SCIENCE

FRIDAY, OCTOBER 15, 1909

CONTENTS

MSS. intended for publication and books, etc., intended for review should be sent to the Editor of SCIENCE, Garrison-on-Hudson, N. Y.

INAUGURAL ADDRESS OF THE PRESIDENT OF HARVARD UNIVERSITY[1]

AMONG his other wise sayings Aristotle remarked that man is by nature a social animal; and it is in order to develop his powers as a social being that American colleges exist. The object of the undergraduate department is not to produce hermits, each imprisoned in the cell of his own intellectual pursuits, but men fitted to take their places in the community and live in contact with their fellow men.

The college of the old type possessed a solidarity which enabled it to fulfil that purpose well enough in its time, although on a narrower scale and a lower plane than we aspire to at the present day. It was so small that the students were all well acquainted with one another, or at least with their classmates. They were constantly thrown together, in chapel, in the classroom, in the dining hall, in the college dormitories, in their simple forms of recreation, and they were constantly measuring themselves by one standard in their common occupations. The curriculum, consisting mainly of the classics, with a little mathematics, philosophy, and history, was the same for them all; designed, as it was, not only as a preparation for the professions of the ministry and the law, but also as the universal foundation of liberal education.

In the course of time these simple methods were outgrown. President Eliot pointed out with unanswerable force that the field of human knowledge had long

[1] Given by Dr. A. Lawrence Lowell on October 6. Reprinted from the Boston Evening *Transcript*.

been too vast for any man to compass; and that now subjects must be admitted to the scheme of instruction, which became thereby so large that no student could follow it all. Before the end of the nineteenth century this was generally recognized, and election in some form was introduced into all our colleges. But the new methods brought a divergence in the courses of study pursued by individual students, an intellectual isolation, which broke down the old solidarity. In the larger institutions the process has been hastened by the great increase in numbers, and in many cases by an abandonment of the policy of housing the bulk of the students in college dormitories; with the result that college life has shown a marked tendency to disintegrate, both intellectually and socially.

To that disintegration the overshadowing interests in athletic games appears to be partly due. I believe strongly in the physical and moral value of athletic sports, and of intercollegiate contests conducted in a spirit of generous rivalry; and I do not believe that their exaggerated prominence at the present day is to be attributed to a conviction on the part of the undergraduates, or of the public, that physical is more valuable than mental force. It is due rather to the fact that such contests offer to students the one common interest, the only striking occasion for a display of college solidarity.

If the changes wrought in the college have weakened the old solidarity and unity of aim, they have let in light and air. They have given us a freedom of movement needed for further progress. May we not say of the extreme elective system what Edmond Sherer said of democracy: that it is but one stage in an irresistible march toward an unknown goal. Progress means change, and every time of growth is a transitional era; but in a peculiar degree the present state of the American college bears the marks of a period of transition. This is seen in the comparatively small estimation in which high proficiency in college studies is held, both by undergraduates and by the public at large; for if college education were closely adapted to the needs of the community, excellence of achievement therein ought to be generally recognized as of great value. The transitional nature of existing conditions is seen again in the absence, among instructors as well as students, of fixed principles by which the choice of courses of study ought to be guided. It is seen, more markedly still, in the lack of any accepted view of the ultimate object of a college education.

On this last subject the ears of the college world have of late been assailed by many discordant voices, all of them earnest, most of them well-informed, and speaking in every case with a tone of confidence in the possession of the true solution. One theory, often broached, under different forms, and more or less logically held, is that the main object of the college should be to prepare for the study of a definite profession, or the practise of a distinct occupation; and that the subjects pursued should, for the most part, be such as will furnish the knowledge immediately useful for that end. But if so, would it not be better to transfer all instruction of this kind to the professional schools, reducing the age of entrance thereto, and leaving the general studies for a college course of diminished length, or perhaps surrendering them altogether to the secondary schools? If we accept the professional object of college education, there is much to be said for a readjustment of that nature, because we all know the comparative disadvantage under which technical instruction is given in college, and we are not less aware of

the great difficulty of teaching cultural and vocational subjects at the same time. The logical result of the policy would be that of Germany, where the university is in effect a collection of professional schools, and the underlying general education is given in the gymnasium. Such a course has, indeed, been suggested, for it has been proposed to transfer so far as possible to the secondary schools the first two years of college instruction, and to make the essential work of the university professional in character. But that requires a far higher and better type of secondary school than we possess, or are likely to possess for many years. Moreover, excellent as the German system is for Germany, it is not wholly suited to our republic, which can not, in my opinion, afford to lose the substantial, if intangible, benefits the nation has derived from its colleges. Surely the college can give a freedom of thought, a breadth of outlook, a training for citizenship, which neither the secondary nor the professional school in this country can equal.

Even persons who do not share this view of a professional aim have often urged that in order to save college education in the conditions that confront us we must reduce its length. May we not feel that the most vital measure for saving the college is not to shorten its duration, but to insure that it shall be worth saving? Institutions are rarely murdered; they meet their end by suicide. They are not strangled by their natural environment while vigorous; they die because they have outlived their usefulness, or fail to do the work that the world wants done; and we are justified in believing that the college of the future has a great work to do for the American people.

If, then, the college is passing through a transitional period, and is not to be absorbed between the secondary school on the one side and the professional school on the other, we must construct a new solidarity to replace that which is gone. The task before us is to frame a system which, without sacrificing individual variation too much, or neglecting the pursuit of different scholarly interests, shall produce an intellectual and social cohesion, at least among large groups of students, and points of contact among them all. This task is not confined to any one college, although more urgent in the case of those that have grown the largest and have been moving most rapidly. A number of colleges are feeling their way toward a more definite structure, and since the problem before them is in many cases essentially the same, it is fortunate that they are assisting one another by approaching it from somewhat different directions. What I have to say upon the subject here is, therefore, intended mainly for the conditions we are called upon to face at Harvard.

It is worth our while to consider the nature of an ideal college as an integral part of our university; ideal, not in the sense of something to be exactly reproduced, but of a type to which we should conform as closely as circumstances will permit. It would contemplate the highest development of the individual student—which involves the best equipment of the graduate. It would contemplate also the proper connection of the college with the professional schools; and it would adjust the relation of the students to one another. Let me take up these matters briefly in their order.

The individual student ought clearly to be developed so far as possible, both in his strong and in his weak points, for the college ought to produce, not defective specialists, but men intellectually well rounded, of wide sympathies and unfettered judgment. At the same time they ought to be trained to hard and accurate thought, and

this will not come merely by surveying the elementary principles of many subjects. It requires a mastery of something, acquired by continuous application. Every student ought to know in some subject what the ultimate sources of opinion are, and how they are handled by those who profess it. Only in this way is he likely to gain the solidity of thought that begets sound thinking. In short, he ought, so far as in him lies, to be both broad and profound.

In speaking of the training of the student, or the equipment of the graduate, we are prone to think of the knowledge acquired; but are we not inclined to lay too much stress upon knowledge alone? Taken by itself it is a part, and not the most vital part, of education. Surely the essence of a liberal education consists in an attitude of mind, a familiarity with methods of thought, an ability to use information rather than a memory stocked with facts, however valuable such a storehouse may be. In his farewell address to the alumni of Dartmouth, President Tucker remarked that "the college is in the educational system to represent the spirit of amateur scholarship. College students are amateurs, not professionals." Or, as President Hadley is fond of putting it: "The ideal college education seems to me to be one where a student learns things that he is not going to use in after life, by methods that he is going to use. The former element gives the breadth, the latter element gives the training."

But if this be true, no method of ascertaining truth, and therefore no department of human thought, ought to be wholly a sealed book to an educated man. It has been truly said that few men are capable of learning a new subject after the period of youth has passed, and hence the graduate ought to be so equipped that he can grasp effectively any problem with which his duties or his interest may impel him to deal. An undergraduate, addicted mainly to the classics, recently spoke to his adviser in an apologetic tone of having elected a course in natural science, which he feared was narrowing. Such a state of mind is certainly deplorable, for in the present age some knowledge of the laws of nature is an essential part of the mental outfit which no cultivated man should lack. He need not know much, but he ought to know enough to learn more. To him the forces of nature ought not to be an occult mystery, but a chain of causes and effects with which, if not wholly familiar, he can at least claim acquaintance; and the same principle applies to every other leading branch of knowledge.

I speak of the equipment, rather than the education, of a college graduate, because, as we are often reminded, his education ought to cease only with his life, and hence his equipment ought to lay a strong foundation for that education. It ought to teach him what it means to master a subject, and it ought to enable him to seize and retain information of every kind from that unending stream that flows past every man who has the eyes to see it. Moreover, it ought to be such that he is capable of turning his mind effectively to direct preparation for his life work, whatever the profession or occupation he may select.

This brings us to the relation of the college to the professional school. If every college graduate ought to be equipped to enter any professional school, as the abiturient of a German gymnasium is qualified to study under any of the faculties of the university, then it would seem that the professional schools ought to be so ordered that they are adapted to receive him. But let us not be dogmatic in this

matter for it is one on which great divergence of opinion exists. The instructors in the various professional schools are by no means of one mind in regard to it, and their views are of course based largely upon experience. Our law school lays great stress upon native ability and scholarly aptitude, and comparatively little upon the particular branches of learning a student has pursued in college. Any young man who has brains and has learned to use them can master the law, whatever his intellectual interest may have been; and the same thing is true of the curriculum in the divinity school. Many professors of medicine, on the other hand, feel strongly that a student should enter their school with at least a rudimentary knowledge of those sciences, like chemistry, biology and physiology, which are interwoven with medical studies; and they appear to attach greater weight to this than to his natural capacity or general attainments. Now that we have established graduate schools of engineering and business administration, we must examine this question carefully in the immediate future. If the college courses are strictly untechnical, the requirement of a small number of electives in certain subjects, as a condition for entering a graduate professional school, is not inconsistent with a liberal education. But I will acknowledge a prejudice that for a man who is destined to reach the top of his profession a broad education, and a firm grasp of some subject lying outside of his vocation, is a vast advantage; and we must not forget that in substantially confining the professional schools at Harvard to college graduates we are aiming at the higher strata in the professions.

The last of the aspects under which I proposed to consider the college is that of the relation of undergraduates to one another; and first on the intellectual side. We have heard much of the benefit obtained merely by breathing the college atmosphere, or rubbing against the college walls. I fear the walls about us have little of the virtue of Aladdin's lamp when rubbed. What we mean is that daily association with other young men whose minds are alert is in itself a large part of a liberal education. But to what extent do undergraduates talk over things intellectual, and especially matters brought before them by their courses of study? It is the ambition of every earnest teacher so to stimulate his pupils that they will discuss outside the class-room the problems he has presented to them. The students in the law school talk law interminably. They take a fierce pleasure in debating legal points in season and out. This is not wholly with a prospect of bread and butter in the years to come; nor because law is intrinsically more interesting than other things. Much must no doubt be ascribed to the skill of the faculty of the law school in awakening a keen competitive delight in solving legal problems; but there is also the vital fact that all these young men are tilling the same field. They have their stock of knowledge in common. Seeds cast by one of them fall into a congenial soil, and like dragon's teeth engender an immediate combat.

Now no sensible man would propose today to set up a fixed curriculum in order that all undergraduates might be joint tenants of the same scholastic property; but the intellectual estrangement need not be so wide as it is. There is no greater pleasure in mature life than hearing a specialist talk, if one has knowledge enough of the subject to understand him, and that is one of the things an educated man ought so far as possible to possess. Might there not be more points of intellectual contact among the undergraduates,

and might not considerable numbers of them have much in common?

A discussion of the ideal college training from these three different aspects, the highest development of the individual student, the proper relation of the college to the professional school, the relation of the students to one another, would appear to lead in each case to the same conclusion; that the best type of liberal education in our complex modern world aims at producing men who know a little of everything and something well. Nor, if this be taken in a rational, rather than an extreme, sense, is it impossible to achieve within the limits of college life? That a student of ability can learn one subject well is shown by the experience of Oxford and Cambridge. The educational problems arising from the extension of human knowledge are not confined to this country; and our institutions of higher learning were not the first to seek a solution for them in some form of election on the part of the student. It is almost exactly a hundred years ago that the English universities began to award honors upon examination in special subjects; for although the mathematical tripos at Cambridge was instituted sixty years earlier, the modern system of honor schools, which has stimulated a vast amount of competitive activity among undergraduates, may be said to date from the establishment of the examinations in Literis Humanioribus and in mathematics and physics at Oxford in 1807. The most popular of the subjects in which honors are awarded are not technical, that is, they are not intended primarily as part of a professional training; nor are they narrow in their scope; but they are in general confined to one field. In short they are designed to ensure that the candidate knows something well; that he has worked hard and intelligently on one subject until he has a substantial grounding in it.

For us this alone would not be enough, because our preparatory schools do not give the same training as the English, and because the whole structure of English society is very different from ours. American college students ought also to study a little of everything, for if not there is no certainty that they will be broadly cultivated, especially in view of the omnipresent impulse in the community driving them to devote their chief attention to the subjects bearing upon their future career. The wise policy for them would appear to be that of devoting a considerable portion of their time to some one subject, and taking in addition a number of general courses in wholly unrelated fields. But instruction that imparts a little knowledge of everything is more difficult to provide well than any other. To furnish it there ought to be in every considerable field a general course, designed to give to men who do not intend to pursue the subject farther a comprehension of its underlying principles or methods of thought; and this is by no means the same thing as an introductory course, although the two can often be effectively combined. A serious obstacle lies in the fact that many professors, who have reaped fame, prefer to teach advanced courses, and recoil from elementary instruction—an aversion inherited from the time when scholars of international reputation were called upon to waste their powers on the drudgery of drilling beginners. But while nothing can ever take the place of the great teacher, it is nevertheless true that almost any man possessed of the requisite knowledge can at least impart it to students who have already made notable progress in the subject; whereas effective instruction in fundamental principles requires men of mature mind who can see the forest over the tops of the trees. It demands unusual clearness of thought, force of statement and enthusiasm of expression. These qualities

have no necessary connection with creative imagination, but they are more common among men who have achieved some measure of success; and what is not less to the point, the students ascribe them more readily to a man whose position is recognized, than to a young instructor who has not yet won his spurs. Wherever possible, therefore, the general course ought to be under the charge of one of the leading men in the department, and his teaching ought to be supplemented by instruction, discussion and constant examination in smaller groups, conducted by younger men well equipped for their work. Such a policy brings the student, at the gateway of a subject, into contact with strong and ripe minds, while it saves the professor from needless drudgery. It has been pursued at Harvard for a number of years, but it can be carried out even more completely.

We have considered the intellectual relation of the students to one another and its bearing on the curriculum, but that is not the only side of college life. The social relations of the undergraduates among themselves are quite as important; and here again we may observe forces at work which tend to break up the old college solidarity. The boy comes here sometimes from a large school, with many friends, sometimes from a great distance almost alone. He is plunged at once into a life wholly strange to him, amid a crowd so large that he can not claim acquaintance with its members. Unless endowed with an uncommon temperament, he is liable to fall into a clique of associates with antecedents and characteristics similar to his own; or perhaps, if shy and unknown, he fails to make friends at all; and in either case he misses the broadening influence of contact with a great variety of other young men. Under such conditions the college itself comes short of its national mission of throwing together youths of promise of every kind from every part of the country. It will, no doubt, be argued that a university must reflect the state of the world about it; and that the tendency of the time is toward specialization of functions, and social segregation on the basis of wealth. But this is not wholly true, because there is happily in the country a tendency also toward social solidarity and social service. A still more conclusive answer is that one object of a university is to counteract, rather than copy the defects in the civilization of the day. Would a prevalence of spoils, favoritism or corruption in the politics of the country be a reason for their adoption by universities?

A large college ought to give its students a wide horizon, and it fails therein unless it mixes them together so thoroughly that the friendships they form are based on natural affinities, rather than similarity of origin. Now these ties are formed most rapidly at the threshold of college life, and the set in which a man shall move is mainly determined in his freshman year. It is obviously desirable, therefore, that the freshmen should be thrown together more than they are now.

Moreover, the change from the life of school to that of college is too abrupt at the present day. Taken gradually, liberty is a powerful stimulant; but taken suddenly in large doses, it is liable to act as an intoxicant or an opiate. No doubt every boy ought to learn to paddle his own canoe; but we do not begin the process by tossing him into a canoe, and setting him adrift in deep water, with a caution that he would do well to look for the paddle. Many a well-intentioned youth comes to college, enjoys innocently enough the pleasures of freedom for a season, but released from the discipline to which he has been accustomed, and looking on the examinations as remote, falls into indolent habits. Presently he finds himself on probation for neglect of

his studies. He has become submerged, and has a hard, perhaps unsuccessful, struggle to get his head above water. Of late years we have improved the diligence of freshmen by frequent tests; but this alone is not enough. In his luminous Phi Beta Kappa oration, delivered here three months ago, President Wilson dwelt upon the chasm that has opened between college studies and college life. The instructors believe that the object of the college is study, many students fancy that it is mainly enjoyment, and the confusion of aims breeds irretrievable waste of opportunity. The undergraduate should be led to feel from the moment of his arrival that college life is a serious and many-sided thing, whereof mental discipline is a vital part.

It would seem that all these difficulties could be much lessened if the freshmen were brought together in a group of dormitories and dining halls, under the comradeship of older men, who appreciated the possibilities of college life, and took a keen interest in their work and their pleasures. Such a plan would enable us also to recruit our students younger, for the present age of entrance here appears to be due less to the difficulty of preparing for the examination earlier, than to the nature of the life the freshman leads. Complaints of the age of graduation cause a pressure to reduce the length of the college course, and with it the standard of the college degree. There would seem to be no intrinsic reason that our school boys should be more backward than those of other civilized countries, any more than that our undergraduates should esteem excellence in scholarship less highly than do the men in English universities.

The last point is one that requires a word of comment, because it touches the most painful defect in the American college at the present time. President Pritchett has declared that "it is a serious indictment of the standards of any organization when the conditions within it are such that success in the things for which the organization stands no longer appeal effectively to the imaginations of those in it." We may add that, even in these days, indictment is sometimes followed by sentence and execution. No one will deny that in our colleges high scholarship is little admired now, either by the undergraduates or by the public. We do not make our students enjoy the sense of power that flows from mastery of a difficult subject, and on a higher plane we do not make them feel the romance of scholarly exploration. Every one follows the travels of a Columbus or a Livingston with a keen delight which researches in chemistry or biology rarely stir. The mass of mankind can, no doubt, comprehend more readily geographical than scientific discovery, but for the explorer himself it would be pitiful if the joy of the search depended on the number of spectators, rather than on zeal in his quest.

America has not yet contributed her share to scholarly creation, and the fault lies in part at the doors of our universities. They do not strive enough in the impressionable years of early manhood to stimulate intellectual appetite and ambition; nor do they foster productive scholarship enough among those members of their staffs who are capable thereof. Too often a professor of original power explains to docile pupils the process of mining intellectual gold, without seeking nuggets himself, or when found showing them to mankind. Productive scholarship is the shyest of all flowers. It cometh not with observation, and may not bloom even under the most careful nurture. American universities must do their utmost to cultivate it; by planting the best seed, letting the sun shine upon it, and taking care that in our land of rank growth it is not choked by the thorns of administrative routine.

If I have dwelt upon only a small part of the problems of the university; if I have said nothing of the professional and graduate schools, of the library, the observatory, the laboratories, the museums, the gardens, and the various forms of extension work, it is not because they are of less importance, but because the time is too short to take up more than two or three pressing questions of general interest. The university touches the community at many points, and as time goes on it ought to serve the public through ever increasing channels. But all its activities are more or less connected with, and most of them are based upon, the college. It is there that the character ought to be shaped, that aspirations ought to be formed, that citizens ought to be trained, and scholarly tastes implanted. If the mass of undergraduates could be brought to respect, nay, to admire, intellectual achievement on the part of their comrades, in at all the measure that they do athletic victory; if those among them of natural ability could be led to put forth their strength on the objects which the college is supposed to represent; the professional schools would find their tasks lightened, and their success enhanced. A greater solidarity in college, more earnestness of purpose and intellectual enthusiasm, would mean much for our nation. It is said that if the temperature of the ocean were raised the water would expand until the floods covered the dry land; and if we can increase the intellectual ambition of college students the whole face of our country will be changed. When the young men shall see visions the dreams of old men will come true.

INAUGURAL ADDRESS OF THE PRESIDENT OF DARTMOUTH COLLEGE[1]

THE past sixteen years have been and ever will be notable years in the history of Dartmouth College. In that time the number of students has all but quadrupled; and the material equipment of the college has expanded in proportion. The college has added to its libraries, built laboratories for its scientific departments and modern dormitories for its students. Its teaching staff has grown in size and advanced in quality. In every direction its growth has been rapid and great, but at the same time normal and balanced. The student body has changed in more ways than mere numbers, for if we believe with William Wyckham, "that manners maketh man" and to a very considerable extent they undoubtedly do, Dartmouth is not only graduating more, but a better average of men than in earlier times. Dartmouth's development in these years has been due in an extraordinary degree to the work of a single leader, and that leader is Doctor Tucker. His winning, alert and earnest personality, his wisdom, foresight and daring, his moral and physical energy, have carried the college forward over many obstacles which to others, at the time, seemed insuperable, and so they would have been under other leadership. The college has been truly blest with an intrepid and farsighted pilot, who has brought her safely over rough seas and through some narrow and dangerous channels. The college, the state and the nation have just reason to take pride in Doctor Tucker's great achievement.

That grave problems still face the college is but evidence that Dartmouth is thoroughly alive, for in death only are all problems solved. It is not, however, of Dartmouth's individual problems that I wish to speak to-day—I am not yet sure I know them all. I want rather to speak of some of the problems common to all our American colleges, and ask per-

[1] Given by Dr. Ernest Fox Nichols on October 14.