

not too strong for the occasion. No one who has had to do with schools of science and technology has failed to know that a kind of prejudice long existed respecting the students and the graduates of such schools, in fine and fashionable circles. Perhaps that prejudice was never so conspicuously manifested as in laborious efforts at condescension and toleration. It was time that schools of this character should be established and should fight their way to success and general recognition, when manual labor had come to be deemed dishonorable in America; when the discolored fingers of the chemist ranked him below the daintier student of philosophy and rhetoric; and the rough clothes in which the young mechanical engineer pursued his work were considered the badge of an inferior occupation. Already we see the signs of a great change in this respect, due directly to the influence of schools like this on which we look around to-day. The scions of our "best families" are no longer ashamed to be seen winding an armature, or charging a furnace, or working at the lathe, in a paper cap, a leathern apron, and hob-nailed shoes. The intellectual squeamishness, to which I a moment ago referred, was much less contemptible in its spirit, but it was, none the less, a thing to be reformed, and reformed altogether. The notion that scientific work was something essentially less fine and high and noble than the pursuit of rhetoric and philosophy, Latin and Greek, was deeply seated in the minds of the leading educators of America, a generation ago; and we can hardly hope to see this inveterate prepossession altogether disappear from the minds of those who have entertained it; but from the new generation, scientific and technical studies will encounter no such obstruction, will suffer no such disparagement.

Secondly, another objection, entitled to far more consideration, which the new education has encountered, has been from the sincere conviction of many distinguished educators, that in the pursuit of science the student loses somewhat of that disinterestedness which they claim, and right-

ly claim, is of the essence of education. For the spirit of this objection, I entertain profound respect; I differ from these honorable gentlemen only in believing that the contemplated uses of the sciences do not necessarily impair disinterestedness, which, I fully concede, is essential to the highest and truest education. I am willing to admit that, in my humble judgment, many technical schools have erred in addressing themselves too directly to the practical side of instruction. I believe that, in doing this, they have made a mistake, even from their own point of view. Young men graduating from such schools may be the more successful for this during the first few years of their professional practice, and yet in the whole of their career be the worse for it. The thorough mastery of principles is of far more importance to the engineer than the acquisition of a certain amount of immediately useful knowledge or the possession of mere knacks and technical methods and the tricks of a trade. Nay, even the principles of science are of less importance, not only for the purpose of education, but for the uses of the world outside the school, than is the scientific spirit. All this a longer experience can not fail to demonstrate to the conviction of any intelligent body of trustees or teachers who may have erred in that respect at the beginning.

Moreover I am free to acknowledge that, in my humble judgment, those who direct many technical schools have made a mistake in omitting from their curriculum philosophical studies as distinguished from scientific, liberal as distinguished from exact; I am proud to say that no man ever received the degree of the Massachusetts Institute of Technology without a substantial course in language, literature, history, and political science, extending through not less than three years; and I rejoice to find in your catalogue, Mr. President, ample proof that, under its present enlightened management, the Pennsylvania State College does not neglect liberal and philosophical studies. You are right in this. You are wise, even from the point of view of the technical professions. These stud-