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MY FRIEND, DOC CLEMENTS

By Charles F. Kettering
Vice President of General Motors Corporation
General Manager, Research Laboratories Division

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It was in 1898 that Dr. Frank O. Clements and I had our first association. I was then a first-year student at the Ohio State University and Doc was doing advanced work in chemistry there, he having previously graduated from Otterbein College. To help pay his way, Doc had taken a teaching fellowship at the University and was serving as laboratory instructor in freshman chemistry. I was a student in one of his sections and from my associations with him there I came to have a high regard for his ability and tact.

When six years later I went to the National Cash Register Company to be employed in the inventions department, I found that they had no technical staff in the manufacturing end. There was therefore practically no control of materials, and many difficulties were due to that lack. So I recommended to the general manager that he set up a chemical laboratory and test department to look after materials inspection and allied problems. I suggested also that they get Doc Clements to organize the new department and run it. "I don't know just where Doc is now," I said, "but he is just the man for the job."

Upon investigation, it was found that during the years since he had been a graduate student and laboratory instructor at the Ohio State University, Doc had been employed three years as chemist for the Pennsylvania Railroad in its laboratory at Altoona, and two years as principal assistant chemist in the Laboratory of the Union Pacific Railroad at Omaha. In both these places he had been very successful. After some hesitation about whether he ought to leave the good position he then had with the Union Pacific, Doc came to the National Cash Register Company and began there what turned out to be a particularly productive part of his long career in industry.

At NCR he was directly responsible to John H. Patterson who was the founder and president of the Company. He was also an industrial autocrat, who, with all his progressiveness, was so fiery and so demanding as to be greatly feared by members of his staff. It was not until six months after the new chemical laboratory and test department had been established that Mr. Patterson paid his first visit to the place. When at long last he did come into the laboratory, Doc locked the door and pulled down the windows.

"What are you doing that for?" demanded Mr. Patterson.

"Well, I've been here six months now, and I don't want to let you get out of here until you have seen some of the things we have done so far and until you can tell us what you would like to have done further."

Mr. Patterson was so pleased by that audacity and by the things he saw which the laboratory had already done for the business that Doc took immediately a high place in his esteem. And that place he held throughout the dozen years of his service there. After that occasion Mr. Patterson gave Doc many, many assignments, some of which were not at all related to his position as chief chemist of the company.

Doc's success at NCR was due as much to his diplomacy as to his ability as a chemist. The rule-of-thumb men in charge of the technical department there at that time were mistrustful of such new-fangled ideas as applying chemistry to their jobs. Some of them were even suspicious that the chemist himself might be a spy seeking something on the men. But Doc saw to it that the credit for improvements realized chiefly through his efforts, and there were many such improvements, were shared in each instance by the men in the department to which they applied. It was by this means, and by his friendliness to everyone, that Doc built up the good will and cooperation needed for success in his endeavors.

Then, in 1916, after battery ignition and the self-starter for cars, and also the engine-driven farm lighting set which I developed, had become well established, I decided to set up a pioneering research laboratory. I wanted a research laboratory which would be separate and apart from any business, so that investigations might be conducted

without immediate industrial implications, or without interference from day to day problems. It was perfectly natural that I should ask Doc Clements to organize that new laboratory and to become its technical director. He consented to do it and thus entered another productive phase of his busy and useful life.

Having been organized just before the entry of the United States into World War I, that new laboratory was soon converted altogether to war endeavors: to a search for a superior fuel for fighting planes, which resulted in the development of the first synthetic high-octane aviation gasoline; to a program of developing an automatic flying or robot bombing plane - the equivalent of the "buzz bomb" of World War II; and to the solution of problems relating to the manufacture of airplanes for the war.

Then, in the year after the war closed, that laboratory with all its personnel was taken over by General Motors Corporation and made the nucleus of its centralized research laboratory, the present Research Laboratories Division. Doc served as the technical director of this new and expanded institution from the time of its organization until his retirement in 1939. And he had a hand in all the important developments, too many to mention, which came out of that laboratory during those nearly twenty eventful years of his service.

— One of Doc's greatest services to the Research Division

came out of the particular interest he has always had in people, especially in young people and in their proper education. "The recruiting of capable men is our most important task" he would say. And, as the success of a research laboratory, more than any other institution perhaps, is due to the capabilities of the people in it, and as Doc took the greatest pains in building up a qualified staff, that was a very great contribution indeed.

The first employee of that research laboratory which Doc organized for me back in 1916 was the late Thomas Midgley, Jr., who became one of the most productive research chemists in the world. And Doc had previously picked Midgley from the 1911 graduating class at Cornell University for the staff of the National Cash Register. The second man whom Doc hired for that laboratory was Harry C. Mougey, who also became an outstanding producer and who, when Doc retired twenty years later, succeeded him as technical director of the Research Laboratories Division.

It was characteristic of Doc that he always did everything he could to help young people, to further the cause of education, and to advance the welfare of scientific societies. He was active also in the YMCA and a strong supporter of it. He always gave generously of his time and his income to such causes.

Doc's interest in technical society affairs caused him to belong to several such societies, including the American

Chemical Society, the Electrochemical Society and the Society of Automotive Engineers; but he especially was active in the American Society for Testing Materials. One reason for that was that his first boss, Dr. Charles B. Dudley of the Pennsylvania Railroad, who helped to found the American Society for Testing Materials during the years when Doc was working for him at Altoona, inspired him with his initial enthusiasm for it. In 1932 Doc himself became president of the American Society for Testing Materials, and in his presidential address he said this of Mr. Dudley:

"To have started my career in his laboratory was indeed a privilege that has meant much to me in my subsequent professional activities. His photograph hangs in my office close to my desk. ***** Never did I imagine that, a quarter of a century later, I should be permitted to serve his society as president."

It was appropriate that, during Doc's presidency, membership in the American Society for Testing Materials was thrown open to students of engineering and science. Doc was active also in establishing and enlarging the research fund of the Society and he himself became a large contributor to it. This he did because of his philosophy of research, which he once expressed in these words:

"We must be dissatisfied with things as they are. ***** I like to think of our accumulated knowledge in terms of a high mountain. The higher we climb, the wider the horizon and the farther we can see."

One of the greatest testimonies to large industries
came from Doc, who was one of the most conscientious and

public spirited men alive. During his forty years of service for four large enterprizes, the Pennsylvania Railroad, the Union Pacific Railroad, the National Cash Register Company and the General Motors Corporation, Doc was naturally engaged in some of their most intimate and vital endeavors. But never once in all that time, he said, was he ever asked to do anything at all with which his conscience disagreed -- which is quite different from what has been said in some quarters.

Althogether, Doc and I were intimately associated in research endeavors for about twenty-five years. During all that time we never talked so that we even had to close the door. One of the chief things we had in common was enthusiasm for research. I have always said that unless a fellow has been bitten by the research bug he will never get anywhere with it. Doc was one of those who was early bitten by that bug. And because his blood was full of the effects of that bite, he was a successful man and a very useful one in each of the important positions he filled.