

INDUSTRIAL EXPLORERS

Research and Development at Brown Company

Berlin, New Hampshire, 1915-1968

Panel 02: PROLOGUE

The city of Berlin, New Hampshire, located alongside a two-mile stretch of waterfalls in the Androscoggin River, became the center of the pulp and papermaking industry in northern New England in the late 1800s. There was little economic activity in Berlin from the time it was chartered in 1829 to the 1850s. This all changed with the arrival of the railroad in Berlin in 1852, the mid-century introduction of turbine engine technology that could generate power for mills, and the availability of a new immigrant population in the United States to work in industry. The industrial enterprise that later became known as Brown Company began with the construction of a large sawmill on the Androscoggin River and rapidly expanded over the next twenty years to include chemical, pulp and papermaking mills, tracking nationwide changes in papermaking technology. The population of Berlin grew from 175 in 1850 to a peak of 21,948 in 1930 in response to the region's expanding forest products industry.

Forest products permeate everyday life, yet they are often taken for granted or may even be "invisible." When did we become so dependent on wood products? What are these products? How were they created? The industrial processes for converting a tree into a wide variety of wood products emerged in the latter half of the nineteenth century. During this same period, Americans (and Europeans) came to believe in the idea of inevitable progress and in the ability of science and technology to promote positive change. Consequently, American universities in this Age of Progress responded to increased demands for research scientists in industry by establishing engineering disciplines. The graduates of these programs revolutionized the American manufacturing system during the next century. The pulp and papermaking mills in Berlin, New Hampshire pioneered such innovations.

Panel 03: RAGS TO RICHES

The Story of H. K. Moore and the Germination of the Research and Development Department at Brown Company.

In 1903, following the demise of his electrolytic cell factory (a cell through which an electric current is passed in order to produce an electrochemical reaction) and facing his wife's grave illness, Hugh Kelsea Moore was desperately seeking work. Moore, who had studied at Massachusetts Institute of Technology, was determined to find work as a chemist in the pulp and paper industry. T. P. Burgess, a Boston acquaintance and owner of the Burgess Sulfite Mill in Berlin, New Hampshire, advanced Moore the money needed for his wife's care and promised him a

position in the chemical mill. Upon arrival, however, the mill superintendent put Moore to work in the wood yard at \$1.50 per day. Undeterred by this turn of events, Moore wandered around the mill in his spare time, looking to identify and address inefficiencies and other problems in the industrial processes of pulp production. Burgess was so pleased with Moore's initial recommendations that he created a chemist position for Moore.

In 1910, Brown Company purchased the Burgess Mill and employed Moore to improve the method of making kraft pulp, which uses the sulphate process to produce high-grade paper, at its La Tuque operations in Canada. The process that Moore devised transformed the papermaking industry and brought him national recognition. Three years later, Moore prevailed upon Brown Company management to construct a small research laboratory in Berlin. Recognizing that research and technology were the lifeblood of American industry in a rapidly changing marketplace, the company soon expanded the research building, more than doubling its size. Moore's dedication and vision laid the foundation for one of the most innovative and dynamic industrial research facilities in the United States. In 1928, a biographer observed that "Moore considers but one thing important, the accumulation of scientific knowledge."

Panel 04: BROWN COMPANY'S RESEARCH BUILDING

The establishment of Brown Company's Research and Development facility in 1915 had a significant impact on the company's economic success. By 1919, the Research Department's scientists had made substantial contributions to the technological advancements of the pulp and paper industry. With a research staff exceeding one hundred, the Brown Company facility was one of the largest in-house industrial research and development organizations in the United States and a novelty in the pulp and paper industry. The department allowed Brown Company to refine and improve its paper products, develop new products, and obtain research contracts from the United States Government and from other pulp and papermaking companies. Besides the obvious products, such as newsprint, photographic paper, masking tape, paper towels, and toilet paper, the research department also created items that have "invisible" wood components, such as cellophane, organic filler in foods and pharmaceuticals, and Rayon for clothing.

Panel 05: THE BROWN COMPANY RESEARCH LABORATORY

Brown Company's research activities during World War I focused on a number of war-related products including "aeroplane-spruce," chloroform, gasmask filters, and tubular gunpowder containers. One of the company's scientists, George A. Richter, was sent to work in Washington, DC for the Chemical Warfare Service. Brown Company completed the expansion of its research facility by 1919 and then redirected its efforts toward developing products for civilian markets. The new laboratory had five main divisions: 1) Pulp Research, 2) Paper Research, 3) Bureau of Tests (concerned with product quality), 4) Microscopy and Optical Section, and 5) Photographic Section. The largest sections, of course, were the pulp and paper laboratories, which expanded tubular research (conduits such as sewer pipes), developed synthetic leather, and contained one of the few privately owned experimental paper machines. Although Brown Company engaged in a moderate

number of costly patent battles, this complex and dynamic facility kept the company on the cusp of industrial development for decades.

Panel 06: POST-WORLD WAR I RESEARCH

With the conclusion of World War I, George A. Richter and a number of scientists from the Chemical Warfare Service returned to Berlin ready to expand Brown Company's research program and create new post-war products. Perhaps the most notable new arrival was William E. Corbin, whose name spelled backwards, Nibroc, would later be identified with the company's paper towel products. Over the next 40 years a number of leading scientists joined the department's staff. Through their combined efforts Brown Company held almost 800 patents in the United States and Canada by 1946. Many of their successes related to improvements to product production. Products that Brown Company scientists developed included waxed paper, kraft paper twine, photographic pulp, synthetic insoles, paper filters, sand paper, and cellophane.

Dr. George A. Richter, 1957

Richter served as director of the research for Brown Company from 1919 to 1940. During that period of some 400 patents were granted to Dr. Richter. He specialized in highly purified and high brightness pulps for use in photographic paper. He was only the second American to be awarded an honorary doctorate by the Chalmers Technical Institute of the University of Gothenburg in Sweden.

W.E. Corbin, 1920

Corbin joined Richter at Brown Company following World War I and was recognized as an outstanding expert in kraft paper. Most notably, Corbin was instrumental in the development of the first wet-strength paper towel (Nibroc), which soon became an important and profitable product.

George A. Day, 1946

George A. Day became director of the department after Richter retired. He had joined the company 20 years earlier after a short career with a consulting laboratory in Toronto. Under Day the research department boasted over 25 university-trained scientists and 50 research assistants.

Panel 07: PICTURE THIS

The Brown Company Photographic Department

The 1915 decision to develop a separate research facility also led to the creation of a unique, state-of-the-art Photography Laboratory. At this time Brown Company officials believed that little had been done in this area by other large industrial concerns. The project had multiple purposes and functions. The photographic department documented scientific research, photographed equipment and buildings for insurance purposes, recorded the activities of the company's woods operations, photographed people connected to the company and the surrounding communities, and assisted the sales department with product marketing. In short, the department was installed for the benefit of other departments and of the company generally. Long-time company photographer Victor Beaudoin produced most of the images that comprise the Brown Company collection at Plymouth State University.

Panel 08: KREAM KRISP

Not all of the products developed by the scientists in the research department, however, were successful. Indeed, the world-renowned H. K. Moore assisted in the development of the product that resulted in Brown Company's biggest financial debacle, the ill-fated Kream Krisp. In a 1918 article in *Atlantic Monthly*, Henry Talbot observed that the United States government was calling for Americans to "abandon our national habits of wastefulness." Talbot regarded this public policy as a "call to arms for chemists." Researchers were eager to devise methods to "avoid waste and increase productive efficiency." The production of hydrogenated oils as a substitute for lard and olive oil was one such effort. Moore conceived the idea of using the excess hydrogen, which was used in the bleaching of pulp at the mill, for the production of a lard substitute. The company jumped at the concept, built a canning factory, and began production and mass marketing of the new product under the name Kream Krisp. Unfortunately, Proctor and Gamble also claimed to have developed a similar method and was marketing its product under the name Crisco. A lengthy lawsuit ensued, and the patent litigation was a significant drain on the research department's resources and on the company's finances. Eventually, Brown Company conceded the patent rights to Proctor and Gamble in exchange for financial remuneration, but the product loss severely damaged the company.

Panel 09: FROM LOG TO PRODUCT

Research makes innovation possible but at what cost?

The history of industrial innovation is bittersweet. The pulp and paper industry has made great strides in reclaiming and reusing industrial waste and in manufacturing by-products. Many of these products have benefitted consumers, but industry often generates chemical waste that may impact a region for generations. Although the process of producing paper remains much the same today as it was a century ago, pressure from the government regulators has spurred the pulp and paper industry to find new methods of reducing chemical emissions. One of the principal challenges confronting industry in the twenty-first century is successfully striking a balance between environmental imperatives and innovation.

Panel 11: SAVING A PART OF HISTORY

In 2005, James Wagner revived efforts to preserve the Brown Company Research and Development Building. Under his direction, in partnership with the board of directors of the Northern Forest Heritage Park (NFHP) and Tri-County Community Action Program (TCCAP), Brownfield grants were obtained to begin environment cleanup of the building. In 2010, the New Hampshire Preservation Alliance placed the Brown Company Research and Development Building on its Seven to Save list.

Acknowledgments

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To learn more about Brown Company and the City of Berlin visit the Northern Forest Heritage Park, (northernforestheritage.org) and the Moffett House Museum & Genealogy Center, Berlin and Coös Historical Society, Berlin (berlinnhhistoricalsociety.org)

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