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*Environments of War*

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## *Environments of War*

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# Was There a Socialist Type of Anthropocene During the Cold War? Science, Economy, and the History of the Poplar Species in Hungary, 1945–1975<sup>1</sup>

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The paper argues that exploring the content and sites of transnational entanglements is a more adequate way to study the relationship between the Cold War and the Great Acceleration phase of Anthropocene than looking at the so-called East vs. West in isolation. By focusing on how scientific ideas, economic concepts, industrial projects, and data production emerged and intertwined in the case of activities related to poplar trees in Hungary, it becomes clear that anthropogenic landscape change during the state socialist period was embedded into the global circulation of ideas about forests, materials and ecology. The paper also points out that forestry is a relevant area of knowledge for studying the reasons behind anthropogenic change leading to the Anthropocene because of continuities it provides across World Wars and regions, and because the profession engages with biological knowledge production, business interests, political demands regarding long-term economic growth, and notions of ecological crisis in its everyday practice.

Keywords: anthropocene, science studies, history of forestry, state socialism, paper production

## *Anthropocene, Cold War and Poplar from the Perspective of Hungary*

Trees can become symbols of historical change. In early 2018, a group of Australian scientists proposed that one of the rings of the only Sitka spruce tree living on Campbell Island, 600 kilometers south of New Zealand, namely, the ring dated to 1965, should become the marker for the divide between Holocene and Anthropocene epochs. Chris Turney and his team found that the <sup>14</sup>C content of the tree rapidly grew in 1965 date due to fallout from nuclear bomb testing that

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1 This paper was written with the support of program entitled “Tudás, tájkép, nemzet és birodalom: A tájkép megismerésének és átalakításának gyakorlatai Magyarországon és a Balkánon, 1850–1945” [Knowledge, Landscape, Nation and Empire: Practices of knowing and transforming landscape in Hungary and the Balkans, 1850–1945] that is program number FK 128978 of the National Research and Development and Innovation Fund, Hungary (NKFIH).

had taken place some years earlier.<sup>2</sup> This perspective emphasizes the globalized nature of ecological change. Turney's observation focuses on a location that looks extremely remote, thus, marginal from the Global North. Reinforcing the same message, the scientist talks of biochemical changes taking place at the level of cells in a tree that a human being purposefully planted there, thousands of kilometers away from its natural habitat. Turney overcomes what might appear as a contradiction between global challenge and local phenomena by stressing that human activity had its impact even in the most remote locations in 1965.

Anthropocene may simply be translated as the Age of Humans. This term emerging around the year 2000 indicates that human influence has become the single most important factor changing the biophysical system of the Earth. The use of the term has been criticized from a number of perspectives. According to critics, talking of Anthropocene recreates the idea of a sharp division between nature and culture that is the very notion that has led to the current damages to sustainability, it veils the role that capitalism has played in biophysical change, and it also ignores non-Western perspectives of ecology as well as the historical contingency of thinking of ecological crisis in the West.<sup>3</sup> Despite the importance of chronology and historical narrative in these discussions, few historians have used Anthropocene as a framework of analysis. Coming close to Turney's proposed dating, J. R. McNeill and Peter Engelke's recent global environmental history associated Anthropocene with the term Great Acceleration that signifies the rapid rise of the quantity of greenhouse gases in the atmosphere.<sup>4</sup> The authors posit that while the post-1945 period was the age of omnipresent ecological destruction, the Cold War was only one of the factors behind biophysical changes since global-scale urbanization, demography, and consumption were powerful factors in their own right. McNeill and Engelke also demonstrate that while talking about the impact of Cold War, countries of the 'West' and the 'Socialist States,' including China, were all engaged in environmentally harmful activities as part of the arms race and struggle for influence. This latter view is not the mainstream among environmental historians working on East-Central Europe. As Zsuzsa Gille's and, more recently, Viktor Pál's monographic studies have pointed out, a number of writings emphasize that it is the Soviet Union and Sovietized thinking that is to blame for pollution and loss of biodiversity

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2 Amos, "‘Loneliest tree’ records human epoch."

3 See Moore, *Anthropocene or Capitalocene*.

4 McNeill and Engelke, *The Great Acceleration*.

and habitats.<sup>5</sup> The purpose of this paper is to contextualize planned and actual anthropogenic landscape change taking place in Hungary, one of the countries of the ‘Socialist Bloc,’ emphasizing both specificities of global connectedness and locally specific features. As Zoltán Ginelli has recently argued, Hungary’s semiperipheral position is a vantage point from which relations that look like dichotomies may be reviewed: “Semiperipherality shares both central and peripheral aspects: being strongly connected through its cultural or geographical proximity to the global center, but remaining peripheral, dependent and subjugated to the global core as its ‘internal other’; not having colonies, but benefiting from civilizational superiority and imperialist practices over the global periphery; developing a strong urge to catch up with and imitate the center, while sharing its civilizational and modernization mission towards the periphery.”<sup>6</sup> Looking at the Anthropocene thesis from this angle contributes to describing the relationship between capitalism and global biophysical change as well as the ‘Western’-ness of the term Anthropocene.

The idea that state socialist regimes developed a Sovietized and harmful pseudo-science instead of carrying out research in the interest of humans has encroached on the popular image of poplar trees in Hungary. On August 30, 2017, the Assembly of the Capital City of Budapest decided that it should get rid of all the trees belonging to the species commonly called ‘Canadian poplar’ because its flowers damage respiratory health, carry the risk of fire, and is a relic from socialist times.<sup>7</sup> The decision indicated that it referred to the species taxonomically named *Populus × canadensis*. However, this term is a terrain of ambiguity. In the accepted nomenclature of the poplar species, which came into force in 1955, *Populus × canadensis* is no longer accepted as a name of a taxon.<sup>8</sup> It is most likely that the decision of the assembly targeted *Populus × euroamericana*, which is a hybrid of a North American poplar species, *Populus deltoides*, and another one believed to be an indigenous species of Hungary, *Populus nigra*. The text of the decision errs when it ignores that this hybrid is not the result of a scientific or pseudo-scientific project; instead, it is a natural outcome that has been around since the eighteenth century. The frequency with which hybridization can take

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5 Pál, *Technology and the Environment in State-Socialist Hungary*; Gille, *From the Cult of Waste to the Trash Heap of History*.

6 Ginelli, “Hungarian Experts in Nkrumah’s Ghana.”

7 City Council, Municipality of Budapest, <http://infoszab.budapest.hu:8080/akl/tva/Tir.aspx?scope=kozgyules&sessionid=6894&agendaitemid=94197> Accessed March 5, 2018.

8 Bartha, “A Magyarországon előforduló nyár (*Populus* L.) taxonok.”

place is in fact talked of as a danger to the genetic stock of poplars.<sup>9</sup> Throughout the twentieth century, especially since the 1920s, a number of cultivar varieties have been produced of the *Populus × euroamericana* hybrid. In fact, the name *Populus × canadensis* may also refer to the variety called Merilandiana that is called ‘early poplar’ in common Hungarian.<sup>10</sup> With the recent politicization of the poplar, we are at the heart of the uncertainty between nature and culture and its archival production in the post-socialist context. Moreover, this is an instance when dendrology experiments and conventional historical records both form part of the archives used for historical research.

The short proposal to eliminate the poplar from Budapest did not spell out the most important context of the link between state socialism and poplar species: paper and cellulose production. Moreover, there are a number of other contexts to keep in mind. Poplar, growing faster than all other families of species considered for forestry in the twentieth century, made it important for urban planning, design of highways, and for containing desertification of areas of the Great Plains of Hungary since the 1920s. Yet, it was the rapid rise of demand for paper products and the cost associated with their import that brought the poplar project to center stage in the history of forestry of the state socialist period of Hungary. Poplar was not the only species that triggered large-scale investment and institutional and transnational effort for increasing the area of growth—in the hope of obtaining more arable land and raw material for industry. The story of pine, especially *Pinus silvestris*, merits a separate study in this regard.<sup>11</sup> The history of afforestation is also intertwined with the history of poplar projects in Hungary, though it cannot be equated with it.<sup>12</sup>

In this paper, I study the history of knowledge production about poplar in Hungary in order to look at links between state socialism, scientific approaches, global institutions, ideas about the economy, and the Anthropocene during the Cold War period until the mid-1970s. In the first part, I explore the question if there was both an ‘Eastern’ and a ‘Western’ science in light of the production of poplar species and emerging views and research about a canker disease that attacked poplar plantations in various parts of the northern hemisphere in the twentieth century. The second section interprets and contextualizes formulas that high-ranking Hungarian foresters presented at global events related to

9 Gaál, “Az őshonos nyárák és fűzek génmegőrzése.”

10 Bartha, “A Magyarországon előforduló nyár (*Populus L.*) taxonok határozókulcsa és rövid jellemzése.”

11 Balogh, “Transnational Modernity, Biography and the Anthropocene in a Cold War Arboretum.”

12 Balogh, “A Program for Afforestation.”



projecting future commodification of forest resources. I will consider these thoughts in light of activities and agendas of Cold War institutions, such as, the European Economic Committee of the UN (UNECE) and the Comecon. The third section brings together the issues of science, data and economic decisions, and relates these to the social and political context of the Yugoslavian-Hungarian deal about paper production that had been in preparation since 1969 and was eventually signed in 1975. Studying the entangled nature of scientific, political, and economic projects related to poplar species, along with the history of how knowledge emerged in state socialist Hungary, contributes to understanding projects and actual changes in the nature-culture relationship during the Cold War decades.

The picture I draw here will not be a complete discussion of how the Anthropocene unfolded in state socialist Hungary. I do not discuss the roles that afforestation and poplar played in the history of the relationship between changing flood basin landscape and hydropower generation projects, such as Bős-Nagymaros or Lake Tisza. I also exclude the issue of pollution that the papermaking industry produced. Energy production, pollution, and protest are topics that other historians have been working on and they deserve separate papers.<sup>13</sup> The present approach is relevant for the discussion on the validity of the term Anthropocene. It looks at developments from the perspective of a semiperiphery and studies forestry, which is an area of knowledge production where the relationship between nature and culture had a century of history by the 1960s.

### *A Case for Entangled History: Poplar Science in Hungary in the Context of Postwar Ideas about Development and Transnational Science*

The history of the poplar species is an entangled history transgressing geopolitical and chronological demarcation lines. Thus, the history of how the transnational scientific poplar project interacted with the launch and expansion of the poplar project in Hungary is a site for assessing the plausibility of the assumption that there was a ‘Socialist’ as opposed to a ‘Western’ science during Cold War.

Poplar is one of families of the tree species that are termed as fast-growing because its rotational cycle, as established by modern forestry, is a fraction of the

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13 Kocchetokova, “Industry and Forests.” For an analysis of the Lake Tisza project see Borvendég and Palasik, *Vadbjergások*; for pollution see Pál, *Technology*.

number of decades that beech, pine, and oak take to reach what is believed to be their optimum industrial size. As a result, proliferation of poplar tree hybrids was one of the global projects that intended to bring about large-scale anthropogenic change in the post–World War II decades under the umbrella of the Food and Agriculture Organization of United Nations (FAO). As a result of an emerging global timber market, new ideas of economic development, and the growing importance of exploring industrial uses of timber in forestry research, beginning in the 1930s there were botanical and forestry experiments aimed at selecting and improving the poplar species.<sup>14</sup> By that time, the European experience in the cellulose industry showed that the material was indispensable, but importing spruce as a major resource put a large burden on the national economy in times of exportation difficulties.<sup>15</sup> European countries lacking pine forests or with significant regional variation of accessibility, such as the Netherlands, Italy, Yugoslavia, and Hungary, were in a particularly difficult situation in this regard. Italy became the first hub of collecting and selecting poplar species and Italian foresters gained specialized knowledge in vegetative propagation (cloning) of selected clones.<sup>16</sup>

The poplar program in Hungary has to do with three transnational histories. First, there were pre–World War II links to Italian forestry. Second, Hungary took part in so-called international provenance studies that aimed at finding what the optimal conditions were for certain varieties.<sup>17</sup> Third, in 1949 the government of the Rákosi era allowed some foresters to take part in the 3rd Full Session of the International Poplar Commission (IPC) in Belgium and in the Netherlands.<sup>18</sup> In fact, Hungarian foresters Miklós Rosner and György Koltay were the only participants from the ‘Socialist Bloc’ at the event. The international event in actual fact included only European participants: Swedish, British, Swiss, French, Hungarian, Italian, many Dutch and Belgian, and a few Luxembourgian foresters. FAO and the international organization of forestry research institutes, IUFRO, also sent a representative in their own right.<sup>19</sup> The meeting of 1949 was an important milestone for the Hungarian perspectives because, due to

14 For changes in world economy and invention of the idea of national economic space see Goswami, *Producing India*; Mitchell, *Rule of Experts*. For global timber economy see Beattie, *Empire and Environmental Anxiety, 1800–1920*; Ravi, *Modernizing Nature*.

15 *Papers of the 2nd World Forestry Congress*.

16 Kopecky, “A nyárák nemesítése.”

17 Koltay, “A nyárfa.”

18 *Ibid.*

19 International Poplar Commission.

discontinued membership of countries of the ‘Socialist Bloc’ in FAO and other UN organs in the 1950s, there was no Hungarian delegation at the subsequent six full meetings. During that decade, Yugoslavia was the only East-Central European country to take part in some of the full IPC meetings. From 1955, meetings became biannual or less frequent. Yet, this was a sign of decline only until 1961 when the IPC started to have its Executive Committee. By the 1960s the IPC stopped being a Western and Southern European event. Yugoslavia hosted a full session in 1962, Teheran was the venue of the full meeting in 1965, Bucharest in 1971. In the light of this trajectory, the regional event that Hungary hosted in September 23–29, 1956 was an important opportunity for reinvigorating the IPC network of contacts both among socialist countries and across the Iron Curtain.<sup>20</sup> Assessing the international embeddedness of the poplar project of Hungary, the report on the event believed that:

In the first place, we need to highlight the general impression that foreign participants took with them. A few of them have taken part in other poplar conferences and when comparing our event and the other ones they stated that what they saw here was proof of the high standard of research and practical work. We may say that we used to work in isolation, but it has its advantages besides disadvantages, namely, we continued to work on processes (cross-breeding distant species, homogenous hybrid poplar stands) that have been rejected abroad and we managed to bring these to fruition.<sup>21</sup>

In other words, the report was critical of the era of isolation but was keen to point out that parallel experiments and innovation might contradict and refute contemporary mainstream practices. The IPC regional event was an occasion to gather feedback on ongoing experiments and applications. It also indicated that poplar research in Hungary began around 1950, during some of the coldest years of the Cold War and that is why a booming and high international visibility was possible and feasible immediately after Stalin’s death. Moreover, the event highlighted that there were three crucial issues for a transnational poplar research program, namely, reconciling sustainable levels of biodiversity of forest stands with needs of industrial use and with the push to lower costs of planting and felling, the acceptance and credibility of experimental results, and the issue of a poplar disease, *Dothichiza canker*. It was also clear that the

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20 Bakay, *A Magyar Tudományos Akadémia és az Országos Erdészeti Főigazgatóság együttes rendezésében megtartott nyárfakonferencia*.

21 MNL OL XXVI-K-3 box no. 16. “A nyárfakonferencia” [The poplar conference].

three issues were intertwined. What the report on the regional event suggested as a definitive conclusion about the viability of homogenous plantations was actually still in an experimental stage in 1956. Two years earlier, János Magyar, the forester with superior knowledge of mathematics, set out to resolve the question of what constituted the minimum necessary biodiversity for the poplar project. His conclusion was that it would not make sense to mix different poplar species in the same stand; however, best results may be expected if below poplars there is a second tree level in the stand that is made up of species that tolerate shade. During the discussion of his results, György Koltay plainly stated that “The biological condition of homogenous poplar stands is bad, and their productivity remains acceptable only as long as the negative impact of biological conditions does not show up.”<sup>22</sup> The concise nature of Magyar’s methodology and presentation asked for more research on more numerous stands before a final conclusion could be reached.

In the same years, another factor, the spread of *Dothichiza canker*, also underlined the salience of experiments about the biological condition of stands where poplar hybrids dominate. The issue of canker became so serious that it looked it would end the career of some of the most promising *Populus × euroamericana* clones in the second half of the 1950s. The disease causes the bark of poplar trees to swell and deform, but it may also begin as a leaf infection. Trees are likely to survive initial the disease, though many tend to die and collapse during the next wet period because of their reduced level of resistance. In Hungarian poplar stands, the symptoms appeared suddenly in the early 1950s, and specialists had to dig for a description that appeared in print in 1938. The cause of canker was a mystery that took years to solve. The bibliographical references of papers published in the 1950s point to lacunae in transnational knowledge circuits during Hungary’s years of relative isolation. In 1953, T. R. Peace’s the comprehensive study of poplar in UK stated that it had no information about the spread of canker in Eastern Europe, while researchers of the Forestry Research Institute of Hungary (Erdészeti Tudományos Intézet – ERTI) did not reference Dutch experiments and results from the 1930s and 1940s that T. R. Peace of the UK Forestry Commission praised.<sup>23</sup> Hungarian foresters also did not know of Alma Waterman’s work which referenced turn-of-the century

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22 Magyar gained reputation with his work on designing the web of protective forest belts necessary for increasing agricultural output in 1948–49. Magyar, “Nyárasok faállományszerkezeti vizsgálatának eddigi eredményei.”

23 Peace, *Poplar*.

results, including specifications of large-scale canker damage registered in 1915–1916 in some of the states of the USA.<sup>24</sup> The common denominator in literature was another British botanist, K. A. Sabet, who posited a link between weather and *Dothichiza canker* and between fungi and bacterial infection causing it.<sup>25</sup> Eventually, foresters agreed that the disease appeared as a result of combined presence of fungi known as *Cryptodiaporthe populea* (Sacc.) and bacteria.<sup>26</sup> By the time *Magyar nyárfatermesztés* (Hungarian Poplar Cultivation) was published in 1962, Hungarian researchers were aware of all previous publications and the various names that authors used to name the disease.<sup>27</sup> Since all authors agreed that there was no cure for the disease, research was oriented towards identifying resistant and vulnerable varieties and circumstances that increase risk. To avoid a major loss of stands, foresters needed to prevent weakening of trees from dry periods and unsatisfactory soil conditions, and too much manure also increased susceptibility. The example of *Dothichiza canker* allows one to highlight three features of the transnational aspects of poplar research. First, the range of the poplar species and varieties that forestry experimented with was a common pool across the Iron Curtain in the 1950s. In fact, if it was not for the widespread of *Populus × euroamericana* clones, *Dothichiza canker* would not have threatened poplar plantations. Second, decades of expertise in vegetative propagation for engineering suitable variants did not mean that it became possible to control nature-culture interaction. Third, in the early 1950s, knowledge circulation was lacking between Hungarian foresters and their Western counterparts, but this did not mean a complete stop to scientific articles crossing borders. Peace’s study mentioned the lack of information in key publications appearing in the ‘West.’ This situation changed by the early 1960s, but the regional IPC event of 1956 played a key role in realizing distances and reconnecting Hungarian researchers to the circulation of ideas elsewhere.

These conclusions clarify the fact that the contemporary status of the state socialist form of political control was relevant to the history of the poplar in Hungary. Initially, planting more poplar species as means of water management along rivers and as part of protective forest belts was one of the aspects of

24 Waterman, “Canker and Dieback of Poplar Caused by *Dothichiza Populea*.”

25 Sabet, “Studies on the Bacterial Die-Back and Canker of Poplar.”

26 Tóth, “Megfigyeléseim a nyárfákról.” See also Waterman, “Canker and Dieback of Poplar,” 175–83. <https://academic.oup.com/forestsscience/article-abstract/3/2/175/4763880?redirectedFrom=PDF> Accessed on July 10, 2018.

27 Keresztesi, *A magyar nyárfatermesztés*.

afforestation. Afforestation had nearly a century of history by 1950, but it was during Rákosi's regime that it became a means of mobilization and a link to 'Stalin's plan to transform nature,' which was launched after the postwar famines in the Soviet Union. Propaganda and the need to respond or adjust to it remained an integral part of political life after the Rákosi era and after 1956. The poplar project evolved into a national assessment of all postwar poplar stands, and, subsequently into the National Poplar Committee under one of the key bodies of the early Kádár era, the Committee of Economic Affairs of the Council of Ministers. This meant the politicization of the attitude towards the poplar species and ever more propaganda about the issue.<sup>28</sup> The high number and content of articles that appeared in the most important contemporary journal targeting foresters, *Az Erdő*, also confirm that the poplar campaign and the goals it set had a profound impact on forestry in the early 1960s. Looking at propaganda related to the poplar campaign is one of the ways to connect related written source material that researchers and institutions produced and a wider social realm of foresters and forestry employees working on the ground. Under such conditions, oversimplification of tasks and the tendency to look at poplar species as panacea were everyday issues. Poplar made its way to the agenda of the local units of the National Forestry Association. It appears from the debate articles that a younger generation of foresters was impatient with the limitations that classification of niches meant in terms of the choice of species. In regions such as Hajdú County, replacing oak with poplar looked like a natural process that loss of soil humidity had been triggering for nearly a century. However, senior researchers, especially Imre Babos, who produced textbooks about afforestation, were squarely against replacing oak stands along the Tisza River or overusing spruce and poplar in the Western border area.<sup>29</sup> The tone that some members of the generation of foresters who played major role in producing basic literature for afforestation campaign in the 1950s used in an official professional journal to discredit the excesses of poplar propagation shows that there was a political decision to place limits on the undesirable transformation of forests, land use practices, and landscapes that the propaganda might have brought about. Debates about the ways soil and niche classification limited the expansion of the area covered

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28 Keresztesi, "Nyárfagazdálkodásunk helyzete." About the Committee of Economic Affairs see Csernyánszky, "Kádár csúcszerve. A Gazdasági Bizottság megalakítása."

29 Debate about poplar in the journal called *Az Erdő* 1963–64: Babos, "Hozzászólás Polner Antal;" Babos, "Viszontválasz Borsos Zoltánnak;" Borsos, "A fafaj megválasztás néhány kérdéséről; Cebe, "Hozzászólás a fafajmegválasztás kérdéséhez."

by poplar species, in other words, about the usefulness of experimentation and scientific observation, intensified among Hungarian foresters as the poplar project gained political salience and a national dimension throughout the 1960s. As we shall see in the third section of this paper, the assessment carried out between 1973 and 1976 found that while the campaign of 1960–61 reached its goal in terms of drastically increasing the presence of poplar species in terms of both percentage and visibility in specific landscapes, poplar-based afforestation often took place without due regard for soil quality and requirements.

Studies summarizing knowledge produced on poplar cultivation (volumes published in 1954, 1962, 1978, and 1996) are consistent about stating that the poplar program in Hungary began as a set of transnational entanglements.<sup>30</sup> This consciousness reflects that taking part in projects with global reach was considered to be a prestigious and valuable act throughout these decades. The interaction between the agenda of IPC and poplar research in Hungary shows that differences between experiments and goals did not constitute a fundamental divergence of scientific work on specific fields. This unity did not only stem from common elements of point of departure such as the reception of related work in Italy and the IPC meeting of 1949. The goal of Hungarian poplar researchers was to produce and eventually present globally relevant results on the occasion of regional level academic meetings even when formal full-scale participation in FAO meetings was halted by the ‘Eastern Bloc.’ Dendrology and scientific forestry aspects of the poplar project were fundamentally about the belief that it was possible to transform the state of nature into another one in which a group of specifically designed non-human species turn into resources in the foreseeable future and, thus, benefit goals of national economic development.

In summary, increasing the area covered by poplar was a transnational project in the post–World War II era. Despite years of relative isolation from transnational level knowledge production, the main goals of the poplar project in Hungary were in tune with international developments and major threats were also shared. Due to relatively fast growth, short rotational cycle, and the industrial qualities of its timber, the poplar species carried the promise for growing industrial output and economic growth, or at least, improving the terms of trade in a number of countries of the northern hemisphere by the late 1950s. The Hungarian poplar project was not a pseudo-scientific exercise. Yet, politicization of the poplar campaign and, thus, the difficulties of setting limitations for it,

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30 See Koltay, *A nyárfa*; Keresztesi, *A magyar nyárfatermesztés*; Keresztesi, *A nyárfa és a fűzék*.

arguably, distinguished it from parallel projects elsewhere. However, zeal and propaganda were coupled with professional demand for experimental evidence before moving forward with plantation and the selection of cultivars.

### *Global Commodification, Economic Projections, and Cold War Institutions*

Before turning to the question of how landscapes changed and how the timber was eventually used, the next step in assessing the relationship between the Anthropocene and the Cold War in the light of poplar projects is to consider the changes that the years between 1955 and 1975 brought about in terms of thinking about the calculability of the timber commodity chain and how entanglements worked in this field from the point of view of Hungarian foresters. The proposals that Hungarian forestry economists aimed to mainstream at the transnational level were closely intertwined with the vision about Hungary's position in global economy that informed the "New Economic Mechanism" of the second half of the 1960s. This introduction of a new approach to state socialist economy in Hungary catalyzed thinking about linkages between timber and commodification and the global position of Hungary. Thus, the argument of this section complements recent results in the analysis of the global position of Hungary at that time. Tamás Gerőcs and András Pinkasz and the monographic study of István Feitl argue that one of the major histories of the political economies of 1960s was the failure of the countries of the Socialist Bloc to set up frameworks of closer integration that might have opened a way of emancipation in place of dependencies. Dependence was the result of the contemporaneous drive of modernization and import substitution and, more generally, a semiperipheral position.<sup>31</sup> Second, this section also contributes to bridge the gap that seems to exist between the popularity of long-term economic projections with Hungarian foresters and the market-oriented New Economic Mechanism.

There were three sites where interaction between Hungarian foresters' economic ideas and transnational environments took place. Two of these were institutions operating within the framework of the United Nations: the FAO World Forestry Congresses, held every six years since 1948, were essential for aggregating and disseminating new ideas about what forests meant for society and economy. The congresses of Seattle (1960), Madrid (1966), and Buenos Aires (1972) were groundbreaking in this regard for their role in drawing attention to

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31 Gerőcs and Pinkasz, "A KGST a világrendszerben;" Feitl, *Talányos játszmák*.



both global inequality and ecological sustainability in these assessments.<sup>32</sup> At the European level, the United Nations Economic Commission for Europe (UNECE, operating since 1947) was another important and permanent site for prognostication that brought together experts from across the ‘blocs.’ In 1972, the summary report of the activities of UNECE emphasized that collecting statistics about production and trade of wood and timber products was a novelty in the postwar period.<sup>33</sup> The regular publication of *Timber Bulletin for Europe* was a key output of the activities of UNECE in the field. It maintained a database of commodity prices that allowed projecting and mapping economic factors, such as, demand for certain goods, availability of resources, and patterns of aggregate growth. Third, a specialized body of experts working on issues related to timber, cellulose, and paper appeared on the Comecon scene in the late 1950s. The Permanent Committee on Timber, Cellulose, and Paper Comecon was set up in 1956 and soon began to work on a 15-year prospective plan.<sup>34</sup> The documentary footprint of that plan was an assessment of technological development vis-à-vis ‘capitalist’ countries, assessing the volume and extent of trade between individual member states and capitalist countries, with an evaluation of dependency and setting up a framework of exchange within which growth in efficiency and catching up would be possible. This exchange potentially included joint projects, but no specific ones were launched.

Biographies are the link connecting archives of a regionally specific UN body, professional global meetings, Comecon, the ministry-level dossiers of state socialist Hungary, and the story of poplar projects. In Hungary, foresters working in key positions during the late 1960s and early 1970s belonged to the same generation attending the Forestry College of Sopron just before 1945: Emil Sali, Aladár Halász, András Madas, and Béla Keresztesi were in their early fifties in 1970. While in the early 1960s, Keresztesi had the most political capital, it was Madas who reached the highest position in the group. After spending decades in senior positions at the Office of Planning, he was deputy minister at the giant Ministry for Agriculture and Food Procurement between 1972 and 1975. Upon his retirement, he produced academic texts that are keys to understanding how a generation of high-ranking forestry economists thought about turning forests into sustainable commodities under conditions of state

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32 See FAO Unasylva.

33 *Az Európai Gazdasági Bizottság tevékenysége 1947–1972.*

34 MNL OL XIX-K-13-a box no. 22.

socialism.<sup>35</sup> Having to engage with the issues that a new price mechanism meant for forestry, and with the poplar project, influenced Madas's thinking in a decisive way. From the mid-1960s, Madas posited in all his publications that the export of primary agricultural products could not finance paper related import, but export of previously imported timber material was an important asset in this regard.<sup>36</sup> Madas became committed to applying the idea of 'timber economy' that reflected that forest management, timber processing, and international trade should be treated as a whole.<sup>37</sup> For him, this meant that calculations about future timber consumption and availability at the continental and global scale should precede regional and national level planning and decisions.<sup>38</sup> The long-term plan that the National Technical Development Committee of Hungary published in 1967 frequently referred to the Timber Bulletin that the UNECE published. Together with Aladár Halász, he was one of the Hungarian expert delegates to UNECE and he had a career there: Madas was repeatedly elected chief expert of forestry. In the mid-1960s, as a result of his participation in UNECE and his familiarity with statistical work produced at that institution, Madas began to work out a model about timber supply for the global scale. He presented his work at the section he chaired at the World Forestry Congress of 1973 and a year later the publishing house of the Hungarian Academy of Sciences published his model in English.<sup>39</sup> On the one hand, his work was premised on assessing whether a certain region was a major timber importing region or an exporting one and if it was feasible to establish link between centers of demand and of supply. He did not see sites of export as underdeveloped. Rather, he argued that the most underdeveloped areas were those that were unable to export due to lack of infrastructure. His prime example for this was mechanization of timber production in Canada, the country that needed to double its export capacity if growing demand in the USA was to be satisfied. His geographic analysis had blind spots: he only considered growing demand in China in passing and he believed that the lack of infrastructure in Western Africa and in Latin America would prevent these areas from becoming centers of export. He was most nuanced in his assessment of Northern Europe, Japan, and North America. One of the most outstanding features of his presentation was that he treated

35 Madas, *Erdészeti politika*; Madas, Ésszerű környezetgazdálkodás a mezőgazdaságban.

36 For example see Halász and Márkus, *A fagyazdaság ökonómiai alapjai*.

37 Madas, *World Consumption of Wood*, 19.

38 Ibid. 7–8.

39 Halász et al., Beszámoló a Hetedik Erdészeti Világkongresszusról; Madas, *World Consumption of Wood*.

Europe together, without reference to the Iron Curtain, but discussed the Soviet Union separately. In this form, ‘socialist’ countries were only one of a group of countries where Soviet exports were expected to grow to an unspecified extent. Madas’s second but related starting point was that historical trends and correlation between demography, GDP, and demand for different timber products should be combined in arriving at plausible estimate. He offered corrections to earlier models published by UNECE on this basis. Importantly, he posited that 20 percent of all forested areas should be reserved in the interest of the oxygen balance of the atmosphere and for recreational purposes. Altogether, Madas argued that demand would double until 2000 due to a surge in the consumption of paper products and despite a relative decline of many other categories of timber commodities, but he believed that this increase may be met in a sustainable manner. The model showed a belief in the possibility of prediction based on economic rationality and mathematical modeling and was receptive to fresh concerns about ecological crisis. He did not spend time on discussing the role of Hungary in the model, but the implicit message was difficult to miss: each country needed to integrate into a regional and global economic scene that had nothing to do with being or not being a socialist economy or a Soviet ally. His analysis also made it obvious that there was no database available at the time that could match his ambition to predict supply and demand.. Therefore, for his projection and estimation he used data available for end points fixed in time. He also thought it obvious that it is demand and supply that determined the future of commodities. Within this picture it would make no sense at all for a government to force the use of resources disregarding its own global position or not admitting uncertainties. For Madas, a sensible policy was one that was clear about challenges, addressing them strategically. Rational economic decisions and projections had a place, but short-term decrees contingent on concerns for a political support base could hardly fit in. In 1966, Halász, as head of a team of foresters, edited a publication that consisted of tables about timber trade. These tables did not list the ‘socialist bloc’ or Comecon member states as a separate region within Europe and did not apply political divisions to any other part of the world.<sup>40</sup> This choice reflects a vision where commodity and hard currency requirements depended more on opportunities and availability than on power blocs.

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40 Halász, *Faellátásunk helyzete és fejlődése*.

‘Paper timber’ export and import in several European countries between 1955 and 1964 in 1000 m<sup>3</sup>

Country	Import			Export		
	1955	1960	1964	1955	1960	1964
Austria	138.6	307.4	626	–	–	3.2
Belgium	201.9	330	516	12	13.7	11
Bulgaria	–	–	–	–	–	–
Czechoslovakia	–	–	–	125.9	307.1	445
Denmark	4.9	3	–	0.3	0.3	9.5
United Kingdom	364	328.8	313	–	–	–
Finland	28.4	206.1	1120	3083.8	3176.1	837
France	656.7	833.3	1108	5.7	400.6	733
Greece	–	–	–	–	–	–
The Netherlands	335.2	276.4	374	0.3	11.8	10
Yugoslavia	–	–	–	700.2	445.1	358
Poland	–	75.3	205	534	372.7	512
Hungary	177.6	196.4	331.8	82.6	69.2	176.7
GDR	435.8	675.7	843	–	–	–
FRG	1663.8	1272.3	1242	0.9	8	34
Norway	818.7	1133.7	1898	225.8	290.2	286
Italy	740.1	1127.7	1203	–	–	–
Portugal	–	–	1.3	0.1	120.9	155
Romania	–	–	–	0.2	354.8	926
Spain	8.6	48.4	123	–	–	1.6
Switzerland	440.6	144.2	127	0.7	1.8	10
Sweden	279.9	603	259	1051	407	1308
Soviet Union	302.1	150	–	547.2	1589.4	4046

Table 1. Export and import of ‘paper timber’ in several countries  
(Translation of Halász 1966, 54.)

These published tables had their roots in Ministry reports showing that Hungary was chiefly integrated into the European timber market via cellulose and paper products.<sup>41</sup> The narrative was clear: the volume and value of imports multiplied between early 1950 and the early 1960s and stabilized at the high

41 MNL OL XIX-K-9-az box no. 37. “A fafelhasználás, az erdőgazdálkodás és a fafeldolgozás” [Timber use, forest management and timber processing].

end. The changing figures related to export was the outcome of Hungary being increasingly involved in the re-exportation of timber from the Soviet Union for the purposes of paper production.<sup>42</sup> Emil Sali, the Head of Forestry Department within the ministry, and member of Madas's generation, believed that a greater capacity to share across Comecon countries would reduce the financial difficulties that paper demand caused.<sup>43</sup> The report of Madas's team about global trends and resources had reservations about Soviet Union's capacity to open up new routes to timber in Siberia, and thus underlined that cooperation has to mean more than trade with the Soviet Union. Moreover, Madas's team of researchers also saw limited further growth of timber resources and high labor costs in Northern Europe, and thus predicted that timber imports would grow steadily in 'capitalist western' economies.<sup>44</sup> In their view, for Hungary, the way to go forward was to grow its own timber stock, and equally importantly, push for regional cooperation across borders. Comecon would have been a likely candidate for becoming a framework for this change, but Madas and the generation of forestry economists discussed above never seemed to have proposed anything in that regard. And this was a not simply a coincidence.

In 1957–58, as part of breaking away from the Stalinist notion of autarky, but keeping to the idea of import substitution, a number of experts' meetings discussed the position and status of Comecon member countries in terms of potential timber resources and timber processing industrial capacity as well as their major problems. However, there was a long-lasting disagreement regarding the scope of the committee. While Hungary, the GDR, and Bulgaria were interested in more cooperation, Romania wanted to limit it. Their stance was that the Permanent Committee on Timber, Cellulose, and Paper should first discuss whether a certain product could be included in the agenda. Initially, the Soviet Union supported Romania's position.<sup>45</sup> One of the turning points of the discussion was when Hungarian representatives of the Committee argued that the Soviet support for the Romanian position related to agenda setting was untenable in the light of statements that the Soviet delegation at UNECE made about the importance of cooperation.<sup>46</sup> During the first years of its existence,

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42 Ibid.

43 MNL OL XIX-K-9-az box no. 37. "Az erdőgazdasági termelés feladatai" [Tasks of production in forest management].

44 Madas et al., *A fogyasztás és fuellátás várható alakulása*.

45 MNL OL XIX-K-13-a box no. 22. folder no. 6.

46 Ibid.

the work of the Permanent Committee revolved around gathering data and information, and decisions about strategic direction that should be followed. The meeting held in Moscow in February 1958 accepted that in the field of developing paper production, one of the goals should be sharing the burden of industrial capacity building among Comecon member states. The Hungarian delegation suggested that considering the technological superiority of GDR industry in processing hardwood, it might be considered if GDR can increase its capacity to take resources of other member states to produce cellulose.<sup>47</sup>

The document that Comecon's Permanent Committee accepted was premised on a dilemma: it highlighted that paper production and production capacity were insufficient in Comecon countries and that these countries had overused their forest resources since the end of World War II and that this trend had to be reversed. As a workaround, the document promoted the use of reed, hay, and waste until better machines and production lines became available for more efficiency. The report that Hungary prepared about its own situation emphasized that with all efforts of afforestation and mechanization, only 50 percent of yearly timber requirement was expected to come from the forests of the country. The summary also showed that Hungary imported only 3 percent of its paper needs from Comecon countries while its paper import from 'capitalist' countries increased 62-fold even as overall paper supply decreased between 1950 and 1957. The drop in total use of paper was a sign of shortage rather than of drastically increased efficiency.<sup>48</sup> Moreover, some of the technologies of cellulose production were entirely absent.

Cellulose and paper production were not the main focus of reports that Hungarian authorities prepared for the purposes of drawing up the 15-year plan of Comecon. The possibility of replacing timber with other materials, reusing waste, introducing more and better machinery in felling, moving, sawing, furniture making, and meeting the requirements of railways, mines, and construction occupied the center stage.<sup>49</sup> Yet, these documents recognized that there was a need for change in the type of resources and cellulose products the paper industry utilized for better keeping up with demand in Hungary.

47 MNL OL XIX-K-13-a box no. 22. "Az erdőgazdaságra vonatkozó következtetések és javaslatok" [Conclusions and suggestions relating to forest management] 3.

48 MNL OL XIX-K-13-a box no. 22. "A faanyag és cellulóz terén dolgozó..." [Working the field of timber and cellulose...].

49 MNL OL XIX-K-13-a box no. 22. "Írányelvek kidolgozása a cellulóz és papíripar 15 éves műszaki fejlesztéséhez" [Working out guidelines for the 15-year technical development of cellulose and paper industry].

The initiative regarding the shared establishment of cellulose factories among Comecon countries did not have a bright future. It also disappeared from the agenda of the meetings of the Permanent Committee by early 1961–62.<sup>50</sup> Unfortunately, the archival record of the work of Hungarian representatives in the Permanent Committee between 1963 and 1968 is yet to be located. For the years in which related documents reappear in the archives of the supersized Ministry of Agriculture and Food Provision, Hungarian reports on meetings of the permanent Comecon committee on agriculture and forestry express a degree of disappointment in regard to how much cooperation actually took place. This picture resonates with István Feitl's argument about the failed attempt of Hungary and Poland to fundamentally change the structure of Comecon.<sup>51</sup> Despite wide-ranging data collection, estimates, and prognoses about the way substantial coordination within Comecon could improve the economic position of member countries in global comparison, by 1970 standardization and bi- or trilateral scientific cooperation were the only noticeable Comecon activities in the field of forestry. There were serious issues with mechanization due to the lack of available machines within Comecon and the unwillingness of member states to sign multilateral agreements.<sup>52</sup> In terms of the archival landscape, the simple filing of reports written in Russian replaces discussions and position papers.<sup>53</sup> There were no plans submitted for a joint cellulose project.

A revealing episode from 1973 connects global thinking and local events of the paper supply chain. Besides Madas, several members of the Hungarian delegation to the Seventh World Forestry Congress were also stakeholders in the issue of the poplar project. In 1973, Keresztesi was the head of ERTI and editor of collective efforts to summarize the state of the art of the Hungarian poplar project in 1962 and also in 1978. Aladár Halász was deputy head of the Department of Economics of the Ministry of Agriculture and Food Procurement; Endre Szenes was the director general of LIGNIMPEX, the state export-import agency dealing in timber. Thus, it was one of the highlights of the weeks spent in Argentina when, as part of their organized study trip, the delegation joined a Finnish party visiting a cellulose and papermaking factory near Rosario. The Hungarians were delighted to see an adjacent paper tree plantation consisting of 5–15 year old pine and eucalyptus species with felling

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50 MNL OL XIX-K-13-c box no. 14. and MNL OL XIX-K-13-a box no. 23.

51 Feitl, *Talányos játszmák*; Gerőcs and Pinkasz, "A KGST a világrendszerben."

52 MNL OL XIX-K-9-m box no. 327. "Varna meeting."

53 See for example MNL OL XIX-9-m box. no. 116, 244. and 346.

going on in a part of the area at the time of visit. The group was so impressed with the method of propagation and care for the seedlings that they gathered and produced a detailed technical description of each step of the process.<sup>54</sup> The scene represented the ideal situation of high technology applied in a paper tree plantation of very short rotational cycle a few kilometers away from a large processing complex that produced both cellulose and paper products. The ground reality in Hungary was far from this exotic perfection.

### *On the Ground: Data, Cooperatives, and the Yugoslavian-Hungarian Paper Deal*

In response to the lack of effective Comecon coordination in timber processing, the Hungarian government eventually moved to bilateral solutions, and imported related machinery from the Soviet Union, Czechoslovakia, the USA, and Italy. In the field of paper imports, the major bilateral move was a contract on timber products that LIGNIMPEX, on behalf of the Hungarian government, signed in the autumn of 1975 with Yugoslavia concerning joint production of cellulose and paper. The deal with Yugoslavia entailed that Hungary would transport poplar as raw material for paper to two Yugoslav paper mills along the River Sava: Krsko in present-day Slovenia, and Srmska Mitrovica (Szávaszentdemeter) in present day Serbia. Throughout the second half of 1960s, the relationship between the political elite of the Hungarian and the Yugoslavian party-states improved beyond imagination.<sup>55</sup> Thus, bloc level politics did not stand in the way of using the opportunities that the Danube provided for timber trade. At the same, the relationship with another potential partner, Czechoslovakia, was at an all-time low around 1969–70. The volume of timber that Hungary had to bring to the factory at Srmska Mitrovica was three times larger than the volume intended for the Krsko plant. In return, Hungary would receive cellulose and paper products at a price that was 5% below the Scandinavian market price. The most important objective of the Hungarian government was to save hard currency on paper importation.<sup>56</sup> In the lack of records about the negotiations, one may only assume that the Yugoslav government was interested in signing a deal to overcome problems of raw material supply to the factories. Transports

54 Halász et al., *Beszámoló a Hetedik Erdészeti Világkongresszusról*, 560–65.

55 See for example Bottoni, “Majdnem Nyugat.”

56 I could not locate the contract itself, which is not in the archives, but MNL OL XIX-K-9-m box. no. 311. describes it.



to Krsko were to begin in the summer of 1976, while to Sremska Mitrovica only in 1977. The contract signed with Yugoslavia meant that the volume of poplar timber production needed to rise sharply until 1980 and stabilize at a high level for the next fifteen years.<sup>57</sup> To gain insight to the ground realities of the poplar project in Hungary, we may look at the Yugoslav–Hungarian deal as the outcome of three decisions on the Hungarian side. First, it had to be decided that there should be no processing capacity built in Hungary for the timber material that the poplar project would produce. Second, the quantity and quality of timber had to be calculated. Third, transporting timber from Hungary to the processing plants had to be judged feasible and possible from the point of view of logistics.

Regarding the first question, archival traces are scanty, but it is clear that it was a matter of discussion for nearly a decade as to whether the country should build its own productive capacity.<sup>58</sup> In 1958, Madas believed that expansion of the paper mill at Csepel would solve the question.<sup>59</sup> Another potential candidate was the paper mill in Dunaújváros (formerly Sztálinváros), south from Budapest, along the Danube. It was built and became operational in the mid-1970s, but studies submitted to the Ministry of Light Industry did not see it feasible to expand it further to process poplar grown in Hungary.<sup>60</sup>

The question of how the quantity and quality of available poplar timber was assessed is a more complex issue. The Hungarian–Yugoslavian poplar–paper deal entailed a large-scale effort of resource commodification that consisted of several steps during the 1960s and the 1970s. In 1966, the assessment of the implementation of the plan that the National Poplar Committee drew up showed that by 1970 there would be an abundance of poplar ready to be commodified. As András Madas put it in a letter to the deputy head of the National Planning Office (OT): “since liberation we have planted circa 330,000 hectares of forest. Fast-growing poplar species constitute around 20 percent of these new forests. Thus, the capacity of the country to produce raw material has been considerably increased.”<sup>61</sup> However, the scale of the planned Yugoslavian–Hungarian deal made authorities feel that there might not be enough poplar trees in Hungary

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57 MNL OL XIX-K-9-m box. no. 311. Note that the guide for archival unit XIX-K-9-m did not always reflect actual stack situation. Assistance from archivist György Ritter was crucial for locating relevant material.

58 MNL OL XIX-K-9-az box. no. 37. “Földes László” folder no. 13.

59 Madas, “Nyártelepítések jelentősége papír- és cellulóziparunk fejlesztése szempontjából,” 231–36.

60 MNL OL XIX-K-9-az box. no. 37. “Földes László” folder no. 13.

61 MNL OL XIX-K-9-aj box. no. 22. “Földes László” folder no. 12.

to fulfill contractual obligations.<sup>62</sup> Thus, only a year later, the Department of Forestry of the Ministry of Agriculture and Food Provision also carried out an assessment of the availability of raw material for the Yugoslavian–Hungarian deal, making an account of poplar and willow species that were considered ‘paper timber.’ The assessment showed that the Hungarian party would be able to fulfil its obligation in the first year of the contract, especially since supplies to Sremska Mitrovica were to begin in 1977. The calculation also stated that even though large areas of poplar stands were set to mature in the same period, it would only be possible to keep up with such a rise in demand if additional species and sources were included, such as spruce imported from the Soviet Union and beech from Hungary.<sup>63</sup> In 1975, amid such uncertainty, the Department of Forestry embarked on a third survey that was intended to produce a reliable database and be more comprehensive than the previous ones. The design of the study was such that it reflected awareness of the fact that the partnership with Yugoslavia meant that calculations about economic feasibility and availability of supplies had to be combined with a long-term ecological assessment of the poplar project that had been on-going since 1960. Sali explained in the books summarizing poplar research that researchers used data directly from management plans, but they checked each area for which a plan was prepared before 1966, and the survey included all forests where the proportion of poplar species was at least 5 percent.<sup>64</sup> The assessment of 1958, which preceded and conditioned the forming of the National Poplar Commission, concluded that several local level forest management plans erred in assessing ratios of poplar species in afforested areas. In 1958, Keresztesí, in his paper summarizing this data, estimated that 162,658 ha. of poplar would be planted between 1958 and 1975.<sup>65</sup> The assessment of 1975–78 showed that in 1973 the total area of poplar was 154,300 ha. and this figure was expected to decrease in the coming decade. This meant that in peak years poplar species covered around 11 percent of total forested area, while this figure was closer to 8 percent in most years of the period under discussion. This figure is comparable to the area covered by pine in the late 1960s. Delegated staff of ERTI and the planning unit of the

62 MNL OL XIX-K-9-m box no. 206. “Assessment of poplar project in 1967–68 and expected volume of timber.” See also among papers of the Forestry Research Institute MNL OL XIX-K-13 box no. 339. and 341. For doubts see MNL OL XIX-K-9-m box no. 209.

63 MNL OL XIX-K-9-m box. no. 294.

64 Sali, “Nyárfatermesztési célkitűzések,” 13.

65 Keresztesí, “Nyárfagazdálkodásunk helyzete,” 219.

Department of Forestry used computers for developing the predictive model and for calculating the quantity and quality of timber for each subsequent year. The models showed that certain factors, especially considerations of quality, would result in loss of the area of poplar until 1990, while additional plantation was also considered.<sup>66</sup> Although when narrowing it down to the question of the Yugoslavian–Hungarian deal, the survey gave a positive response, the overall result was that the quality of poplar in Hungary was less than mediocre and that this was due to hasty decisions about the locations of poplar stands that did not take soil conditions seriously enough during the early 1960s. Foresters also concluded that Hungary would not be able to supply a pulp making factory if it were built on its territory. The recurring evaluation of the impact and implementation of the 20-year plan of the National Poplar Committee, namely, increasing the area and quality of poplar within the total forested area and within the afforestation effort, was one of the catalysts and opportunities for thinking in terms of a ‘timber economy’ in Hungary.<sup>67</sup> The assessment was a formidable and successful exercise that contained valid methods for assuring data quality, evaluation, and predictive analysis using all available computational technology to achieve the best results. It was no less than the reappraisal of the sustainability of commodification of poplar species and stands in the light of changes that the new economic thinking, collectivization, and global market integration brought about in the relationship between nature and culture in Hungary. Uncertainty about the conclusion of assessments might make the impression that the study was the outcome of ‘communist’-style official optimism and calculation.<sup>68</sup> However, the methods of data collection were the outcome of several factors, such as, ideas about the economy and about nature, transnational circuits of and long-term practices of knowledge production, and conflicts over land use. Forestry has been a data intensive science since the mid-nineteenth century. As part of the forest management documentation, foresters were expected to create a plan about how and when a specific forest area reached optimum timber output for the intended type of product. Experiments and mathematics were used for producing tables about growth rate of different tree species, and calculations of value and prices were also an integral part of the knowledge base. Data collection and the assessment of data played a key role in the poplar project as a result of

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66 Sali, “Nyárfatermesztési célkitűzések,” 14–28.

67 Madas, et al., *A felfogyasztás és jaellátás várható alakulása.*

68 Tulbure, “Post/Socialist Infrastructures of Knowledge.”

continuities within the profession, and not only due to the nature of the state socialist regime or advances in computational technology.

As part of the complexity, specifically state socialist conflicts over land use also mattered. The launching of the plan of National Poplar Committee coincided with the final wave of aggressive collectivization. Studies of Gábor Máté demonstrate that in the drive to apply chemicals and water management techniques, collectivization at times brought about landscape degradation and created ecological issues that were not present before.<sup>69</sup> It is yet to be explored how the poplar plan impacted the first years of new cooperatives, but there is at least one document that allows researchers to highlight points of tension. In regard to Somogy County, the author of a 1963 report believed that natural conditions were suitable for poplar and it would be possible to plant 6,000 hectares. According to the draft, cooperatives would have to undertake the bulk of the task, besides the Hungarian State Railways and Water Management authorities. The author, however, noted that 40–70 percent of seedlings died due to carelessness and grazing.<sup>70</sup> When Madas and Halász dealt with the economic behavior of newly formed cooperatives and the actual shortage of raw materials such as pine and firewood, they brought attention to several risks that rational economic behavior of the leadership of cooperatives might cause. Madas pointed out that in terms of land ownership pattern, Hungary was unique among ‘socialist’ countries. There was virtually no private forest by the 1970s, but cooperatives managed 22 percent of forested areas and a relatively low proportion, 77.7% of forests, were under direct state management. Madas and Halász believed that this was not an ideal situation since cooperatives treated forests as secondary areas of activity and used timber for relatively inferior purposes, thus keeping the valuable material off the market.<sup>71</sup> The pressures that the Yugoslavian-Hungarian deal triggered resulted in a showcase of these issues. In the first year of the contract, issues with actual supplies were so serious that they could potentially jeopardize the entire deal. The question of prices was no less complicated than logistics. In the climate of post-1968 economic regime where enterprises were encouraged to make profit, buying up stocks was only possible if the price offered was higher than it would have been for other products. Ministerial administration sought a fix to these pressing issues experienced on the ground. In order to make the supply chain operate, central administration organized meetings for various regional

69 Máté, “Táj és kollektivizálás.”

70 Library of the National Forestry Association, Bundle for the year 1963.

71 Madas, *Erdészeti politika*, 248–49.

level actors of the reshaped realm of cooperatives, forestry enterprises, and state enterprises involved in trading timber related commodities.<sup>72</sup> Despite serious issues encountered regarding cooperation between forestry enterprises and cooperatives, the latter were expected to take an ever-larger share in the poplar program since without their poplar stands the entire operation would have fallen short of supply.<sup>73</sup> Because of these developments, and other logistics issues, less than half of the required quantity left for Yugoslavia by mid-June 1976, and later months looked uncertain too. It was also a difficult logistical task to make sure that production in the eastern part of Hungary reached the ports where ships departed from. Although the two neighbouring Pest and Bács-Kiskun counties, and a county along the Danube, Győr-Moson-Sopron, were the prime areas of poplar, without the output of the Trans-Tisza region there would not have been enough timber to transport.<sup>74</sup> Despite these concerns and the social sensitivity of the World Forestry Congress of 1973, forestry economists did not consider social conflict or forms of resistance to the poplar campaign as a factor.<sup>75</sup> It requires a further reading against the grain to locate specific instances and forms of resistance to the poplar project.

The Yugoslavian–Hungarian paper deal led to a major professional, institutional, and academic enterprise to assess and predict the future availability of a species seen as a natural resource, the presence of which had been the result of anthropogenic intervention in the late 1950s and during the 1960s. Attention shifted to the issue of identifying and sustaining ecological conditions that made commodification possible. The assessments of the poplar project included the problem of the distance between data and information, institutional interests, Hungary’s place in the global economy and within the so-called ‘Eastern Bloc,’ and the problem of combining local efforts into a single cause. The correlations and risks that the tables point to reflected that the production of paper poplar was a site where the collectivization of agriculture, forestry, prices induced by the New Economic Mechanism, and scientific practices of producing information about nature all intertwined.

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72 MNL OL XIX-K-9-az box no. 37. “Földes László” folder no. 5. and XIX-K-9-m box. n. 412.

73 MNL OL XIX-K-9-m box no. 311. and Sali, “Nyárfatermesztési célkitűzések.”

74 MNL OL XIX-K-9-m box no. 311. and 412.

75 MNL OL XIX-K-9-az box no. 37. “TSZ-ek faanyagának értékesítése” [Selling timber from coops].

## *Conclusion*

This paper addressed the science and economy of an Anthropocene thesis from the vantage point of semiperipheral Hungary during the Cold War. It chose the poplar species as the subject matter because poplar-based industrial production underwent a surge in post-World War II Hungary and it included large-scale efforts at landscape change, while research activities began in the first half of twentieth century. Historicizing poplar is an opportunity to study how the performativity and transnational nature of economics and life sciences intertwined with the political history of Cold War institutions and the social-political history of state socialist countries to bring about a new era of nature-culture relationship that we may call the Anthropocene.

The first section highlighted that forestry research on the poplar species was an essentially transnational one, even if that history might look domestic or isolated to present-day interpreters. The history of the interaction between activities of the International Poplar Committee was intertwined with major stages of the Cold War, such as the withdrawal and return of countries of the Socialist Bloc to UN organizations. Moreover, the institutionalization of links among researchers also connects to natural-cultural histories, such as the history of engineering hybrid clones, the idea and technology of tree plantation, and the presence, destruction, and economic loss that living organisms preying on trees might cause. This is not to deny that the social history of landscape change, and the way professional groups might influence it, was arguably specific to state socialist regimes such as Hungary. That is because the science of the Anthropocene is about entanglements.

Economic models that top leaders of Hungarian forestry profession presented at global events were reflections and an attempted means to break away from a semiperipheral position, despite the limitations and failed hopes that Comecon meant by the 1960s. The section on the projecting of long-term patterns of timber availability showed that it was the combination of the drive to growth, consciousness of dependencies, emerging notions about a potential ecological crisis, and a shifting social context that resulted in changes in the nature-culture relationship. The global economy and ecology of the era of Anthropocene has been a process of emergence, rather than an outcome of plans.

Besides transnational entanglements of science and economic models, the history and specific stories of data collection proved to be a hub for understanding

what was specific about the way ideas about aggregate demand and economic potential come together with measurements of ecological sustainability—to turn potentially valuable resources into commodities of calculable-calculated value in state socialist Hungary. The third section addressed how the state socialist economy of Hungary adapted to the changing natural-cultural circumstances that its very actions of commodification contributed to. The assessment of the poplar project between 1973 and 1976 pronounced that what looked like policy at first sight was the hybrid of many factors: incompletely counted trees, the political decision to promote or harm certain interests, human economic behavior and its perception, and regional and global ecological, economic, and political contexts. The Yugoslavian–Hungarian paper and cellulose deal signed in autumn 1975 was the key element at the juncture of the poplar plantation campaign that began 1960s and assessments of timber resources. The context of the deal underlines that linking local events and global change is indispensable for the studying the Anthropocene from a historical perspective.

These histories of linkages, entanglements, and complexities help us see both state socialism and the Anthropocene less as a matter of course. Since the history of the formula of nature-culture is not fully accessible, there is scope to add new and unexpected elements to it in order to change the model of future ecology.

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