitation

a. Methods of exploitation did not change and were conducted according to existing plans. The clear-cut method was preferred but selective cutting and thinning became more important because timber was in short supply. The tools used did not change but iron and steel tools were very difficult to replace and the necessary supply was soon very limited. This factor enabled the peasants to avoid forestry work and each year more of them were able to claim exemption because they lacked tools. Every year more tools were imported from Germany, but most of them disappeared on the black market.

b. Annual production (set at 3,500 festmeters) was valued at 15 Reichsmarks per festmeter.(3) As said above, full production was never reached and annual production declined sharply each year.(4) Most logging activities were planned for the eastern forests but had to be transferred to Lithuania proper because of the greater resistance activity in the east. Toward the end of the occupation, the only wood taken was that in the most accessible areas including the city parks.(5) [See end of report for availability of a photograph of a park in Vilno showing the results of German logging operations.]

c. In 1943, when resistance groups became particularly strong, the military ordered strips 50 meters (later 100, 200 and even 500 meters) wide to be cleared on each side of main railway lines and highways. The timber was simply cut and in most cases was not hauled away. Under this program, 15,000 to 20,000 hectares of forest were cleared and overall forest density dropped about 1.5 to 2 per cent.

d. The German forces used 1,900,000 festmeters of wood in 1943, mainly of structural timber, pulp wood, and mine timber. Most of the 1,600,000 festmeters delivered to the population were consumed as fuel.(6) A great deal of spruce bark was produced for use in tanning leather in Vilno and Siauliai, and a small amount was exported to Germany.

8. Reforestation

Artificial reforestation gradually increased each year to a high of 12,000 hectares in 1943. Large sums were budgeted for the purpose but forced labor had to be used to get the work done since compensation was low (four to six Reichsmarks per day) and worthless and the supplements (fuel wood and little whiskey) were insufficient. The Forestry Department was very much interested in the program and managed to reseed or replant almost all the cut-over areas. The end result was poor, however, because the plots were not tended and most of the seedlings were choked out by hardier second growth of a soft deciduous type. The only significant investments in the forest during the period were in reforestation and exploitation. No new buildings were constructed.

C. The Wood Economy

1. Supply and Demand

a. Fuel wood was already in short supply before World War II and the wartime demands of the Soviets and then the Germans intensified the shortage. Structural timber was greatly needed, to rebuild towns and villages which were destroyed during the conflict, but was even scarcer. The wood shortage was not less acute in Germany itself, however, small German manufacturing shops using wood as a raw material got almost no supply unless they were making war goods,(7) and the same was true in Lithuania. Fuel was rationed in sufficient quantities to prepare foodstuffs and heat buildings slightly. Every family received a fuel wood ration, which it had to cut and transport itself. This was a particular hardship for the urban dwellers who sometimes had to get wood at distances of from 30 to 50 kilometers. When it was obtained, it was usually of very poor quality. The forestry

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officials and guards who supplied it were sometimes allied in corrupt combinations to attempt to profit from the distributions at the expense of the weaker elements of the population (especially the non-German, non-Lithuanian elements). The low fuel supply was one of the reasons for the high mortality rate, especially among city children during the hard winter of 1941-1942. The Lithuanian forestry officials were so much concerned with war production that they could not help their own population very much. Initially, fuel wood production was set at 1,000,000 festmeters annually. This was far too little and it was raised to 2,400,000 festmeters, still far short of enough.(8)

b. Structural wood could only be purchased by persons whose homes had been completely destroyed (to a total of 50 festmeters). The Forestry Department had anticipated such a situation early during the German occupation, however, and had sold the timber left by the Soviets to the population at low prices. This amounted to 600,000 - 700,000 festmeters and was the only substantial amount released from 1940-1944. Every higher forestry official (German and Lithuanian) down to and including forestmasters was entitled to sell a small amount of wood at fixed prices at his discretion. Most of this material was sold for bribes and diverted to the black market.

c. In 1941-1942, about 85 per cent of the German demand (1,600,000 festmeters) was produced and 80 per cent was delivered. In 1942-1943, these figures were 70 per cent and 50 per cent, and in 1943-1944, 50 per cent and 30 per cent. The Germans allocated their anticipated supply as follows:

Sawmills	200,000	festmeters
Pulp Wood	300,000	festmeters
Mine Timber	200,000	festmeters
Fuel Wood	1,400,000	festmeters
Ties	50,000	festmeters
Deciduous Logs	50,000	festmeters
Total	2,200,000	

All German production was exported. The only domestically consumed wood was fuel. Almost no lumber was available to the population. Although they used drastic measures and punishments to stimulate production, the Germans were unable to stimulate the collapsing wood economy and industry.

d. The wood assortments did not change significantly except that structural timber was formed according to German requirements.(9) Evergreen timber was formed, however, according to Lithuania specifications.

2. Labor and Wages

a. The Germans mobilized all possible resources for war, both at home and in conquered areas. They set fixed prices, wages, and work norms. The work norms were generally highest in Germany and so were the wages. Forced labor was introduced in Lithuania and failure to report for work was punished by deportation to Germany. The peasant farmers were left on their farms but were required to furnish transport and a very large proportion of their food production. No more than one extra man was permitted on a small farmstead, or two to three on the largest ones. The surplus laborers were moved to wherever [redacted] labor was needed, including Germany. A system of labor-book documentation was introduced under the supervision of the county employment bureaus. Many young peasants hid themselves early in the occupation to avoid deportation to Germany and later on, many hid to avoid conscription into the German auxiliary Armed Forces. As a result of these factors, the surplus of manpower quickly disappeared.

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b. The Forestry Department had workers assigned to it on a permanent basis. The workers were eager for assignment to the forests because it meant that they could stay in Lithuania. They worried little about the low wage rates, which were about 10 per cent beneath the German scale, or about 3.17 Reichsmarks per day. A piece-work system was used but a laborer could not earn over 10 per cent more than his normal eight-hour wage. Transport workers (with a horse and cart) earned 112 Reichsmarks a month in Germany and 100 Reichsmarks in Lithuania (4 Reichsmarks per day; 4.5 on a piece work basis).(10) Rafting workers earned about 50 per cent more than regular forest laborers, or about 4.75 Reichsmarks per day in Lithuania. During the period, while wages remained the same, prices on the black market rose 50 to 100 times. The workers remained at work, however, in order to avoid deportation. Production was low and most of the laborers had additional agricultural, black market, or theft operations. In addition, supplements in fuel and even structural wood were additions to their incomes. A worker at one time was permitted to buy one festmeter of structural wood for every 20 festmeters (later 15 and 12 festmeters) he produced. A festmeter of structural wood brought 200 to 300 Reichsmarks on the black market, and thus, the worker could raise his income two to three times. After 1943, the workers received an additional ration of 1 to 1.5 liters of cheap whiskey and the right to buy steel tools. Shoe leather and tobacco rations were also sometimes available.

c. In spite of all inducements and threats, production dropped 30 to 40 per cent and in some cases 50 to 60 per cent. A new class of people appeared who possessed worker's certificates which they had bought from corrupt officials. They did nothing at all. There were no strikes by the workers, but there was considerable communist activity and propaganda among them. In all there were 40,000 to 45,000 forest workers, about 25 per cent more than were normally employed. They worked a 48-hour week.

3. Transportation

a. Transportation was the weak spot in the forest economy under the German occupation. The transportation system of eastern Europe never was properly developed and under wartime demands, it was very inadequate. The peasants were forced to supply labor to transport wood not only to the edges of the forests, but from there to the shipping points. The transport "norms" were set by the Germans and were not very high (14 to 20 festmeters per farm), but were never fulfilled. At first, an average of 50 to 60 per cent of the quota was fauled but by 1943-1944 it had declined to 30 per cent. No inducements (threats, punishments, pay supplements) the Germans used could make the peasants fulfill their quotas. The release of some timber on the stump helped a little, but not enough.

b. During the occupation 600,000 to 800,000 festmeters of timber and pulpwood were available for transportation by railroad to points within Lithuania and to Germany, but only 50 to 60 per cent were actually transported. The system broke down because of the failure of deliveries of timber from the forests and the problems caused by the increasing resistance forces. Rafting was increased as a substitute for the railroads, but the only thing that kept the raftsmen working were the supplements they received and in spite of them they preferred industrial work in the cities. For example, they were paid three Kg of salt, two liters of kerosine, and one liter of whiskey to make up a raft of 100 festmeters of timber; and for delivery of the raft, three-four Kg of salt, two liters of kerosine, and one-two liters of whiskey. In addition, they were permitted to buy fuel wood, poor quality clothing, and rubber shoes.(12) The rafting quota for 1942 was 290,554 festmeters but only 164,278 (51 per cent) were delivered, 135,700 (71 per cent) in 1943. The increase in the percentage is an indication of the effectiveness of the supplements in inducing men to work.

c. Truck transport was negligible, although the forestry administration had more trucks than ever before as a result of the trucks left behind by the retreating Red Army. Gasoline was very scarce and most of the trucks ran on charcoal.

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4. Industry

a. The Germans did not alter the communist industrial system during the occupation, but converted all its output to war purposes. The lumber industry was particularly important to the Germans because it was best developed. They used the lumber mainly for barracks construction and for forms for pouring concrete, but the best was diverted to aircraft. Lithuanian industry was not badly damaged by the war because the German offensive overran the country in only a few days.

b. At the end of 1940, there were 207 wood enterprises with a total of 5564 workers and 20 paper enterprises with 1433 employees.(13) Of the 207 wood enterprises, there were in Spring 1944, 130 sawmills, of which 20 produced for export and industry and the rest served the needs of the population; 20 furniture manufacturers; nine other small wood products shops; one match plant (700 festmeters production); seven cardboard shops; four paper shops; and one plywood shop.

c. The Germans kept the wood industries under their control and independent of the Lithuanian puppet government. They paid higher wages than was the rule in other industries. Wood industry workers received 20 per cent more wages than forestry workers; regular rations; special clothing, shoes, fuel, salt, and lamp oil; and small quantities of their own production. The industry was always busy and some units worked two shifts. Production was high but quality declined. Normal utilization of the timber was 62-65 per cent, but under the Germans it rose to 70-75 per cent.(14) The reason for this was the German need for quantities of lumber for rough construction, rather than quality goods. Machinery and equipment which were worn out were in many cases, replaced and remodeled by the Germans. Annual net production of lumber was about 85,000 cubic meters. The scrap and litter of the production amounted to about 35,000 cubic meters. The match plant annually consumed 1000 festmeters of aspen; the paper industry 9000 festmeters of timber; the plywood industry 1000; and the furniture and other small shops about 5000. Overall consumption was about 250,000-280,000 festmeters per year. The value of this production was 20,000,000-22,000,000 Reichmarks.

5. Commerce

a. Commerce also continued to run on the system introduced by the communists. There was no private enterprise. What did exist operated under direction of the Germans on commission (7-10 per cent). Any profits they made were the result of graft or supplements to their monetary commission. They dealt on the black market to sustain themselves. In the forests, the Germans sometimes supplied prisoner (war or concentration camp) labor to these enterprises. In addition to the few private operators, there were many German wood industry representatives present to supervise wood production for war supply. They forced production by pressure rather than by supplements or graft.

b. All commercial transactions were handled through the Reichbank on account for the Generalcommissariat of Lithuania. All wood was sold at fixed prices which were sometimes raised, but never lowered. A price system similar to that of East Prussia remained in effect but prices were lowered to compensate for the greater distance from the German production cities. The German boundaries and other former international boundaries were closed to private commercial traffic. The formalities of border crossing were even stricter than they had been before the war, and the customs' rates remained the same.(15) In spite of legislation and threats, the black market boomed. 'Basic' items on which comparative prices were based were 100 Kg of rye and one liter of whiskey. Prices fluctuated as these two commodities did.

c. The supply of fuel wood was regulated by the Germans. Prices were fixed according to east Prussian standards (but 10-15 per cent lower).

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CHAPTER VI - FOOTNOTES

(1) "Musu Girios," Sept-Oct. 1943, p 64

(2) Author

(3) "Waldheil Kalendar", 1940 p 12,120

(4) Jameikis 1950, p 104

(5) Ibid

(6) "Musu Girois", 1943, p 26

(7) "Waldheil Kalendar", 1940

(8) "Musu Girois", 1943, p 26

(9) "Waldheil Kalendar", 1940, p 65

(10) "Waldheil Kalendar", 1940, p 40

(11) Author

(12) "Musu Girois", 1943

(13) Skerys, 1947, p 43-44. The figures include all small furniture, box, and barrel shops and the paper industries include printing shops and cigarette paper and filter manufacturers.

(14) Author

(15) "Waldheil Kalendar", 1940, p 139-140

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Chapter VII

The Second Soviet Occupation and Forestry in the Lithuanian SSR

A. The Situation in Brief

1. By the Fall of 1944, the Red Army had reoccupied all of Lithuania. Administrative changes were introduced which reunified the Klaipeda area with Lithuania proper and added a portion of the Druskieniki area of Poland to Lithuania. Lithuania now includes, as a result of these additions, 65,197 sq Km.(1) The total area had 2,900,000 people in 1940 and in 1956 had 2,700,000.(2) The administrative system was revised to the system of the 1939-40 occupation. In 1946, there were 23 counties;(3) this number later increased to 42; but in 1950, the system was changed. Lithuania was divided into 87 rayons plus additional city and other administrative units. In 1955, there were 83 rayons and, as of February 1957, the system still appears to be fluid and changing.

2. In the Fall of 1944, Lithuania was in a period of severe poverty. There had been severe physical damage to the country and the population was greatly depleted by the flight of large numbers of people who preferred not to live under Soviet rule. Some of them were caught and forced to return but the largest part of the professionals and intelligentsia made their escape. The harvest of 1944 was interrupted by military activities and only a small part of the crop was harvested. The forests were badly damaged by the wartime and the first few years after the war were very hard.(4)

3. A Five Year Plan was introduced by the Soviets to restore and rebuild the area of Lithuania and the USSR proper. Soviet losses during the war were estimated at 1710 cities and towns; 70,000 villages; 65,000 Km of railroad; 32,000 industrial establishments; 109,000,000 head of stock; and 7,000,000 people. Total damages were estimated at 679,000,000,000 rubles. The Soviet forest economy alone (including Lithuania) lost 3,000,000,000 rubles. Damage was especially high in the western USSR.

B. The Lithuanian Forest Economy

1. The Soviet economic system, as it had existed in the USSR since 1918, was rapidly introduced in Lithuania. All land was expropriated, and all property nationalized. The dispute over forest use had been settled in the USSR since 1932 and Lithuania forests were divided according to the Soviet plans.(5) There was a tremendous exploitation of Lithuanian forests from 1944-50. On 1 January 1950, Lithuania contained 1,300,000 hectares of State Forests plus 50,000 hectares of former peasant forest areas attached to Kolkhozes. The state forests were divided in two groups, the first (28%) designated as preserves to be maintained for soil and water conservation, resorts, and parks; and the second (72%) to be exploited and managed under a productive forest economy.(6)

2. Present Status of the Forests

a. The most accurate and up-to-date estimates of Lithuanian forests are given by M Yankauskas in his book, "Maumedziai", 1954, page 234. He gives the following figures:

Evergreen stands -		
Pine	487,600	hectares
Spruce	425,300	"
Deciduous stands -		
Northern Alder	52,400	"
Birch	33,300	"
Oak	9,000	"
Kolkhoz Forests	50,000	"
TOTAL	1,057,000	"

The difference in this total figure and the figure of 1,350,000 hectares given above, 292,400 hectares, is composed of swamps, roads, lakes, meadows, and other incidental areas.(7)

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b. General forest density is given as 16% /i. e. 16% of Lithuania is forest or forestry property/, but it has not been accurately determined and figures vary between 15.3 and 17.6%.(8) There are approximately 120,000 hectares of sandy area in Lithuania which should be reforested. If this were completed, forest density would raise about 10%.(9) The machanization of farming has caused the transfer of small areas of land, formerly tilled, to meadowland. They are too small to be ploughed by tractor and as their use changes they tend to reforest. Thus, the area of brush land has increased. There are about 0.4 hectares of forest per person(10) or about 1.2-1.5 F.I.Y.(11)

c. The forests are composed proportionately of the following trees:

Pine	42%	Aspen	7.3%
Spruce	28%	Oak	0.8%
Birch	13.1%	Ash	0.7%
Northern Alder	7.8%	Other	0.3%
			100% (12)

These figures show a remarkable increase in pine forests over earlier (pre-World War II) years and a decrease in spruce forests. About 21% of the total is composed of soft formations, indicating that previous natural reforestation has resulted in less valuable second growth.

d. The state forest areas (excluding the Kolkhoz forests) are composed of:(13)

(1) Pineta						
Pinetum	Cladiosum (Arid Type)	-	75,600	hectares	-	15.5%
"	Vacciniosum	-	214,600	"	-	44.0%
"	Myrtillosum	-	126,300	"	-	25.9%
"	Polytrichosum	-	3,900	"	-	0.8%
"	Sphagnosum	-	31,700	"	-	6.5%
"	Ledosum	-	16,100	"	-	3.3%
"	Caricoso Sphagnosum	-	6,300	"	-	1.3%
"	Coryllosum and Tilliosum	-	2,900	"	-	0.6%
"	Oxalidosum	-	10,800	"	-	2.1%
			487,600			100%
(2) Piceta						
Picetum	Oxalidosum	-	172,600	hectares	-	40.7%
"	Coryllosum	-	21,600	"	-	5.1%
"	Vacciniosum	-	18,500	"	-	4.4%
"	Myrtillosum	-	162,000	"	-	38.2%
"	Polytrichosum	-	9,500	"	-	2.2%
"	Sphagnosum	-	1,300	"	-	0.3%
"	Caricosoe Sphagnosum	-	9,500	"	-	2.2%
"	Alnoso-Urticosum		12,900	"	-	3.0%
"	"-Caricosum	-	16,800	"	-	3.9%
			425,300			100%
(3) Alneta						
Alnetum	Urticosum	-	11,400	"	-	21.8%
"	Irosum	-	15,700	"	-	30.0%
"	Caricosum	-	25,300	"	-	48.2%
			52,400			100%
(4) Betuleta						
Betulum	Caricosum	-	33,300	"	-	100%
(5) Querceta						
Quercetum	Oxalidosum	-	9,000	"	-	100%
			1,007,000			

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e. The most desired, highest quality trees are included in these stands as follows:

First and Second Quality Pine - 139,400 hectares - 28.6%
" " " " Spruce - 255,200 " - 78.9%
" " " " Oak - 9,000 " - 100%

In 1950, the state forests were divided by ages as follows:

Young stands	51%
Middle Age Stands	31%
Ripe Stands	12%
Old Stands	6% (14)

Average age is about 30 years. By tree type the forests were distributed according to age as follows (There is some discrepancy between the tables):

Tree Type	Ripe Stands	Old Stands
Pine	3.7%	2.2%
Spruce	5.0%	2.2%
Oak	0.2%	0.2%
Birch	1.9%	1.0%
Aspen	1.3%	0.8%
Northern Alden	1.0%	1.4%
Other Deciduous	0.3%	0.1%
	13.4%	7.9%

It can be seen from the tables that present Lithuanian forests are completely exhausted and largely composed of young stands. The density of mature formations is low.(15) The young stands are thinkly overgrown with brush and evergreen undergrowth.

f. The distribution of the forests is not significantly different than it was in 1944. In 19 former counties, forest density is below 15%, in 15 it is between 15 and 25%, and in 7 counties above 25% but not over 47%.(16) The annual yield is fairly high (roughly 2,500,000 - 3,000,000 festmeters) because young stands have a fairly high increment (up to 10% on good soils), but the crop is largely (80-90%) brush, saplings, and bark (about 30%) of relatively little value even as fuel.(17) If the forests are cut according to the principal of sustained yield, they can produce about 10% structural wood, and 20-25% of pole type material suitable for mine timber and pulp wood.(18) In former years brush wood was considered valueless and was not even considered in statistical computations of the wood supply. Only in recent years has it been used and valued as fuel. Judging by the present situation, the shortage of structural timber will last 20-30 years. If cutting is restricted, the timber supply will steadily increase and within that space of time, the crop will be on a more normal basis.(19) Production of structural timber cannot increase considerably for 60-70 years, but if present practices are maintained, production by that time can be almost double (about 5,000,000 festmeters annually).(20) It is very doubtful that this will occur, however, because of the rising population (1-1.1% annually) and increasing industrialization.

3. Forest Management

a. The Soviets established a Lithuanian Ministry of Wood Industry in 1945, patterned after the Commissariat of Wood Industry which had existed in 1940-41, and like it, essentially interested in exploiting the Lithuanian forests. The problems of reforestation and forest management were secondary to the tremendous needs for timber. The Ministry of Wood Industry was split in two in 1947 and a new Ministry of Forest Economy took its place beside the original Ministry. The duty of the new Ministry was management of the forests in a normal forestry program considering reforestation, conservation, etc. The original Ministry was responsible for logging, and transportation. It furnished the raw timber for Lithuanian industry. When that material came from other areas of the USSR, the Ministry of Wood Industry actually sent work parties to the area in which the wood was available, to cut and ship it. For example, wood used in construction of the hydroelectric dam on the Nemunas River near Kaunas was cut in the Karelian Isthmus by Lithuanians. Both local Ministries were patterned after the All-Union Ministries in Moscow and functioned in a similar manner.

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b. The heedless exploitation of and damage to the forests in Lithuania and the USSR from 1940-1950 brought them to a point of almost complete exhaustion. As a result, the danger of drought, flood, and erosion became so serious that it threatened the agricultural base upon which the USSR was so dependent. The seriousness of the situation led to the establishment (in 1947) of the two Ministries and eventually to their re-combination in 1956 into one Ministry of Wood Industry.(21) The Ministry works in connection with the paper, wood, and construction industries which are controlled by other Ministries. It handles all the functions of the former Lithuanian Forestry Department. /See end of report for availability of a sketch of one Soviet Lithuanian Forest Administration, 1956./

c. On the local level, there was no administrative change until 1947 when a system of primary administrative units called Leskhozes was introduced. Each Leskhoz contained one or two of the former forest master districts. In 1950, there were 23 Leskhozes in Soviet Lithuania, 180 forest ranger districts, and 2340 forest guards.(22) Average size of the various divisions was:

Leskhoz	- 55,000	hectares
Forest Ranger District	- 7,000	hectares
Forest Guard Circuit	- 540	hectares

The administrative headquarters of each Leshkoz is responsible for:

preparation of work plans;
collection of forest statistics;
determination of logging areas and volume;
designation and preparation of timber to be harvested;
Supervision and control of work parties;
Reforestation;
drainage and irrigation;
Protection against theft, insects, fungi, firest, etc.;
Production of wood products for local needs;
Education of the population concerning the forestry program; and
Improvements (Road and bridge repair, construction, etc.)

d. Each Leskhoz is directed by a college or high school educated forestry professional plus a communist official, with engineering and technical aids. ✓✓ Since the number of administrative units has declined, there are probably enough professionals to staff the system, at least at the leskhoz level. The areas controlled by the forest rangers are quite large, as much as $2\frac{1}{2}$ times larger than before World War II, and the rangers ideally should be college educated foresters. Foresters under the Soviets have one new duty; the promulgation of communist propaganda through the medium of evening schools and courses to raise and improve production.

e. The frequent changes in the administrative system, and the large size of the forest ranger districts indicate a shortage of professional personnel. Approximately 200 forestry officials (30%) left Lithuania with the Germans in 1944 and never returned. There was approximately the same percentage of defections from Latvia, Estonia, White Ruthenia, and the Ukraine.(23) Many of those who left were the best educated and most capable. Their loss was a severe blow to the Soviets who have had constant trouble in building up an adequate man power reserve. The forest rangers (Girininkas) of Soviet Lithuania now have to perform essentially the same duties (on an average of 7000 hectares) as the forest masters formerly did (on an average of 20,000 hectares), and the same as the lesnichy (forest masters) of the USSR proper. There has never been a forestry position in Russia equivalent to the Lithuanian Forest Ranger. Probably many former Lithuanian forest masters now serve as rangers, so the quality of the work may in some cases be excellent. In addition, many former rangers still hold their own or equivalent positions. The guard system has not changed appreciably. The guards undoubtedly have more responsibility than before, because forestry activites (reforestation, cleaning, care, etc) are more complicated and time consuming in young stands, and the forest rangers cannot be capable of assuming all the duties held by the forest master plus the forest rangers. The guards must, therefore, also have additional training and education.

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f. The whole number of forestry officials is estimated to be:

	Director	Aids	Other	Multiplied By	Totals
Leskhoz	2	5	10	23	391
Forest Ranger	1	2	3	180	1080
Forest Guard	1			2340	2340
Total					3811

This compares with a force of 3100 persons in 1943. Judging by the situation under the occupation of 1940-41, the central administration is larger than it was in 1943. The Soviets must have a constant problem based on the nationalistic sentiments of the Lithuanian population and, particularly, of the foresters. Some foresters of the higher ranks (about 20 with their families) were deported to Siberia as dangerous to the regime. They were in guarded camps for 5-10 years, but most have now been released and work on naval stores production, logging operations, etc, mainly around Krasnoyarsk.

g. About 350-400,000 Russians have been brought into Lithuania. As the most reliable element of the population, they hold the leading positions, act as police, and help to supress nationalistic tendencies in economic as well as political affairs. Many of them are active in forestry, as Leskhoz Directors and in the central administration.(24) There is a policy of sending young Lithuanians to Russia for advanced education, practical experience, and to learn new techniques. As a result of the post-World War II flight and deportation of Lithuanian foresters, and the Soviet policy of transferring Russians in and Lithuanians out of the system, there are more Lithuanian foresters now in the US than in the Lithuanian SSR.(25) The Soviets do respect professional ability however. For example, former forestmaster Krushinskas, who fled before the Soviet armies but was captured in Germany, now holds a responsible position in forestry in Siauliai. On the whole, the back bone of the local forestry units is still Lithuanian.

h. Many young Lithuanian men and women have "volunteered" for pioneer service in Kazahkstan, beyond the Volga, and in Siberia. Many have stayed beyond their contract (1-3 years) time, some permanently, and have won responsible positions. The policy, plus army service and university study in Russia, has resulted in a scarcity of young Lithuanian men in Lithuania. In their places are young Russians.(26) One of the Russian's duties is to counter any Lithuanian nationalist movements and neutralize any passive resistance on the part of the Lithuanians.

i. Salaries of Lithuanian officials are low. For example:

	Per month
Director of a Leskhoz or timber mill or a	1300-1600 rubles
University faculty member	400-500 rubles
Unskilled worker	150-200 rubles
Janitor (female)	500-800 rubles(27)
Forest rangers and aids	

In addition to their salaries, forestry officials receive fuel and a dwelling. Prices vary between the official level and the black market level as follows:

Goods	Official	Black Market
Butter (1 kg)	28 rubles	38 rubles
Cottage Chees (1 kg)	16 rubles	
Fish (1 kg)	2.5 rubles	
Eggs (10 in winter)	18 rubles	
Eggs (10 in summer)	6 rubles	8 rubles
Sugar (1 kg)	9.5 rubles	25 rubles
Dress (ready made)	560-600 rubles	
Stockings (woman's cotton)	120-140 rubles	
Suit (best quality)	1000 rubles	
Shoes (man's)	200 rubles(29)	

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Vital consumer production falls below demand and the inflated value of the monetary unit is reflected in the black market price level. A minimum existence salary is about 700 rubles per month but most workers and lower officials do not make this much. As a result, corruption, theft, apathy, and passive resistance are common, in spite of severe punishment and widely disseminated propaganda. (The curious communist propaganda is deeply rooted in the common conceptions of the eastern European peoples, who have suffered under totalitarianism longer than the West. According to this concept, which is widely held by the Russians and other Slavs (Lithuanians included), every government is imposed by God. No government, however, can be good government since it must exploit the common man in order to maintain itself and there is only a difference in the degreeoof the exploitation. The common man has no sympathy or love for his government, and no desire to help it. The communists try to break down this prejudice (among the intelligentsia as well as the people) by means of propaganda and other devices which they hope will be more effective than prisons.)(28) ✓

j. The Lithuanian forests are exploited more intensively than ever before because of their sparseness, and all officials have more to do. The forest guards are particularly busy because they have taken many of the duties formerly held by the forest rangers and because the danger of fire in young pine stands is enormous.

k. The Communist Party has steady control over every element of life in Soviet Lithuania. From headquarters in Vilno, it surveys the activities of the central forestry administration, instructs it, and if necessary, punishes it. Leading officials of the administration are Communist Party members. The "Congress of Activists" discusses communist doctrine as applied to forestry as well as to other subjects. The responsibilities (forestry and political) are great and punishments severe, but in spite of every inducement and threat, their productivity is low. The professional level of the officials is probably (no data is available) low. There are too few professionally educated persons and too much concern with political doctrine. The backbone of the system is still the native Lithuanians; the communists are dissatisfied with them and trying to replace them.(30) ✓

4. Forestry Education

a. The staff of the Faculty of Forest Sciences left the country almost entirely (90%) in 1944. The few who remained were primarily interested in other fields, not forestry, or were assistants or aids. The communists made all sorts of promises to try and induce these professionals to return to Lithuania, but all of them failed. As soon as the Forestry Administration was revived, the Faculty of Forest Sciences was reopened and later on an Institute of Forest Research was established. All of these institutions required many more personnel than were available.

b. The lower level schools in Lithuania are subordinate to the Lithuanian Ministry of Education. Professional schools and colleges are directed by the All-Union Ministry of Education or by All-Union Ministries corresponding to their specialties. The new Faculty of Forest Sciences was incorporated into the University of Vilno, so it originally reported to the All-Union Ministry of Education but was later transferred to the All-Union Ministry of Agriculture. The All-Union Ministry supervises all its subordinate educational institutions, prepares their programs, and ensures that they are in line with other Soviet curricula. Professors who received old-style educations are given special courses in Leningrad or Moscow to ensure that their teaching is in line with party practice. ✓

c. The education given is new. The traditional Lithuanian forestry education was patterned after that of Czarist Russia which sought to produce naturalists and forestry administrators for an essentially passive forest economy. The Soviets put the emphasis on engineering (mechanization of forestry techniques, transport, and industry) as is done in Western Europe and application of the new biological theories.(31) Instruction is in Russian.(32) The total number of professors is unknown, but of the old guard, the following are known to be in Lithuania and to be or have been employed:

Vladas	Vaitkus	(Retired)
Vincas	Taujenis	(Possibly retired)

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Lithuanians among the members of the Institute of Forest Science of the Lithuanian SSR Academny of Science are:

M Yan Kauskas (Dean of the Faculty of Forest Science, Academy of Agriculture, Kaunas)

(FNU) Rugelis

(FNU) Stinskas

M Daujotas

A Minkevicius (Botanical Section)

M Lukinas

A Kvedaras

Only the last two are, or may be, Communist Party members. All were graduated from Lithuanian schools prior to World War II, and it is believed that most of them work as lecturers or even as professors at the Faculty of Forest Science (Vilno).(33) The most outstanding professionals are:

(1) Mykolas Yankauskas, 55, a Lithuanian, graduated from the Forestry Division of the Agricultural Academy in Dotnava, author of "Maumedziai L.T.S. Miskuose" ("The Larch Species in the Forests of the Lithuanian SSR"), Vilno, 1954, and of many articles in the former forestry magazine Musu Girios. He is a specialist on forest workplans and the best Lithuanian forest scientist and researcher. He was a Christian-Democrat and an anti-communist. He now is the best paid of the Lithuanian foresters,(34) and seems to be the most productive.

(2) Professor Doctor A Minkevicius, about 60, a Lithuanian, former professor of the Lithuanian University, graduate of Kaunas University (about 1925), is a botanist devoted to the study of the dendrology of the Lithuanian SSR. He is a very active, productive researcher, and author of many publications on botany. His book on the evergreens of Lithuania was published in 1954 and he has also written a guide book to Lithuanian mosses. He is currently professor of botany at Vilno. He is not a communist.(35)

(3) Vladas Vaitkus, 73, former professor of forestry now retired. A strong sympathizer of the communists, now old and infirm.(36)

(4) Tadas Ivanauskas, 70, Polish, was a non-communist. He is a very active and able professor at Vilno, and an advocate of proper hunting and conservation of wild life. He founded the preserve at Zuvintai in 1930 and is the author of many publications. "Draugas" described him in 1954-55 as a warm supporter of Michurin-Lysenko ideaa who introduced them into his zoology classes. In addition to his teaching responsibilities in zoology and Forestry Science (probably hunting) he is also interested in ornithology.

(5) Vincas Taujenis, 70, a Lithuanian, is probably now retired. He was active as a lecturer on drainage and peat production as late as 1952. He is a non-communist and has very limited talents as an educator.

d. The Faculty of Forest Sciences probably has a total of 10-12 professors. Probably some of them are Russians. Any Lithuanians other than those mentioned above cannot be men of experience or importance. There is a shortage of people even in the USSR properly capable of teaching the engineering aspects of forestry which the Soviets stress. The faculty members seem to be tolerated by the communists and to be subject to very little interference. Apparently the communists have learned a painful lesson as the result of the mass flights of intellectuals during and at the end of the war. (It may be noted, however, that according to US press reports almost the entire staff of the Hungarian Forestry College left Hungary during the insurrection of 1956.) It is well known that in addition to their greater freedom, professors are some of the highest paid members of Soviet society (1000-1600 rubles per month plus the right to shop at special state stores).

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As a result, the Soviets have no difficulty in attracting new men (even Lithuanians) to academic and research careers. In spite of the leniency, however, professors are pretty tightly controlled by the auxiliary communist organizations within the universities such as the Komsomols, and others. Professors are frequently subjected to press criticism (individual and collective) as hold-overs of the bourgeoisie and its ideology.(37) Professors in the bidogical sciences have been especially subject to the criticism.

e. The level of the available Lithuania professors would seem to be too low for Soviet conditions. The new concepts of Soviet forestry are strange to Lithuanians. Lithuanian forestry was passive, extensive, and conservative (except for exploitation). Soviet Forestry is dynamic and active. The level will rise as additional training is given in the USSR, and a few Lithuanians have made new studies of merit (T Ivanauskas in ornithology, A Minkevicius in botany, and M Yankauskas in pure forest sciences).

f. The number of forestry students at Kaunas is unknown. Formerly there were around 15 graduates each year, and it may be estimated that from 1947-1957 approximately 150 persons have been graduated in forestry science. Judging by the size and qualifications of the staff at Kaunas, however, the number may be larger. Official communist sources give misleading and exaggerated estimates of student numbers. According to them 18,000 Lithuanian professionals had already graduated by 1956 and there were 23,000 students. These figures include all persons (some without even an elementary school education) who have taken or are taking various practical courses concerning the work they are already performing.

g. The efforts of the Secretary of the Lithuanian Communist Party to gain control of the professional schools and colleges of the Lithuanian SSR and his complaints that the All-Union Ministries tend to lower the number of students in them are quite interesting.(38) The policy of the All-Union Ministries has particularly impeded the training of necessary agricultural specialists. It is difficult to account for the policy since the shortage of trained professionals is still acute throughout the USSR, and particularly in Lithuania. The Lithuanian shortage is aggravated by the fact that many graduates are sent out of Lithuania to fulfill the terms of the scholarship contracts under which state pays for their education in return for work to be accomplished after graduation. (The statement of A Konciusy, a teacher in the forest technicum in Vilno, in a letter of Dec '56 that the number of Lithuanian foresters in the US is greater than the number in Lithuania again comes to mind - [see footnote 25]. Most of the students have to use these scholarship arrangements. Their parents cannot afford to pay for their educations and it is almost impossible in the USSR to support oneself while going to college. The sons and daughters of the former leading families are forced to avoid the scholarships and the colleges and most applicants come from the ranks of the poorer elements of the population who are more sympathetic with communist philosophy.

h. The extreme nationalism inculcated by the Lithuanian Government from 1927-39 has very deep roots, even among the poor. A strong nationalist reaction developed among Lithuanian students following the Hungarian revolt of 1956. As a result, the professors were denounced by the government as reactionaries. Late (Jan 1957) letters from Lithuania indicate that the student movement was strong and that active student leaders were executed. The students are poorly fed and dressed and are under steady police and auxiliary communist organization control. They do not have sufficient books or equipment.

i. It may be roughly estimated that there are now 100-150 college trained foresters working in Soviet Lithuania (as Leskhoz directors, forest rangers, in the central administration, and in the wood industry). There should be at least 400 college trained professionals in the forest economy, so the balance must be made up of Russians. There are not enough Lithuanian graduates to fill the posts and many graduates go into other professions or are sent to other parts of the USSR. The decreasing number of students in the university is undoubtedly part of a policy to deliberately russify Lithuania.

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j. The Soviets apparently were very eager to train foresters because the Forestry Technical School in Vilno was reopened almost immediately after the Soviets reoccupied the area in 1944. Lithuanian young men preferred to stay in school to complete their college work rather than being content with only the technical instruction. There were complaints about this before World War II, and the Soviets are still complaining about the same problem.(39) The faculty and number of students of the Institute are not known but it has always trained large numbers of people. The average number of graduates each year was approximately 20-25. The war-time teaching was accelerated (73 graduates each in 1942 and 1943)but the quality of the graduates declined.(40) They were trained well enough, to handle the former duties of a forest ranger, but not the duties of a ranger under the present system. The number of graduated students (20-25) today is probably about the same as it was before World War II.(41) This sort of practical school fits well into the Soviet scheme of education, although its curriculum has undoubtedly been changed, particularly as regards engineering.(42) The need for people with this practical training has always been high. There may be 300-350 living graduates of the school in Lithuania now, but 500-600 are required. The students of the school are probably mostly Lithuanians.(43) The director is unknown. A Rubikas, former director, was deported to Siberia in 1945.(44) Others on the staff include A Koncius, a Lithuanian, and M Lukinas, a Russian who was educated in Lithuania, and a pro-communist.

k. The Soviets are greatly interested in the training of all ranks of officials. Special attention is paid to the lower ranks in order to win devoted supporters to communism and to train them to accept greater responsibilities. In forestry, this attention has special importance for the forest guard which is largely composed of peasants with no more than grammar school educations. Under the present forest conditions of abundant young stands there are great problems of nursing, cleaning, clearing, and thinning the young growth areas. The forestry technical staff is too small for the task and the guard force has had to be trained to take on some of the responsibility. The training includes elementary plant biology and other technical details, but in addition, it serves as an opportunity for indoctrination concerning communist theories of nature and politics. The communists trained 70 higher rank people for two months in 1949, and planned to train 150 forest rangers, inspectors, aids, and forestry bookkeepers in 1950.(45) Practical training of guards and laborers is carried out in all forest ranger districts. 569 persons attended this training in 1949, and about 1000 in 1950. Eventually the communists plan to train and indoctrinate all workers with communist ideals. Graduates of Lithuanian colleges prior to 1944 must take additional courses in Moscow (two years at the All-Union Ministry of Forest Economy) and Leningrad (3 months in the Forest Technical Academy). This instruction concentrates on the communist biological concepts and the new mechanical techniques.

l. The Academy of Science of the Lithuanian SSR had 13 member institutes (in 1952).(46) Among these is the Institute of Forest Economy which is located in Kaunas and is responsible for forest evaluation and reforestation. Its main task is the publication of studies on the forestry policy of the USSR and the Lithuania SSR. Applicants for membership in the Institute (and in the Academy) must be college graduates over 40, be loyal to the regime, and have published works on forestry. The following persons are known to the author:

(1) Director of the Institute was Antanas Kvedaras, former director of the Forestry Department (1940-41), and a high official in the Ministry of Forest Industry (1945-?). He is about 65, a Lithuanian, a graduate of the Forestry Technical School in Dotnava (1924), and a communist. He has very limited scientific capabilities and it appears that he is an administrator, not as active scientist;

(2) The most outstanding member of the institute is Mykolas Yankauskas (See above);

(3) Another good man is [FNU] Rugelis, 46-50, a Lithuanian, a college graduate (1940), a non-communist, and an active, able person. He is especially interested in evergreen reforestation;

(4) Mykolas Lukinas, a Polish born Russian about 55, is also able, although un-productive, person. He graduated from college in forestry in 1929. He is pro-communist, and a long time administrative official.

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He was a teacher in the Forestry Technical School in Vilno, and may still be there. He is interested in the reforestation of oak forests. He is the backbone of communist control of the Forestry Technical School. He is a drunkard.

(5) Vincas Stinskas, about 40, is a non-communist Lithuanian who graduated in 1942 from the Faculty of Forestry Sciences in Vilno. He is an able person. He served as chief referee (1941-1944) in the central forestry administration in Kaunas. His specialties are entomology and phytopathology.(47)

(6) Marian Daujotas, 65, Polish, graduated in 1915 at St. Petersburg. He is a non-communist expert in reforestation, especially of sandy areas. He is not very active or productive, possibly because he is also a teacher in the Forestry Technical School in Vilno and a lecturer in the Faculty of Forest Economy in Kaunas.

m. In general, the Institute is Lithuanian and non-communist but it is lead by communists. Its membership includes most of the best and most active Lithuanian forestry professionals. Its program is dictated by the National Academy of the Science of the USSR. Reforestation is certainly the institute's most pressing problem.(48) 75% of all the stands are young and unreforested and there are large aand dune areas and swamps. New Soviet reforestation policies call for the introduction of rapid growing trees to obtain maximum production in the shortest possible time. The Michurin idea of taking from nature rather than waiting for it to give, and Lysenko's theories are followed faithfully. ✓ Many attempts are made to develop tree hybrids. The Institute has issued only a relatively few larger publications, but may be circulating additional pamphlets, circulars, etc. Essentially, however, its research work has not yet reached the stage of producing reportable results. It works slowly and its effort does not compare with the more dynamic Latvian Academy.

n. Scientific regional meetings guide and control the activities of the various Academies of Science.(49) For example, a meeting to discuss forestry policies and practices which met in Kaunas in 1951 included representatives from White Ruthenia, Lithuania, and Latvia. It was led by Professor V I Perechod, an old experienced socialist (and communist for an unknown period of time). After the meeting, Perechod (a White Ruthenian) visited several Lithuanian Leskhozes to further spread communist doctrine.

5. Press and Publications

a. The professional publications concerning Lithuanian forestry have always been issued haphazardly as the result of incidental research conducted by individuals and reported in short articles. Few of these were scientifically acceptable. In the main they were articles, reviews, ✓ criticisms, and descriptions of popular interest, or detailed explanations of particular techniques, or statistical reports. They contained a good deal of information on minor problems. The Russian forestry press was of a similar nature but especially following World War II the program of an official forestry press was incorporated into ✓ the overall forestry plans. The present magazines are the only forestry publications available in Lithuania. They are issued monthly but distribution is limited as well as size (about 160 pages per issue). They can- ✓ not possibly be adequate to include the material of interest which is available. The material included, while interesting and written by competent specialists, is too brief and is more the type of material whihh one would expect to find in circulars and pamphlets. They include considerable material of seasonal interest and so they can be and are used as directives to the local units.(50) They are issued regularly, but delivery is poor. They contain a great deal of criticism and many new and vital ideas and experiences. The press gives evidence that the forestry program of the USSR is dynamic and that Soviet forestry research leads in Europe.(51)

b. The various magazines discuss the actualities of the present problems besetting Soviet forestry. Much attention is paid to the combating of drought, the protection of watersheds, and the problem of drainage in the northern forests. There is also considerable material inserted on communist political themes. The magazines, especially those on forest biology are based on new currents in Soviet science, and are not, as forestry magazines frequently were before World War II, monotonous and copied

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from one another. Most seem to be designed almost as text books. Many have been translated into Lithuanian and distributed as directives.(52)

c. Professor Minkevicius published a college text "The Basis of Phytopathology" in 1944 and Professor Kolpikov published a similar volume, "Elements of Forestry" in 1949. Other publications issued for training purposes (including the forest guard) include:

"Rules for the Case of Nursery Seedlings", 3100 copies
"Practical Control of Forest Cultures", 4600 copies
"Guide Book for a Forest Guard", 6000 copies
"Leskhoz Regulations" 1700 copies
"Rates of Forest Productions", 2100 copies
"Stakhanovites in Forest Production", 3100 copies
"Instructions in the Prevention of Forest Fires", 3100 copies
"Inventory and Accounting Procedures", 500 copies

Total 23,600 copies

In the period of 1946-1956, more publications on Lithuanian forestry were issued than in the 21 years of the Lithuanian Republic. Professional books were then rare but now appear to be popular, to the advantage of the Lithuanian forest economy. Science under the Soviets is not separated from production, but serves it.

C. The Status of the Soviet Forest Economy

1. While the USSR is rich in natural resources, it has many serious problems to solve concerning the lack of food and wood which are brought on by climatic problems and the vast distances within the country. The largest forest areas are located in the northern portions of the European USSR. The swampy forests have a very low production (1-1.5 festmeters per hectare per year) in spite of their maturity. A great deal of the wood is spoiled by rot.

2. The central portion of the European USSR has the most moderate climate of the USSR and while precipitation is low, the growth of structural evergreen timber and some deciduous timber proceeds very well. The area is heavily populated and with the pressure of industrialization, the forests have been overcut. In addition, they were especially hard hit by wartime damage. For exploitation purposes, they will be useless for a long time.

3. The southern portions of the USSR include wide steppe areas with even larger areas of desert and semi-desert. All have very fertile soils but insufficient precipitation. The periodic droughts which occur here seriously harm the agricultural economy of the USSR. The forests of the area, especially in the Ukraine, have been decimated and their production is very insufficient. The overcutting has brought about serious new erosion problems, rivers are drying up, and floods are a common occurrence. As a result, desert and semi-desert areas are spreading northward into central Russia, and the swamps of the north, previously blocked by forest stands which have been cut down, are spreading southward.

4. The overcutting of the forests after World War II lasted until 1948 when a common outcry was raised against the serious effects brought on by the cutting. There was a sharp reversal of forestry policy bringing an end to the over exploitation, and a change to a policy of maintaining the forests in order to protect crops, and combat drought.

5. The Siberian forests are very vast, but again, large areas are in swampy regions and have a low annual production. They contain high quantities of mature and over-ripe (largely spoiled by disease) stands, but they are so far from the centers of manufacture and population that they cannot be of much use. Only the West Siberian forests have an influence on the forest economy of the European USSR. One of the reasons for the transfer of Western Soviet industry to eastern areas is the greater availability of wood in the east.

6. Wood was in short supply in the western and southern portions of the USSR even before World War II. The Soviets were exporting wood from those areas, however, in order to build up foreign exchange balances.(53) As a result of the war and post-war demands, the supply of wood almost stopped, especially of structural timber. The shortage will not be alleviated for several decades.

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The first move to restore the ruined forest economy was set underway in Dec '47. It became part of the first priority policy of the government to rebuild the USSR's agricultural base.(54) Major attention was paid to the replanting of strips in the southern steppes and along the major rivers, and to the protection of the remaining forests in those areas for conservation purposes. The northern forests were not given the same attention. The central zone (Lithunia included) receives the greatest care. Its production potential is highest while the northern forests have the least and the southern forests given promise of limited production of structural timber. In 60-70 years, the USSR hopes to have an abundant wood supply for its own use and perhaps even enough to supply the needs of the European wood market.

7. The Soviet forestry policy is part of a plan for the "reconstruction of Soviet nature". The forestry policy foresees:

   a. large plantings in the semi-arid steppes to protect crops;

   b. large plantings and special care of existing forests along main rivers;

   c. establishment of large nursery areas;

   d. large plantings to control shifting sand dunes;

   e. incorporation of mechanization into forestry work;

8. The main problems confronting the forestry administrators are:

   a. increasing of the quality and quantity of production;

   b. accomplishing an increase in production as rapidly as possible;

   c. increasing the forest area of the central portion of the European USSR; and

   d. training the necessary personnel;

   Most of the problems which beset the Soviets are only a continuation of problems which were serious in Czarist times. The Soviets, face these problems on a larger scale, but attack them with greater energy and new methods.

9. One of the most interesting aspects of the new Soviet forestry drive is the new conception of nature, officially recognized and legalized by the party and government, under which it operates.

   a. The originator of part of the new Soviet theory was an able gardener Ivan V Michurin, who became known in 1928 as the developer of various strains of drought and frost resistant fruit trees. While Morosov and other Soviet scientists had been skeptical of the influence which man could have on nature, Michurin delcared that man could alter the nature of plants in a desireable way within a short span of time.(55) Without using acceptable scientific methods and explanations, Michurin obtained practical results upon which the Soviets base their plans for future agricultural practices. He is, therefore, considered by them to be one of their heroes.

   b. Michurin's ideas were developed by others, especially T Lysenko, who without a scientific basis disputed the heridity laws of Mendel, Morgan etc., and claimed that new organisms can be devdoped by applied environmental conditions. The basic idea behind this is that man can alter the hereditary characteristics of an organism within a few generations by the application of external influences and that the cells, not the genes, bear these new characteristics. The Soviet concept of dialectic materialism provided a theoretical basis for the Michurin-Lysenko ideas.(56)

   c. The important thing about the Michurin-Lysenko theories from the standpoint of this study is not that they are right or wrong, but that they are recognized and obligatory state concepts. They are taught in all schools and have important influences on forestry because all estimates in regeneration, nursing, and typology are based on them. Under them the forestry economy of the USSR must not only produce timber but must cooperate closely with agriculture, and other branches of production. In the steppes, for example, combined orchards and forests were planted and new domestic and foreign trees were introduced. Special research stations have been set up to perform hybridization experiments.

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D. Status of the Lithuanian Forests Under Soviet Forestry Theory

1. All the concepts and regulations of Soviet forestry are reflected in Lithuania except the efforts to control drought areas which have little application to Lithuanian conditions.(57) Much of the new theory was originally unclear and confusing and a revulsion of criticism followed early applications, not only in Lithuania, but throughout the USSR. Official requirements demanded the application of the theories but the scientific community, passively resistant to new ideas, was powerless to do so. It taught them, but without persuasion or forcefulness. Communist leaders were quick to attack this lack of enthusiasm and to force more enthusiastic acceptance of new doctrines.(58) While Lysenko has been discharged from his position as President of the Agricultural Section of the Academy of Science and his theories denounced, there does not seem to have been much change in their application. Apparently, they are still the basis for forestry planning.(59)

2. Work Plans:

a. All state forests in the Lithuanian Republic were managed under ten year work plans (some of which have been revised). In Vilno, there were work plans for all state and some larger private forests. The devastation of the forests from 1940-48, however, destroyed the usefulness of these plans and new ones had to be drawn. Yankauskas' new book about the larch proves that this had been accomplished prior to 1954.(60) There is even an indication that productivity tables have been composed.(61) The work plans were probably prepared in accordance with the estimates Yankauskas gives in his book (see Part B, 2. above).

b. The old Soviet school of forest typology (Kruedener, Sukachev, Morosov, etc.) had already been denounced before World War II as a result of the new theories.(62) The new school sought to ignore the time factor in the natural processes of plant life and to hybridize new, artificial forest formations.(63) A proper theory of forest typology is highly significant in developing a proper forest economy. In the Lithuanian Republic, the question of typology was only theoretical because forest types were already determined. It was of interest, however, because clear cut practices brought about fundamental changes in the forests. Forestry management tends toward a goal of dividing and managing forests by specific tree types. Only this method which can employ standard techniques in a large area can achieve maximum production.

c. There have been two groups of forest typologist in the USSR, forester typologists and botanists (phytozonologists). The last group divided the types bases on the character of the herbs to be found growing beneath the forest crown. The foresters were a more informal group, basing their individual decisions on such indications as soil, elevation, etc. They sought to copy nature and to help the botanists and nature to form natural formations. They were practical; the botanists theoretical.

d. Lithuanians under the Republic (1918-39) tended to apply theoretical typology to their forests, particularly that of Sukachev. J Vilcinskas and Yankauskas were followers of Sukachev's thinking. Sukachev and other theoreticians described artificial or temporary types as well as the natural types in their schemes. Thus, the practical school was able to accept Sukachev's scheme and to introduce new, artificial types into their present practical schemes. At the International meeting of Forest Typology in Paris in 1956, Sukachev represented the USSR and was authorized by the meeting to develop a general principle of typology for European forests as a whole.

e. The present Lithuanian forest type scheme was inspired by Sukachev, supposedly with consideration given to the ideas of the practical foresters. It was not practical to divide forestry activity by forest types in the Lithuanian Republic because of the lack of personnel. The present application of the system (23 different types) in the individual, separate forest stands of the Lithuanian SSR requires a very great number of educated, intelligent professionals. Even the lowest ranks must be carefully trained to handle the complications of the system. Thus, education is a prime concern of the forestry administration.

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f. The study of forestry types is important in forestry's chief problem - regeneration. As a rule, regeneration failed before foresters learned the proper steps to follow by studying forest types. Active management by forest type looks attractive but in practice, economic, political, and psychological obstacles interfere with man's plans, especially in Soviet dominated areas. The apathy, passive resistance, and disgust with Communist rule which were generated under Stalin all served to hinder forestry progress. The Bulganin-Khrushchev policies toward greater freedom should serve to win greater support for the regime and for forestry policies among others.

g. No serious, extensive forest plan can be drawn for Lithuania before large scale research is completed. The Forest Institute of the Academy does seem to be achieving some notable research results but much hard work remains to be accomplished.(64) The Communist Party and its auxiliary organizations work steadily to increase productivity by means of propaganda, rewards, competition, and criticism. High Soviet officials sometimes visit Lithuania to provide stimulation for this program.

3. Exploitation

a. All Lithuanian forests are now sub-divided as follows:(65)

(1) Group I - Forest preserves for purposes of soil and crop protection and for resort use including parks and landscaped areas around and within cities; forest strips for water conservation purposes are also included (since 1949). 4 km strips parallel both sides of the Nemunas and Vilija Rivers and 1 km strips parallel both banks of the Nevezis, Dubisa, Sventoji (the tributary of the Nemunas), Zeimena, Merkys, Verkme, Minya, Sesupe, Baltoyi, Ancia, Venta, Nemunelis, Musa, Svete, Levuo, Bebrungas, Mituva, Akmena, and Jura, Rivers and the Minija-Baltic Sea Canal. This group consists of approximately 355,000 hectares or 28% of the Lithuanian forest area.
Group II - All other forests (72%) consisting of approximately 919,000 hectares.(66)

(2) No logging is allowed in forests of the first group except the removal of dead or diseased timber.(67) The forests of the second group are logged by the clean-cut method.

b. As said above, Lithuanian forests are in very poor condition. Normal production from 1944-50 would have been 2-2,500,000 festmeters each year(68), but 5,000,000 festmeters a year were cut /41.5% was structural timber/.(69) Even Soviet sources admitted that the Lithuanian forests were badly over exploited.(70) Judging by the present forest ages (see par. B, 2.), the over-cutting was much higher than estimated by German sources (see footnote 69). In 1947, orders were issued to cut the exploitation of the Lithuanian forests 30% (fron the estimated high of 5,000,000 festemeters to 3,500,000 festmeters (still far too high) because mature timber was almost nonexistent,(71) but it is doubtful that the exploitation dropped.

c. The first years of the Soviet occupation brought confusion to the forests since selective cutting was the rule.(72) If the yearly cut remains as high as 3,100,000 festmeters, there will be no ripe timber in Lithuania within a few years. The estimate of 41.5% structural timber in 1945 shows that much more was cut than should have been.(73) Young stands produce high percentages of brush wood and bark, not structural timber.(74) Their yield from thinning and clearing may be 80-85% of the wood crop. Part of this yield may be useful as mine props and pulp wood. The situation will last for several decades and a good crop cannot be expected for 50-70 years.(75) A great deal of attention will have to be paid to the use of substitutes, especially for fuel, such as stumps, peat, and coal. There is no problem of disposing of the yield at prices set by the government. Such prices should be low since the quality is so poor.

d. In order to raise production, extensive thinning is conducted in middle age stands, causing an increased growth increment among the remaining trees. The areas with most structural timber remaining are located in eastern and southern Soviet Lithuania, in the former Polish forests north and west of Svenciany and south of Druskieniki.(76) There is also ripe timber available around Lebanorai and Simonys but not in great quantity.

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4. Reforestation

a. Reforestation and restoration of the devastated forests is a major goal of Soviet Lithuanian forestry. Not only must production rise, but it must be improved. The following goals have been set:

(1) To increase the productive area by planting sandy areas, draining swamps, and planting sparsely forested areas;

(2) To manage the forests as much as possible by division into forest type areas;

(3) To support natural feforestation and apply artificial reforestation widely;

(4) To introduce rapid growing foreign trees and new, resistant stock developed from domestic species; and

(5) To introduce mechanization in nursing, cleaning, thinning and reforestation.(77)

b. The second Five Year Plan (1950-55) following World War II foresaw the artificial reforestation of 105,000 hectares of forest. Assuming that the present forestry management is cutting about 10,000 hectares per year or 50,000 hectares in the 5 year period, this is a gain of 55,000 hectares in new forest area. In addition, 32,000 hectares were reforested from 1947-1949.(78) In this area are included portions of sandy soils which are included in the reforestation plans. It is evident that the Soviets are seriously interested in artificial reforestation.

c. The chief tree types are not significantly different than they have been, pine and spruce.(79) Oak has a high priority for regeneration and reforestation (10,000 hectares of pure oak plantings from 1950-55) and special protection and care for naturally reforested seedlings.(80) Special foresters have been trained for oak forests. In 1949, they produced a seed crop of 120,000 Kg of acorns.(81)

d. The Forest Institute is responsible for studying the introduction of foreign trees. Yankauskas' study of the larch has been discussed above. He found that the larix species as well acclimated to Lithuania and gives even higher production than some native evergreens. There is increasing attention paid to the introduction of this tree and various mature stands are being developed for their seeds.(82) There is evidence that the black poplar (Populus Nigra and varieties) is also being introduced into Lithuania but not on a large scale. The tree has grown in Lithuania since 1905 when it was used as landscaping around military construction. The tree grows rapidly and can be harvested within 40-50 years. It does not readily reseed itself in Lithuania, but regenerates well from stumps and roots. It is possible, however, that the Soviets have developed a variety which produces germinating seeds readily under Lithuanian climatic conditions. More serious efforts are being spent on producing a variety of the European aspen (Populas Tremula) which will be resistant to rot. If they succeed in this they will have a rapid growing, pioneer tree which produces wood valued for match wood, the cellulose industry, furniture and many other minor uses. Aspen wood is white and light. If protected against dampness, it is very durable. Official sources (83) announce that the red oak (an American tree) and ash are also being planted. Overall, however, it appears that most dependence is still being placed upon regeneration of the native trees and that the Lithuanians are somewhat skeptical of the great plans of their Soviet colleagues.

e. The scale of the work in forest regeneration is impressive. From 1950-1955 the following was accomplished:

	1950 only	1950-55
Seeding and Planting	15,000 hectares	105,000 hectares
New Nurseries	90 "	425 "
Seed Production	16 tons	90 tons (84)

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This work averaged out per year as follows:

	Leskhoz	Forest Ranger District	Forest Guard Circuit
Seed Production	1300 Kg	170 Kg	13 Kg
New Nurseries	3.5 hectares	0.4 hectares	0.03 hectares
Seeding & Planting	550 "	85 "	6.5 "
Nursing Young Stock	3300 "	400 "	30 "
Efforts to Stimulate Natural Reforestation	650 "	95 "	6.5 "

The tables show that the forestry administration spends a great deal of time on reforestation, but no more than is necessary to do the job properly. The money appropriated for the purpose (about 13 rubles per hectare) is very low and therefore the work cannot be done particularly well.(85) This is a repetition of the mistake made by the Lithuanian Republic. A great deal of effort has been put into increasing seed production (an additional 40 Kilns and 70 stoves).(86)

f. There are 120,000 hectares of non-productive sandy areas in Lithuania, especially along the Baltic and the Bay of Kuronia.(87) The earlier plantings in these areas were largely destroyed in 1944. Reforestation of the areas is difficult and the Lithuanian SSR has appealed to Moscow for help in doing so.(88) The planning has been completed to establish a special leskhoz for this purpose.

g. There are 160,000 hectares of swamps and swampy forests which must be drained and reforested. The 1950-55 2d Five Year Plan called for new drainage of 5000 hectares annually by open ditches and renovation of 1300 Km of existing ditches.(89) Other plans were made for increasing the forest density of Vilkaviskis, Kalvarija, Pogegiai, and other counties.(90)

h. The plans, and the schedules for their completion, appear to be realistic. In 1949, the successful plantings were averaging 91% and on one 7500 hectare area as high as 97%. A few work brigades even achieved 100% success.(91) In 1950, the planting and seeding plan was over fulfilled (15,594 hectares - 105%) and so was the establishment of new nurseries (70.5 hectares 117%).(92)

i. In 1956 Rugelis a member of the Lithuanian Institute of Forestry, sharply criticized the reforestation program. According to Rugelis the vitality of the planted and seeded stands was very low, the care and nursing of young stands ineffectual, and the status of the forests as to type exactly as it had been before 1939.(93) Judging by this criticism much of the Soviet effort has failed, probably because of insufficient appropriations, lack of research, and lack of enthusiastic support from the workers and population. There is no evidence that the Soviets have been able to accomplish mechanization of forestry techniques, or that they have been able to lengthen the planting season (as is done in the USSR proper) to include fall and winter months.(94) Better vitality and care of the young plants have been obtained by reorganization of the workers (mostly women) into brigades. These brigades and their divisions sometimes work with a new stand until its crown closes (6-10 years). This is a new and apparently useful technique.(95)

j. The former peasant forests which now are included in the state forest area but exploited by the Kolkhozes, have not improved much from their historically bad condition. They produce only about 1-1.25 festmeters per hectare per year.(96) On 1 Jan 50 there were 50,000 hectares of this type of forest in Lithuania, but the area is steadily increasing.(97) The increase means that small areas of arable and meadow land which cannot be farmed mechanically are not being used and are being naturally reforested by pioneer soft woods. The Kolkhoz forests are 70% young stands, 28% middle aged, and 2% mature. They need closer control by the state forestry administration before they will be productive. In Jan 1950, 5000 hectares of young stands in these forests were completely deforested young stands.

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5. Conservation

a. Fires caused terrible damage to the forests following World War II. They fed on the fallen and dead wood which choked the forests until 1948 when the authorities began to clear away the trees.(98) The pine plantings on the Kuronia Pennisula suffered most from fire. Fire is one of the major reasons why forest productivity has dropped so sharply under communist rule.(99) By 1949, however, fire was under much better control, declining by 95%.(100) There is no indication of the cause of the fires which have occurred, but arson (as a political protest) may be a major cause as it was in earlier days.(101) The authorities planned the construction of 50 observation towers from 1950-55 and the extension of the telephone system for 300 Km (30-50 telephones).(102) Plowing of protective strips with tractors has also been speeded up.(103) Special care to protect against fire is taken in the Kolkhoz forests. Certain populated places are regularly assigned to combat forest fires in the forest rangers of their areas.

b. Grazing is allowed in mature forests, but not in young (expecially oak) or cultured stands. Live stock does considerable damage to the Kolkhoz forests.(104) Theft is still a problem in forestry management, again especially in the Kolkhoz forests, and was a serious matter as late as 1950.(105) This is not unexpected because the supply of fuel wood is low.

6. Improvements and Investments

There is very litte data available on this subject.(106) The scope of the effort put into education, reforestation, conservation, etc. has been indicated above. Investment figures available which may be considered about average show:

1949 - 200,000 rubles for construction of watch towers, husking houses and administrative structures in Birzai, Kaisiadorys, Kazlu-Rudos, and other areas;(107)

1,000,000 rubles for renovation and repair of existing structures.

1950 - 800,000 rubles for new capital investments;

1,300,000 rubles for renovation and repair of existing structures.

There were no special appropriations for road programs.

E. The Lithuanian Wood Economy(108)

1. Production(109)

a. As said above, Lithuania now produces only about 2,500,000 - 3,000,000 festmeters of wood, of which 80% is of small size and inferior quality. 30-40% can be used for pulp wood and mine timber, but the balance is usable only as fuel. There are a few ripe stands left which still produce valuable structural timber, but much of this must be selectively cut from occasion mature trees in younger stands. Much of the larger timber is still not suitable for lumber and therefore, the supply of timber available for the sawmills is negligible. Some of the structural timber suffers from rot (e.g. aspen which originate from sprouts have a rotten core), but are used as logs to build cabins in the arid areas of the Southern USSR. The supply of wood available is divided approximately as follows:

(1) Smaller sized wood (80%)		
(a) pulp wood & mine props	560,000	festmeters
(b) brush, branches, stumps, etc	2,240,000	"
(2) Larger size wood (20%)		
(a) Sawmill timber	100,000	"
(b) Structural logs(110)	600,000	"
	700,000	"
	3,500,000	"

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b. The decision was reached in 1948 not to harvest over the average annual increment (about 3,500000 festmeters) and to thin and clear extensively in order to increase the yield of the remaining formations. This situation will probably last through 1970-1980.

2. Demand

a. Local

(1) The needs of the population for fuel have probably decreased since there is less available housing and fewer cattle and other domestic animals. In 1956, the population of Lithuania was 2,700,000.(111) This population would need a minimum supply of 1-1.25 F.I.Y.(112) of wood for fuel and other minor uses or 2,700,000 - 3,300,000 festmeters per year. After a comparison with the production table above, it can be seen that the supply falls 500,000 festmeters short of the minimum. The supply of brush, stumps, etc. for fuel can be used only by the rural peasants who can cut and haul it themselves. It is not cheap because it requires so much time to cut and collect and so much hauling space (2-3 horse carts per festmeter). It cannot be transported more than 20 Km because of the bulk and high costs of the transport (2-3 times as high as regular fuel wood) and its poor heating quality (2-3 times less than regular fuel wood). For economic reasons, the urban population must be provided with better quality fuel but because there are serious shortages of cord wood, coal, and peat, the cities suffer greatly. For example, in Vilno the situation has been so bad that public buildings have been unheated in winter and sewer and water supply systems have frozen.(113)

(2) The distribution of fuel has been a pressing problem for every government since 1938. No official wanted to assume responsibility for the duty. There is now a special Ministry of Local Industry and Fuel Distribution which runs fuel yards in each town or city, from which it distributes wood, oil, coal, and peat. Many occasions, the yards are empty(114). As a result of the shortages, theft of wood from construction sites, old buildings, and parks is commonplace.(115) Little attention is paid to rural needs and the Kolkhozniks are left to find their own supplies. Since brush and undergrowth is increasing, fuel is not a serious problem in rural areas. More serious is the problem of supplying public institutions and small industries which require fuel wood no smaller than 15 cm in diameter. Railroads and the army also require fuel wood in large quantity. Their demand is unknown, but it undoubtedly takes precedence over that of the population and accounts for the shortages in the cities.

(3) One half festmeter of structural wood per inhabitant or 1,350,000 festmeters, was normally required each year. Structural wood is now distributed by special ministries in charge of contruction of city and Kolkhoz dwellings which have their own building crews and supply yards. The peasants forced on to the Kolkhozes live under such miserable standards that they ordinarily cannot afford to even repair their own log cabins. Formerly each peasant usually had a one room home (about 8 x 12 meters) with a porch (8 x 4 meters) a wooden floor and ceiling and a thatched roof (occasionally shingle or tin plate); a dirt floor stock shed about twice as large as the home; and a barn about the same length as the shed but wider (up to 10 meters). To build these structures required 100-120 festmeters of timber. They would last no more than 50 years (because of poor foundations) and at least two festmeters of structural timber were required each year to repair them. After collectivization (completed by 1952) the abandoned farmsteads of the wealthy peasants who were transported to Siberia or to other areas, rotted away or were torn down for their timber. Newer or better buildings were transported to the Kolkhoz centers. All peasants lost their barns. If they were not actually moved away, the owners tore them down. Very few still exist. On the old individual farmsteads the houses, sheds, and occasional small storehouses still remain. Most fences have disappeared, having been burned as fuel. The Kolkhoz centers are often located on the sites of the former large estates which were mainly Polish owned and which had larger and better kept buildings.

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(4) The Kolkhozes are being steadily enlarged and the inhabitants of the individual farmsteads are being transferred to the "agrograds". One reason for this is the saving which can be effected in fuel and structural wood by building large, communal buildings. This movement has progressed farthest in the areas of higher forest density and poorer soils (the upland areas) where the available buildings were generally of the best quality and could be transported to agrograds.(116) In the more fertile plains where forest density is lowest the available structures are of poorer quality and are unsuitable for transfer to agrograds. Many are built only of brick and raw clay and cannot be removed. Therefore, there is not as much population concentration in the plains. The agrograds have really become new towns with all the necessary farm buildings and workshops. Surrounding the centers are small clusters of individual dwellings which have been moved from old, individual farmsteads. These "suburbs" are larger in the uplands and smaller in the plains. The individual homesteads which still dot the plains are in miserable condition. The poorest are located in Mazeikiai and Siauliai counties.(117) There is no evidence of any new construction. No one remaining on his old farmstead can receive any structural wood allotments. The only source of this material for them is theft.

(5) The build-up of the Kolkhozes has been very slow. Official sources blame this on wood and transport shortages.(118) The new living quarters which have been completed are ugly structures 100-150 meters long, 10-12 meters wide. In many cases they are made of raw clay. Windows are small and only on one side of the building. The builders are able to save three doors by this plan. Buildings of this type are in use on Kolkhozes in the Alytus, Lasdijai, Jurbarkas, and Pakruojus areas.(119) There is not a great deal of data on the progress of Kolkhoz construction, but obviously it is very low.

(6) The construction of buildings in cities and towns appears to be more advanced than rural construction, but still far from adequate.(120) Persons arriving in the west from Lithuania give the impression that new construction for dwelling purposes is on the order of military barracks.(121) Some private construction of small wooden cabins is reported in the suburbs of Kaunas and Vilno. Timber for this construction is purchased from any available source, legal or otherwise. The only labor available for private construction is that of persons whose regular duties are completed. They charge huge prices for their services.

(7) For all types of construction, no more than 500-600,000 festmeters of wood a year are available. This could be transformed into about 10,000 small units (50-60 festmeter average), approximately the annual volume of construction before World War II. There is an enormously increased demand, however, for reconstruction, repair, and new construction and the available wood supply is far below the needs of the moment. For major construction (e.g. the Hydro-electric plant on the Nemunas below Petrasiunai) timber supplies are imported.(122)

b. Industrial The most pressing need is for lumber. Suitable timber for lumber now grows only in eastern and southern Lithuania (75% of the supply). The rest is scattered and cannot be economically harvested except for local use. Vilno and Kaunas probably still have some minor sawmill activity, but there is certainly no lumber available for export and the supply of lumber is no more than half of what it was before World War II. The annual supply of 100,000 hectares of sawmill timber can be converted into approximately 65,000 cubic meters of lumber.

c. Exports, Imports and Transportation

(1) The incorporation of Lithuania into the USSR and other post-war events made possible the re-opening of the Polish border and Polish and White Ruthenian timber began to pass down the Nemunas and Vilija again. Mature timber was still available in the Polish part of White Ruthenia in spite of the war damage. The Soviet White Ruthenian situation, however, was even worse than the Lithuanians. Active warfare and guerilla activity has never ceased in White Ruthenia and a tremendous amount of damage was done to the forests.

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The timber rafted on the Nemunas and Vilija is destined for Klaipeda and the Kaliningrad district (formerly East Prussia) and appears to be mainly for construction of pilings. Limited quantities of this material may remain in Lithuania. Wood has also been imported from Karelia (for the Nemunas hydro-electric station) but in unknown quantity.

(2) In spite of its severe shortages, Lithuania still exports timber (mainly the product of thinning in middle age stands) to the cellulose industry of Klaipeda and Tilsit-Ragnit and the coal mines of the Ukraine. The Lithuanian supply is certainly inadequate to supply these areas but it is supplemented by the White Ruthenian and Polish supply.

(3) The most valuable pine stands left in Lithuania are those in the southwest portions which were formerly Polish (around Drusieniki). ✓ Some valuable timber of large dimensions left this area and was rafted to Klaipeda for the sawmills there or for sea shipment to the Baltic military ports in the Leningrad and Paldiski (Estonia) areas.(125) This was necessary because the northern Russian and Karelian forests do not produce such timber.(126) In addition, Lithuania exported some lumber, prefabricated houses, matches, writing paper, and railroad ties. The bulk of these shipments went to the southern portions of the USSR.(127) Probably the exports mentioned were part of the exploitation to fill the post war needs of the USSR, however. Under present conditions it is doubtful that Lithuania is able to export any wood or wood products.(128)

3. Wood Substitutes

a. The most important fuel substitutes are domestic peat and imported coal. There is a sufficient peat reserve to allow long range, intensive production (6,000,000 raummeters of air-dry peat mass),(129) but production is difficult and fit only for prisoners on forced labor in the opinion of most Lithuanians. Production has never been more than 100-200,000 tons per year. Present production is not known but other fuel shortages must have forced an increase and new peat bogs have been put into production.(130) Shops in Vilno can turn out 50 complete peat-digging outfits each year which should adequately fill Lithuanian needs.(131)

In 1950, the peat production goal was set at 822,000 tons. 620,000 tons were actually produced. In 1952, production rose to 850,000 tons.(132)

It appears that peat production has steadily increased and that its use may be easing the fuel wood shortage. Most is consumed in the cities by government institutions and buildings and railroads.

b. Coal has always been scarce in Lithuania. In 1940-41, during the first Soviet occupation, there was no coal imported at all. Trains, the army, and industry all used wood in its place. The quantity available in Lithuania now is unknown, but coal is supposedly available for the railroads and industry and even rarely for the population.(133)

c. Oil has never been widely used in Lithuania for heating purposes, but has been used for lighting. It is in very scarce supply and when a shipment arrives, lines of 600 or more people form to buy it. Kerosine is practically unavailable in winter, and so the people hoard oil whenever they can get it. Pine torches may still be in use in rural areas as they were during World War I.

d. Chief substitutes for structural wood are cement, bricks, raw clay, lime, ✓ and field stone. The first Lithuanian cement plant began operation in 1952.(134)

(1) As early as 1941, plans had been made for a plant capable of producing 150,000 tons of cement annually. The capacity of the present plant may be close to this. Whether the production is used just in Lithuania is difficult to ascertain.

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(2) Brick production requires large quantities of fuel. In 1939, 68,000,000 bricks were produced in Lithuania, but this fell far short of the demand. Considerable quantities were imported, but increasing protective import tariffs cut off the supply. As a result, brick construction is rare and is confined mainly to government buildings in cities. The production goal for 1950 was 136,000,000 bricks, but 890,000,000 /SIC/ were actually produced and production in 1952 rose to 1,570,000,000 bricks.(135)

The increasing brick industry depends upon imported fuel and along with the railroads and other industry is a major fuel consumer. Judging by the figures cited above there has been no considerable new brick construction in Lithuania and the available brick had probably been used for repair purposes. In any event, the activities have not been sufficient and travelers to Lithuania report that cities look old and dirty.(136) From 1951-55, 600,000 sq meters of living space were constructed by the state, and 248,000 sq meters by private individuals (with state credit). In addition, Kolkhozes and other official organizations constructed 7,000 small dwellings. What part of this production is brick is not known, but certainly almost 100% of the private and most of the government construction was of wood.

(3) Even under the Lithuanian Republic, production of buildings of raw clay was encouraged and supported by the government, particularly in areas where the forest density was low. Such construction is not durable and does not stand up well under prolonged rain. To protect against this, the buildings must be plastered and this considerably increases the cost. Clay is abundant and widely used, but it is essentially an emergency material and the techniques of using it are not well known to Lithuanian workmen.

(4) Field stone is abundant, but mainly in areas where timber is also most available. The Czarist Government, tried to support this type of construction with credit and advice, and in many cases the large estates build their out buildings of field stone formed with a lime mortar. These buildings when set on proper foundations, were very durable, but also very expensive and required a great deal of lime or cement. Therefore, they did not become popular. Field stone is probably still used for foundations.

(5) The availability of lime is dependent upon the supply of cheap (soft, deciduous) wood (aspen, alder, willow). The lime stone pits are mainly found in northern Lithuania and also, south of Vilno. Production has always been low, of poor quality, and largely used in minor industries and for brick painting. (Some of the northern lime is used in sugar production.) Lime was replaced as mortar by cement.

4. The Wood Industry

a. Management The All-Union Ministry for the Paper and Lumber Industry is in charge of the production of the wood industry. Territorial sub-divisions of the Ministry represent it at the county level in the management of wood combines, which are made up of combinations of individual mills, shops, etc. Individual enterprises which produce items of minor importance (Shirpotreb) for domestic consumption only are directed by the Ministry of Wood Industry, but all others are subordinate to the Ministry for Paper and Lumber.(137) The known combines are those in Klaipeda, Kaunas, Vilno, New Vilno, and Ukmerge.(138) The latter produces prefabricated houses for domestic use.(139) The Ministry of Paper and Lumber industries seems to be one of the most russified branches of Lithuanian industry, probably because the raw materials are largely imported and the finished products exported, and also because the quality of available Lithuanian technical manpower is very low.

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b. Equipment On their withdrawal from Lithuania in 1944, the Germans took all equipment of value with them, especially that of industrial importance such as locomotives; and in the wood industry, engines and frames. Most of it was removed as far as East Prussia or even to the present East Germany where it was largely destroyed.(140) That which remained in Lithuania was worthless, worn-out and outmoded. The Soviets restored some of the industry with captured German equipment, but there are no statements by Soviet sources about what has been accomplished. Occasional reports from non-professionals who have reached western Europe from Lithuania indicate that the wood industries of Klaipeda, Tilsit-Ragnit, and Koenigsberg are in production,(141) but the reports are not adequate to form the basis for an opinion of their capability and production. It is probable that their production is much less than it was before the war because the equipment must be very worn and outmoded (few, if any, new installations have been erected) and the wood supply is limited. Accurate data does not exist, however.(142)

c. Saw Mills Klaipeda, center of the saw mill industry, suffered heavy damage in 1944. There are indications that some of the mills were destroyed, but a considerable part of the former installation has been restored and is now in production. Production is mainly dependent on timber imported from White Ruthenia and Poland.

d. Plywood(143) The Klaipeda plywood industry is in production and is probably producing at a higher rate than before the war because timber for this purpose is available. The Tilsit-Ragnit district is also in production. The product is exported.

e. The Match Industry The Kaunas plant is in production, but there is no information about the Klaipeda plant. Production figures are not available. The product is exported.

f. Furniture and Pre-Fabricated Homes

(1) There were a few hundred small workshops engaged in furniture manufacture prior to the war. The communists socialized the industry in 1940-41 into a collective, cooperative enterprise and the Germans maintained the system. The industry is now unified under a combine arrangement. Its size and capacity is unknown but its production for domestic consumption is below the pre-war level because furniture is rarely available on the Lithuanian market. Apparently most output goes directly to the USSR proper.

(2) The pre-war production of prefabricated houses (mainly small units) was of importance in the growth of Kaunas, and the surrounding counties. The industry has always been largely russified. It produces standard houses of 280 sq meters size and larger homes up to ten rooms. Most are shipped to the Ukraine.(144) There are prefabricated home combines in Kaunas and Vilno. Their production is unknown, but cannot be high.

g. Cellulose The cellulose industries of Klaipeda and Tilsit-Ragnit are in production again. Their combined capacity formerly was about 700,000 raummeters (560,000 festmeters) of spruce pulp wood per year. It appears that the Soviets reconstructed this branch of the wood industry most thoroughly. Its raw material supply, however, is limited. There are large, yonng spruce stands in Lithuania, (former Sveksnay, Rietavas, Taurage, Pajure, Jurburkas, and Telsiai forest master districts) but their production is low since they were devastated in 1940-41 by German military fortification construction. At times the cellulose plants have had to close and their workers have had to go to the USSR to cut pulp wood themselves. The plants run below capacity and in 1955 the plant in Klaipeda lost 7,000,000 rubles.(145)

h. Others Other industries such as the match, excelsior, paper and cardboard industries operate in their old locations and produce not significantly more than they did in pre-war years because of the raw material shortages. Most of their production is also exported. This is true of all the wood industry, even though Lithuania suffers from such a shortage of their products. Nothing is known about resin production or whether the one plant (Alytus) is still in existence, but the shortage of ripe pine stands means that production must be below former years. Soviet Latvia, where pine is also scarce, is experimenting with spruce resin to try to obtain colophonium and turpentine from spruce trees. It is possible that Lithuania may be trying the same thing.(146)

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5. The Wood Industry

a. There was no mass exodus of unskilled labor from Lithuania with the German troops in 1944. The laborers, like the peasants, were very conservative and chose to remain in their homes. They were not necessarily favorable to communism, although many had been subjected to communist propaganda, but many had large families and saw little hope for themselves in Germany. The wood industry in Klaipeda lost many skilled workers to (German) army service as regular or auxiliaries. Few of them ever returned to Klaipeda. Those who remained rebuilt the wood industry together with many Russians who were brought in. The Vilno area also lost many skilled workers. The Jews were killed by the Germans and many Poles were repatriated to Poland after the war (1945-46). The number of skilled people available is difficult to ascertain, but the shortage is a serious problem for the Soviets.

b. Unskilled labor is now abundant because many ambitious young peasants moved to the cities after collectivization, especially after 1952. This is one reason for the communists' intense interest in training unskilled workers. The high figures which the Soviets list for students in universities include the unskilled workers attending courses to obtain a necessary theoretical basis for their work (the techni-minimum educational system). Apparently as a result of this training the acute shortage of skilled workers no longer exists. Certainly the forest economy and wood industry do not now seem to have a serious shortage of trained people.

c. The mechanization of agriculture on the Kolkzoses has released additional labor. Many of the surplus laborers have been sent out of Lithuania, to the Far East, the southern deserts, and Siberia. It appears that the concentration camp system failed after the death of Stalin. The camp labor had such a high mortality rate and was so restive and unwilling that its labor was practically worthless. The release of these people to live as family units did not help particularly, however, for when living conditions become particularly bad in the Buryat-Mongolian Republic, southern USSR, and especially Siberia, many of the families leave and return to their old homes.(147) The easing of restrictions under Bulganin and Khrushchev particularly resulted in the return of many of the former camp inmates. Many remained because of life-long terms of banishment, but the old restrictions have been eased and the Soviets are attempting to induce rather than force people to go to the frontier areas. Those who return from the new lands have no right to work on government supported enterprises, including Kolkhozes, for two years, and they are propagandized to return to the new lands again for a definite contracted period after which they can return home. In many reported cases they have even been promised permission to return to areas from which they were banned. In the new lands, the Soviet government tries to offer every inducement including better living conditions, better pay, schooling for their children (and even scholarships). The result of all these efforts has been a slow but steady movement of people into the new lands.

d. The recruitment of youth for work in Siberia and Kazakhstan is also very actively progressing. The work is "voluntary" but the pressure exerted is very great. It appears that young men leaving the army must sign contracts to go to the various areas as pioneers in forestry, agriculture, and industry. Some remain there, marry, and establish families. The young people remaining at home are constantly besieged by propaganda, and the communist press constantly criticizes officials who have not performed this service in their youth. As a defense against the pressure, young people pour into schools. There they have at least temporary safety from the prospects of frontier service and this is a major reason why Soviet schools are so crowded. While the communists originally welcomed the interest in education, it has now become a problem and they attempt to discourage it. Admissions to colleges are sharply decreasing. Even devoted communists object to this tactic, however. The Secretary of the Lithuanian Communist Party, A Snieckus, has complained about it and stated his view that all educational institutions should be subordinated to Ministries of Education in the separate republics not to the All-Union Ministry.(148) The decreasing number of students has actually resulted in considerable unemployment,(149) but the communists skillfully exploit this situation by forcing the unemployed into fishing (Baltic and Atlantic) or the new lands. As said above, eye witnesses have reported upon the scarcity of young people in Lithuania. This has such great importance that it is a major factor in communist planning because:

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(1) It removes a potentially dangerous and aggressive, nationally minded force from the country which has been partially replaced by more dependable Russians; and

(2) It aids the overall economy by the stimulation of large, fertile areas in agricultural and industrial development.

Overall this Soviet policy appears to be successful.

e. The Lithuanian forests are worked by communist organized ~~under~~ work keep's brigades. During the period of intense exploitation (1944-48), and from 1947-50 most of the rural population and even some city dwellers were mobilized for forest work (men from 16-50, women from 18-40).(150) The individual farmers, who were still numerous during the period, were all forced to go and the Kolkhozniks as well. 12,000 brigades including 260,000 workers were formed. They worked not only close to their homes but in distant areas as well (especially the large forests around Druskieniki).

f. In addition to the Lithuanians, there were Polish, Russian, and White Ruthenian brigades. The workers lived the lives of prisoners, under guard, supervision, and discipline. They had common food and received rations according to their productivity. They could be ordered to any area. Lithuanians worked in Karelia and the Poles, Russians, and White Ruthenians in Lithuania.(151) Individual salary rates were established. Outstanding workers (Stakhanovites) received premiums in higher wages, gifts, etc. Women were assigned easier tasks such as removing branches and bark, piling branches, etc. In general the Russians worked more willingly than the Lithuanians, who at times committed acts of sabotage.(152) Supervisors had serious difficulties in getting the peasants to work.(153) In addition to the logging brigades, there were special brigades for transportation and hauling. Apparently the brigades set up during this period are still organized and still function on a smaller scale during the winter logging operations. They may also be mobilized for reforestation and nursing care of the young stands. Most of the participants in the latter work are women and youths who are bound to their duties in caring for particular areas until the stands reach a certain age. Then another brigade charged with thinning and clearing takes over.

g. All forestry workers receive practical training, classwork, and communist indoctrination.(154) They hold meetings and organize competitions to improve production. Additional training is necessary because of the mechanization of many processes. In spite of all the organization and training, however, the system of mobilized workers is stiff and unproductive, much less efficient than the former system employing well paid free workers. Therefore, since 1949 about 2,000 permanent forestry workers have been hired (about 100 to each Leskhoz).(155) This is a system which was seriously considered before World War II and is a desirable step forward from the standpoint of the forests (it has long been used in Germany). Classification of positions has also progressed. Thus, a logging brigade which worked in Karelia had such specialists as a leader, his aids, raftsmen, saw men (with power saws), axe men, tractor drivers, and winch men.(156)

h. Salaries are low and consumer goods are in very short supply. The "real" prices are those of the black market and they are very high. Best paid Soviet laborers work in the coal mines, and oil and metal production; lowest paid are the Kolkhozniks, (3-10 rubles per day) and the forestry workers have only a slightly higher wage scale.(157) Average salary for a 46-48 hour week is 400-500 rubles. The necessary minimum wage for survival is 700 rubles.(158) Skilled workers (carpenters, plasters, plumbers, etc) for a few hours of private employment can earn 2-4 times as much as for their week of government supported employment.

6. Transportation From 1944-1950, transport brigades supplied the hauling using horsecarts and sleds. Tractors were introduced on larger operations (2-3%) in 1949.(159) Since that time mechanical hauling has become more common place,(160) but even today with little heavy timber available, horse and man power is still most important. The horses (and men) are supplied by Kolkhozes but there is not enough stock. Most Leskhozes have benzine driven trucks, but apparently they are not available for timber hauling. It is doubtful that much Lithuanian timber is rafted tody, but large amounts still passthrough Lithuania on the Nemunas and Vilija Rivers from Poland and White Ruthenia (forests of northern Bialowieza) to Kaipeda.(161)

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7. Mechanization

a. The most mechanized field of the forest and wood economy is the wood industry. Forestry techniques did not change for over 100 years but the communists were eager to mechanize in order to speed up the work and to free labor for other tasks. A special division of the faculty of forest science was in charge of encouraging forestry students to study mechanization techniques and this subject received priority attention.

b. Primary logging tools are still the axe and cross-cut saw, but some electric powered saws are now in use.(162) Tractors and a few trucks are also in use, but their use is limited by extremely poor forest roads. In some cases, available trucks are driven by 2-3 shifts of drivers a day in order to transport the wood.(163) Considerable attention is paid to the introduction of heavy ditch digging equipment for drainage of swamps and peat bogs. This could accelerate proposed drainage work very much and help to increase forest area and production.

c. Most advanced mechanication applications have been made in preparing the soil for reforestation.(164) Work is under way to apply special cutters in thinning and cleaning young stands. It appears that the permanent workers being assigned to the Leskhozes are all specialists in mechanization. Mechanization has many advantages including acceleration of the work, increased production, decreased dependence on hand workers (and their tendencies toward sabotage) and their release to other work, and easier control over the whole forestry operation. Some of the difficulties of mechanization include the lack of ability of the available workers to handle the equipment, the lack of repair facilities, and the expense. Overall indications are, however, that the mechanization program is a success leading to the fulfillment of plans.(165)

F. Conclusions

1. The Forest Economy

a. The Soviets plan to increase the Lithuanian forest area from 15-25% by planting sandy and swampy areas and even by converting land which is now used for agriculture. Apparently the Soviets want to concentrate on forest development in the natural forest zone and to concentrate on agriculture in the southern areas of the USSR.

b. The present Lithuanian forest stand is poor (7% mature, 43% middle age, and 50% young stands). Normal production of normal (33.3% of the forests in each age group) stands on the present forest area (approximately 1,000,000 hectares) would be 2,500,000 - 3,000,000 festmeters per year under an intensive forestry program. This production would be divided into 10% structural timber, 30% semi-structural timber, and 60% fuel wood. Present production, however, is only about 2,000,000 festmeters per year divided into 10% structural timber (of lesser quality, little suitable for lumber) 20% semi-structural timber, and 70% low quality (brush) fuel. This unfavorable situation cannot be corrected for 20-30 years after which the supply of structural wood may be more nearly normal. After 50-60 years, if the system does not change, production could be as high as 4,500,000 - 5,000,000 festmeters with as much as 30% of the harvest structural-wood.

c. In order to supply its increasing population and industry, the USSR is introducing rapid growing trees which can be cut within 50 years. For export purposes, it plans to raise stands of more valuable, slowly growing timber (pine, spruce, larch, and oak) which are cut from 100 years and up. New mixed stands with softwoods growing among everygreens are being planted. Only oak is planted without the company of other trees. Natural (climax) forest types will be produced but new forest types with new and more resilient trees will also be introduced. Apparently the Soviets plant to increase soft wood (poplar, willow, aspen, alder, etc) production which could yield 500,000 - 6,00,000 festmeters per year if properly managed (even in spite of extensive forest thinning and cleaning). Assuming that the forest area will increase by 25% and rapid growing trees will be introduced it may be supposed that within 20-30 years these new areas will be producing two festmeters per hectare per year, and that in 50-60 years the total production may be 6,000,000 - 6,500,000 festmeters.

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d. Present exploitation is chiefly by selective cutting (thinning, cleaning, dead wood removal), but clear cut methods are used in some ripe stand remnants. Thinning is very extensively used in order to increase the growth increment of the remaining trees. The only exploitation in the forest of Group I (conservation forests) is the removal of dry wood. In general, exploitation is much more intensive than it ever was before in Lithuania.

e. Reforestation activities are very intensive and theoretically all cut-over areas are artificially reforested in order to save time. An extensive program is underway to reforest all former forest areas and raise the forest area by 25%. To date, reforestation results have not been satisfactory but much effort is being put into improving them. Appropriations for this purpose are not adequate, however. There are plans to establish large nursery areas to raise native and foreign seedlings, and some of this work has already been accomplished. The collection of seeds from existing stands is an important objective.

f. Conservation is of increasing importance. Forest guards have more responsibilities and duties. Conservation is easier than in former times because of the decreased rural population and its concentration on Kolkhozes; closer community control; and the decreased number of stock. Stock grazing in the forests is still allowed, however, except in young stands. Fires are still a pressing problem, judging by the number of protective measures taken (watch towers, telephone, etc), particularly since 90% of the pine stands are young and subject to fire (older stands are fire resistant). Nothing is known at this point about measures taken to protec against harmful insects, fungi, etc. The problem of damage by the May Bug to young pine stands is probably very serious.

g. It appears that the Lithuanian forestry system is fully incorporated into the Soviet system and works under its direction. Apparently the post war personnel shortage has been overcome and an adequate supply of trained professionals exists. The central management and even local units are more decentralized than they were under the Lithuanian Republic. The system is more specialized and flexible than ever before. Forestry is now led by communist educated professionals who are actively or passively supported by a number of Russians in the department. Very few of the old Lithuanian professionals still hold position of importance. Even those who were loyal communist supporters and the backbone of the administration of 1940-41 have been replaced.(166) The old guard no longer has any considerable influence on forestry policy. With communists firmly in control, the Soviets have no worries about the direction of the forest economy. Evidence indicates that the professionals are in sufficient numbers and of higher quality than those who worked under the Lithuanian Republic. The older men have to take educational courses to bring themselves up to date. All must have a wide knowledge of biology and of mechanization concepts, and he propagandists of communism.

h. The forestry research program is progressing on a serious productive, basis. Its aid is to lay a scientific basis for government plans, especially in reforestation, and introduction of new trees and forest formations. Increasingly large scenes are available for investments and improvements.

2. <u>The Wood Economy</u>

a. While present production is large considering the condition of the forests, it is of poor quality and difficult to transport (brush wood). The rural population seems to have enough fuel wood, but the cities suffer from a severe shortage. Increasing domestic peat production and coal imports tend to alleviate this situation. The fuel wood shortage will not be solved for 20-30 years when the supply may be sufficient to ease the demand for coal, if peat production continues high. Present structural wood production is insufficient to restore burned cities and towns and to construct new "agrograds". Domestic lumber production cannot meet local demand, but some wood products are exported on an emergency basis in spite of local shortages.

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b. The present status of the wood industry is mainly unknown. Because of the wartime damage and the shortage of raw material, it cannot be higher than before World War II. The existing industry is small and unproductive, fulfilling only a part of local demand. The Klaipeda industry has recovered but is hampered by a shortage of raw material. Its products (and those of the Tilsit-Ragnit area) are mainly exported to the USSR and Western Europe. Its capacity is apparently no higher than it was in 1939. Large investments are needed to modernize Klaipeda's plants but more important is the provision of an adequate timber supply. The Polish forests are on the point of exhaustion, and the East Prussian forests were not even sufficient to supply Koenigsberg, Tilsit-Ragnit and Elbing before World War II. The production of Klaipeda will certainly drop in the near future.

c. Labor would be abundant in Lithuania but the Soviets have taken almost all young people for army service or work in the new lands. In their place, the Soviets have sent in many Russian colonists to help increase Soviet influence and control. The attempt by Lithuanian young people to escape deportation by enrolling in school has been checked by the Soviet policy of cutting enrollment quotas. Mechanization has resulted in considerable unemployment which has freed additional persons for removal to the new lands. The training of skilled workers receives a high priority. This is important in the forest economy because of the new problems raised under the intensive forest policy. Mass forest labor is performed by Kolkhozniks bound to brigade organizations which are available for seasonal forest work plus emergency service. For the first time, permanent workers are employed in the forests. The general level of the labor is steadily improving. The laborers are not sympathetic to communism and its results, but they are completely under communist control and are inactive and indifferent.

3. The Outlook for the Future The centralized, inflexible, totalitarian Soviet police state is in full control of Lithuania. The ruthless tactics of the state suppress any hope among the people for a better life. The population is indifferent and tired, but uncooperative and even hostile toward the government. This mood and unwillingness to cooperate is the best scale for judging the success of the communist system. It is the worst obstacle to the Soviets' plan to increase production. There are no serious political movements against the Soviet regime, especially in Lithuania which has been thoroughly penetrated by Russians and enervated by the removal of its young people. There is still a shortage of skilled workers and of professionals. They are being rapidly trained but the quality of their training is not yet adequate. There is a particular shortage of skilled workers in all phases of mechanization, but serious efforts to solve this problem are underway. The plans laid for improving the forest economy are workable if the population can be forced or encouraged to carry them out. The new policies of Bulganin and Khrushchev are intended to give the people more hope and enthusiasm.

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PART II

Chapter VII

FOOTNOTES

(1) Pakstas, K., "Lietuvos Plotas ir Gyventojai", Draugas, No 259, 1951

(2) "Narodnoye Khozyaistvo SSSR", 1956, p 18

(3) "Weltforst Atlas", Hamburg, 1954

(4) "Letters from Lithuania", 1957, R.V.E.

(5) Matulionis, A, "Lesnoye Khozyaistvo Sovietskoy Litvy", 1950, p 16

(6) Ibid

(7) Author

(8) Gugninas, A., "Lietuvos SSR Mijku Ukio Suklestejimas", Vartis 1954, p 3

(9) Ibid

(10) A. Matuliouis Gives 0.43

(11) Festmeters per Inhabitant per Year

(12) Matulionis, A., 1950

(13) Jankauskas, A, "Maumedzia", 1954, p 234

(14) Matulionis, 1950, p 18

(15) Gugninas, 1954, p 3

(16) Matulionis, 1950, p 18

(17) Author

(18) Ibid

(19) Buchholz, "Mitteilungen", April 1948, p 12, & author

(20) Author

(21) "Tiesa", No 31, 5 Feb 56

(22) Matulionis, A., 1950, p 24

(23) Buchholz, April 1948, p 2

(24) Pakstas, "Draugas", 1955, No 5

(25) Author - From a letter (Dec 1956) written by Professor A. Koncius now residing in Lithaunia

(26) Sandara, 18 Jan 57; Draugas, 24 Mar 51, 19 Apr 51; Naujenos, 2 Feb 56

(27) Naujenos, 1956, No 228

(28) Author

(29) Naujenos, 1956, No 226

(30) Gugninas, "Vartis", 1953, p 9-10

(31) Matulionis, A., p 12

(32) A photograph of a Lithuanian forestry professor and a group of students received in the US in 1956 bore the note that few of the students were Lithaunians

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(33) Author

(34) From a letter from Lithuania received in the US in 1957 - Author

(35) "Girios Aidas", 1956, No 14, p 41

(36) From a letter from Siberia received in the US in 1956 - Author

(37) "Naujenos", No 261, 11 Oct 50

(38) Ibid, 18 March 56

(39) Ibid

(40) "Musu Girios", 1944, p 64, 66

(41) Author

(42) Ibid

(43) Ibid

(44) Ibid - From a letter from Siberia received in 1956

(45) Matulionis, 1950, p 25-26

(46) "Tiesa", 22 June 52, No147

(47) "Lesnoye Khozyaistvo", 1952, No 4

(48) Ibid

(49) Ibid

(50) Gugninas, "Vartis", 1953, p 40

(51) A letter dated in 1956 from the West German forestry expert, Dr. E. Buchholz

(52) "Lesnoye Khozyaistvo" 1950

(53) Buchholz, E., "Die Wald u Holzwirtschott dos Ostraumes"

(54) Ibid, Mitteilungen, 1948, No 4

(55) Ibid, 1951, No 13, p 2

(56) Ibid, 1950, No 12, p 23-24

(57) Matulionis, A., 1950

(58) "Naujenos", 11 Oct 50

(59) Ibid, 11 April 56 - The author has had insufficient opportunity to study this point, particularly as it applies under the regime of Bulganin and Khrushchev.

(60) Yankauskas, "Maumedziai", 1954, p 234

(61) "Vartis", 1954, p 4

(62) Pogrebniak, P.S., etal, "Osnovy Lesnoi Tipologhii, 1941

(63) Ibid, p 4

(64) The secrecy surrounding Soviet research may make this conclusion presumptious - author

(65) Matulionis, A., 1950, p 16

(66) Ibid, p 24

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(67) As a practical matter, these strips had already been robbed of their mature timber prior to World War II

(68) Author

(69) Bachholz, "Mitteilungen", No 4, 1948, p 3

(70) "Vartis" 1954, p 4

(71) Ibid, p 5

(72) Ibid, p 4

(73) Buchholz, "Mitteilungen," No 4, 1948, p 3

(74) Author

(75) Ibid

(76) "Draugas", 12 Jan 51

(77) "Maumedziai", 1954, p 3, 247

(78) "Vartis", 1953, p 7

(79) "Draugas", 7 Dec 50

(80) Gugninas, "Vartis", 1954, p 8

(81) Matulionis, A., 1950, p 30

(82) Yankauskas, "Maumedzia", 1954, p 18-19

(83) Matulionis, 1950, p 3

(84) Ibid, p 29

(85) "Draugas", 7 Dec 50

(86) Matulionis, 1950, p 29

(87) Ibid, p 33

(88) "Vartis", 1954, p 8

(89) Ibid, p 7

(90) Matulionis, 1950, p 33

(91) Ibid, p 36

(92) Ibid, p 37

(93) "Tiesa" as reprinted in "Draugas"

(94) "Lesnaya Promyshlennosi", 1956 "Peredovoi Leskhozlitvy", p 20

(95) Ibid, p 20

(96) Matulionis, 1950, p 34

(97) Matulionis, 1950, p 34

(98) Ibid, p 15

(99) Ibid, p 13

(100) Ibid, p 23

(101) Author

(102) Matulionis, 1950, p 29

(103) Ibid, p 35

(104) Ibid

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(105) Ibid

(106) To the author

(107) Matulionis, 1950, p 32

(108) Economic Statistics for the Soviet forest industry are very scarce, particularly regarding Lithuania- author

(109) Author

(110) Ripe stands make up about 7% of the forest or about 7,000 hectares. A. Matulionis Lesailesnoye Chouyaistvo 1950

(111) Festmeters per Inhabitant per year

(112) "Narodnoye Khozyaistvo SSSR", 1956, p 18

(113) "Tiesa, #4159 - 1957

(114) Ibid

(115) Letters from Soviet Lithuania - author

(116) Ibid

(117) "Naujenos", No 202, 1956

(118) "Tiesa" no 31, 1956, No 69, 1951

(119) "Draugas", 1952

(120) "Tiesa", No 31, 1956

(121) "Naujenos", 4 July 56

(122) Ibid, 2 Feb 56

(123) "Draugas", 10 April 50

(124) "Naujenos" 2 Feb 56

(125) "Draugas", 1952; "Tiesa", No 81, 1952

(126) The exports of Klaipeda have not been examined - author

(127) The emigrant papers claim that over 100,000 cubic meters of wood products are exported, but this is exagerated - author.

(128) Author

(129) "Musu Girios", 1944, p 3

(130) "Draugas", 1951 from "Tiesa" 10 Jan 50

(131) "Maciuka, B, Lithuania in the Past 30 Years", p 178

(132) Ibid, p 175

(133) "Tiesa", 4159 - 1957

(134) Maciuka, p 179

(135) Ibid, p 175

(136) "Naujenos", October 1955

(137) Matulionis, 1950, p 24

(138) "Tiesa," No 81, 1955

(139) Maciuka, p 180

(140) Buchholz, E., "Mitteilungen," No 4, 1948, p 2

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(141) "Naujenos", No 226, 1956

(142) Author

(143) "Naujenos", 26 Feb 51

(144) "Tiesa", No 81, 1956

(145) "Sandara", 1956

(146) "Lesnoye Khozyaistvo", 1949, No 2 (19(p 23

(147) Numerous letters from Siberia and Lithuania, 1956, 1957 - author

(148) "Naujenos" 8 March 56, from "Tiesa" 19 Feb 56

(149) "Naujenos", 18 Feb 56

(150) "Draugas" 1 Dec 51, 12 July 50

(151) Ibid, 1952

(152) Ibid, 20 Feb 51

(153) Ibid

(154) Matulionis, A., 1950, p 26

(155) Ibid, p 29

(156) "Naujenos", 2 Feb 56

(157) Author

(158) "Draugas", 1 April 56

(159) Ibid, 4 Oct 50

(160) Matulionis, A., 1950, p 32

(161) "Draugas", 1 Dec 51

(162) Ibid, 31 Jan 57

(163) Ibid, 31 Jan 51

(164) Matulionis, A., 1950, p 32

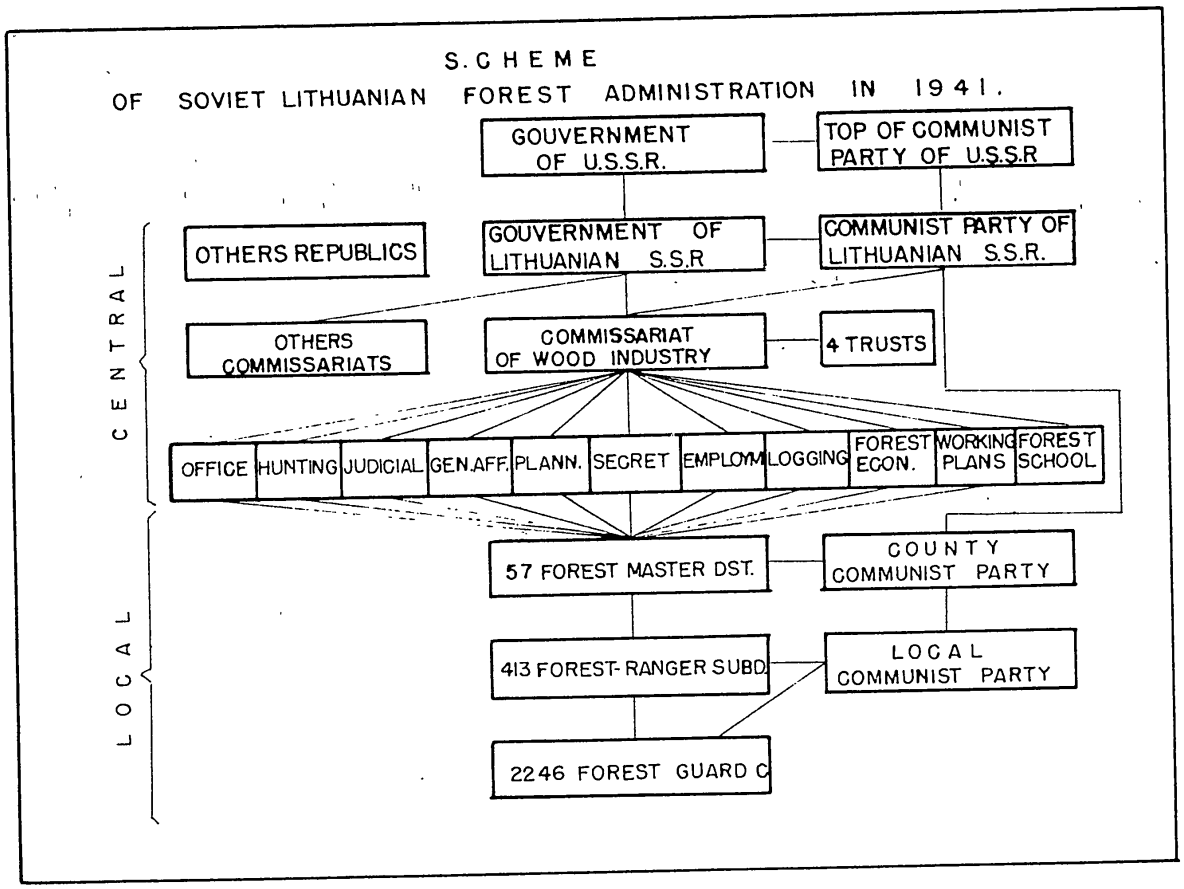
(165) "Draugas" 31 Jan 57

(166) Letters from Poland and Siberia - author

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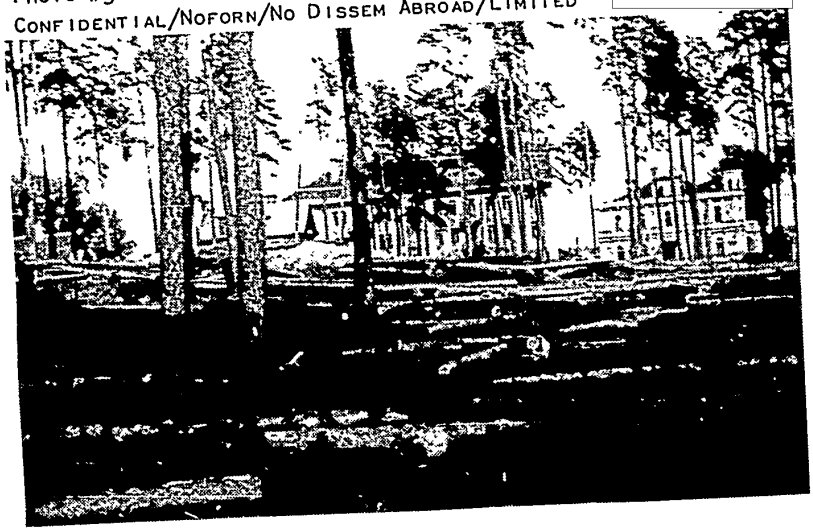
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#38

45MN USSR LITHUANIAN SSR VILNYUS 54 40 N 25 20 E
TIMBER LOGGED BY GERMANS IN PARK.
PHOTO #38
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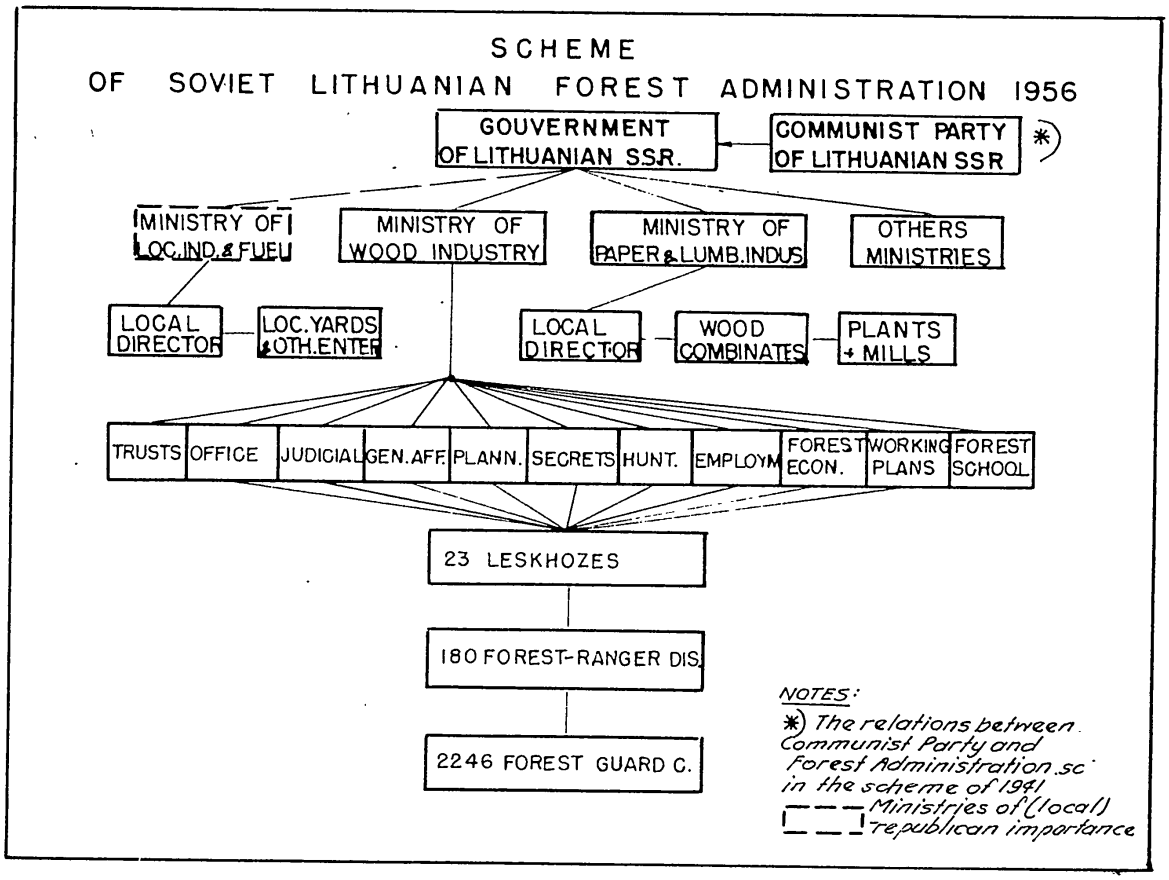
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german cut down park in city of Vilno.

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