The Rise and Future of Engineering

Engineering

HERBERT HOOVER, in a speech upon receiving the American Institute of Mining and Metallurgical Engineers Medal:

Three great forces contributed to the development of the engineering profession. The first was the era of intense development of minerals, metallurgy and transportation in our great East. It greatly stimulated invention; it made a demand for training and skill on the part of our engineers. The pressure of material development advanced our American practice beyond the rest of the world. Moreover, the skill of our engineers of that period owes a great debt to American educators. The leaders of our universities were the first of all the educators of the world to recognize that upon them rested the responsibility to provide fundamental training in the application of science to engineering under the broadening influence and cultivation of university life. They were the first to realize that engineering must be transferred into a profession in the highest sense, not only in the training and character but that the essential quality of a profession is the installation of ethics. That implies not alone the job, but the responsibility of the community for the job. Our universities poured into our development a great stream of men with this background and training. A third distinction that grew in American engineering was the transformation from solely a technical profession to a profession of administrators—the business manager with technical training.

Our American engineering practice in many branches, particularly in mines, transportation and electricity became the envy and ideal of the world. American engineers were solicited to install American methods and American machinery abroad. The first of these demands came from South Africa of such men as Hamilton Smith, of Hennen and Sydney Jennings, of John Hays Hammond. Quickly their brilliant success created a demand for more and more of their kind, followed by hundreds of others. Your expressions are at least idealization of that whole caravan of American missionaries. Perhaps few of us realize the effect of their service both at home and abroad. A vast sum of industrial advance over the whole world came from their hands. A vast amount of added experience was brought back to our country. A vast support was given to our manufacturers and workers in the export of American equipment. There grew up a vast appreciation of America as a land of intellectual as well as material accomplishment.

The reputed salaries and high commands of these great men in our professions fired the imaginations of the college youngsters of my day. But when we left college and offered our intellectual wares, however, to the hard-footed mine managers we had great disillusionment. We went further into the depths when we moderated our offerings step by step from a willingness to favor them in the position of assistant manager, down finally to a job pushing a car and pounding a drill in the wettest level. In any event, on the night shift we youngsters had a certain amount of time to think how much easier it was to be a consulting engineer or manager of great enterprises at a high salary than to push a car at $2 a day. I was sure at that time that the manager of the mine where I worked had so little a quality of insight into my true value that at least he would never merit being called into anything higher. I was even disposed at that time to think he was destined for something even lower. But, in fact, in after years I was grateful for this apprenticeship and, indeed, it is this rigorous insistence on the part of our elder engineers which has contributed much to our American training. In time came the opportunity from the great leaders of American engineering at home and over the world for crews of university-trained youngsters. One of these jobs came near our town. There was no fantastic salary attached to it, but we had difficulty in refraining from offering to take it for less for fear it might escape.

This first real important job is the momentous thing in an engineer's life. Each of us in turn has believed that all hope for the future and the present fate of whole nations depended upon its proper accomplishment. And these first jobs are never arm-chair labors. They do not take place in the comfort of cities. Living on the edges of civilization is a much more drab affair than the current novels on frontier life would lead one to surmise. Yet there endures to the layman something of remorse and adventure in the engineering profession. Kipling, Richard Harding Davis and others have given high color to the romance of our profession. My own experience with the romance of it has made me wary at times of the romance parts. When I hear of it I have a desire also to know how long ago it took place. I have learned that the romance factor increases with time. My experience in the adventure parts of the engineering profession is even more dubious—anything of this sort from bad men to armies, wars, shipwrecks or floods which come across the engineer's orbit, are disturbers of progress. They all require repairs afterwards and no engineer gets satisfaction from repair jobs. But, after all, it is an occupation of enormous diversity of interest, a change of scene, of vivid and human relations. There is but little of repetition. It is a constant call for all that lies in men.

The exchange of engineering experience and scientific discovery between nations is one form of internationalism that is beyond any reservations. America has made notable contributions to this advancement. . . . The job of the engineer is the application of science to the increased comfort of safety of man. It is his work to take from the laboratory of the scientist the raw material of thought and discovery and to materialize it into daily use. He, therefore, has a responsibility not alone to keep his application of science abreast of science by discovery but, on the other hand, he must assure research; for without new discovery the progress of engineering must cease. . . .

As our population grows in numbers, as our problems become more complex, so does also grow the need for wider and wider vision of the engineering profession. Our problems of transportation, of housing, of power, of communication, of economical use of our natural resources, of safety and protection to our people now require long planning in advance. We no longer have a right to think in terms of our own generation. A greater America for our children will, in a large degree, depend upon the engineering profession.

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