

## THE EARLY HISTORY OF PARKE-DAVIS AND COMPANY\*

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*Milton L. Hoefle, Warner Lambert-Parke Davis*

### Introduction

By the end of the Civil War Detroit was a prosperous and bustling city. The completion of the locks and canal at Sault Ste. Marie in 1855 had opened the way for transporting the iron ore and copper from Michigan's Upper Peninsula to the markets in the east. By 1860 Michigan was the largest producer of iron ore and copper in North America (1). Both of these products were critical in the North's victory in the Civil War, and the mining and transport of these materials was highly profitable. In Detroit gracious homes lined the tree-shaded streets which led into Woodward Avenue, and the most prosperous citizens were building mansions on estates along the river off of East Jefferson Boulevard.

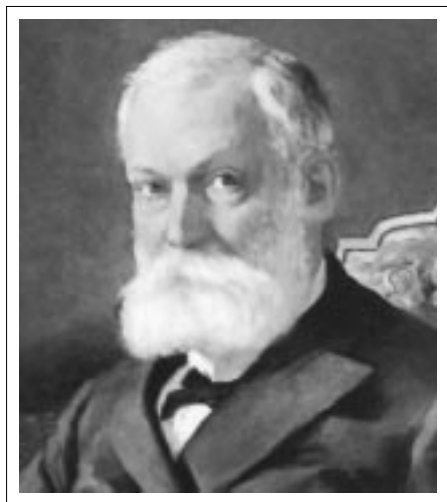
Times had not proven to be that prosperous, however, for Dr. Samuel Duffield, who owned a small drug store at the corner of Gratiot and Woodward Avenues. The experience of the Civil War and the large number of people moving west had demonstrated the need for a greater supply of medicinal preparations (2). So in 1862 Dr. Duffield had begun to make a number of items in larger amounts than required for his own use and to sell them to other pharmacists and doctors. Dr. Duffield's store was strictly a one-man operation, and most nights found him working late in the crowded laboratory in the back of his store. Here he had a still that could produce two barrels of alcohol a day and presses for making extracts. In the Detroit City Directory he advertised "ether, sweet spirits of nitre, liquid ammonium, Hoffman's anodyne, mercurial ointment, etc." But the

shipping service to Detroit was poor and potential customers in the major population centers in the east were skeptical of any company located in what they considered to be a backwoods town. Consequently, it was difficult to find anyone to extend credit or to invest in such a business (3).

Then in 1866 Dr. Duffield met Hervey C. Parke who was interested in starting a new business. Hervey Parke was 38 years old. He had managed a copper mine and then owned a successful hardware store in Michigan's Upper Peninsula. In 1865 he sold his store and moved his wife and two children back to Detroit because of the better business opportunities there. On October 26, 1866, the partnership of Duffield and Parke was formed, and this event is recognized as the beginning of Parke-Davis and Company.

### Part I – 1866-1900

Soon the increased competition of the eastern drug firms made the new partners realize the necessity of finding someone who could promote and sell their products. So in 1867 a young, ambitious, wholesale drug salesman was brought into the firm as the third partner. This was George S. Davis, the son of a prominent Detroit resident. After high school he chose going into business rather than attending college. He was only 22 when he joined the partnership, but he had already established himself as an outstanding salesman. Although sales continued to expand, new troubles kept appearing. Dr. Duffield's health began to fail and he needed to spend



Hervey C. Parke

more time with his wife who had become seriously ill. In time, Dr. Duffield became disheartened and withdrew from the business in order to go into private practice as a physician. So in 1871 Parke and Davis became the owners of the company that was to bear their name for the next century.

Hervey Parke and George Davis had very different personalities. Where the former was quiet, gray bearded, and dignified, the latter was young, flamboyant, and full of ideas for increasing their business. Under their direction the company entered an era of unprecedented growth. Both men were committed to the belief that the high quality of their products was a major selling point, and the motto "Medicamenta Vera" or "truth in medicine," first adopted by Dr. Duffield, continued to be one of their major concerns.

In order to gain both publicity and new products, Davis began sending expeditions to far-off corners of the world to collect various plants used by the native peoples. Starting in 1871 expeditions were sent into the wilds of Central and South America, Mexico, the Pacific Northwest, the West Indies, and the Fiji Islands. Over a twenty-year period, Parke-Davis introduced 50 new drugs, and most of these proved to be of sufficient value to be recognized in the *United States Pharmacopoeia*. Probably the most familiar product, Cascara Sagrada, introduced in 1876, is still used today (4).

The best-documented expedition financed by Parke-Davis was that of Henry H. Rusby, who recorded his adventures in a book called *Jungle Memories* (5). Rusby had just received his medical degree from New York University, and he was hired by Parke-Davis as a "botanist and pharmacologist." Late in the fall of 1884

George Davis asked him how soon he could leave for Bolivia because he wanted to obtain a large supply of coca leaves so that this drug could be investigated. Rusby quickly gathered up all the equipment that he might need and by January was on a boat headed to South America. He was just 22 years old and setting out alone on a trip that would take two years. He would cross the Isthmus of Panama and travel down the rough western coast of South America to Bolivia. From here he would cross the Andes and then travel the length of the Amazon River from its western tributaries to the Atlantic Ocean. While in the Bolivian jungles Rusby kept hearing reports about the bark of a mystery tree called "cocillana" which was reported to possess a remarkable range of therapeutic uses. Finally a native identified this mysterious tree and Rusby immediately had it cut down and its bark removed and dried. In order to test the properties he administered a small amount to one of his native companions and it produced an increase of mucus in the mouth and throat. A double dose was then given to two other natives with similar results. Thus encouraged, Rusby again doubled the dose and took it himself. The result was "nausea, pallor, and an abundance of thin watery mucus from the nose." Based on these findings and what information he could gather, Rusby considered that this drug had properties similar to those of ipecac and that it had commercial possibili-



George S. Davis

ties. So he hired natives to gather 600 pounds of this bark which was then packed, carried over the mountains, and shipped back to Detroit.

In the late 1800s Parke-Davis supplied a group of leading physicians with samples of new products and little pamphlets called "Working Bulletins." These pub-

lications provided all the known information about the preparations and their physiological effects. In turn the physicians were invited to report their experience with the drug, which would then appear in later issues. It is interesting to note that Cocillana bark was listed in the 1888 catalog just two years after Rusby sent back the first sample. Cocillana never replaced ipecac but eventually was utilized in cough preparations, and Rusby received a royalty of 10 cents per pound of bark.

The first manufacturing plant was located in downtown Detroit, but by 1873 the rapidly increasing demand for Parke-Davis products made it necessary to build new manufacturing facilities at Joseph Campeau Street and the Detroit River. This location would be the home of Parke-Davis for the next century. There were two major manufacturing operations; extracting plant materials and rolling pills. By 1874 the Parke-Davis catalog listed 254 types of fluid extracts, 300 types of sugar coated pills, 74 solid extracts, 53 concentrations, 46 medicinal elixirs, 23 medicinal syrups, 15 medicinal wines, 8 alkaloids, and chloroform (6).

Because additional money was needed to finance the expansion, Davis had the job of trying to encourage Detroit businesses to invest in the company. But money was tight following the recession of 1873 and so it was not until January 14, 1875 that Parke-Davis and Company became a corporation under Michigan law. Parke was the president while Davis was the general manager, and there were three other stockholders who had paid in capital totaling about \$82,000. By 1876, exactly 10 years after Duffield and Parke had joined forces, the company reported its first profit of \$5,264.65 and Parke-Davis had become Detroit's largest industry next to manufacturing stoves. During this period George Davis was the real driving force. In addition to selling, he managed the production and laboratory facilities; if salesmen were needed, he trained them. Most importantly, his restless genius was responsible for a number of brilliant and farsighted decisions that would result in Parke-Davis becoming one of the most respected pharmaceutical companies in the world by the turn of the century.

One of the major problems encountered by the pharmacists and physicians at that time was the variation in the strengths of the prepared medicinal extracts on the market. These could range from being worthlessly weak to death-threateningly strong. Obviously, the drug manufacturers wanted to avoid the possibility of their products killing anyone, so they tended to err on the weak side. Consequently, most doctors felt more secure in either compounding the drugs themselves or dealing with a pharmacist they knew and trusted. Davis was keenly aware of this situation and hired a chemist to work on the problem. In 1879 a process for standardization by chemical assay was developed, and the first standardized medicinal drug in history was placed on the market. This led to a systematic investigation of standardizing other liquid formulations and in 1883 Parke-Davis announced a list of twenty such "normal liquids (7)."



First factory

By the early 1890s medical research scientists began to realize the potential usefulness of animal glands as a source of new medicinals. Parke-Davis was quick to begin research in this new field and in 1893 introduced desiccated thyroid gland as a treatment for glandular disorders. Because the

new biological materials did not lend themselves to chemical standardization, in 1897 Parke-Davis introduced the idea of physiological standardization in which the effect of the drug in test animals was quantified. Two decades later over 1,100 Parke-Davis products would be standardized by these methods.

Other pharmaceutical companies recognized the significance of standardization and developed methods of their own so that over a relatively short period of time this principle was adopted by the whole industry. However, Parke-Davis' leadership and diligence were widely recognized and appreciated. In order to maintain standards it was also necessary to establish quality control. Thus, in 1886 Parke-Davis initiated the practice of using lot numbers on the labels of all their products. Since that time every item produced has carried

its own control number. This number is the key to the complete history of the product and each ingredient used in its manufacturing including the source and testing. It was not until 1962 that the FDA required all drug manufacturers to do this.

By 1890 Parke-Davis was a successful and prosperous company. It had finally succeeded in breaking into the competitive eastern market, and a full-scale manufacturing operation was built in Walkerville, Ontario, to take care of that business. In the same year a Parke-Davis branch was established in London, England, in order to enable the company to extend its sales to Europe. New buildings were also going up on the waterfront property, and the number of employees was steadily increasing. A big bicycle shed was built on Jos. Campeau to shelter all of the bicycles which were the favorite form of transportation. Parke-Davis employed a large number of women, especially in the Capsule and Finishing Departments. The women wore long ankle-length skirts fashionable in that era, protected by starched aprons brought from home. Work started at 7:00 a.m. and ended at 5:30 p.m.; and on Saturday everyone worked from 7:00 a.m. to 1:00 p.m. All of the capsules were handmade and the rate of pay for hand trimming and joining capsules was 8¢ per thousand. A top operator could earn up to 80¢ a day.

It was at this time that George Davis met a young Japanese chemist, Jokichi Takamine, who had come to the United States to try and interest the distilling industry in a potent starch-splitting enzyme that he had developed. Davis was impressed and immediately hired him as a consultant. Taka-Diastase was marketed in 1895 as a digestive aid and became very popular. Once again Davis' intuitive ability to recognize talent was evident, because in 1900 Takamine isolated adrenaline and was part of the team working in the Parke-Davis laboratory that identified the chemical structure. Later, after returning to Japan, Takamine became the first president of Sankyo. Because of this common bond a close relationship has existed between the two companies since that time.

In 1894 the German scientist, Emil Behring, and the French scientist, Emile Roux, announced the discovery of an antitoxin for the treatment of diphtheria. George Davis immediately realized that it would bring tremendous prestige to his company if such an antitoxin could be produced commercially because at that time diphtheria was one of the most deadly of the common diseases. Moving quickly, he recruited two scientists

from the University of Michigan to set up the first commercial biological laboratory in this country. On March 19, 1895, a Detroit physician administered a shot of Parke-Davis diphtheria antitoxin to an ailing company employee. This marks the first time that a commercially produced serum was given to anyone in the United States. Two years later Antistreptococcic and Antitetanic serums were marketed. In fact, the serums and vaccines that were developed in this biological laboratory were to provide the bulk of the sales for the next twenty-five years.

It is ironic that just at the time that Parke-Davis was doing so well and George Davis was making decisions and initiating actions that would shortly make it the most successful pharmaceutical company in the world, the personal life of Davis became chaotic and tragic. As the business prospered the lives of the two partners grew apart. Hervey Parke still quietly took care of the finances. Around Detroit he was known as a successful, conservative man and a philanthropist. On the other hand, George Davis remained a bachelor although he was said to be an ardent admirer of beautiful women. He owned a big mansion on East Jefferson and a 500 acre farm on the lakefront where he kept his racehorses. He had a luxurious yacht for sailing on Lake St. Clair, and he was a well-known and popular figure around Detroit where he entertained lavishly. A great admirer of Napoleon Bonaparte, Davis had an extensive collection of relics of Napoleon. He also liked to collect rare "first editions" and by 1886 he owned a library of more than 5,000 books. He became intrigued by the prospects of California real estate and invested large sums of money, and this proved to be his undoing.

In 1893 business was booming and then suddenly the bottom dropped out of the market. The failure of British banks had caused British investors to unload American securities for cash, the result being a drain of gold reserves. This caused Americans to become apprehensive and to start withdrawing their savings from the banks. In turn hundreds of banks failed, thousands of businesses closed, and hundred of thousands of people were thrown out of work all across the country. The great panic of 1893 was on. In the resulting depression Parke-Davis suffered only a minor setback, but George Davis' heavy investment in California land proved to be a catastrophe. He lost vast sums of money, and in order to cover some of his losses, he drew on Parke-Davis for more money than he was due. Naturally, the stockholders objected. Although Hervey Parke, the president, stood by his partner through the resulting

storm, eventually it was necessary to ask Davis to resign. After almost 30 years of service, his stock was turned in as partial payment of his indebtedness and he was given a "leave of absence." In order to pay off his debts Davis sold his mansion, his farm, his beloved Napoleon collection, his yacht, and even his racehorses. From the time that he had started with a salary of \$60 a month until his resignation in November, 1896, this unusual man had allowed over a million dollars to slip through his fingers. Suddenly after 30 years of hard work and brilliant leadership, everything was gone. In 1903 he was forced to declare bankruptcy, and at that time the Board of Directors voted him a special pension in recognition of his many contributions. He lived quietly in various rooming houses and seemed to have no regrets. He seldom mentioned Parke-Davis but often talked about the beautiful racehorses he had owned. He died in 1930 at the age of 85 and only a few people attended the short burial service in Elmwood Cemetery.

After George Davis was forced to leave the firm, Hervey Parke continued as president, but was less and less active in the actual management because of poor health. The prominent Detroiters who had bought Davis' stock were named to the Board of Directors, and other names appeared more and more frequently in the company records. Then on February 8, 1899, Hervey Parke died. At his funeral in Detroit's St. John's Episcopal Church the large sanctuary was so crowded that special seating had to be reserved because all the leaders of Detroit's business and social life were present.

So, we come to the end of an era. Over the period of slightly more than 30 years the efforts of two men working in concert had directed the development of a pharmaceutical company from obscurity to a position of international prominence. Indeed, by the spring of 1904 Parke-Davis proudly proclaimed itself to be "The World's Largest Pharmaceutical Manufacturing Concern."

The middle of the 19<sup>th</sup> century was the time for pharmaceutical pioneers. Familiar names like Merrill, Lilly, Squibb, and Warner all date back to this period. It also marked the beginning of systematic research in the field of medicine. Thus, in 1864 Louis Pasteur proved that airborne microbes caused fermentation and putrefaction. In turn this work stimulated Lister to experiment with antiseptic agents, and this ushered in the modern age of surgery. But the amazing success of Parke-Davis and Co. must be attributed to Davis' ability to recognize the importance of the new discoveries

and to find a way to capitalize on the new possibilities. At the same time Hervey Parke managed to balance the enthusiasm of his young partner with a sense of reality and to keep the company financially solvent during some very turbulent times. The single most important contribution to their success, however, was the development of standards of purity and strict adherence to maintaining the quality of their products. The favorable publicity that resulted was the basis of Parke-Davis' international reputation, and as this reputation grew so did sales.

## Part II – 1900-1974

The beginning of the 20<sup>th</sup> century marked the start of a new era for Parke-Davis and for the United States. The automobile had arrived. In Detroit the police posted speed limits of 8 miles per hour in order to halt reckless driving. The popular Theodore Roosevelt as President was busy reforming the government of the United States. The leading sentiment of the time was "There's nothing wrong with society that the government can't fix." Under Roosevelt America was becoming a world power and there was recognition that human rights were as important as the rights of property (8). Americans had a new sense of pride in themselves and their country. Most of all, everyone was enjoying prosperity.

The founders of Parke-Davis were replaced by new leaders, but everything else remained the same. Since the company was so successful there was no need to risk being a pioneer and to blaze new trails. With sales continuing to grow the name Parke-Davis was recognized throughout the world as being associated with the highest quality products available. In no way did the new managers want to lose this reputation. So from 1900-1930 subsequent managers were able to maintain Parke-Davis' preeminent position by expanding upon that which the two partners had started. Thus, the first commercial biological laboratory that George Davis had established in 1894 was a major contributor to this success. In the lab that started with three horses and a few guinea pigs, the number of horses rapidly increased to several hundred. The company leased two large stables adjoining their river front property from the Detroit United Railway System, but soon these were overcrowded. The city of Detroit was also expanding so that the Parke-Davis property was gradually surrounded by residential areas. So it was a very popular decision in 1907 when the company purchased a large farm near Rochester, Michigan, and started moving all of the animals out there. The animals at Parkedale were prob-

ably the best fed and cared for in the world. Horses were required for the production of serums used against diphtheria, tetanus, and gangrene. During World War I there was a tremendous demand for Antitetanic Serum and ultimately over 600 horses were kept on the farm.

The period leading up to World War I was a happy time for the more than 3,000 employees of Parke-Davis. There were company picnics and boat excursions. There were social clubs and dances, bowling leagues and company sponsored athletic teams. The company pioneered a profit sharing and old age pension plan. There was a general feeling of being a member of a big, happy family; and a strong mutual sense of loyalty developed between the company and its employees that would last for almost fifty years. In 1927 F. O. Taylor, who was Chief Chemist at the time, wrote, "Long years of service by those in both high and humble positions gives to Parke-Davis and Company an *esprit de corps* of immeasurable value and assurance that replacement in the ranks shall fully carry on, and indeed improve, the traditions of the past (9)." This company spirit was certainly helpful in the difficult times resulting from the depression that followed the stock market crash of 1929. All of the employees agreed to a cut in pay so that no one was laid off. Profits were down but the company's record of never missing a dividend since the first one in 1878 was maintained (10). But because of the focus on traditions the company began to fall slowly behind its competitors in sales.

This trend continued until 1946 when a soil sample collected from a field in Venezuela yielded an unusually active antibiotic, Chloromycetin. This unique substance showed outstanding activity against typhus and typhoid fever. The structure was quickly identified, and the small group of organic chemists was successful in synthesizing the compound. The development of this drug was accomplished in a remarkably short period of time. By 1949 Chloromycetin was released to the medical profession, and within three years the sales of this product alone totaled \$120 million. The company had regained its premier position in the US.

By 1952 there was an increasing number of reports of hypoplastic anemias following the administration of Chloromycetin. At this time over eight million people had been treated successfully with this drug, and there had been remarkably little sign of any toxicity. But concern about this problem resulted in the council on Pharmacy and Chemistry of the American Medical Association issuing a report to the Committee on Research and

appointing a subcommittee on blood dyscrasias in June, 1952 (11). This was followed up by a report of the Council on Pharmacy and Chemistry in 1954 (12), which advised the restriction of the use of chloramphenicol to the treatment of typhoid fever and other infectious diseases caused by organisms resistant to other antibiotics. The sales that initially plummeted in 1952 gradually increased so that by 1960 Parke-Davis once again led all US pharmaceutical companies in sales. As the onslaught of bad publicity continued, the sales of Chloromycetin in the US gradually dwindled to almost nothing.

By 1961 Parke-Davis was in a downward spiral. The expansion brought about by the success of Chloromycetin had resulted in higher fixed costs, and there were no new products available to ease the pressure. Finally, a hostile takeover bid by Revlon forced the Board of Directors to consider alternative buyers of the company. They settled on the New Jersey conglomerate, Warner-Lambert, which purchased Parke-Davis in 1970. The merger was finalized in 1974.

Today the old Parke-Davis plant at Joseph Campeau and the Detroit River has been converted into a big riverfront complex of apartment buildings, shopping center, hotels, and upscale office buildings. The name "Parke-Davis" now identifies the ethical pharmaceutical division of the Warner Lambert corporate family. This division includes the former Parke-Davis research facility in Ann Arbor and the manufacturing plant at Holland, Michigan.

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"Parke-Davis 1866-1966, A Backward Glance", *Parke-Davis Review*, P. Walker, Ed., Parke-Davis and Co., 1966, 23, No. 1-9.

"Parke-Davis at 100", Parke-Davis and Co., 1966. This booklet was distributed to all stock holders.

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\*Presented at a symposium on the History of US Pharmaceutical Companies, 216<sup>th</sup> ACS National Meeting, Boston, MA, August, 1998, HIST 008.

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## ABOUT THE AUTHOR

Milton L. Hoefle, Ph.D., University of Minnesota with W. M. Lauer, began working for Parke, Davis and Co. in 1953 in Detroit. In 1959 he moved to the new research laboratories in Ann Arbor and remained there until retiring in 1986 as director of Cardiovascular Chemistry.

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