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The founding father of biotechnology: Károly (Karl) Ereky

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Summary: Nowdays it is generally expressed opinion of the leading scientific circles that the purposefully planned biotechnological actions of the 21st century will be indispensable of realizing the sustainable technical development in the supplementation of the increasing population, especially those who suffer privation, thus the long-distance interests of mankind will be met without impairing the world's ecological integrity. In 1989 Robert Bud gave account of the fact that the father of the term "biotechnology" was the Hungarian agricultural engineer, Karl Ereky. Recently, we have explored and found some important biographical sources and scientific documents which had been published by Károly (Karl) Ereky, the which, however, have already been forgotten. This article expands on that more contextual treatment to explore the man and his doctrine. It draws upon Hungarian and private sources as well as on German publications.

Key words: father of the term "biotechnology", Károly (Karl) Ereky, history of sciences, Hungary

Introduction

In the *Nature*, *Robert Bud* (1989a) gave account of the fact that the father of the term "biotechnology" was the Hungarian Karl Ereky who, in his book (*Ereky, 1919*) published in Berlin, in 1919, entitled *Biotechnologie der Fleisch-, Fett- und Milcherzeugung im landwirtschaftlichen Grossbetriebe* (Biotechnology of Meat, Fat and Milk Production in an Agricultural Large-Scale Farm), disclosed his observations and new views in that regard. Robert Bud discovered the significance of Karl Ereky, as he sought to find the source of a variety of apparently derivative uses of the word biotechnology during the 1920s (*Bud,* 1993). At that time the word *Biotechnologie* was to be found in German dictionaries and a few English uses could be found both in Britain and the US. Some of the results of this historical research were published then but these were dependent purely on German sources.

Ereky's life and work

Known in Hungarian as *Ereky Károly*, our hero was born in October 18, 1878 in the 1000 year old Hungarian town on the Danube, Esztergom as Wittmann Károly and changed his name in 1893 to Ereky. His father Ereky (Wittmann) István, mother dukai Takács Mária. On the maternal side, one of his ancestors was the poetess, dukai Takács Judit (1795–1836), whose aunt was Zsuzsanna the wife of Berzsenyi Dániel the leading personality and poet of the Hungarian literature of enlightenment (end of the 18th century). Ereky Károly had three brothers, Ereky Jenő, Ereky Ferenc and Ereky István. Ereky István was a remarkable lawyer, professor on the University, member of the Hungarian Academy of Sciences on the beginning of the 20th century, one of the founders of the modern system of self-government in Hungary. Ereky finished his grammar-schools at Sümeg and Székesfehérvár, subsequently, learned at the Technical University of Budapest and took his degree of technical engineer in 1900. He worked until 1905 as employee of different enterprises designing machines for paper- and food industry in Vienna, Austria. He then moved back to Budapest, became assistant professor on the József Technical University. Although his activities after a brief moment of fame as Hungary's minister of nutrition in 1919 to his death in 1952 have been obscure, he was a prolific writer. He seems to have been responsible for more than one hundred publications which first appeared more than a century ago. He wrote his most important papers first in Hungarian and then published them in German, frequently on his own expenses. Through his own personal experience Ereky was familiar with the agriculture of Germany, Denmark and England. He was a good lecturer and skillful debater in public discussions. For more than quarter of a century, his opinion was esteemed by governments and scholars not just in Hungary, but also in Germany, Britain, Australia and Canada. He was proficient in German and

English, held conferences and wrote papers with special care, and if possible and necessary supported his arguments with economic analysis. His writings display the character of a highly educated erudite professional, who endeavoured the synthesis of the recently developed scientific knowledge of all related disciplines. His arguments went far beyond the particular issues of his time and he explored the possibilities of the remote future.

His classic work, "*Biotechnologie*" which appeared in Berlin in 1919, defined the new discipline (*Bud,* 1989a; *Bud,* 1989b; *Bud,* 1991; *Bud,* 1993). The book achieved great success in Germany with several thousand copies sold within a few weeks (*Vidor,* 1922) and was reviewed by distinguished scientists (*Bud,* 1993). In 1920, *Die Naturwissenchaften,* the German general periodical, Hugo Pringsheim, the remarkable microbiologist (*Prigsheim,* 1920) praised Ereky's attempt to lay the fundaments of biotechnology. In Hungary, the political and economic situation was even more turbulent than in Germany. The revolutionary situation was not conducive to a calm appreciation of Ereky's work. Nonetheless in October 1919 when Ereky himself was briefly minister of nutrition, there was a review by the country's leading periodical dealing with agriculture, "*Köztelek*", by the director of the Experimental Station of Animal Physiology and Feeding, István Weiser (*Weiser, 1919*). In 1920/21 "*Biotechnologie*" earned further recognition in Netherlands and England. A Dutch editor asked Ereky to permit a Dutch edition of his biochemical studies. A March 1921 letter from the "*Experimental Department of the Agricultural University of Cambridge*", expressed high esteem (*Ereky,* 1922). Nearly three decades later, in 1947, the *Biotechnologie* of 1919, was being cited as Ereky's crowning scientific achievement (*Fehér,* 1947). In 1922 Ereky published a second pioneering work, on chlorophyll whose mechanism of working he hoped might inaugurate a new era of animal feeding (*Ereky,* 1922). Three years later he built on this with a book on the use of leaf protein as a potential food source. In this case too he would be no mere theoretician and indeed launched a commercial product (*Ereky,* 1925). In the 1930s he would promote the use of leaves as the source of novel fibres.

After the end of World War II the last news reporting about Ereky is a subsequent enigma for the posterity. In September 19 of 1946 Károly Ereky was condemned to 12-year of prison by the People's Tribunal being guilty because of "his counter-revolutionary role in the public life during and after the fall of soviet-type communist Council Republic" in Hungary (1919) (*Gulyás,* 1990). His memory was obliterated. Not until the year 2000 was even his death formally confirmed to his relatives. Károly Ereky had lived his last eight years in the prison of Vác where died at the age of 74 years, on June 17 1952 (*Magdolna Ereky, pers. com.,* 2000).

The further unknown details of his life and activity still wait for exploration.

The principles of the Ereky's biotechnology

Today, biotechnology seems the quintessential modern technology. However it is clear that before 1917 Ereky drew on the 19th century formulations of the theory of the work and management, philosophy, economics, biology and chemistry. The concept is related to the works of German chemists Justus von Liebig, Emil Abderhalden, Emil Fischer, the Polish Casimir Funk, as well as the Anglo-Saxon researchers Osborne, Hoppkins and McCollum. (*Ereky,* 1917a; *Ereky,* 1918a; *Ereky,* 1918b; *Ereky,* 1919). He appealed to the physiological (bio) chemistry studies of the leading German chemist, Emil Abderhalden (1877-1950), published between 1911 and 1915 (*Ereky,* 1919). On the other hand as he developed biotechnology after 1919, Ereky anticipated the possibilities and the spirit of molecular research. It is striking that he called the attention to the identity of nucleic acids in all living organisms, which are differing in their structure, only: "*we see that proteins, of either vegetal or animal in origin, contain the same amino-acids. The same is true if we compare the nucleic acids found in plants with those in animals, which are built up of purin and pyrimidin plus a kind of monosaccharid and phosphoric acid.*" (*Ereky,* 1918b). So as early as 1918 he was proposing a linkage of biotechnology and nucleic acids.

He would spend a lifetime giving substance to his vision of a new era of technology based upon biochemistry (*Bud,* 1993). He devised strategies focused upon the remediation of famine threatening mankind. His obsession was a "*large scale agricultural plant, which is lead by up to date expertise and uses modern machines*". He was deeply convinced that the material welfare would be based upon the joint application of natural sciences, techniques and economics.

Ereky was a man of many interests. He considered himself first as engineer, then secondarily as an expert in the food industry, and had a modest opinion of himself as a minor public figure with some expertise in engineering and food technology. He strove to explore the ways how an abundance of food could be created within Hungary as well as worldwide leading to the final abolition of famine so that "*the word of hunger could be cancelled from the dictionaries*". From as early as 1905, he pleaded, passionately, for the idea that the developed societies could not be supplied with sufficient food by means of the peasant's obsolete systems and tools. Instead the natural sciences and technologies should be purposefully applied to modern agricultural factories functioning, as he came to say, on the principles of biotechnology.

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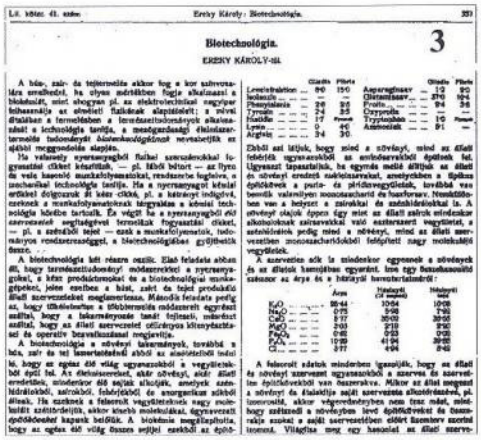
Biotechnologie

der Fleisch-, Fett- und Milcherzeugung

landwirtschaftlichen Großbetriebe

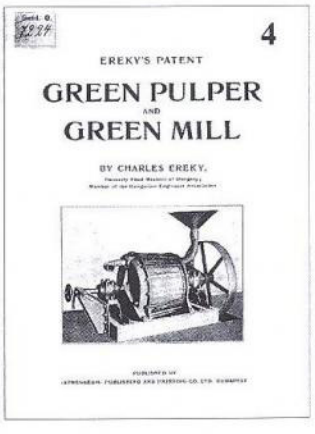
naturwissenschaftlich gebildete Landwirte

Dipl. Ing. Karl Ereky


3

Biotechnológia.

ERDKY KÁROLY-től.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EREKY'S PATENT

GREEN PULPER AND GREEN MILL

BY CHARLES EREKY.

Fig. 1. Posthumus portrait of *Károly (Karl) Ereky* (1868–1952) painted by Ferenc Uzonyi after a black-and-white photo made in 1942. Courtesy of Orsós Ottó Laboratory, University of Debrecen Faculty of Agriculture, Debrecen, Hungary

Fig. 2. Cover page of the famous book *„Biotechnologie"* published by Ereky in Berlin, in German (1919)

Fig. 3. Front page of the first article *„Biotechnológia"* published by Ereky in Budapest, in Hungarian (1918)

Fig. 4. Front page of the most important Ereky's patent *„Green Pulper and Green Mill"* edited and published by Ereky in Budapest, in English (1926)

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