

the work, if we may call them so. We forget them, our minds are so filled with the systematic attainment of results or with the study of the geologic structure of the veins, or with the forecasting of what will happen to our ore on the next level, or with the needs of the community of workers, or above all with satisfying the board of directors on whom, back in the central office somewhere, the manager must always have a wary eye.

With the last consideration, the dress-suit side of the profession comes in. Not only must our man in authority look out for his miners, but he must be just as ready to meet his directors on equal terms. He may live most of the months in the remote community, but with the revolving year comes around the time of annual reports, of conferences, of presenting in person the results of operation; it may be also of hospitalities extended and social courtesies, of meetings with the Institute of Mining Engineers and mingling with one's fellows. And then we have to shed the overalls in favor of the dress suit. One must guard against too much overalls, and not let the stiffly starched bosom choke too hard at the neck because of disuse. Some young engineers are a little inclined to overdo the overall phase of the profession, whereas we should be good companions with all sorts and conditions of men.

Commencement is a time of changes and of breaking old ties and associations. Perhaps you will not mind, if, as one not too far removed from his own experiences of the same sort, I touch upon them for a few moments. I am moved to do so from another bit of experience that was gained in those years at Cornell, earlier mentioned. It was the university's custom to have a Sunday afternoon sermon in the chapel. The most eminent ministers available were invited to preach. Now as we faculty people listened to the sermons Sunday after Sunday we could see that almost always the clergyman said to himself: "I am going up there to address a university community. I must prepare a careful essay on the problems of modern philosophy or science or human destiny. I must not disappoint that audience or fall below its expectations." But had we been given the opportunity, we university people could have said to him: "My dear man, we have all those themes six days in the week in the class room. Sometimes we like to forget them." One afternoon there appeared in the pulpit a clergyman from Louisville, well along in years. With no evidence that he was making the supreme effort of his life, he talked to us in a kindly pastoral way of the experiences which fall to the lot of every one of us. He obviously was animated by love of his fellow man and what he said came naturally and was welcomed in full measure by those who heard him.

I am far from being able to speak from any such ripe experience or in any but small degree to take the same position. We engineers, moreover, are men of quasi-military training, and we have a haunting dread lest our emotions get the better of our judgment—lest in moments of excitement or lack of attention we read our transits or compasses wrong and make a mistake. In engineering, whatever else we do, we must not make mistakes. Too much depends on our being right. Nevertheless, we can talk over the things that fall to the lot of us all.

To my mind the most trying time with all of us is at the start. Almost every young engineer has several unsettled years before he finds a permanent place. While this experience is not invariable, it is the rule.

The entrant into the profession is getting experience and is taking a course in that subject of "Life" for which we have not and cannot have a professorship. In the long run, however, all the years total up their contribution to the final result and most men of maturity are loathe to admit that any of their experiences have been without final use. It is not a bad plan for a young engineer to look himself over and see what value he would really place upon himself to his company. It takes time to get broken in and to learn the routine. No harm is done in assuming the employer's point of view and seeing if, with conditions reversed, we ourselves would give any more for the service. Every one and especially the beginner may properly wish to give full equivalent for compensation received. A subordinate may often wisely in his imagination put himself in the position of his chief, live his daily round, think over his responsibilities and harassing cares, and then see what can be done to make them a little less burdensome. Most of the men whom we know, partly from individual characteristics, partly from the pull of outside influences, come to revolve in fairly definite orbits. If we secure and use a sufficient number of observations, we can calculate a particular orbit, just as do the astronomers in dealing with a planet. We can with a little study and foresight know where to find our man at different times of the year and under the circumstances produced by any conjunction of known forces supplied by outside influences. Can a junior thus forecast what his chief will need and be unostentatiously ready, and can he avoid asking too many pestiferous questions of a busy man, he will certainly secure the appreciative gratitude of his chief. Let me whisper to you that even among professors often kept under keen nervous strain by the demands of classes and by the consuming desire to have their subjects understood by the young people before them, the foresight of an assistant who knows where all the specimens or apparatus are that are to be used in illustration and has them ready without undue oversight, comes as balm to excitable nerves.

Work after leaving the engineering school is on the whole rather less difficult than the exacting requirements maintained by our good institutions. There is less variety but more intensive effort of the same kind. The young engineer often misses the keen intellectual stimulus provided by his association with his classmates in the courses. He finds that his work calls less for the full exercise of all his powers. Once some years ago I made a quick trip to give a little lecture on gold mining in a course before the university and townspeople at Evanston, Illinois. Hastening home for my classes, I sat down in the dining car opposite a man whose appearance attracted me, but to whom with the foolish diffidence of Americans generally I was afraid to speak. Europeans can give us a few useful points in these respects; for on the other side, if two strangers find themselves seated at a small table together, they will at the very outset very often exchange cards and chat pleasantly together. Well, we two on the diner eyed each other out of the corners of our eyes, each afraid no doubt that the other would sell him a gold brick if he opened up an acquaintance. Finally my neighbor passed me the salt and we fell into conversation. Once started we had so much to say that we talked half the night. He proved to be a graduate of the Rensselaer Polytechnic Institute, the earliest of our engineering schools in America, and the great mother of civil engineers. He had gone into the iron