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THE LEHIGH UNIVERSITY,
ASA PACKER, FOUNDER.

Citizenship
AND
Technical Education.

AN ADDRESS

DELIVERED ON

FOUNDER'S DAY,

OCTOBER 8, 1896,

BY

JOHN H. CONVERSE, A.B.,
OF PHILADELPHIA.



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CITIZENSHIP

AND

TECHNICAL EDUCATION.

THE observance of Founder's Day in such an institution as this is a most commendable and fitting custom. In one sense it is unnecessary. Your beautiful grounds, your stately buildings, your admirable outfit and your corps of able instructors, all are a perpetual memorial of the wisdom and the benevolence of the founder. The inscription in honor of Sir Christopher Wren in St. Paul's Cathedral, which, for lack of novelty, I refrain from quoting, might, with propriety, here be written of Asa Packer. But the full force of his act and the lessons of his perfected purpose would not thus be emphasized.

It is well to have the stimulus of a recurring anniversary to bring to our minds the complete significance of the conditions which here surround us. Architecture has been aptly styled "frozen music." The plant of this University may be properly designated as "materialized benevolence." And it is well that the wisdom which guided that benevolence should receive careful consideration for all the lessons which it conveys.

It is not my purpose to indulge in a eulogy of the distinguished founder. Others have done this hereto-

fore, and others can do it far better than I. It was not my privilege to have more than a passing acquaintance with Judge Packer. Personal tribute would, therefore, be out of place. It may, however, be appropriate to utilize the time which is allotted me by a superficial consideration of the subject suggested by the occasion—“Citizenship and Technical Education.”

In our democratic system technical schools are not supported by the State. It would, in the estimation of voters, savor too much of paternalism to permit of such a practice. A common-school education in most communities, with here and there a high school or academy at the public expense, constitutes all that our people have thus far deemed advisable or necessary. The argument for the existence of these is that they are requisite for the training of those who are to be citizens, and that they are in the interest of the State, as operating for the prevention of crime, which is the handmaid of ignorance. All beyond this is by the will of the majority stamped as unjustifiable—as a luxury for which the recipients and not the State should pay. As a general proposition this theory may be sound, although if an education which only negatively benefits the State may be provided at the public expense, much more, it might be argued, should the State promote a training which shall produce positive results in advancing the public welfare. Elsewhere this latter principle is recognized. France has its comprehensive scheme of education, including the primary, the secondary and the superior technical schools. The outgrowth of that era of organization which marked the first Empire, it has been maintained and developed to the present day. Government supervision and uniformity of method have made its advantages available to all seekers. Ger-

many goes still further. There the gymnasium leads to the university for literary and general culture ; to the realschule for business training ; or to the technical schools for the acquirement of the practical professions. Even China, half heathen as we are accustomed to regard "The Flowery Kingdom," has its system of competitive examinations under governmental auspices, promoting the highest culture under the standard there prevailing. Appointments and promotions to civil office are made from the lists of those who have obtained the highest rank in these competitions.

In the absence, then, of any provision by Government in our country for special education, such institutions must chiefly be created and maintained by private beneficence. It is a fact, I believe, that few if any of the institutions for higher education are self-supporting. The wise benevolence of individuals is the basis on which most have been created. The citizen who is the steward of earthly possessions must recognize an obligation in this respect. Not only does the constitution of society demand it, but in some sense every citizen is but discharging a debt to the community by contributing to the support of institutions of learning. In this respect the claims of technical education are peculiarly strong. The maxim that "every man is the architect of his own fortune" is only true in a qualified sense. Every man is indebted to the contributions of his predecessors and his contemporaries. The chemist who has determined the properties of matter, the engineer who has shown in practice structural possibilities and principles, the architect who has enriched the world for generations to come by a creation which is a "thing of beauty and a joy forever," the metallurgist who has developed methods of manufacture which have

enhanced and extended the usefulness of the materials at men's command—all these have contributed to the common stock of human knowledge, and have made their successors or their associates their debtors. Herein is true socialism—that socialism which grows out of the constitution of society ordained by Divine wisdom. It is not the creation of arbitrary law, but demonstrates anew the universal brotherhood of the race in the dependence of one on another, and in the indebtedness which every successful man incurs to his fellows. Every mill or manufactory, every coal mine, every productive enterprise which dots this teeming Lehigh Valley, and has made it and its workers what they are, is the concentration of the unbought but priceless experience of thousands of thinkers and workers who have gone before. How better can you or I, if we have profited by their labors, repay our debt than by passing on to our successors the opportunities for training which shall be the means of further progress?

“I hold it truth, with him who sings
To one clear harp in divers tones,
That men may rise on stepping-stones
Of their dead selves to higher things.”

If then provision for higher education is a debt which the citizen owes to the community, how better can he pay it than by contributing during his lifetime? More certainty of his plans being properly carried out is thus assured. The case of the late Hon. Samuel J. Tilden is in point. Eminent lawyer as he was, his will, drawn by himself, was partially set aside and his purpose frustrated. It is better that a man should be his own executor in his benefactions. Under his personal supervision defects in the original scheme can be reme-

died, omissions made good, and additions suggested by experience incorporated. To say nothing of the gratification which a completed and successful work confers upon its author, its influence upon others is stimulating and far-reaching. Since Lehigh University was founded, Johns Hopkins, Bryn Mawr, Chicago, Leland Stanford, Drexel Institute and others have been established. Who shall say that Judge Packer's example was not efficacious in all or many of these foundations?

But the debt which the citizen owes to the community for higher education involves an obligation on the part of the recipient which cannot in most cases be discharged by a pecuniary consideration. You who are alumni, or are to be alumni, of an institution like this are not privileged to use your intellectual equipment here acquired solely for your own aggrandizement. Society has claims upon you. In the practice of your profession you must contribute something to the welfare of the community as opportunity offers. The clergyman performs many offices of mercy for those in need, but who have no claim upon him. The physician, in his hospital practice and in his gratuitous attendance on the poor, renders an extensive service for which he receives no moneyed compensation. The lawyer, by his conduct of the cases of those unable to engage counsel, discharges in some measure the obligation under which he rests. Are these learned professions, as they are called, alone amenable to this rule? There are emergencies and conditions where the mechanic, the engineer, the architect, the chemist, may render a valuable service to the community, and which he should regard as opportunities of privilege. You may not ask the architect to draw plans for your

house without full compensation, but for an art gallery, or a hospital, or a library, for the benefit of society, you might well expect a concession in the regular fee. It is agreed that the happiest definition of civil engineering is that it "is the art of directing the great sources of power in nature for the use and convenience of man." If the engineer (and in that term we may include all the graduates of an institution like this) possesses a power so important, built up, as it has been, by the experience of thousands of predecessors, and made possible of acquisition by the founding of technical schools like this, he certainly has a duty to use it in some measure for the benefit of his fellows. Christianity teaches us that the Saviour of mankind promises the highest recognition of service done in His name to even the least of those in need. The relations of men in society show that there is an obligation of service even in the realm of materialistic progress.

The foregoing considerations lead to the inquiry, What scheme of education is best adapted to promote true citizenship? It may be presumptuous in me to attempt to answer this question. In the presence of another audience I should hesitate. But here I feel that I have your sympathies in the effort. Lehigh University itself has largely indicated the reply. The idea of the founder, as I understand it, was to provide intellectual and moral as well as technical training. The "combined course" which is offered in your circulars, points in the same direction.

The true citizen must be more than a narrow specialist. His education must be thorough, comprehensive, humanizing, practical. The function of the university, properly so called, is to afford precisely such a training. It should include not only the humanities,

but also, necessarily and inseparably, the preparation for a profession or calling.

The ideal university then might have, first, say, a three years' course in the humanities, leading as now to the degree of A.B. ; and, secondly, a two years' course in technical, scientific, legal or other specific studies leading to the degree of C.E., M.E., E. of M., or other appropriate degree. And these two courses should be made, not optional, but obligatory, forming in effect a five years' course. If it be said that students will select in preference a merely technical school where in a shorter time the desired diploma may be obtained, I answer that I have no concern with that policy. My contention is that there is room for a university wherein the training afforded and enforced shall make the citizen as well as the engineer, the broadly cultured, self-reliant man, and not a specialist exclusively.

The trend of educational development points, I think, to something of this character as the true university. A marked change has come over the schemes of higher education during the past generation. Formerly the theory in our universities was culture for culture's sake. Utility, as an essential of the studies pursued, was little regarded, or was scouted as something common or unclean. The classics, the mathematics, and metaphysics constituted in the main the approved curriculum. Complete courses in chemistry, in biology and in physics were rare in the department of arts. Even the modern languages scarcely ever appeared in the curriculum. The classics were emphasized to the exclusion of the natural sciences. Some in my hearing may remember the sensation produced by Charles Francis Adams, when, two or three decades

ago, in an oration delivered before the Phi Beta Kappa Society of Harvard, he denounced as a fetich the slavish worship of Latin and Greek in the college course. The feeling which he then voiced has unceasingly prevailed. Since that time the change in college methods has been remarkable. Requirements in entrance examinations have been enlarged. More Latin and Greek and mathematics and English literature, and history are demanded as a condition of matriculation, in order that more time in the four years' course may be available for the natural sciences, literature and the modern languages. In many colleges, scientific courses and elective special studies struggle to replace the time-honored curriculum. Laboratory work has been introduced and enlarged; geology and biology are pursued by practical investigation; and even manual training and shop practice have found a place as cognate branches in some of our universities.

The significance of this movement is not far to seek. At a time when the ruling interests of the country were agriculture and the products of the forest and the sea, a college curriculum moulded in mediæval form was sufficient. But with the development of mines and manufactures of every kind and the extension of new conditions of life, a different training was demanded. Our educational institutions have responded under the pressure of a new civilization. The founding of this institution thirty years ago was but the recognition in the mind of a sagacious business man of the demands of a new era of materialistic development. The shaping of its scope and purpose is an indication of the best form which is to be reached by what we call higher education.

In order that the general course may be covered in

the term of three years, the time usually given to Greek and Latin might be considerably curtailed. In proposing such abridgement I am not insensible of the value of the study of the classics, but for the ordinary student without especial taste for the dead languages and their literature, I believe that much of the time ordinarily devoted to their study might more profitably be bestowed on other subjects. For all etymological and technical uses, one-half the time usually given to Greek and Latin in the curriculum would suffice. Why not one or two books of Herodotus or Livy, or Thucydides or Tacitus, as well as half a dozen? The style of the author will be sufficiently impressed and the inducement to further private reading presented. For those, however, who manifest a special taste for the language and literature of Greece and Rome, a special post-graduate course should be provided. Two years devoted to the classics exclusively may be as fully warranted as two years devoted to mechanical or mining engineering. Parts of some other branches now included in a general course could also, I presume, be transferred with propriety to the technical courses. That three years is considered practicable for a general course is, I think, demonstrated by the fact that the authorities of Harvard College are said to be considering the adoption of a three years' course as leading to the degree of A.B. in that institution. Such a scheme would, I think, have manifest advantages. Its adoption would mark the true university.

It is undeniable that many boys enter college with no well-defined purpose as to their future. Neither they nor their parents know for what calling they are best adapted. A three years' general course, whilst giving them a broad and comprehensive culture, would

better enable them to judge what profession or calling to adopt, and would bring them to an age of superior discretion, when their choice could more intelligently be made. The example and the influence of the engineering or special courses, of which by contact and contiguity they gain some knowledge, would greatly facilitate such choice. During the three years' general course the student would have constantly before him the suggestion and the purpose of acquiring a technical training, and would be less likely to be satisfied with the degree of A.B. alone.

Another advantage of the scheme, incidental but most desirable, in my judgment, would be the opportunity for practical work which might be interjected between the general and the technical courses. At the end of the three years' general course let the student spend a year in actual business or work. Employment in the line of his future profession would be preferable, but failing that, any business experience would be beneficial. To illustrate this, take the case of an intending mechanical engineer. At the end of the three years' course the university might give and encourage a year's leave of absence, during which period the young man might find employment in a machine shop or factory and obtain some practical training in the use of tools and machinery. Much could be accomplished even in that brief time, and I venture to assert that there are many manufacturers in the United States who would heartily co-operate in such a scheme. The young man, after a year or fifteen months of practical work, would enter upon the scientific studies in mechanical engineering with a higher appreciation of their value, with a more intelligent comprehension of their application, and with greater

ability to assimilate the theoretical principles of the text-books. It is a well-known fact that the best draughtsmen (and I use the term not for mere copyists, but for designers) are those who have had shop practice. They have learned what tools can do, and by what process results can be reached most economically and effectively. I need not extend the illustration. You will at once apply it to the case of the civil engineer, the engineer of mines, the chemist, and the architect.

The young man who has thus taken the complete course of five or six years will, when he finally receives his engineering degree, be entitled to stand as a thoroughly educated engineer. His culture will have been broad and liberal. He will be equipped for the highest citizenship, and can stand as a peer of any in the community. There are few professions where the widest knowledge can more fully be utilized than in that of the engineer. No man, whatever his calling, can know too much. He will find use in the most unexpected manner for attainments apparently foreign to his pursuits. The engineer, of all men, must be a practical man, a man of business. He must be able to write concisely and vigorously. If he possesses the faculty of a public speaker, it will come in play. His knowledge of business forms and methods should be complete and exact. He should be a bookkeeper, a banker, a manufacturer, a merchant. Something at least in all these pursuits may fall to his lot in the varied conditions of his professional life. All these attainments, and more, can be utilized if he is to fulfil the definition of an engineer which I have already quoted, as one capable of "directing the great sources of power in nature for the use and convenience of man."

The young man successfully completing such a course as I have outlined has not only the liberal education which makes the man, but has also a profession or calling at his command. Uncertainty as to his future is measurably removed. He is ready to enter at once upon his life work. The contrast is marked between his case and that of the newly graduated Bachelor of Arts of a classical or literary curriculum. The latter finds himself, not infrequently, not only with no equipment for a life work, but uncertain as to what to undertake. In many cases he is at a disadvantage compared with the boy of seventeen who has had less education but more practical experience. But the graduate of the ideal university which I have attempted to picture will be at no such disadvantage. He will be ready to take his place as a useful member of society and faithfully to discharge the duties involved in the truest citizenship.

One other advantage of such a course may be particularly emphasized. In such a five or six years' course the student will, in most cases, have before him a definite object and purpose. His studies will be pursued more intelligently and more effectively. Graduation will find him with a profession or calling enabling him at once to begin his life work. The Hebrews of old were wise in requiring every young man to learn a trade. Our educational system to-day should not prevent, but rather promote, a similar policy.

In conclusion permit me to emphasize one thought. Complete as will be the education of the engineer, as the result of the system which I have outlined, it will not be all that will be required in actual business.

The education will, it is true, be an effective imple-

ment, but its owner will still have to learn its use. The interests of manufacturing and commerce have little respect for the dignity of science. Their motto is that "nothing succeeds but success." The practical man, who knows thoroughly a few things, is considered superior to the theorist, who has a partial knowledge of a variety of subjects. The graduate must, therefore, be ready to subordinate his training to the necessities of business. He will, undoubtedly, in good time, find ample opportunity to use all his acquirements; but he must be content, in entering on his work, to accept conditions as he finds them, and to wait patiently for an opportunity to utilize his knowledge. There is one term too commonly used which is mischievous in its influence. We hear of a young man seeking a "position" in a business. It is not "position," but opportunity of usefulness that should be sought. Faithful and intelligent service will generally secure recognition in the long run. A young man of my acquaintance, who had completed his course as an electrical engineer, sought employment with the Westinghouse Electrical Company. The first work to which he was assigned consisted in trueing up by hand the plates of an armature and covering it with asbestos, a process which, perhaps, could have been as well done by an ordinary laborer. The manager grimly remarked that such a job was what they usually assigned to college graduates. The young man accepted the task without a murmur, and in no long time was promoted to more important and congenial duties. Another case within my knowledge is that of a young man who had received his degree as a mining engineer. He learned that a certain smelting works in one of the Western States had applied to the President of his in-



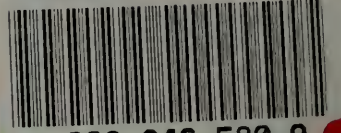
stitution for some one to serve as helper in the assay department. The salary was inconsiderable, but the place was accepted, and within one year he had been promoted by successive steps until he was offered an engagement as manager of the works.

One more instance will suffice. At the commencement exercises of 1895 of my own Alma Mater, a young man, just graduated as a mechanical engineer, applied to me for employment. It was arranged, and, on September 1, he reported for duty and was assigned to work in running a shaping machine in a night gang. Several promotions were secured in a reasonable time, and, in May last, an application, which was received from the Government of the United States of Colombia for a principal instructor in a mechanical school in that country was filled by the nomination, by his employers, of the young man referred to. I have every reason to believe that he is satisfactorily and successfully discharging the duties assigned him.

As a general proposition, then, it may be said that the demand in business is for men who can accomplish specific results. Any opportunity of service, if in the right direction and patiently and faithfully utilized, has in it the promise of a successful and useful career. Add the broad, complete and symmetrical training which it is the function of the university to give, and the result may be not only individual prosperity, but true citizenship.



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