

Talk by: W. Braddock Hickman, President
Federal Reserve Bank of Cleveland
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THE CHALLENGE OF CHANGE

Thank you, Dr. Langsam. I should first like to extend greetings to you, to the Board of Directors of the University of Cincinnati, to its distinguished faculty, and to today's graduates and their families and friends. I should also like to thank the University of Cincinnati most sincerely for the Honorary Degree and for the Citation. The Citation, in particular, was most impressive to me -- much more so, I am afraid, than anything I will say to you today. In fact, it is perhaps just as well that the Citation was written before, rather than after, my talk -- otherwise, it is quite possible that the tone would have been somewhat more restrained.

Commencements are always joyous occasions, and this one is certainly no exception. Today's recipients of the various undergraduate and graduate degrees -- in the liberal arts, the "hard" sciences and the social sciences, and the learned professions -- have received their just rewards by surmounting all obstacles that academia has placed before them -- and sometimes when I was a student I used to think no one was more adept at dreaming up obstacles than members of the academic profession.

You have earned your degrees and you will soon commence upon the careers for which your various degrees have qualified you. I say that you will soon commence upon your careers. There is necessarily a hiatus between the receipt of the degree and the commencement itself -- known as the Commencement Address, which is a final test of your endurance. After that the fun really begins. Having been on the receiving end of the educational process myself, I am sympathetic, and shall try to make the hiatus between the degree and the commencement as brief and as painless as possible.

Lest any of you think by my brevity that I am shirking my responsibility, let me remind you that few remember for long who the commencement speaker was or what he had to say. To me, this was proved conclusively, if not entirely scientifically, by a test made recently by the Dean of a large Eastern university. The Dean asked some 40 alumni and alumnae attending their thirtieth class reunion about the commencement speech and the speaker. No one could remember anything about the subject of the address, but one alert little lady said she was sure the speaker was a member of the military and she thought he was a General. It turned out that the speaker was a vice president of the General Electric Company, who, like me today, was receiving an LL. D. degree.

Now, what all of this is leading up to -- as I am sure most of you have already guessed by now -- is that a great deal of what is learned in any discipline (law, medicine, science, and the humanities) is universally useful, while even more of what we think of as basic knowledge, at the time it is learned, will prove to have only ephemeral value. The human memory is a marvelous instrument, which automatically retains the permanently useful and erases other information after it has become passé. This is indeed fortunate -- for each one of us will find in a decade or two or three, that most of our facts, and many of our theories will be relegated to the junk heap. What remains for the educated man is a sense of scientific proof (of how to obtain generalized information from individual observations), of how to acquire information from others, and of how to communicate his own findings and ideas. Proof, the reference process, and the communication of ideas are the basic ingredients of the liberally educated individual -- almost everything else you have learned up to this point will prove to be of only limited temporary value -- to be replaced by other information, which in turn will eventually be superseded in the exponential expansion of scientific knowledge that is occurring today.

Since I know very little about most things, and a great deal about almost nothing, perhaps you will permit me to refer to my own experience in the learned professions. I was trained in economics, mathematics, and statistics, and received the Ph. D. in Political Economy -- economics to you -- in 1937, just about three decades ago. At that time we were still in the late phase of the Great Depression, with between 10-12 million people unemployed. Some limited scientific progress in economics had been made by Wesley C. Mitchell, Simon Kuznets, and others working at the National Bureau of Economic Research to measure and understand what happens during business cycles. However, the great majority of economists were engaged in what I call a priori theorizing, that is, the deduction of dubious conclusions from doubtful axioms or assumptions. Classical economic theory, still the majority view as late as the mid-1930's, maintained that competition in a free market economy would eliminate all except so-called "frictional unemployment" -- all of this despite the fact the unemployed at that time totaled well in excess of 10 million. In medicine, this would be like attempting to cure cancer by assuming it did not exist. Today, of course, we know that the body economic can operate at various levels short of full employment, and that balanced growth and full employment depend upon a rough synchronization of the various components that comprise the whole -- much as had been thought to be true by the pioneer economic scientists Wesley Mitchell and Simon Kuznets. I might add that we have made tremendous strides during the past 30 years, both in our economic understanding and in our technology as well. As a consequence, the standard of living in America today is about two and one-half times as high as it was then. We still have a lot to learn, and this will lift the standard of living even higher.

In medicine 30 years ago things were slightly better than they were in economics, but the difference was not great. The standard treatment for pneumonia, or for any one of a number of symptomatically similar diseases, was to put the patient to bed, put him on a light diet, and keep him as comfortable as possible -- not a very much different approach fundamentally from tribal attempts at cure by incantation.

How different things are today! In advanced industrial countries, medical science has all but eliminated infectious diseases. Antibiotics have eliminated organisms that just 30 years ago constituted principal causes of death in the United States. Immunization -- most notably the success of the vaccine discovered by Dr. Albert Sabin at this University -- has eliminated many of the major viruses as principal causes of death. Cancer and cardiovascular diseases remain as principal causes of death, but both are slowly yielding to the explosive growth of knowledge now underway in the life sciences. One effect of all of this is that today life expectancy at birth is about 70 years, as contrasted with about 62 years in 1935.

And those of you from the College of Law can attest to the rapidity of change in that area. When I went to undergraduate school in Virginia, I was told that John Marshall had largely written the constitutional law of the United States. (As I realize today, this doctrine was taught us primarily because it was true, but partly also because John Marshall was a Virginian.) Much of this constitutional machinery was brushed aside by the social, economic, and political forces unleashed by the Great Depression. The common law, since my college days, has been modified from time to time by court decrees, and has been codified and recodified by frequent legislative action. On top of all of this has been superimposed a great body of administrative law, which was in its infancy in the mid-1930's.

For the older alumni of the Evening College, most of whom, I assume, are engaged in business, the last 30 years have been no less revolutionary than in other fields. One way to measure this progress is through the development of the common, or garden, variety of computer. The modern electronic computer has made many important contributions to business, such as control of inventories, the reservations systems of large airlines, the solution of problems in queuing theory for supermarkets, discount stores, and the like, and the performance of much formerly humdrum work, such as payroll accounting, and the handling and sorting of bank checks.

Thirty years ago the prototype of the modern computer was the IBM 601 multiplier. With a great deal of noise, effort and some error, this multiplier performed an 8 by 8 digit multiplication and recorded the product on a punchcard in about five seconds, or at the rate of 12 per minute. Today the IBM 360, and similar machines produced by other manufacturers, multiplies an 8 by 8 digit number and records the product on magnetic tape in 2 microseconds, or at the rate of 500,000 per second, or (hold onto your hats!) 30 million of such 8 by 8 digit multiplications per minute. I might add that the IBM 360 is quiet, effortless and almost never makes an error. In fact the machine can be programmed to perform multiplications in parallel to check its own results.

And so we could go on about physics, psychology, sociology, genetics, biology, space exploration, and so forth. All is change; all is flux! And yet the basic principles of scientific inference remain the same today as then. Also, the knowledge of how to reference materials in the journals and in the libraries remains the same. And finally, the knowledge of how to communicate effectively our findings to others remains the same -- and may even have improved as our language has been enriched by other languages and has taken on greater flexibility.

This, then, is my message to you who are about to enter into your respective fields of law, medicine, the sciences, humanities, or the challenging field of business. Everything you have learned during your 20 years or so of scholarly endeavor will prove useful for a while and all of it will provide the foundation and springboard for further knowledge. Only a part, however, will be found to be universally and eternally true; the remainder will be forgotten and replaced by new facts and new theories. In the twentieth century explosion of science and technology you will have to run hard to stand still. This is a challenging period in which to enter a career, and an exciting one in which to live and learn. Good luck, and best wishes to you all in the learning process that lies ahead! If my experience is any criterion, you may find only parts of your career to be profitable -- but all of it will be a lot of fun!

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