Symposium on Structure and Properties of Regenerated Cellulose

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DR. EMIL CZAPEK

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Emil Czapek was born in Wrutitz, Austria, the son of Caroline Walter and Emil Czapek, Privy Councillor to the Austro-Hungarian Ministry of Finance (Hofrat zum Finanzministerium). Dr. Czapek was educated in Austria, receiving a Doctor of Philosophy degree in organic chemistry from the University of Prague in 1913 and a Doctor of Chemical Engineering degree in cellulose technology from the Vienna Polytechnic Institute in 1922. He was fortunate indeed in that the University of Prague had an outstanding faculty at that time, which included Albert Einstein, who was his physics professor and who became his lifelong friend.

After World War I Dr. Czapek became associated with Wolff & Co., Walsrode, Germany, where he was Director of Research until 1924, and Director of Operations (including both research and production) until 1933. Wolff & Co., founded in 1815, had originally been a powder and explosives plant and had later entered the nitrocellulose film and lacquer field. At the end of World War I, new peacetime fields for expansion were sought, and with Dr. Czapek's arrival an interest in cellophane was developed.

At that time, Dr. J. E. Brandenberger had already shown the feasibility of commercially producing regenerated cellulose film; he based his process on the extrusion of a viscose solution directly into a coagulation bath of ammonium sulfate solution, followed by regeneration of the film in an acid bath. During its passage through the process steps, the film was supported only by a number of driven rolls. The product was expensive, however, and there was no market for it.

This was the status of cellophane when Dr. Czapek, together with engineer Richard Weingand, set out to develop a new commercial process for the manufacture of cellophane from viscose for Wolff & Co., and to design the necessary equipment. They decided to extrude the viscose onto a movable support. This procedure involved many technical difficulties: the film could not be properly removed from the support, particles of partially coagulated film or of uncoagulated viscose remained on the support and, if coagulation was carried too far, excess coagulation liquid remained on the support. The result was that the hopper soon became clogged and operations had to be interrupted.

However, by attacking this problem from the standpoint of colloid chemicals rather than mechanics, Czapek and Weingand found that it was possible to coagulate the film in such manner and to such extent that it could be easily removed from the support and left no deposit of viscose, film, or coagulation liquid. This, then, was the basis of the Wolff & Co. process. After working out equipment design and plant layout, Dr. Czapek finally saw his project realized in 1921 when the commercial plant was placed in operation. This was the second cellophane plant in the world and the first in Germany. The product, sold under the name of "Transparit," found wide acceptance both in Germany and abroad.

In the meantime, Dr. Brandenberger's company, La Cellophane, had been active in developing sales markets, and in this effort Wolff & Co. contributed as well. Both Dr. Brandenberger and Dr. Czapek took an active interest in all phases of the companies' ventures, and although their firms were competitors in a sense, the two men had a lasting friendship based on mutual respect, until the death of Dr. Brandenberger in 1954. It was a source of special satisfaction to Dr. Czapek that Dr. Brandenberger still lived to know that the First Symposium on Regenerated Cellulose Film sponsored by the Cellulose, Colloid and Polymer Divisions of the American Chemical Society, organized and chaired by Dr. Czapek, was dedicated to Dr. Brandenberger.

In 1933, Dr. Czapek left Wolff & Co. to set up his own consulting business with headquarters in Berlin. This he maintained until 1939. His fields of endeavor were primarily regenerated cellulose by both the viscose and cuprammonium processes, nitrocellulose and other cellulose derivatives, and technological problems. It was during this period, too, that he developed a commercial process for manufacturing transparent film from cuprammonium cellulose solutions; this process was installed in plants in several European countries immediately before the outbreak of World War II.

In the nineteen twenties Dr. Czapek visited the United States on behalf of Wolff & Co. and, from 1937 to 1939, several times on behalf of Allied Chemical & Dye Co. for whom he was a consultant. In connection with these trips he formed many lasting associations in the United States, so that it was natural to move to New York in 1939 when the situation in Germany became intolerable for so many. He said later of this period, "I decided to stay [in the United States] because I did not wish to accept a position in Nazi Germany's ammunition industry, which was 'offered' to me. I wanted to live in a free country. If I had remained in Europe, I am certain that I would have been forced to work in the ammunition industry in view of my experience in the powder and explosives field." Dr. Czapek became a citizen of the United States in 1944.

In 1939, then, Dr. Czapek established his consulting business in New York City. His interests remained more or less the same, but also expanded into the fast growing field of plastics. Among those who sought his advice was Dr. Fred Olsen, then Director of Research for Western Cartridge Co., East Alton, Illinois. Consulting for this firm consumed an ever increasing share of Dr. Czapek's time, with the result that he finally moved to the Alton area in 1946. His formal status with the company was changed in 1948 from consultant to full-time employee, and he was placed in charge of cellulose research. The company underwent reorganization, and after transformation of Western Cartridge Co. to Olin Industries, Inc. and the subsequent merger with Mathieson Chemical Co., Dr. Czapek, in 1954, became Director of Cellulose Research in the Central Research Laboratories of Olin Mathieson Chemical Corp. at New Haven, Connecticut.

During his association with the Olin companies, Dr. Czapek concerned himself chiefly with the cuprammonium and viscose processes for cellophane manufacture; to some extent, with other problems of interest to the company. He played a vital role in the entry of Olin industries into the cellophane field in 1951. Although cellophane manufacture had become a smoothly operating procedure by this time, there remained, and still remains today, quite a number of questions to which the answers will be supplied only when we gain a better understanding of the mechanisms of the various reactions taking place throughout the process. Dr. Czapek believed firmly that an even better and cheaper film could be produced if such mechanisms were elucidated, and it was in this direction that his research efforts were slanted.

Dr. Czapek reached the mandatory retirement age in 1956. At that time he resumed consulting practice with various rayon and cellophane producers in the United States, South America, and Europe. Work in Brazil provided unusual challenges; among other achievements was the commercial production of dissolving pulp suitable for cellophane manufacture from the plentiful Brazilian eucalyptus. He remained active in consulting work until shortly before his death on December 28, 1959.

Dr. Czapek was a member of the American Chemical Society, the Verein Deutscher Chemiker, the Bunsen Gesellschaft, and the Deutsche Kolloid Gesellschaft. He published numerous papers and was the holder of many patents.

He spoke fluent German and English, and some French, Italian, Czech, Latin, and Greek; in travels through countries where he did not speak the language, he sometimes sought the parish priest as interpreter, with whom he could converse in Latin. He was very familiar with the history and culture of numerous countries, and was also well versed in the world's great literature, art, and music. During the last years of his life he became seriously interested in the Aztec culture which he had not previously encountered during his wide travels.

Dr. Czapek's sports activities ranged as widely as his other interests. He engaged in serious mountain climbing in the Alps and was accomplished as well in sailing, swimming, skiing, ice skating, riding, and tennis. Each of these activities was undertaken with his characteristic thoroughness, enthusiasm, and indefatigability.

Dr. Czapek's training as an artillery captain in the Austro-Hungarian army never wore off entirely. He bore himself with nobility and dignity and worked under the most rigid discipline, both for himself and his associates. At East Alton it was half-jokingly said that only the patriarch and owner of the works, Mr. Franklin W. Olin himself, was entirely unafraid of Dr. Czapek. But Dr. Czapek was also a kind and generous person, with a keen sense of humor and engaging personality, and was always a gentleman regardless of circumstances. He will be remembered by many persons whose respect he gained both as a scientist and as a person.