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NOTES ON THE FORESTS OF NORTH-EASTERN CHINA AND THEIR UTILIZATION

OLAVI LUUKKANEN

SELOSTE:

KOILLIS-KIINAN METSISTÄ JA METSÄTALOUDESTA

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The paper consists of a report of a study tour made by Finnish forestry students, under the leadership of the author, to Harbin, Changchun, Peking, Nanking, and Shanghai in December 1977. In addition, some earlier literature sources concerning forestry in China are briefly reviewed. The paper presents the general geographic characteristics of north-eastern China, as well as the vegetation zones and timber species of this region. Silvicultural methods and the main features of forest technology and forest industry are also discussed. The last chapters describe the forestry administration and current trends in forestry education and research in north-eastern China as observed during the tour.

1. INTRODUCTION

In recent times, only very little information has been available concerning the forests of the People's Republic of China. There are at least two reasons for this situation. Firstly, the population of China is the largest in the world (one estimate is 900 million) and it is the third largest country as regards land area, with an area of 9.74 million km².

Very little precise data have been collected about the population, natural resources or the economy of this vast territory, either owing to the lack of primary data or because of the emphasis on local administrative units rather than on a national one. Secondly, following the founding of the People's Republic of China in 1949 and almost up to the present time, China has been isolated from the rest of the world. This isolation has been visible in international politics as well as in trade or technological development.

Some data are, however, already available in the literature. Information on various aspects of forestry in China has been collected by LIN (1956), RICHARDSON (1966), WANG (1961), WESTOBY (1975), and SAMSET (1976). Concise cartographic information is also available (FULLARD 1968). Forestry in China, particularly from the viewpoint of cooperation between China and Finland, has also been reviewed by PUTKISTO (1975).

1976 was, in many respects, an important year for modern China, perhaps second in importance only to the year when the People's Republic was founded. During that year, internal changes also created a new atmosphere favouring international cooperation in science and technology. As a result, the exchange of knowledge with foreign countries and economical development with the aid of foreign experience is also taking place in China today.

In the field of forestry, China has also shown interest in cooperating with Finland both in basic research and in practical applications of new technology. Finnish forestry specialists have either visited the country or such visits are being planned. Several tours aiming at a more general exchange of opinions with Chinese colleagues have also been arranged for Finnish foresters.

The present information was gathered during a tour made by Finnish forestry students, under the leadership of the author, to Harbin, Changchun, Peking, Nanking, and Shanghai in December 1977[1]). I am indebted to Professor Kalle PUTKISTO, Department of Logging and Utilization of Forest Products, University of Helsinki, for making this tour possible and for providing information on forestry in China; to the Embassy of the People's Republic of China in Helsinki and the "Lüxingshe" travel agency for the practical arrangements of the tour; to Messrs. SHI Tsing-li, LI Shiu-fa, and SUN Beo-yen for their excellent interpretation from Chinese to Finnish; to Mr. Tapani OKSANEN for technical leadership during the tour; and finally to all the 22 other participants of the tour for assistance in collecting the present information.

2. GENERAL CHARACTERISTICS OF NORTH-EASTERN CHINA[2])

The People's Republic of China extends from northern latitude 18 to 54° and from tropical to northern coniferous vegetation zones. The altitudinal variation is larger than in any other country of the world and includes such extremes as the Himalayas and the Plateau of Tibet in the south-west. Geographically the north-eastern part of the country (Heilungkiang, Kirin, and Liaoning provinces and adjacent parts of Inner Mongolia) is dominated by the Manchurian Plain, which is surrounded by mountain ranges in the north (Great Khingan and Little Khingan Mts.) and in the south-east (Liaotung, Changpai Shan, and Changkwansai Mts.). The northern part of this region belongs to the catchment of the Amur (Heilung) River and its tributary, the Sungari, whereas the southern part of the plain is part of the Liao River catchment area.

North-eastern China is one of the main industrial centres in China – coal, petroleum, and iron are being important natural resources. The Manchurian Plain is also an important agricultural region. Wheat is a major crop, and rice is also grown in this area. Other common crops include millet, sorghum, soybeans, maize, sugar beet, and cotton. The total population of the three provinces Heilungkiang, Kirin, and Liaoning exceeds 50 million. Shenyang, Lüta, and Harbin are the largest cities (the latter being the only major population centre in China which is not situated on or near to the coast or on the Yangtze or Hwang Ho rivers).

The climate of north-eastern China is characterized by long and very cold winters, warm summers, low rainfall most of which, however, occurs during the summer. The growing season lasts for about 5 months. The monthly mean temperature varies between 18 and 25° C in July. The annual precipitation varies between 500 and 700 mm over most of the region. In Inner Mongolia, west of the Great Khingan Mountains, the precipitation is between 250 and 500 mm only.

Pre-Cambrian rocks occur in Liaoning Province; the rest of the geologic formations in north-eastern China consist mainly of Mesozoic, Cainozoic, or igneous rocks. The soils of the Manchurian Plain are the richest ones in China, although the low amount of rainfall often limits agricultural production. In the western half of the Manchurian Plain chernozems, chestnut soils, and loess occur; the rest is covered by brown podzolic forest soils. The high lime content in these "wheat area" soils contrasts distinctly to the yellow-red and acid subtropical "rice" soils originating from subtropical forests.

[1]) This report covers the conditions which prevailed during the tour, and some changes (*e.g.* in forestry administration) have obviously occurred or are being established. – In orthography the way of writing the Chinese names of persons or places used during the tour has been preserved.

[2]) Main source: FULLER (1975).

3. FOREST ZONES AND TIMBER SPECIES

The vegetation of north-eastern China has originally consisted of temperate broadleaved forests, except in the central parts of the plain and areas along the Mongolian border, where temperate grasslands are common, and in the Great Khingan Mountains which are covered by forests resembling the boreal (taiga) zone. According to the vegetation zone classification of HÄMET-AHTI *et al.* (1974), most of the area in question belongs to the temperate vegetation zone, but altitudinal hemiboreal (orohemiboreal) belts occur in Great and Little Khingan Mountains, on the mountains between the Manchurian Plain and the Yalu River basin at the Korean border, and elsewhere at higher elevations. In the northernmost corner of China, the true hemiboreal, southern boreal, and middle boreal zones are also present.

The forested area has been considerably reduced through clearing for cultivation and through timber utilization for construction and fuel wood. The two northern mountain ranges as well as the region along the Korean border still retain their natural forest vegetation, however.

The Heilungkiang Province is the most important area in China as far as forest resources are concerned. About 40 % of the province is covered by forest. However, the forests are mainly restricted to mountainous areas; Great Khingan Mts. in the northwestern part of the province (the main part of the range lies within Inner Mongolia), Little Khingan Mts. bordering the Amur Basin in the north, and Wan Ta Shan Mts. which form the western border of the Ussuri Basin.

In Kirin Province the forested area is estimated as about 7 mill. ha or 30 % of the total area. In 1949 only 24 % of the province was covered by forests.

The upper limit of the mountain forest lies at about 1000 m a.s.l. in north-eastern China. The highest peaks of Great and Little Khingan Mountains which extend above this timberline, belong to the *Pinus pumila* shrub zone and are classified as the upper oroboreal zone according to the definitions of HÄMET-AHTI *et al.* (1974). Up to the actual timberline, in the middle oroboreal zone, larch *(Larix gmelini* s.l.) is the dominant species. In Heilungkiang Province, this is also the most important species as far as timber volume is concerned. For instance, in the Great Khingan Mountains, larch comprises about 70 % of the total volume. In Great Khingan *Pinus sylvestris* var. *mongolica* also occurs. Among broadleaved species, birch *(Betula platyphylla* s.l., *B. manchurica)* and oak *(Quercus mongolica)* are common in the middle and lower oroboreal zones.

The hemiboreal, hemioroboreal, and temperate zones are dominated by the Korean stone pine, *Pinus koraiensis,* which forms mixed stands together with a number of valuable broadleaved species *(Fraxinus mandshurica, Juglans mandshurica, Tilia amurensis, Acer mono* and others). The stone pine is the most highly valued species in Heilungkiang Province. Despite continuous cutting it still comprises up to 60 or 70 % of the growing stock in some areas, such as the Little Khingan Mountains.

More than 30 tree species are regarded as economically important in Heilungkiang Province. Next to stone pine and larch, spruce *(Picea jezoensis* and *P. koyamai)* and fir *(Abies nephrolepis, A. holophylla)* are the most important naturally occurring coniferous species. Spruce and fir are the dominant species of natural forests of the lower oroboreal zone, and they also accompany *Pinus koraiensis* in the hemi(oro)boreal and temperate zones.

Forest cutting has resulted in an increase in the amount of broadleaved species in former coniferous forests. Tree planting has also changed the species composition in northeastern China. Among conifers, *Pinus tabulaeformis* is now common as a result of artificial regeneration. Similarly, Scots pine which originally occupied only a small area in northeastern China has become a common species. *Robinia pseudoacacia* is an example of an introduced broadleaved species which has become completely naturalized.

4. SILVICULTURAL METHODS

Silviculture in Heilungkiang Province aims at preserving and enlarging the area of coniferous forests. Exact figures concerning the extent of different silvicultural practices are not available. However, a total area of 300 000 ha of forest for timber production has been artificially regenerated since the year 1949 in this province alone.

In tree planting, larch *(Larix gmelini* s.l.) is the most important species in Heilungkiang Provincen Also Scots pine *(Pinus sylvestris* var. *mongolica)* is commonly used. A typical planting density is 3300–4000 seedlings/ha. In the case of larch, two-year-old seedlings (which reach a height of more than 20 cm) have been used. In Kirin Province, planting densities of 3300–4400 seedlings/ha are recommended for fast-growing species, whereas slow-growing ones are planted at a density of 4400–6600 seedlings/ha.

Early development of planted coniferous stands is illustrated by data available for Changchun, Kirin Province (the experimental fore t of the Kirin Forest Research Institute, 250 m a.s.l.). In a *Pinus sylvestris* var. *mongolica* stand originating from Hailar, Inner Mongolia, a dominant height of 3.6 m and a b.h. diameter of 4.3 cm was reached at an age of 12 years (Fig. 1). Planting density in this stand was 6600 planting spots/ha, each spot originally having two planted seedlings. Erosion control was mentioned as the reason for such a high density in this particular case.

In the same experimental forest, *Larix gmelini* var. *olgensis* (local provenance from above 800 m a.s.l.), at an age of 18 years, reached a b.h. diameter of 6.1 cm when planted at a density of 10 000 seedlings/ha, whereas the diameter increased to 8.0 cm at planting density of 4400 seedlings/ha (Fig. 2; height growth data were not available). An older stand indicated the following production figures for the same larch variety: age 38 yrs., dominant height 16.3 m, b.h. diameter 14.8 cm, total growing stock 161 m^3/ha, and density 1550 stems/ha.

The black pine *Pinus tabulaeformis* is also widely planted in Kirin Province. In the same

Fig. 1. Tour participants in front of a planted stand of ***Pinus sylvestris*** var. ***mongolica*** in Kirin Province. The planting density is 6 600 spots/ha, each spot originally being planted with two seedlings. – Photographs: O. Luukkanen.

Kuva 1. Matkan osanottajat Kirinin maakunnassa, taustalla taimisto, johon on istutettu tavallisen männyn koilliskiinalaista rotua 6 600 laikkua/ha, kaksi tainta kuhunkin laikkuun. – Kuvat: O. Luukkanen.

Fig. 2. Planting density experiments with a local provenance of Dahurian larch (***Larix gmelini*** var. ***olgensis***) in Kirin Province. The age of the stand is 18 years.
*Kuva 2. Dahurian lehtikuusen paikallisen alkuperän (**Larix gmelini** var. **olgensis**) istutustiheyskokeita Kirinin maakunnassa. Metsikön ikä on 18 vuotta.*

experimental area as for the results presented above, the following data were available: age 38 yrs., dominant height 12.8 cm, b.h. diameter 15.3 cm, total stock 172 m^3/ha, density 1450 stems/ha (Fig. 3). Thus the yield of black pine exceeded that of larch. The slower height growth was also more than compensated for by the faster diameter growth of pine as compared to larch. Timber quality (as far as stem straightness or branchiness was concerned) was clearly inferior in black pine, however.

Among coniferous species, Korean stone pine *(Pinus koraiensis)* is also recommended by researchers and is planted especially by state forest farms. Researchers have shown that, in contrast to earlier assumptions, this species is also a relatively fast-growing one. In natural stands, however, a rotation age of up to 120 years is used.

Maximum timber volume yields in natural stands of *Pinus koraiensis* are reported as 800 m^3/ha and average ones as 300 to 400 m^3/ha. The oldest planted stands of this species are only 40 years old, but they have already reached a timber volume of 400 m^3/ha in some cases. In young *Pinus koraiensis* stands, hardwoods are commonly left as protective nursing canopies; thus the natural development of this species as part of the mixed hardwood and conifer forest is also followed in silvicultural practice. Seeds of Korean stone pine are widely gathered and used as staple "nuts" in north-eastern China (as in neighbouring countries).

Owing to the priority held by agriculture in land use in China, forestry is limited to poor soils and often to mountainous areas. The natural vegetation on such lands in Heilungkiang Province often consists of low-valued hardwoods, such as oak *(Quercus mongolica),* elm *(Ulmus pumila),* and aspen *(Populus davidiana),* and a dense shrub layer consisting of *Crataegus* sp., *Rhamnus* sp., *Lonicera* sp., and the leguminous *Lespedeza bicolor.*

Polars and willows are widely used on fertile land available for tree planting because of the high yield of these species. In China, agricultural shelterbelts as well as shade and windbreak plantations along roads and railways are also used for timber production. Pruning is a common practice in these as well as in other plantations around villages and towns and provides important fuel wood while sometimes also reducing the growth of

Fig. 3. A 38-year-old stand of ***Pinus tabulaeformis***. This species, which is widely planted in Kirin Province, grows faster but exhibits a poorer stem form as compared to larch.
Kuva 3. Kiinan mustamännyn metsikkö (ikä 38 v.). Tämä Kirinin maakunnassa yleisesti viljelty puulaji kasvaa lehtikuusta nopeammin mutta on runkomuodoltaan huono.

the trees.

The length of the rotation period varies according to the tree species. As mentioned above, the age at final cutting may be up to 120 years in natural *Pinus koraiensis* stands, but in planted and regularly thinned stands the rotation may be reduced to 80 years in this species. In larch, 50 years is considered to be the optimal age for final cutting, whereas poplar stands are mature for regeneration at an age of 25 years (the trees having a diameter of 30 cm or more).

The first thinning is usually carried out at an age of 10–15 years in conifer stands; this depends, however, on the way in which the thinned trees are to be utilized. Thinning may be repeated three to four times in dense stands and one to two times in more sparsely planted stands during the rotation. Poplars are usually thinned once or twice prior to the final cutting.

All the residues from thinnings, including branches and even cones, are used as fuel, except for some remote, uninhabited (mountain) regions in which the debris is left in the forest. Researchers do not believe that this causes any serious threat to the nutrient balance of the forest ecosystem.

Seed for forest tree nurseries is obtained through a special government organization. In Kirin Province there are three seed-collecting stations which select the stands suitable for collecting and look after the whole process of seed handling. Seed extraction from cones usually takes place in the field near the selected stands. Nursery owners (local state forest farms or people's communes) order the seed from these stations.

The purpose of thinning is to improve the quality of the trees as well as the complete utilization of all the wood produced. According to prevailing thinning regulations, productivity must not be endangered by selective cuttings. Mixed stands, including both conifers and hardwood species, are used along with those consisting of a single species.

Pests are not considered to be a serious threat in the forests of north-eastern China. Minor, periodic insect damage is reported for larch (needle, bud and cone damage) and *Pinus sylvestris (Blastophagus* bark beetles in young shoots), whereas rust fungi sometimes attack *Pinus koraiensis* (older stems of this species are also commonly attacked by heart

rot). Chemical control against insect damage is used, but the importance of biological methods (including artificially reared parasitic wasps and pathogenic microbes for destroying moth larvae) is strongly emphasized.

The yield of forest stands in Kirin Province and the effect of various silvicultural practices has been studied using a network of permanent experimental plots. These sampling plots, each having an area of 400 m^2, are placed systematically at a distance of 8 km from each other throughout the forested area of this province. Each stem on these plots is measured every five years and the amount of undergrowth is checked. As a result, growth and yield tables have been compiled for the major timber species.

5. FOREST TECHNOLOGY AND FOREST INDUSTRY

In north-eastern China, timber harvesting is usually carried out during the winter, from November to March. This region has the most advanced forest technology available in the whole country. In cutting, chain saws with elevated handles (resembling the models familiar from the Soviet Union) are used. Wheel tractors are being introduced into timber transport, although heavy-duty crawler tractors are still widely used. Nordic countries (including Finland and Sweden) have recently supplied China with some of the most advanced tractor equipment.

After skidding, the tree-lengths or large-sized logs are usually transported as such to the final sites of timber utilization. Land transport (roads and railways) is the most important form of timber transport, although some floating is also carried on along the waterways in north-eastern China. Most of the industrial timber from this area is processed in other parts of the country, long-distance transport mainly taking place on the railways. For road transport, domestic trucks as well as foreign-made vehicles (e.g. from Sweden) are used. Cableway technology has been adopted in some mountainous areas.

Timber utilization in north-eastern China consists mainly of wood for construction purposes and as fuel. There is a shortage of construction material in the country. This fact has necessitated the use of other materials such as bricks and concrete instead of the cheaper wood. Even vessels used for inland waterway navigation (up to 20 ton capacity) are made of concrete on steel frames. Increasing the productivity of forest land is thus of urgent importance.

In the pulp and paper industry, raw materials such as bamboo, straw, sugar cane residues, and reed are commonly used instead of wood.

The production of plywood and various boards is rapidly increasing in China. Besides domestic consumption in house construction and furniture making, this industry is to an increasing degree also aimed at foreign markets. Most of the plywood industry is located outside the region of north-eastern China. The north-eastern provinces nevertheless supply a major part of the raw materials for this industry. The plywood factories, as far south as Shanghai, mainly use wood originating from Heilungkiang, Kirin, and Liaoning Provinces. Another source is imported timber, mainly from Indonesia and the Philippines.

As an example, the total annual consumption of raw material at a plywood factory in Shanghai is 60 000 m^3. Hardwoods such as ash *(Fraxinus mandshurica),* lime *(Tilia amurensis, T. mandshurica)* and birch *(Betula mandshurica, B. platyphylla,* and others) from north-eastern China are used for plywood making in this factory, together with imported tropical hardwoods. The residue comprises the raw material for fibre-board production within the same industrial complex. The export of the products is centrally managed by a governmental agency, whose main connections abroad are located in Hong Kong.

6. ADMINISTRATION

The highest organ in forestry administration is the central Ministry of Agriculture and Forestry in Peking. At the provincial level, forestry may consitute an independent branch or it may be combined with agriculture. The same flexibility also applies to district level administration. In north-eastern China, forestry is separated from agriculture on both levels of local administration.

Within a district, forestry is in some cases integrated with the activities of people's communes, but, on the other hand, it may also be run independently on state forest farms under government or provincial authorities outside the communes. People's communes, state farms, all higher administrative organs, as well as every factory, school, hospital and similar units, are led by revolutionary committees, consisting of workers, technical staff, and party representatives. The revolutionary committee also leads the forest management carried out by the special administrative unit at the respective level of administration, as well as the activities of the revolutionary committees on the immediate lower level.

People's communes are the basic units of administration in rural areas, and their responsibility covers a much wider spectrum of activities than agriculture alone. For instance, industry, education, and military affairs are also organized by this administration. People's communes have to a great extent replaced the administrative functions of towns and rural counties in present-day China. Originally, they were formed by combining agricultural co-operatives into larger units (the co-operatives had developed from previous mutual aid teams of private farmers). The population of a people's commune may exceed 50 000 people.

Smaller units within a people's commune are production brigades, which are divided into production teams. A production team consists of several families.

Timber production in a people's commune is permanently assigned to selected production brigades or production teams. People's communes are independent as far as decision-making in forest management is concerned. This situation reflects the decentralization which is typical for the whole Chinese administrative structure today. The commune or the production brigade also runs its own forest nurseries independently. However, when necessary, technical aid is obtained from provincial-level forestry authorities, which also may supply the forest tree seed, as mentioned earlier. The commune utilizes the timber for construction work and own manufacturing utilities, or it may also deliver it to other users. Individuals are allowed to use branches, cones and other residues from forest stands as fuel.

The major share of industrial wood in China is supplied by state forest farms. In north-eastern China these farms produce more timber than is utilized within the region; consequently the state forest farms deliver their timber for further processing in other parts of China.

Forest farms are common in mountainous areas. State farms have also been established for agricultural production, particularly on newly acquired frontier land bordering the deserts and grasslands. Afforestation is a major method for controlling erosion and improving hydrological conditions in these regions. Various organs, ranging from the Chinese Academy of Sciences, the Academy of Agricultural and Forestry Sciences and the Inner Mongolian Forestry Research Institute to forest farms and people's communes, are also conducting experiments to improve silvicultural methods in desert areas. Technical improvements developed by the state farms and experimental conditions under such extreme conditions have also later been adopted by forest farms and in people's communes in other areas.

Desert fighting has resulted in a considerable amount of man-made forests in north-eastern China. The entire autonomous region of Inner Mongolia (which extends outside north-eastern China as defined in this paper) has acquired more than 800 000 ha of new forest and farmland as a result of tree planting since 1947 (KAO and HSIANG 1977).

7. EDUCATION AND RESEARCH

The Forestry College of Nort-Eastern China in Harbin, the capital of Heilungkiang Province, is one of the three central units of higher education in the field of forestry in China. This college which takes care of forestry education as well as that of the wood-working industry for the region, was established in 1956. The special fields taught in this institute include silviculture, forest protection, game management, forest engineering, mechanical wood technology, pulp and paper chemistry, forest industry engineering, timber transport engineering, and road construction.

The teaching and administrative staff of the college numbers 500 persons, the present number of students being 2 000. Two pilot plants, two experimental forests (consisting of 26 000 ha of planted forests and 6 500 ha of natural mountain forests, respectively), a library and a herbarium can be mentioned among the facilities. Extension service in the form of short-term training courses for forestry graduates, technicians and forest workers are also the responsbility of the institute; the number of such students is about 7 000 annually. In addition to regular students the college also offers correspondence courses in certain fields for part-time students. Schooling of instructors for various levels of forestry education is also one task of the college.

The present curriculum of the Forestry College puts the emphasis on professional skills and theory. The ratio of professional to basic subjects in Harbin is now 4 to 1. A similar ratio exists between theoretical studies and practical field work. Each regular student participates in supervised field work for about three months annually.

Apart from education, the college also fulfills research tasks, suggested by the central government or provincial authorities. However, the teaching staff at the college is also allowed to choose subjects individually and according to educational needs. At the present time, a total of 44 different research projects are in progress at the college, and they are also considered to improve the quality of teaching essentially.

According to the administravite and teaching staff of the college in Harbin, the main difficulties at the present time are those arising from a lack of experience in the most advanced methods of forestry practice in the field. One important reason for this situation is the short period that this institute has been active. Thus no results from long-term experiments are available. The laboratories are not always equipped with modern instrumental facilities. The present development program aims at reaching the general world level standard by the end of this century – this is in accordance with the plans to develop the economy and industrial output of the whole country within a similar time span.

The scientific level of education and research is already high in basic fields such as plant anatomy and taxonomy, plant physiology, entomology, genetics and instrumental ecology. For instance, the use of infrared gas analysers in photosynthetic work and haploid cell cultures of poplar tissues in the genetics laboratory of the college are examples of sophisticated methods applied in research programs. The students' ability to construct their own teaching material is impressive. Ecology classes include the construction of electrical recording instruments, and botany and zoology students are able to demonstrate their objects by skilfully-drawn wall posters as well as by mounted birds and mammals. The herbarium consists of more than 100 000 specimens and offers an excellent base material for studying the taxonomy of local plants. Such interesting genera as *Larix* and *Salix* have already been mapped by the Harbin researchers. The emphasis on the medicinal use of plants, found in many fields of the Chinese culture, is also clearly visible in the botanical work of this college.

Co-operation with foreign scientists and institutes seems to be most welcome in the application of modern methods to timber production, harvesting, forest management and the whole complex of the woodworking industry. In these rapidly developing fields the prolonged lack of foreign contacts has perhaps had a stronger impact on science and techonology in China than has been the case in more basic sciences. This conclusion can also be drawn from discussions with Chinese forest researchers.

Profound changes which have taken place in the Chinese academic world during the recent years have frequently been discussed outside China (cf. BULLOCK 1977, TANG 1977). In forestry education and research these changes have also been remarkable. As with virtually every aspect of life in China, the College of Forestry in Harbin was also "sabotaged" by the "gang of four" during the final years of the Cultural Revolution, according to the representatives of the college. The ousted clique had proclaimed that intellectual work was to be condemned because of its "association with bourgeois ideology" (cf. CHUNG 1977).

This attitude led to the direct harassment of teachers and researchers. Particularly, foreign technology and even the study of foreign languages was condemned. Furthermore, students who attacked the teachers with ideological arguments and refused to take examinations were proclaimed as heroes. In such a technical field as forestry, manual labor and ideological discussions were favoured instead of professional and theoretical knowledge. The college was open for admission, without verification of knowledge or technical skills, to anyone who possessed the "right thought and the support of the masses", and the academic study period was to be completed within three years.

The academic life has now been normalized. The full secondary school course and an entrance examination are required for admission to the College of Forestry. Beginning 1978, a course of study at the college has taken four years, although able students may complete their undergraduate program within a shorter period. As already mentioned, the curriculum now emphasizes professional technical skills and theory, but practical training courses in the field are also arranged.

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SELOSTE: KOILLIS-KIINAN METSISTÄ JA METSÄTALOUDESTA

Kirjoitus sisältää raportin suomalaisen metsäylioppilaiden tekijän johdolla joulukuussa 1977 Kiinaan tekemästä opintomatkasta, jolla tutustumiskohteina olivat Harbin, Changchun, Peking, Nanking ja Shanghai. Lisäksi kirjoituksessa käsitellään Kiinan metsätaloutta kirjallisuuden perusteella. Koillis-Kiinan maantieteellisten yleispiirteiden lisäksi tarkastellaan alueen kasvillisuusvyöhykkeitä ja metsätatoudellisesti tärkeimpiä puulajeja sekä lyhyesti metsänhoitoa, metsäteknologiaa ja metsäteollisuutta. Lopuksi esitetään matkalla saatuja havaintoja Koillis-Kiinan metsätalouden organisaatiosta sekä metsäopetuksesta ja metsäntutkimuksesta.