On professional education, with special reference to medicine : an address delivered at King's College, London on October 3, 1905 / by T. Clifford Allbutt.

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ON PROFESSIONAL EDUCATION

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LITTRÉ.

ON

PROFESSIONAL EDUCATION

WITH SPECIAL REFERENCE TO MEDICINE

AN ADDRESS

DELIVERED AT KING'S COLLEGE, LONDON

ON OCTOBER 3, 1905

BY

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HON. D.SC. OXON., ETC. ETC.

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PREFACE

THE request for the publication of this Address is so general that I trust it may prove on reflection to be not unworthy of its great theme. I have ventured to publish the whole of the manuscript, of which about two-thirds was delivered.

My thanks are due to the editors of the *Lancet* and of the *British Medical Journal* for their excellent reports, of which I have ventured to avail myself. I am indebted also for valuable information to the columns of these and other professional journals of various dates, and finally to Dr. Squire Sprigge for his book on *Medicine and the Public* (Heinemann, 1905), which indeed was published after the date of my Address at King's College, but is based upon his thesis for the degree of M.D. at Cambridge, of which I had official cognisance.

As these sheets are finished for the press, we are all bereaved of a leader in University and State education, and of a great personal teacher; not a few of us of a dear friend. I have now learned that Sir Richard Jebb addressed the British

Association in South Africa on the subject which was occupying our thoughts about the same time at King's College. If my argument, however imperfectly, be in concord with his (I have not yet seen his Address even in abstract) I shall be grateful,—grateful to be a humble servant in a cause in which he was so illustrious a master. Had he lived he would have read my words with indulgence; I dare not dedicate so slight an offering to his memory.

T. C. A.

CAMBRIDGE, *December* 11, 1905.

ON PROFESSIONAL EDUCATION[1]

GENTLEMEN—When the distinguished invitation of your Medical Board to open this session was conveyed to me, my responsibility was lightened by a proposal of the subject of my address—namely, Medical Education in London. London, like every other great centre of education, has its own problems and its own difficulties, but these problems and these difficulties cannot be solved without the illumination of the principles which are true for education everywhere and always. If in England these principles are little heeded by the public, and if accordingly secondary education in England is in grievous defect, it is not for want of preaching. From Matthew Arnold and Michael Sadler to the humble empiric who ventures into the pulpit to-day, of preachers there has been no lack. If I am qualified to deal with the subject yet again, it is that all my adult life I have been engaged in teaching, in centres so different as Leeds and Cambridge, and ought from such conflict of conditions to have

[1] An Address delivered at King's College Hospital, under the title of "Medical Education in London," on October 3, 1905, the opening of the Medical Session.

harvested some wisdom. If without the added dignity of my office I should scarcely dare to address you, on the other hand I must beware lest I give an official colour to my opinions, lest I seem to engage my University in doctrines which it may have no mind to. *Cucullus non facit monachum;* whatsoever then may be inconveniently said by the professor pray write down quickly to the account of the individual. This at least I may plead, that I will say nothing lightly; my convictions are not of yesterday.

EDUCATION AND INSTRUCTION.—Education, as contrasted with instruction, is a drawing forth of faculties, a quickening, enlarging, and refining of them when brought out, and an establishment of them in habits; so that virtue and reason become easy and pleasant to us. The word is used of mind rather than of morals, or of the powers of the body; but by mind we signify both intellect and imagination, and their issue in right action. The more complex the organism can become the more stable it will be, the more it will be in touch with outward contingencies; the more it can use and modify these conditions, the more will be the play at the periphery of the organism, the more, in a word, the life. Education, then, is not the formation of a rigid framework, but of a capacity for ideas and for various and supple adaptations. But, speaking generally, and within civil societies, individuals vary more than circumstances, in other words, out of similar circumstances individuals draw widely different advantages; so that

although up to a certain period of life education may be laid out on broad indiscriminate lines proper for all young persons, yet for adolescents by rapid degrees it must become more and more diverse and several, dividing itself into the education of classes, of groups, and of individuals. Now, such specific or technical educations are difficult only in the sense of the difficulty of persuading the English parent of the value of any education whatever; the ends and the methods are pretty clearly seen; the means it is which are wanting, the means of money, of equipment, and of time, which is money, and the provision and endowment of those engines for making knowledge, called universities, without which sources the technical colleges would soon dry up.

The problem of education in modern England is that of general schooling, of ascertaining the modes which shall prove most valuable to put each person during his youth in touch with the sum of conditions under which he is to lead the best life possible to him; this done he may the more efficiently be adapted to specific or personal functions. Although these personal and specific conditions are never so narrow and so specific as to prevent some occupation with those wider conditions which were held in view during his general education, yet without a somewhat fuller sense of the sum of the conditions of life he cannot measure the relative values of things; he will, as we say, lack common sense. Now the larger and more copious the ideas the more difficult are they

to handle, the more difficult it is to order them in their relative values, that is to say, with "common sense," for this quality is the easier the meaner the range of thought. When the ideation is high some defect of common sense is readily forgiven. The importance of a universal training of the instrument of mind, before the adaptation of it to special engagements, will be better understood when we realise that truth is neither wholly without us nor wholly within us, but is a function of fact and temperament. Now temperament is partly native, but largely also the creature of habit, and habits—such as the habit of virtue and of comprehensive and precise thinking—are the creatures of education, and especially of education in the plastic years of life. Thus the man whose mind has been built up on universal lines, whatsoever his calling, is enabled to free himself from the conventions and temporary notions of the mere "practical man," to distinguish the important from the unimportant truths, and to drop swiftly upon cardinal features—upon the facts which matter.

SECONDARY EDUCATION.—Now—to begin with secondary education—to teach every boy everything is obviously impossible; the difficulty is so to select certain things from the whole of things as best to educe universal conceptions or ideas. That we have been successful in creating such a general education no one will be hardy enough to assert. From our public schools our young men derive many fine qualities. As Herodotus says of the Persian youths, they are

taught to ride and to speak the truth; and, indeed, when our country loses its manliness and its veracity it will lose all things. But these fine qualities do not meet the sum of conditions under which the Englishman has to live; he has to do more than to speak and to act with spirit and uprightness, and to read the sporting papers with intelligence. If he is to be equal to the conflict of modern life he must be able to reason both on man and on nature, to measure his own capacities, to read the hearts and habits of men, and to foresee the trend of natural laws. For these ends, besides energy and will, he must have a curiosity for knowledge, some intellectual seriousness and flexibility, some endurance of attention, some self-possession, and some ideas: qualities eminently in defect in the average products of our public schools.

That the seeds of these qualities are within us we may know by this that they are far more evident in young women, who do not go to public schools; and in the long run not brains only but morals also depend on these more generous features. Too many of our manly and honest young fellows fall into a good-natured, well-mannered selfishness; into acquiescence in common standards; into contentment with very scanty mental furniture. If, then, the public school does much for our boys, it is at the cost of certain virtues. The faults of which I have spoken depend in part on a weakening of the family life and of the family bond, with a consequent loss of much of the variety and many of the gentlenesses which are nurtured in the home, and with an

aggravation of caste distinctions. The American common schools, which do not break into the home, and which bring classes together, have in this respect a great advantage over our own. I think no "educationalist" has noted how much our public school system depends upon a foolish horror of dialects, an intolerance unknown in France and Germany. Even in our own kingdom the Scotch and the Irish tongues are acceptable; but in England for a father to permit his son to associate with the lads of his province so as to catch the dialect, of Yorkshire, let us say, or of Suffolk or Somersetshire, is, as things are, to consent to his social failure. A Frenchman and an Italian may drop *h*'s with impunity, but the English boy who does it will find advancement closed against him. In this respect our public schools thrive on a folly. With the outcry against athletics I have little sympathy: it is not the athletics which do harm, but the publicity and the noise of them. If the University Boat-race and the "Eton *v.* Harrow" cannot be helped, no other public school or university games should be the sport of the public.

The salient defect of the boy, as he leaves school, is his subservience to a wooden routine or convention which seems there to be perpetuated, and prolongs the imitative stage of childhood into early manhood. It is sad to see a lad with a frank, bright, affectionate habit—*un bon naturel*—falling under this awkward compound of self-distrust and self-consciousness, which is, I think, peculiar to the English youth, and generates a reserve which,

although consistent with modesty, is not modesty. Its nature is not easy to read, and the subjects of it are least able to read it; but it appears to be no chrysalid stage before a transformation, but the negative posture of minds deficient in ideas, and ungainly in the use of the few they have. It comes in great part, I think, of what we may call, as truly as paradoxically, the secluded life of the public school. The tendency of the units of all aggregates, if not animated and developed by external provocations, is towards the mean position; that is, in the public school, to the monotonous pattern of Smith major. By the crust of this custom the boy's initiative is palsied, his manners are embarrassed, and he has not moral courage to express himself frankly—'lest he give himself away' as he calls it, lest this precious convention, which he admires in Smith major, be disturbed; so he tries to put on a cloak of indifference in which he is absurdly untrue to himself. With the spirit of Greek he is as deeply imbued as with Chinese.[1] Now unhappily this frost

[1] After the return of the revise sheets of this tract to the printer that delightful book the *Upton Letters* came into my hands. I cannot forbear to despatch one short extract from it, though I am well aware how it puts my poor argument into the shade. Yet is there not in the last sentence a note of dispirited acquiescence, a want of vehement revolt, which makes one think perhaps we need other schoolmasters, and need them different? Or are the *Upton Letters* the ironical smile of a man about to spring?

"I declare that it makes me very sad sometimes to see these well-groomed, well-mannered, rational, manly boys all taking the same view of things, all doing the same things, smiling politely at the eccentricity of any one who finds matter for serious interest

sets in at the plastic age when mental expansion and freedom of thought and emotion are most precious, and in the shell of it the youth withdraws himself from the influence of men from whom he might be led to a wider outlook. In those who come under more generous and formative influences, as in a university for example, this shell begins to chip, in Cambridge usually by the end of the second year of residence; then, discovering his own mind and character, the unit becomes a person, and often a very interesting person, one no longer tired at the very notion of continuous thought. If, on the other hand, the youth passes into common society undisciplined by any such influences, as the reserve of the school cloister gets rubbed off, his scantiness in ideas, contentment in stereotyped phrases and purposes, and intolerance of all mental effort, intellectual or imaginative, lie exposed and untransformed. Thus but too often men reach the prime of life common-minded, incapable, and even intolerant of ideas, that is of large and

in books, in art, or music: all splendidly reticent about their inner thoughts, with a courteous respect for the formalities of religion, and the formalities of work: perfectly correct, perfectly complaisant, with no irregularities or angular preferences of their own, with no admiration for anything but athletic successes, and no contempt for anything except originality of ideas. They are so nice, so gentlemanly, so easy to get on with, and yet, in another region, they are so dull, so unimaginative, so narrow-minded. They cannot of course be all intellectual or cultivated, but they might be more tolerant, more just, more wise. They ought to be able to admire vigour and enthusiasm in every department instead of in one or two, and it is we who ought to make them feel so, and we have already too much to do."

systematic conceptions of present and coming events; and consequently are incurable empirics, and have no higher philosophy than that of muddling through.[1]

COMPULSORY GREEK.—It was mainly because of the dialectical and mechanical methods of it, and of its exclusiveness, that I joined those in Cambridge who opposed "Compulsory Greek," a liberal movement arrested once more, as the old story goes, by reactionary clergy. The current teaching of Greek and Latin is a parody of education; not only does it restrict the range of teacher and pupil, but the imaginations of both are stunted. Until they begin grammars—begin them, that is, without any apprehension of the language and ideas of which the grammars are arid abstractions—the bent of children is quick and real; but under this inculcation their imaginative conception of reality begins to wither, and its place is taken by formulas, rhetorical words and philological bones; their fancy is discouraged, and they discover that, after all, things are not interesting. As research keeps science-teaching alive, so classical training, if divorced from history, literature, and philosophy, must starve. That such teaching of Greek will be changed from within I see no sign; never in any age have reforms in education come from the schoolmaster, but from new conditions and demands in an enlightened society; the schoolmaster has always been not the reformer but the reformed. There is no state so perilous as that

[1] To "muddle" is to mop up effects without analysis, appreciation, and government of causes—to act, for example, as we are now doing with the "unemployed."

in which things seem good to us, and at present in England the schoolmaster is complacent, the public is indifferent.[1] In the sixteenth century the humanist, lacking in the historic sense, believed the literatures of Latin and Greek to contain all that could be useful to man in all departments of life; as the medievalist believed that the sources of knowledge were to be found not in origins but in disputations. Yet the medievalist, in his zealous search for a universal idea, a unifying cause, or a key to the world's secrets, aimed at a complete cultivation of all fields of knowledge; and in the early renaissance the classics were welcomed not so much as language and philology but as the sources of new ideas. Gradually, however, educational like ecclesiastical machinery closed in upon and stifled the spirit which created it. Now, by a curious inversion of things, the scientific study of facts is the lever by which liberal culture has been reawakened, and we are beginning to see that the ideas and methods of natural science, instead of being merely curious or commercial, are, if not the flower of education, at any rate the stem and branches. Though analysis can never be form, it is by scientific methods that the new power is entering into letters and philosophy; for as we observe fully and accurately we must soon begin to select, and then the imagination must conspire to suggest the directions in which truths may lie. As

[1] It is fair to add that in the Perse school at Cambridge Dr. Rouse seems to be creating a new method and awakening new interests in his classical pupils.

the poet must have his own organising intelligence, so the man of science must grow his own visions.

DEVELOPMENT OF IMAGINATION.—And yet in most schools, if not in all, far from an amalgamation of science and letters, these hemispheres of education are cleft asunder. The school is cleft into a "modern" and an antique (?) side: as if all education were not to be modern, as if there could be two essentially different ways of educating boys! I question if there are three headmasters in England who govern and inspire their "modern side," to say nothing of so co-ordinating letters and science that each shall supplement the other, and both unite in fertility. And on both "sides," while the memory is exercised, and the intellect somewhat called upon, the imagination, the centre of creative life, the source of great action, is left out in the cold.

One of the ablest of our headmasters said to me that if he were called upon to educate the imaginations of his boys he would scarcely know how to begin.[1] By some thoughtful men it is said that a contemplation of the "laws" of nature suffices to kindle and feed the imagination; that a study of gravitation, for example, of the theory of ions, or of natural selection, has this effect; an opinion which even in the adult I hesitate to support. The imaginative or making faculty of

[1] In his address to the Royal Society on November 30, 1905, Sir William Huggins lamented the failure of modern education to foster the sentiments of wonder and admiration. I ought here, however, to recall the admirable training of the young imagination by the plays at Bradfield College.

man is fed, not by abstractions or summaries of analytic processes attained by observation from the outside, but by images; not by watching things but by living in them. To be in love and to trace the psychology of lovers are in polar difference. Baudelaire touched the heart of the matter, if with imperfect truth, when he said, "It would be prodigious for a critic to become a poet, but it is impossible for a poet not to contain a critic." The greater the images—creations and deeds—the more intense the life in them, the stronger the imagination. A sense of natural order has its impressiveness, but scarcely makes the glory and dominion of the heavens as did the belief, chimera as it was, that stars bore in their orbits the fate of kings or of men unborn.

> Some consequence yet hanging in the stars
> Shall bitterly begin his fearful date.

By scientific analysis, it is true, we disintegrate the imperfect images of the past, such as those of astrology, and clear the ground for new ideas; but the laws thus discovered are not the new ideas: no theory of colours will make a Titian. By calling his ultimate analysis, his remotest abstraction, a synthesis, Spencer hoodwinked us all: such is the power of a word.

SPECIALISATION.—In the discussion of educational problems we hear much of the baneful effects of this process, and have worked ourselves up into an alarm about it. Yet is it not better that a young man should know something well, should realise what knowledge costs to get, and learn to look below

superficial plausibilities, than pride himself on acquirements, general enough no doubt, but general in their vagueness, shallowness, and inaccuracy?

Too often, indeed, with this rather ugly noun we console ourselves for our ignorance of some department of knowledge with which we find another person is conversant. Yet surely by what gate soever we enter into the kingdom of nature and man, by the East or by the West, by the North or by the South, her kingdom is boundless in domain, sensitive in every direction, and in riches inexhaustible. If then the "specialisation" be narrow the contraction is not in nature herself, but in the mind of teacher, or of pupil, or of both of them. A uniform development of all the faculties, as we have seen, can belong only to the earlier stages even of school life; the abilities of the older boy as he matures will, if he is worth much, betray a bias in one or more directions; and I am satisfied that if the two main coefficients of mind—the intellect and the imagination—are fostered, it proves best in the end to promote development in each person on the lines of his own nature.

To whip up the weaker faculties to keep pace with the stronger, hinders these and really forces the weaker to little ultimate purpose; whereas to promote a generous growth of the more powerful gifts of the individual mind so enlightens and animates the whole that subordinate faculties are drawn onward with the rest. Otherwise the march must be set at the rate of the slowest factors. In adolescence and at the university the same principles

hold good. A young man who in certain directions begins to feel his strength is encouraged; and by mastering the subject or subjects for which he is best adapted, he forms as he progresses truer and truer conceptions of what knowledge is, and what methods are; and will not fail by this measure to test and to call into play such other faculties he may possess. As I have already insisted—it is not so much *what* a man is taught as *how* he is taught it; but I will reiterate the compensatory truth which is most neglected, that there is one kind of "specialism" which to some men is ruinous, and is mischievous to all; namely, to cultivate apart either intellect or imagination. "Specialise" each as you please, but do not sunder them, nor neglect either of them.

THE POWER OF IDEAS.—When we declare, as continually we do, that reality and strength lie in facts, we deceive ourselves: the strong and the real are to be found in ideas and, to use the word of science, in theory. Until it is built into theory or idea a fact is of no more use than a brick—to be wasted on any passing stranger. By ideas it is that men lead, nations prosper, and dominions are established; by ideas dynasties are overthrown, nations convulsed, and peoples scattered; by them the tyranny of custom and the dogmas of schools are broken up; by them we interpret, we work, and we prophesy. But an idea is something far more than an intellectual abstraction; it is a growth and integration of racial experience, functioning through intellect and imagination together. In his desire that his mind should be "a clear, cold

logic-engine in smooth working order," Huxley was not perhaps wholly serious; at any rate he himself was a lively instance to the contrary. Temperance, order, lucidity, are precious conditions, but they are not creative. Into the creative process of making knowledge and purpose, imagination enters as well as intellect. Imagination may, it is true, be nurtured on fables and chimeras; yet even then, if in due time it be purged and braced by a strong understanding, it will be more potent as a source of creative energy than if it had been starved. The more the passion, the more it is under intellectual control and information, the more intimately the imagination and the intellect are fused together, and the more verifiable the ideals, the larger and the higher the practical efficacy. And yet the man in the street who acts by ideas, if by no means by the best at his service, ignorantly and ungratefully regards ideas with indifference, or even with aversion. To this subject I shall return under the head of "Standards."

Again, if progress consists in seeing beyond where we stand, it must consist not only in anticipation of new ideas, but also in timely apprehension of the passing of them, and a readiness to shed them—to shed them betimes, not catastrophically, but as a growing tree periodically sheds its leaves; otherwise we lose sight of their main form, we muddle on—for go we must, we get angry with any one but ourselves, and finding ourselves houseless know not how to rebuild, how to convert the old materials to new needs.

THE POWER OF SCIENCE. — On behalf of the part of science in education we men of science declare that we need not only a "criticism" of man and affairs, which we admit to be a chief end of knowledge and insight, but also a criticism of nature which, if not so final, is no less essential. We need it not merely to make nature our slave, and to prepare the ground for vaster and vaster aggregations of human societies, but also, and rather, to exercise ourselves in the rigid verification of facts, the incessant testing of axioms, and the continual discovery of "laws" which not only prove themselves as we go on, but also afford degrees by which further ascents are made possible. Thus research is its own organon. By virtue of the natural sciences only can this mental discipline be had; so that their study is not only an end in itself but also the means, and the only means, of providing canons for history, politics, and ethics. To these more complex studies—higher studies, if you will—the scientific habit of mind is essential; but it is a habit which the study of literature and even of philosophy alone cannot compass; so that for lack of it humanists and philosophers have too often spent themselves on chimeras: without it the criticism of man in the realms of his thought and imagination have been, not in the Middle Ages only, wayward, unreal, and perverse. With pardonable pride I may recall an early advocate of scientific methods in education in the person of my great-grandfather, John Allbutt, a successful schoolmaster in his day, who wrote a

primer for this purpose which had some vogue. I quote from the twelfth edition (1817): "I am convinced by experience that children might be taught much earlier than they are the elementary principles of many sciences if these were sufficiently simplified and divested of technical phrases, and these," he adds, "would give correct ideas of things with which men are daily conversant."

THE POWER OF THE HAND.—In my *Historical Relations of Medicine and Surgery*[1] I urged at length, and with illustrations from two thousand years of medical history, that we have always been prone, and not in universities only or chiefly, to forget that the temple of education cannot be built without hands. These subtle ministers are directed by the mind, but by the mind which they themselves have created; as in the state we are directed by the government we ourselves have established. So long as nerve and muscle are growing, the hand—and by the hand I now signify every instrumental limb of the body—seems to achieve a little more than the mental suggestion; it explores, and often in each new use or adventure discovers, a little wider range of function than the will had dictated. Of these gains of experience time after time conceptions are returned to the brain, and there registered in multiplications of structure; and thus, gradually from the beginning, by each successive function of such limbs—by practice as we say—both ability and capacity are tentatively

[1] The title of my Address on Inner Medicine at St. Louis in 1904. (Macmillan and Co.)

developed: — "and things outward do draw the inward quality after them." Thus the periphery or growing edge of the whole sphere of bodily function is the mind's workshop. Now by reading or hearing of things only, not making these tentative excursions, it seems certain that this development either does not occur, or occurs in very much less substance and degree. Here then the self-made man has an advantage; and if he has great abilities and comes just at a time when he is wanted, he goes to the front. But such men are rather improvised than made. Forgive me if I recall to you the well-known illustration of Aristotle (in the last chapter of the *Sophistici Elenchi*), where that teacher is condemned who, professing to shew how the feet may be comfortably covered, instead of shewing his pupil how to make shoes, presented him with a good stock of shoes ready-made. Thus a language, for instance, if it is to be a fundamental and comprehensive means of education, must be spoken as well as read, and, in the order of thought at any rate, spoken before it is read.

THE VALUE OF FORMULA.—Formulas and conventions are not by any means wholly for evil. They have their necessary and organic place in the order of progress; by them tradition is handed on in times of failing effort, steadfastness of purpose is assured, and in times of activity mental interference and regulation are economised. Thus by the delegation of duties of inferior range to subordinate centres the tension of conscious adaptation is relaxed; and new and unfamiliar

ideas are made handy for use. The danger begins when, instead of using these steps as a *πού στῶ* by which to rise higher and higher, we use them as easy-chairs; for the man who would crucify any new idea whatever, as a new idea, when he has come to rest in it will defend it as a fortress. Yet if life consists in continual new adaptations, surely in a stable society our prejudice should be, *prima facie*, not against the new but against the old.

MAINTENANCE OF STANDARDS.—Let me repeat that intellect and imagination though, like other attributes, very variously distributed to individuals, and in them very variously cultivated, in life are organically integrated; in psychological analysis only are they separable. Neither in art nor even in science can we say — here intellect ends and here imagination begins; or contrariwise. Of the conjugation of these parents all true and good work is born; without more or less self-conscious analysis and control creative impulse bombinates in the void; the "intellectuels," on the other hand, if such people there be, never did anything, not even for anarchy. The current phrase of "intellectuels ardents" or "zélés" is unmeaning; their energy is generated not of intellect but of passionate ideas. I have said that Huxley did not see how emasculated his own genius would have been had his desire been granted him, even in scientific concerns only, for a clear, cold logic-engine in smooth working order. That best part of memory, the memory of action, is largely imaginative; and its mansions are built up

by the hands. Whether in art or science, sobriety and wisdom consist, then, not in the banishment of ideas, nor even in their abatement or subjection, but in the edification and chastening of them. To be barren of ideas, of imagination, is to drift away from our proper selves, from our traditions, from our historical and developmental continuity; to drop into imitation, and to be reduced to picking up notions made in Germany.

Our ideation, therefore, must not only be awakened but also sustained, as our intellects are sustained; and ideation or imagination is sustained by the contemplation of standards, or, in physiological language, by the maintenance of the corresponding "conductive and reciprocative patterns" in the brain. As by converse with the well-bred we maintain good-breeding, so for the maintenance of the more exalted ideas we must occupy ourselves continually with great traditions, that is to say, with great standards. How difficult it is to keep a standard in the memory, whether of the works of others or of our own, is well known to every critic. A fine horseman once told me he never realised how bad a judge he was of a horse until one day when he found himself looking unawares at "Cremorne." Bol and Van der Helst are pre-eminent till we come into the presence of Rembrandt; or we think this painter or that worthy to rank with Reynolds or Watteau till we find ourselves in the National Gallery or at Hertford House, to repent at leisure. Again a fine copy prevails with us as a genuine work till the original and the copy are brought side by

side, as was done with the two "Conde de Olivares" at the Guildhall in 1901, and with the two "Rabbis" in a recent Rembrandt exhibition. And if this be so in the spheres to which I have alluded as illustrations, so it is with the great masters of prose or poetry, with great musicians, with great discoverers in science, and so forth; and thus it is that we should depend upon a classical education, in no pedantic or merely linguistic sense, but as a contemplation of masterpieces. If we cannot maintain, or but few of us, a perfect memory of standards, we learn at least "to approve the things that are excellent," to distrust our own judgment, and to get some abiding sense of what has been, and so may be, and ought to be. It is not the least of the advantages of the scientific element in education that the categorical consensus and continuity of this kind of research make a high standard easier to comprehend and to maintain. Thus we discern another function of universities, that they are not only engines for the advancement of knowledge civil and individual, two parts of one function, but also the stewards and ministers of standards—that is, of masterpieces in all kinds. A university is a "standardising institution."

Now an intimate conversation with masterpieces in science and art cannot well be attained without some attempt at any rate to make in the same kind; surely it cannot be attained by "driving students, in herds, past the monuments of genius and learning." To judge well of painting one must at least have handled the brush; the scalpel only

can make the anatomist; and he who has never stood at the wicket can be no great judge of cricket. And so with tongues; he who cannot speak a language, such as Latin, for instance, does not think in it, and so, in a sense, never intimately knows it. On the literary side of my own education I owe a greater debt to the practice of Latin verses than to any other single discipline; yet, yielding to clamour where we ought to resist, and resisting where we ought to yield, verse-making was slackened, and the practice of form and concision in composition fell away. Without development of the effector, if not *pari passu* at any rate in some approximate proportion, the receptor machinery cannot be completed.

Yet great traditions with their inspiration have their perils also. The problem in all ancient and picturesque foundations is to temper admiration of the past with hope and faith in the future; to realise that what has been done in any kind can never be so done again; that the old works cannot be reached and can scarcely be approached by copying them; and that the illumination of the past must be used to discover paths ever new. Happily we can meditate on masterpieces without fixing our eyes backwards: as did their creators so we likewise must press on to new interpretations, new conceptions; from our forerunners we must learn their prophetic vision, seeing in them the love of truth which prevailed over the fear of error and the shackles of conventions, and the method of discipline and renunciation by which we also, re-

presenting the large and vital lines of nature, nature which never halts and never forgets, may endeavour to rise above the reach of Time.

How great teachers, artists, and other masters of truth have chafed against the lack of standards in the people of their age, history tells us on every page. They are by nature before their generation; that is, they are mixing with men who are without the corresponding psychic organ, the "conductive patterns" in their brains to which I have referred. A few of the very greatest of them, such as Charles Darwin, have dwelt in serene assurance of the ripening of time: but most of them were fretted and torn by controversies which did indeed imply some ideals, if not their own; or were suffocated in the damp of indifference, which means none. If we hastily accuse such men—men such as the scholars of the sixteenth century—of abnormal sensitiveness, even of vanity and brag; and if we physicians, affronted by quackeries and pretence, are accused of fretfulness and spitefulness, may a gentler public judge them and us as jealous rather for the standards which it knows not, but which those scholars cherished and we cherish, than for personal ascendancy or adulation.

A statesman whom we hear always with admiration, seldom with dissent, speaking on a recent and eminent occasion, made certain comparisons between the old and the new universities, against which, however unwillingly, I must make some remonstrance. Lord Rosebery, addressing the London University on the 5th of October last, is reported as follows:—

"The University of London is a young university. It deals with comparatively new branches of learning. It deals with the practical and the concrete, rather than with the ancient and the abstract. In that respect there is a marked difference between it and those ancient universities to which some of us owe a loyal and filial allegiance which cannot be obliterated by any newer loyalty or allegiance. The newer universities must be content, and wisely content, with something which is not antiquity, and is not tradition, but may be more immediately useful and practical than either antiquity or tradition. We, placed in the largest community in the world, with our hands, so to speak, on the very heart of the Empire, living among new wants and new aspirations, meeting new needs and new acquirements, ready, as I hope, to face the exigencies of to-day and to-morrow, are the university of the future, though we cannot trace our antiquity back to the hoary past."

These counsels, as it appears to me, would disintegrate the best ideals of the higher education; would lead to degradation of the new and petrifaction of the old universities. We are told that the "ancient and abstract" is incongruous with the "practical and concrete"; that the new universities, by a wise renunciation of antiquity and tradition, must be content in a useful and practical life; that they are, however, the universities of the future, while the old, on the other hand, are to inspire loyal and filial allegiance by the sentiments of the past. This is to make one lay down the pen in

despair. If the Chancellor of the University of London says this, and counsels thus, what hope have we of the enlightenment of vulgar opinion? How can we hope to convince it that all education must be, not for the past and not for an elegant retirement, but for the present and the future, and all seats of learning therefore continually inseminated and renewed for this growth! A certain man of the future, if ever one there was—namely, Rudolf Virchow—said many profound things, but none more profound than this—"Alles wissenschaftliche Arbeiten ist ein litterarisches." Is not Lord Rosebery's contrast the false contrast of antique and modern "sides" springing out upon us in another guise? But it may be urged, if it is true that for boys there can be but one best education, whatever this may prove to be, for adults in a university a process of advancing differentiation must go on. This we must grant; yet if these methods are to be sound and useful, they must be taken not as superficial slices from the sphere of knowledge, or they will shrivel for want of inward nourishment, but as wedges or cones with their roots still in the core. The "immediately useful" or ephemeral is either such a film, here for an hour and spent in an hour, or is the growing edge of faculties which have their origin, development, and continual nourishment from the past, even from the remotest past, but which know not Time. Even the "immediately useful," if useful it be, has inevitably some content of the past; and if it is to thrive for future upon future, it must be by that assimilation of the past

which makes past present, and by a constant reference, deliberate or automatic, to the standards of all ages in one. The useful of to-day then, as it draws its deepest life from the bosom of the eternal mother, must itself be but a link from that life to the useful of to-morrow. So far as the new universities have these sources of life, they must draw them, directly or indirectly, from the store-houses of the past; and on every side we see that they are dependent for their teaching on the old universities, or on what these represent. If the love of these by their children have henceforth no deeper root than admiration of a gracious and picturesque matronhood—"the beauty of the grey head" with its gentle disillusions—their time is come; erelong they must be decently buried. But, happily, universities are not as men and women, to be cast into the oven; or, if all living things must die, their term will be infinitely long, unless, like some other dynasties, learning nothing and forgetting nothing, they are led to their death by the affection of sons who flatter them only with sentimental adorations. Between the ancient and the modern, then, there can be no sundering, without a petrifaction of the channels by which the riches of the past are welling up the present.

Again, concerning the contrast of "abstract and concrete"; surely by abstraction, or theory, we mean the rules by which present or concrete problems are most rapidly and economically solved; so that he who has the largest possessions in theory will solve these problems most quickly and efficiently.

A theory, or "abstraction," is indeed a summation of that experience of the race on which the future must be built. The "concrete," on the other hand, means, I presume, rule of thumb; I fail to attach any other meaning to the word, for a "fact" is useless until put into a rule, however narrow and provisional the rule may be. It is evident then that if a technical school may live from hand to mouth on narrower rules it must be fed continually from a university which discovers rules more widely valid, or the technical school will fall into an atrophy. Indeed if the new universities are to trust wholly in current rules, and to fail to provide for the wider abstractions; if, in other words, while distributing mere "concrete" knowledge, they fail to provide for the advance of theory, they likewise must quickly descend to the level of the technical schools. What will be the relative positions of the "concrete" and the "abstract" universities then? The conclusion is that the first business of a new university is to become an old one as soon as it can; to kindle the imagination as well as to inform the intellect. Its youth is its misfortune, a misfortune to be repaired only by alliance with its elders, and by enriching itself from their stores and their educational capital. Happily this is a capital which increases even by lavish distribution.

The truth in the Chancellor's warning seems to be this: that there is a danger in an academic severity, even in the work of the laboratory, lest in expansion of analysis it be forgotten that the student may soar too long above the earth, may

glory too much in the "uselessness" of his pursuit —that is, in its purely prospective profit. In his ardour for the long run he may forget that most of us, while admiring the loftiness and even the aloofness of "pure" research, that which no doubt will tell some day, and may indeed break into amazing effect even to-morrow, have yet day by day to live on a homelier trot, and need not so much a brilliant orbit for our wings as a lantern for our feet. But there is a graver fault than this, for indeed the pursuit of verification on the lines of great speculations is no error but the noblest service. Our danger is not that advanced students are splendidly impracticable, these men will not overrun our academies, but lest they be convicted of a less splendid ineffectiveness. Roberts-Austin was angered, and justly, by the indiscriminate phrase "applied science." Applied science is experimental science, and the scientific student whose argument is too high for the common occupations of men, for "the brewer, the baker, and the candlestick-maker," is untrue to the principles of the experimental method on which all science directly depends, and for which nothing is common or unclean. It is in every-day life, in things as they are falling out around us every hour and every moment, that principles are to be tested, problems discovered, results sifted, processes improved, knowledge increased, and standards established.

If, then, in their maturity, the older universities begin to lose the spirit of adventure; if they cease to vibrate with life to the innermost; if they nurse

themselves more in fear of error than in love of truth; if, wistfully cherishing their "enchantments," they gather their robes aside from the vulgar touch; if in fastidious study they shrink from putting their doctrines to the harsh and common tests of things as they occur—nay, if they fail to seek in modern life new problems and new worlds to conquer; if they think science is not science when it concerns the factory and the market-place, or that art and letters are not for the people, but for the delicate adept; if Oxford and Cambridge are not anticipating "new wants and new aspirations, meeting new needs and new acquirements, ready to face the exigencies of to-day and to-morrow"; if, indeed, they are not by very virtue of their great inheritance fulfilling these masterful purposes with the greater power and the greater ascendancy, then true enough they are the universities of the past, and the dead must bury their dead. The old universities have to-day a nobler calling than ever before, to bear the flower of the experience of the world. The second-rate comes and goes, rises and falls, is courted and neglected; the first-rate rises slowly, but abides, surely withstanding not only the treachery and indifference of men, but fire also, the moth, and the edge of the sword. The works of the men who, seeing beyond the accidents of their own day and place, by their vitality have penetrated every age and hindrance, speak, therefore, still to all times and to all peoples; by some miracle they never die—nay, never grow old.

Is the Englishman stupid?—One of the

greatest men of the generation just passed away was wont to say sadly, "The English people have some rare capacity for throwing up great men now and then, here and there; probably by some occasional blend of mixed races, but of its own nature England is stupid. With a beaver-like instinct it has piled up great works for which hands were sufficient; but as the age of hands alone is passing or past, and as the Englishman does not make mind, he must recede before nations which in the mass are more intellectual." I am not inclined to admit, with my late friend and other wise men of this opinion—with Merimée before him, and Mr. Wells after him, that the Englishman (I speak now of England in the stricter sense) is naturally stupid. Ordinarily he does seem stupid, it is true; but I think with an artificial stupidity, a quality bred of his faulty education. Even in imagination I would argue that he is by nature virile, and even rich; but from the nursery this faculty is persistently abated in him. Like a Spartan, he admires self-control; but instead of cherishing it, forming it, and directing it, he chooses to display this control rather by disowning all emotion, so that he may be bothered the less with either faculty. Yet in the field of politics—to use the word in the widest sense—the Englishman is a great creator; and his wisdom, patience, and efficiency must be rooted in an imaginative power as strong as his practical expediency. If India was made "in a fit of absent-mindedness," the Egypt of to-day is a

monument of deliberate intelligence, imagination, and achievement; a monumental record not of material progress only but of this as a foundation for freedom and righteousness. And even if we take our illustrations from science, the great mathematical physicists of our own country—not only as rare individuals but as a school—present the same qualities. The English engineer who in the age of rule of thumb kept the lead will not now lose it, for he is awakening to the imperative need of theory. As his theory deals with simpler conditions, it has been more quickly consolidated than in more complex spheres of practice, such as our own. The atmosphere which still befogs the Army happily lifted off the Navy long ago; and indeed in chemistry and medicine it is not the leaders who are wanting; but in these quarters the cloud over the public intelligence has not yet rolled away. The laboratories turn out efficient young chemists, "but in England nobody wants them." And in my medical experience I can testify that when the young Englishman can be withdrawn from the upper and the lower vulgar, and will give his time to come under university influence so as to shed his awkward affectations, and to release his more generous instincts for a larger and higher life, he proves to have both brains and imagination, and, to boot, a notable sagacity of his own. Boys are not so dead to intelligent interests as the weary schoolmaster supposes. Towards the close of a medical education I see him as one who has developed slowly,

whose qualities have not been well understood at school, and who has suffered accordingly under a short-sighted, ill-planned, and dislocated secondary education; but who, if rescued in time, which too often is not his luck, hatches out at length as a man of character, and often of distinction. In medicine we fear no comparisons with foreign discovery; and when a defectively educated public, ignorant of standards, rises higher than to copy foreign nations, and is prepared to make public use of our students, it will find us ready with efficient methods to strengthen our people at home, and to plant healthy and thriving nations in lands now devastated by pestilence.

THE SENSE OF CONTINGENCY.—But there is something more to be said: if an appearance of natural stupidity is produced by the intellectual chill and the rather ignoble ideals of the public schoolboy, it is generated also by a more respectable quality, in its due degree valuable and even precious, but which, by an overgrowth unchecked by a larger intelligence, has pushed both intellect and imagination into the background. The Englishman is dogged by the sense of contingency, by the truth that the application of principles to practice is thwarted at every turn by incalculable incidents which in the laboratory cannot be foreseen. Man is composite, things are composite; things must be taken as they come, man must be illogical. Now it is in the field of politics that this eye for compromise is most useful, this mistrust of principles least perilous; in politics he is therefore supreme,

though he does not owe much of this faculty to "the playing fields of Eton." Thus it is that he throws himself into the unbounded worship of rule of thumb. If he can outwit contingencies he is proud of himself; how wastefully he does it he cares little, and the inert spirits are all proud of him. Because in an academic aloofness, in an exclusive occupation with comprehensive scientific laws, there is, as we have just seen, a kind of ignorance, he presumes that in practical work there are no such things as principles. No doubt by adaptiveness and adroitness he wins for a time, but only to give way later to those who, to this contest with contingencies, bring minds better educated in principles and ideas. A professor in a large technical school told me, about a year ago, that while in his district the manufacturers in a certain trade were bemoaning hard times, he as an expert was noting in their processes from fifteen to twenty per cent of waste. And yet these masters would neither come themselves to his classes nor send their sons nor their foremen. What, cried they, could an academic professor know about manufacturing!

Opportunists by all means let us be, but without denying the validity of principles. The man of affairs without science is like the physician who has fallen out of the anatomy and physiology he may once have known; within limits he may be a shrewder and abler practitioner than an academic professor; but this he will be at the cost of being stationary. We shall use rule of thumb, then, and other empirical and semi-empirical

rules based on vigilant and successful experience, but only as provisionally taking the place of theory. The theorist has mastered the principles which in the long run will prevail, yet he is apt, it is true, to forget that there are theories within theories, axioms of lower validity and smaller scope which in the short run will be found to complicate action; to these practical complexities proximate rules and middle rules are better adapted; they are easier to work, and are kept in order by the incessant check of results. But the main principles, or theories, are never thus superseded or invalidated. To principles, sooner or later, the subtlest craftsman has to bow his head, or be left behind; for, even while his hand is on his tools, by theory contingencies and complications are being detected and eliminated, and processes shortened and economised.

UNIVERSITY EDUCATION. — But even if your start in life from school may have been a poor one, you have now before you in the education of a physician a training no less manly, and one which, as a moral and intellectual training, I had almost said is incomparable. Even for those of you who are unable to undertake the more arduous and more costly course of a university education, the education of the hospital and technical school is still one to develop the highest qualities of the mind, and to kindle them in the warmth of hope and charity. With all men you will learn the evil in the world, but you will go from strength to strength in the faith of making it better.

The word "university" meant originally a corporation; but now it signifies an education dealing chiefly with universals—with habits of common sense and breadth of faculties, without which even multifarious learning will be disfigured by pedantry or crankiness, as in the great Roman scholar who, when discussing with Erasmus the immortality of the soul, rested his denial of a future life on the authority of the elder Pliny. Every man has to be educated for more than one set of duties. No two men are alike, and as civilisation advances they diverge more and more; each of us can expand and vary only within a certain pre-ordained quality or scheme, about his own possibility of development. In most people, perhaps in all of us, some of the innate capacities must be sacrificed—an uneasy reflection; but, if so, then which or how much of them? The all of each of us is not wanted: which part of us shall be renounced? About this, at some stage, teachers and pupil may begin to disagree; but out of it the pupil should learn at least the chief of lessons—the lesson of humility. Sacrifice is one of the laws of life, yet it must be sacrifice for some higher end. Admirable, for instance, as is an equable education of all the faculties—"culture" as we are wont to call it—yet culture turns into a selfish conceit if no part of it is subordinated to education in good citizenship; for an aggregation of cultured and consummate persons without some higher unifying influence would not make for a high national life. The sacrifice of culture for the more specific, and often indeed duller and narrower pur-

poses of a trade or profession—the grim *Erwerbsfrage* —is more common and painful. And unhappily only too frequently it is a wasteful sacrifice; for want of private means, or of public assistance, the pupil at a critical age is compelled to renounce extent of learning, and the training of some of his higher faculties, for a brief and technical instruction which may narrow his outlook on life and starve those potential qualities for the rest of his days. Yet even such renunciations, if inevitable, are sanctified by a submission to duty, and accepted in the faith that after all each individual is his own best educator.

We can scarcely hope that the time is at hand when most people will be able to devote time to general training in all three stages of education; many of us must turn to special duties even after the primary school, and many after the secondary school; so the students who for the larger development of their faculties can proceed to a university must, so far as we can see, be comparatively few; still fewer they who can spare time to complete a disinterested university course before turning aside on the narrower lines of professional or commercial instruction. The man who can do this will go much farther in later life than he could have done had he turned aside into technical lines at an earlier stage; still, as things are, most men have to sacrifice more or less of their future to the needs of present livelihood. And happily the alternatives are not so deeply separated as at first they may seem to be; it is found, as we might

expect—such are the teeming wealth, the infinite interweaving, and the essential analogies in men and things—that there is no difficulty, at any rate in university education, in using for general training the broader principles of any one of the professional faculties; so that, for him whose technical instruction must begin prematurely, a general or "semi-professional" training may still be continued on principles of the kind which in their more and more special application will form the substance of his calling in life. For university training differs from technical, not so much in the kind or field of the subjects taught as in the more comprehensive, more deliberate, and more disinterested methods of teaching them; in the wider outlook upon them, and the awakening of curiosity and research. Thus, I reiterate, it is not so much what is taught as how it is taught. Nevertheless, within limits it remains true, and even obvious, that for the best education a completer general training in fields other than those of the future calling must bring about a richer result.

It is freely said of the abler men in our laboratories that those who enter them with minds already expanded on other kinds of study, such as language and literature, bring to the sphere of scientific studies a riper understanding, and draw from them larger immediate powers and a richer endowment for later life. Professor Ostwald once told me that it is the good custom of students in the German universities to attend other lectures than their "Fach"; so that in every university there are

always one or two professors whose lectures on some such subjects perhaps as history, literature, or philosophy, attract large bodies of students from all faculties. By these undergraduates to stick wholly to one's own subject is regarded as a poor and narrow thing. How lamentably the prevalent literary education fails even in that "*exigua cognitio naturae*," which the very humanists themselves prescribed, I have argued already.

Once more, if the enrichments of a university education consist in its own breadth and variety, and in the maturing of the student's understanding, it confers another endowment no less precious: it establishes the habit of study—a habit which rarely gains any strength or fixity at school or technical college, but, once established, belongs to a man for the rest of his life. In the university the student sees maturer men devoting themselves to a disinterested love of knowledge, to a steady and faithful pursuit and furtherance of it for its own sake; he sees, also, the infinite variety of intellectual operations, and perceives that knowledge and wisdom are not summaries, schemes, or mysteries, but are quick and glowing with a manifold and many-coloured life. And not only does he admire the leaders of research, he is also shoulder to shoulder, especially in a residential university, with other eager undergraduates, themselves pressing forwards not on one only but on an infinite variety of pursuits and interests, with the general bearings of which he too gains some familiarity.

It appears, then, that the function of university education is not special instruction in the lines of a profession or trade, however these ends may substantively be promoted, but in expanding and enlarging the mind and making it a more and more perfect instrument of knowledge and progress, whatsoever its destination. The mind so educated will regard whatever is laid before it more truly, and will think upon it more truly; it becomes analogous and assimilated to a wide horizon of the world in which it is to live and work. Christopher Wordsworth (*Scholae Academicae*, p. 171) writes that a university "while aiming at educating professional men never pretended to give the final practical training which is required for every profession. Even in the education of the clergy, to which they gave special attention, the universities attempted to educate them in scientific theology rather than to impart even the elements of the pastoral profession," and so, he adds, "it was with medicine (and, as we may now add, with engineering); the student received the grounds of a valuable education and some theoretical instruction, but was sent to look elsewhere" for the technical work of qualification. Again, in a report on university education Roundell Palmer (as the Chancellor then was known) says: "Of the value of an academical education, even in a strictly professional point of view, when given on a sufficiently comprehensive system, I entertain no doubt. Superior mental cultivation tells very much in every profession; it enlarges the views, improves the judgment, and obtains for its possessor con-

sideration and influence in the ordinary intercourse of mankind." If this be so, and no one will seriously contend to the contrary, a university which adapts itself closely to instruction in the technical attainments of a trade or profession departs from its proper function of training the mind and of increasing knowledge, and enters into competition with schools of technical instruction; such as the hospitals, the Inns of Court, the workshops, and the many other various special institutions.[1]

In testing, then, from stage to stage the progress of its students, the university will look not so much for technical and empirical knowledge and adroitness, or to the amassing of detail for particular uses, as to the training of their minds, and their grasp of principles. And for these

[1] Here I may quote some sentences from the evidence which I gave in the inquiry on the division of the Victoria University:— "To multiply qualifying bodies, and to make them out of the material of universities, tempts these institutions to identify themselves with the more ordinary aspirations, and to hold out false standards of education in the higher faculties. That thus universities have been disposed to facilitate the more direct and utilitarian methods of qualification, and to do what it is the part of the hospital school to do, is sufficiently notorious. Indeed it is remarkable that many university teachers have lost sight of the distinction between qualification for practice, and liberal education in the institutes of a profession for an academical degree. To hint that teachers would conspire to lower standards, or even to be privy to a deterioration of them, meets, of course, with indignant remonstrance; but the indignation is not quite justifiable. Such complacencies have their degrees, as they hold out greater or less facility for a diploma; moreover the governors of universities are not by any means all of them teachers, or even graduates; not a few of them are laymen with very material standards indeed."

results, for the breadth, ease, and naturalness with which they have learned to think and to conceive, will its degrees and distinctions be bestowed. It is too commonly supposed, and very erroneously supposed, even by some who ought to know better, that if a professional or technical instruction be screwed up a little higher, and examination made somewhat stiffer, the successful candidate should have a claim for a university degree —for the degree of M.D. let us say. Or men will submit that twelve or fifteen years in the practice of a profession should give them claims to such university stamp. But we have seen that the function of the university is not qualification for the practice of any art or trade, but is a training of the mind, a formation of habits of study, of insight, of easy handling of ideas, and of methodical research, whether by the principles of the future profession or of any other department of knowledge; an opportunity which is available before, and unless in exceptional cases only before, the technical stage of study is entered upon. After our plastic years, and under the pressure and cares of after life, such a training may be, but rarely is, achieved. In this respect education reminds me of fresco-painting, it must be accomplished swiftly and truly while the plaster is wet; when the plaster sets the false and true lines set with it; the time for correction is past.

The universities of the United Kingdom then step out of their function when they undertake, as they do, to issue with their degrees in medicine a

licence to practise.[1] In my own university the M.D. degree is often bestowed, and is properly bestowed, on persons who never intend to practise medicine, and who would be embarrassed if in any emergency they were called upon for this office. Nor should it be any specific concern of the university how well or how ill its graduates may practise medicine; all that the university should be responsible for is that its graduates should have a certain development of mind and imagination. And, as a matter of practice, its tests for these results are much hampered by its incongruous responsibility for the lives of His Majesty's subjects; its examinations have consequently to deal with many matters of memory and mechanical device which throw little or no light upon the breadth or depth of training, or upon the formation of habits of study or research; indeed, they crowd out more or less the proper tests for such edification. Now the safety of the public being a State concern, the testing of medical efficiency is the duty of the State itself; and this responsibility the State assumes in practically all other European countries. For our nation I think a State portal, in the directest sense, is too cold-blooded, and might become too rigid for us; we desire more spontaneity and more variation. In the United Kingdom, then, the State should entrust this function, in each of the three kingdoms, to certain medical corporations, under the supervision

[1] Their bestowal of a qualification arose when—outside Italy, at any rate—the higher medical education consisted in what was improperly called "theory," but was only book-learning.

of the General Medical Council; and its tests should be for safe practice rather than for large attainments.

Again, gentlemen, I know and regret that you cannot all have university educations—at any rate, not in any near future; more's the pity. Many of you on leaving school have no choice but to complete your professional education in the five years' minimum, a period shorter by a year than in other chief European countries. In this case you have to be satisfied with what your school may have done for your general education—too often, I fear, a paltry result enough; not so much by your fault or even by the fault of your masters, but of those defective methods of secondary education which I have lamented. To learn your profession in five years means that you will get some education, and suffer inevitably much cram. You cannot thus make yourselves into philosophers or investigators, unless by a happy turn of nature you contain some rare capacities and aspirations which by chance were not choked by the public school; such an one must be content, then, with the honourable ambition to become at any rate a competent practical physician, shrewd, resourceful, and unselfish; a guide to health and a stay in adversity. For even in the narrower field of professional instruction—I am speaking of the ordinary medical student—a liberal scientific education is not to be had in five years. Let us think for a moment what it must contain: the elements of physics, something more than the elements of chemistry, a large and minute knowledge of anatomy and physiology—so

far no mean education; then on this foundation to build the superstructure of pathology, medicine, and midwifery; to spend a few weeks in a fever hospital, in a children's hospital, in a dispensary, in several institutions for diseases of the eyes, ears, throat, and skin; to practise anæsthesia; to obtain some knowledge of diseases of the mind, and to add to these the elements at any rate of medical jurisprudence, hygiene, and public health, is formidable indeed. Yet still upon this burden of subjects many enthusiasts are yearning to pile more and more, such as fuller courses on biology, chemical physiology, bacteriology, and pharmacology; not to mention such subjects as the history of medicine, in the absence of which it is said, truly enough, that the education of a physician cannot be complete.

But it is in the all-round or university sense that this is true; without these subjects, and without a considerable familiarity with the principles of them, a university ought not to grant its degree of M.B. or M.D. But, happily, there are among us men loved and respected as members of our beneficent profession who have never been grounded in these principles, furnished with these ideas, or stored with all this knowledge. None of us are more ready to lament this deficiency than such men themselves; yet when we fall sick we thankfully avail ourselves of their aid and consolation. Nay, may we not go still farther and admit—we university men and consultants—that, when it comes to the cure of disease, it is by the closer converse with the patient, the little daily dexterities,

the cautious but shrewd empiricism, the tact and attention which, by easing and modifying abstract lines of the treatment, adapt them to the peculiarities of the individual, day by day meeting quickly every new symptom and contingency by this incidental drug or that little change in diet, that a family physician, who may have enjoyed little beyond the ordinary advantages of a technical training, nevertheless compasses the cure of the individual case on which the consultant can but advise in general terms? Each has need of the other; the practitioner who had not the advantage of a university education desires the easier grasp of coördinating principles of the university graduate, the wider range of his experience and of his outlook on facts, his richer knowledge and his keener recognition of the mists of ignorance; the graduate, on the other hand, admires the *ingenium versatile*, the more homely but not less indispensable and even more varied abilities and deftnesses of the country doctor. The most accomplished physician is, of course, he who has combined both real and practical education, who is armed with technical dexterity, versatility, and resource, as well as illumined by the ideas and guided by the mental and imaginative discernment which are born of a large, deliberate, and inventive education. How the unhappy division of our profession into medicine and surgery has defeated this integration of faculties I need not repeat here, as I have set this aspect of our education forth at length in my *Historical Relations of Medicine and Surgery*.

Too often, I fear, the cry for university advantages is rather for the marketable degree than for the mental increase I have dwelt upon. This increase is dearer to the Scotchman than to the Englishman. But, until we all learn to desire it for its own sake, we shall still have to regret that among educated men the respect given to our profession is for its benevolence and cleverness in a special sphere rather than for broad and accurate notions of things. We are accused of want of touch with other faculties, of a blunted sense of relative values. In our defence, indeed, it may be said that we give hostages to fortune in that we look forwards to the unknown future, while the lawyer fixes his eyes backwards on the past, and the parson tries to stand still on the shifting present; moreover, that in a large part of our field of work, if it be a diminishing part, the best of us must still be empirics, and empirics in a very complex and obscure subject: still, we shall not mend ourselves by making excuses. It may be retorted indeed that, the more we have to act on probabilities only, the more there is need of trained observation and large and sagacious thought. And to these there is but the one way of attainment, the broadening and deepening of learning and of our love of it; not of book-learning only, but of that large sympathy with men which lies in letters, in science, and in life. Wisdom is not learning only, nor practice only, but *eruditio in usu*. So long, however, as the English father for his son aims but at the facility of the artisan, and regards wisdom, which is more precious than rubies and to be had

only with pain and labour, as but an elegance or even a will-o'-the-wisp, so long (whatever our profession) we shall fail to win respect by liberal ideas. It is not for me, who have given much time and pains to urge that by skilful craftsmanship only can the brain be adequately built, and that the finer craftsmanship comes only by pains and fasting, to depreciate craft; yet craft is not all. If father and son together, so long as a little meal remains in the ark, will strive, at all possible sacrifice, to add to the mere technical instruction of the diploma the broader, fuller, and riper education of the university and of the world, they will have their reward.

When, as things are, I try to defend my profession from the accusation of narrowness or provincialism, I lose heart when I stumble upon crudities which fall not only from the undistinguished of us, in whom they may be forgiven, but even from our most eminent colleagues. Strictly between ourselves, let me select an example or two from essays at hand. We shall not be found out. A brilliant specialist says, with a peculiar sense of proportion, "Of all the evils which befall man in the civilised state the evil of disease is incomparably the greatest." Alas for *παθήματα μαθήματα*! To impute insanity to Hamlet, or to read King Lear with an eye on arterio-sclerosis, by substituting disease for conflicts of the mind, annihilates the play. Or, would the fate of Hetty Sorrel have been more tragical had she died of consumption before meeting Arthur Donnithorne? Another physician, who regards not the ethics of

punishment, says that criminals ought to be handed over to the experimental physiologist! The affronted physiologist, saving himself from his friends, would cry "*οὔ τοι συνέχθειν ἀλλὰ συμφίλειν ἔφυν.*" Another says, "We cannot have the *mens sana* without the *corpus sanum*"!—surely a stodgy sentiment. And another assures us that "science is useful, but classics are at best purely ornamental"—can we not put this more prettily? "Unter allen Volkerschaften haben die Griechen den Traum des Lebens am schönsten getraumt." A somewhat wider survey even of professional knowledge would prevent much impatience with the labouring man for keeping his windows shut, and plugging up his chimney; for we should recollect that colder air means more clothes and nourishment, and it is with difficulty that he provides such food and blankets as he has. But this is an ungrateful task, and the more so as, for example's sake, I am obliged to cull these flowers from the writings of leaders in medicine to whom otherwise my debt is too deep for criticism. I would only pause to warn medical hierophants lest they get as far out of value as the ecclesiastical have done.

THE MEDICAL CURRICULUM.—If, then, it is a heavy task to get into five years even a technical education, let alone a more liberal and extended training of the mind; to get into five years an instruction to which in Germany, France, Italy, Holland, Belgium, or Switzerland six years at least are devoted, which in a university course,

modelled from the beginning on larger lines, must occupy from six years to seven, how are we to use to the best purpose this five years' course for the man who has not the means, or perhaps not the kind of ability, to enable him to enter upon a full university career? One way of doing it is to drag the university training down to the level of the technical; to give the M.B. and M.D. degrees for a course which scarcely pretends to rise much above the ordinary five years' professional instruction, however crowded and crammy this may be. Or, if we resign the university to more fortunate men, what are we to think in our serious moments of a technical instruction in which, as now arranged, medicine, surgery, and midwifery, in all the many branches which we have enumerated, are to be taught in part of the fourth year and the fifth—in sixteen to twenty months! No wonder at the development of coaching —that is, not of making men but of stuffing them; no wonder at the stream of cram-books pouring from the printing offices; no wonder at the "window dressings" for examination; our wonder we will keep for the young men who, under such a drill, come out of it with any freshness of mind left, and with any better mental furniture than trite professional formulas.

Now, although universities must be designed from beginning to end on other and more deliberate lines, yet for those students who cannot afford a university education, what they have time for may and ought to partake of a university character; and, generally speaking, this for the Institutes

of Medicine means some teaching in universities, and by university professors. A few exceptional teachers, men of remarkable natural endowments, may teach admirably a subject which is not to be the business of their lives, but this can rarely be the case; moreover, a teacher who devotes an inconsiderable part, or none, of his best hours to research cannot long continue to be fertile and effective. Again, if I may contribute my dole to a current controversy, I would opine that no teacher reaches his best till middle life. Not till then does he gather the fruits of experience, or attain to a rich and vital sense of our ignorance; not till then does he wholly escape from formula and routine; not till then does he learn what to leave unsaid; then it is that erudition and experience mellow into wisdom.[1] For the teacher to be glancing ahead of him and beside him at other purposes, other ambitions in life, than those with which he is immediately and provisionally concerned, is fatal to good work. Teaching then, if it is to be of a university character—if, that is, it is to be education as well as instruction—must be in the hands of men whose lives are devoted to the subject. If it is to be a development of mental faculties, and to penetrate to the principles of its subjects, it must give time for reflection, for earnest investigation, and for

[1] It is some thirty years since I read a paper to the Leeds Philosophical Society to illustrate what I believe to be the truth—namely, that the greatest achievements of the human mind have nearly always found their consummation not in the earlier but in the riper decades of life. Thus Regius professors may supplement each other's researches.

surrender to the personality of the teacher. Yet it is this very time element which is wanting—time in which we are to learn medicine, surgery, midwifery, time for fevers and mental diseases, time for the elements of ophthalmology, otology, laryngology, dermatology, and all the rest of them, not forgetting the many elaborated methods of modern diagnosis of which the family physician —often far from expert help—cannot afford to be ignorant, yet which, after he has left the special fields in which such instruction is provided, he cannot easily learn; time for a firmer grasp of ideas, time for the influence of the teacher to sink in! I repeat that to devote, as at present, but something less than two years to these manifold final professional classes is, on the face of it, absurd. Surely one moiety of his whole period—two years and a half—is barely enough to devote to the matter which is to be the main business of his life.

In the summary education for a diploma then we have been moving on the wrong tack, and moving away from the stouter and truer methods of two generations ago. For two generations we have been loading and loading this brief curriculum as if our ambition were to teach many things ill rather than a few things well. And we have seen how one may spend a lifetime on many acquirements, and yet be uneducated. Our forefathers thought, and I agree with them, that the backbone of medical education is anatomy; that the right way to educate is to teach a few subjects

broadly and deeply, and that the right way to build is to begin with the backbone. Young men love to do something with their fingers, and their instinct is a true one. Finger-work does more than add itself to thought and memory, it multiplies them. The fingers are the busy builders of the brain. How admirable a discipline is anatomy for the young student; how it confirms him in quickness of eye, in accuracy of fact, and in coördination of facts; how it displays to him the marvellous contrivances and adjustments of organised bodies; and, with the sidelights of modern biology and embryology, the stupendous achievements of mutation and selection! As an initial training anatomy is better suited to youth than the more abstract principles of chemistry and physics; and, as modern research is integrating physiology more and more with anatomy, so structure and function —two aspects of one subject-matter—are becoming more and more associated, to the advantage and enlightenment of the student. The movement towards university teaching of these cardinal subjects, a movement which I am in King's College to-day to celebrate, has then my cordial goodwill and advocacy.

In his first two years the student who only seeks a diploma should make his own a knowledge of anatomy and physiology, as broad and thorough as university professors and university dimensions can make it; a discipline to be broken into as little as possible by intercurrent diversions. The elements of physics the student should bring

with him from school, where mechanics should form a quickening part of his mathematics; the advanced physics, which are to be of practical service to the physician, are even now necessarily omitted; such as optics, photometry, high frequency and other advanced modes of electricity, X-rays, and much knowledge on the borders between physics and chemistry. With chemistry the case is different; I agree with Sir William Ramsay that this is not a good subject for boys; nor, indeed, in the course for a diploma has it proved possible to teach chemistry on the scale of a pure science, to teach it comprehensively for its own sake, and as mental training. In a five years' course it is, and perhaps can only be, taught as a technical department—introduced, that is to say, partially and incidentally as immediate utility requires, and not as an education; but after this manner, as pharmaceutical chemistry, as physiological chemistry, as an instrument of clinical diagnosis, and so forth, it should accompany the paramount and thorough training in anatomy and physiology, and be carried forward, as now it scarcely is, with the whole course of medical instruction. In place of formal examination in chemistry for a diploma I am disposed to prefer —at any rate in great part—the submission of laboratory books, initialled weekly or monthly by a demonstrator. Under present methods the first-year student fags up some rule-of-thumb chemistry, with no great mental or scientific advantage, and on no comprehensive scale; and when his

first examination is over he is apt to dismiss this subject from his mind: receptiveness has its limits and the ship must be lightened. This kind of education is not edifying; so the more reason that at least anatomy and physiology should be taught scientifically and for their own sakes—taught, that is, on university methods, taught as education for universal as well as for technical ends; and, seeing that at least as much chemistry would be learned in this utilitarian way as is learned at present, in two full years a really solid scientific foundation would be laid; then the three following years would give more adequate time for the medical studies of men whose minds had received this sound training, and the anxious candidate would not have to spend his last and most precious year with his nose in his books.

The suggestion has been made that the medical student should engage in some occasional hospital work during his scientific period. I understand, however, engineers are by no means agreed that to go from the university to the works, with a view of returning to the university, is an advantage: continuity is broken and habits of study are lost. I have observed the same disadvantages in medical study thus broken. The university medical student does well, then, to postpone serious work in a hospital until he has mastered his scientific subjects, up to pharmacology and general pathology. The professors of the institutes of medicine are, I think, all agreed that the best men have been those who up to the age of twenty-two or

twenty-three had pursued an unbroken university career.

Finally, is the student when just released from the wards of a hospital at the end of his fifth year, quite fit for private practice? We are assured that he is not, not even if after qualification he has held the usual "house appointments"; that for private practice there is still much in which even a highly educated student is ignorant or unskilled. My old friend and colleague, Mr. C. G. Wheelhouse, used to impress this upon us time after time, and on the ground of such deficiencies to lament the abolition of apprenticeship. More recently, Mr. M. A. Wardle, of Bishop Auckland, has temperately and persuasively expressed the same opinions.[1] For my own part, while I admit how much the young diplomé or graduate has to learn in the way of tact and little adroitnesses in the management of private patients, in the conduct of trivial or tedious disorders which do not find their way into hospitals, in the dispensing of medicines, and so forth, yet surely to revive the bond of apprenticeship for these minor accomplishments is to burn a house for roast pig. Manual dexterity, it is true, can be gained only in early life, but this would come with the earlier application to anatomy which I advocate. The apprentice did not always get the best or most conscientious of masters; in any case he was liable to be infected, at a critical time of his life, and too often was infected, with an incurable empiricism, and became habituated to a narrow routine. A

[1] *Brit. Med. Journal*, Sept. 27, 1902.

convenient and elastic routine and a wise and discriminating empiricism are good, but these resources should not be the beginning of wisdom; after the scientific habit of mind is established they can be added to it; and I agree that six months' occupation with an able and intelligent family physician would prove an invaluable finish to hospital instruction. But I think that such residence should be with masters registered for their special fitness by the General Medical Council.

GRADUATE WORK.—There are not a few physicians who, unable to avail themselves of a fuller education at the commencement of professional study, would gladly enlarge their education at a later time of life: what facilities do we offer them for advanced study? Graduate or advanced work, both in the fields of instruction and research, has received of late some of the attention which its great importance demands, and I think our profession does not quite realise the debt we owe to Mr. Jonathan Hutchinson for his enthusiastic and indefatigable exertions in the development of such advantages for qualified practitioners who have still much to learn, a class indeed coextensive with us all. We ought not to be satisfied until the advanced studies are so organised as to lead up to a university degree; though it follows from what I have said before that in this case they must include subjects, such as history, philosophy, or literature, to enlarge and enrich the mind beyond the scope of medicine, and indeed beyond the wider but yet far from catholic domain of science itself.

EXAMINATIONS.—The undergraduates who are listening to me will expect me to touch upon the distressing subject of examinations. It has been inferred no doubt from what I have already said that, like other disinterested observers of medical education, I am in favour of that "one portal" which is established in virtually all the other nations of Western Europe, and the advent of which is certain in our own, though as usual we shall waste much time in trying to apprehend an idea before it is materialised in custom. To all persons thus qualified the appellation of "Doctor" has so long been granted by English custom that official recognition of this title can hardly be withheld; moreover, the Conjoint qualification should carry with it the Membership, not of one only, but of both the Colleges. The multiplication of modern universities in England—one of the most inspiriting features of our day—must compel the institution of one portal; the steam-roller of the General Medical Council cannot even pretend to equalise so multiform a system. In my university I find that the one portal is virtually in force, for from 70 to 80 per cent of our men take the diploma of the Colleges before presenting themselves for our more advanced graduation. Sometimes I say to them, "Get qualified and then we can get on with your education." But, as this proceeding of theirs is not universal or compulsory, we do not derive the benefit of it; still are we obliged to load our examinations with tests of the memory, sharpness, fluency, and "dodginess" of our candidates, which indeed tend perhaps to stifle real study, or at

any rate testify in no direct way to the broader training and enlarged capacities which are particularly our concern. For qualification I regard the Conjoint examination as excellent: the examination of a university, however, ought to have a somewhat different aim and method from a test of conventional equipment and efficiency; it ought to be much less inquisitive and exacting, much more of a leisurely, thoughtful, and individual appreciation. We want to move away from tests of results without methods, of practical habits which stand still while knowledge is progressing, of bookish acquirements without experience, of seedlings on stony ground which have no root in themselves and so endure but for a time; to move away from the reproduction of other men's notions, and towards the recognition of a critical and flexible judgment, of the habit of looking problems fully and intelligently in the face, and appreciating the relative values of ideas both in the present and in the past. It is for these qualities that a university degree should be conferred; and to this end it is that in Cambridge—I believe with the loyal consent of all our medical graduates—we retain our thesis for M.B., and attach a cardinal importance to it. In his thesis for M.B. the student—too often for the first time—realises that he, too, can grapple with the interpretation of things; that he has got beyond the stage of beseeching his coach "to tell him how to answer, but not for heaven's sake to explain the reasons of the answer."

If education consists in adventuring, encouraging, and building up the faculties of pupils, and, so far

as may be, the peculiar faculties of each—for "originality" consists in that by which each man differs from his fellows—it is clear that, in a university at any rate, an external examiner, unless he be the assessor rather than the administrator of the tests, is a dangerous person, and the more dangerous the maturer the student. For children, by judicious and sympathetic inspectors, uniform examinations may be so managed as to be harmless. But it is to the teacher that the value of each pupil is best known; and the proper safeguard against prepossession, or slackness of method in him, is not the external examiner but inspection of internal examinations by wise and experienced visitors. The professional examiner, he who makes it his business to range from place to place imposing mechanical tests wholesale, is one of the new terrors of life. For it is unkind to puzzle him with miscellaneous companies of young persons, each eager after his own fashion, each assimilating the common nutriment to ends which are various, each conceiving things in his own way. The professional examiner knows nothing of the many colours of the pupils, nothing of their several endowments, nothing of the inspiration of their teachers; for his purposes, then, they must be ruled into uniform lines, and he must bring with him tests on uniform systems, as he cannot be expected to invent new tests for each seat of learning, not to mention each several boy and girl. Thus for such an examiner the pupil may not be taught to think, because he may think wrong; or at any rate he may think outside

the schedule. And so examinations drive on; those subjects only being chosen, and that treatment of them prescribed, which promote not enlargement of the mind but the convenience of examining: the "Who blew what, how many times, round the walls of where?" kind of question. So the teacher too must be tethered, lest he lead some of his pupils to browse in pastures, sweet it may be, but inconvenient and unexpected. The teacher may desire to interest his pupils in fresh subjects, to open the windows of their imaginations as well as to strengthen their understandings, in which case he will be accused of a preference for "soft options"—a euphemism for unexaminable subjects. Sentiment may be ill-informed or vaporous, yet surely in real knowledge or true ideas no one subject can be softer than another. I am far from suggesting that boys and girls should study what and how they will, or be left passively to receive impressions; the discipline of study, attaining gradually to a systematic and even severe intellectual occupation, if an indirect fruit of learning, is one of the chief. But, in my experience, "soft options" usually stands for soft teachers, soft methods, or matter which cannot be sawn into planks for the examination platform. A visitor of examinations, on the other hand, is not tempted to save his own labours by examining to pattern; on the contrary, in newness of methods and diversity of results, in the evidences of lively conception, free initiative, and original aptitudes, he finds refreshment. In urging these truths, however, it must be remembered that I am

speaking of education, not of technical equipment. For instance, the Medical Council, from the exclusive point of view of qualification, might condemn an examination,—let us say, of Oxford or Cambridge,—which, however educative, did not make an inventory of the mental furniture; which did not call for those empirical facts and axioms on which physicians, like engineers, have to work provisionally until larger principles are attained. For if in education memory and drill must be subordinate, in technical instruction they must have a high place. In education the teacher must act with his whole mind on the pupil's whole mind, therefore he cannot be dogmatic; he will prosper by methods rather than by doctrines: in technical instruction, on the other hand, he has to act with parts of his mind on parts of the pupil's mind, and therefore must seem to fix principles which ought to be transitory, and must reiterate doctrines which get out of connection with facts and truths almost as fast as they are inculcated.

We permit ourselves to rail at examinations, because at least they are liable to much abuse; perhaps more than any other machinery they are open to the faults of routine, of crushing the minds they should educate, of substituting formula for thought, of setting glibness and handbook acquirements above originality and development of the understanding. By our railing we keep these inherent dangers of examinations always before us, we guard against the abuses of tests which can scarcely be dispensed with in any kind of graduation, certainly not in medicine. We shall thus be on

the watch to keep these appreciations moving in the direction of freedom and elasticity, of discovering enlargement of mind and ideas rather than demanding the repetitions of task-work. Still, in medicine, such is the absence in the public mind of any right standard of medical knowledge and competence, and such therefore its liability to capture by any vain or designing person, whether in possession of a qualification or not, who lies in wait to exploit novel methods of therapeutics, whether in principle sound or unsound, and so long may such adventures flourish, that for the practice of our profession tests of competence must be strict, even to some meticulous degree. A man may be a bad lawyer, a bad engineer, or a bad shoemaker, and little harm ensue but to himself and his own fortunes; the harm of a pretentious physician is not so soon found out, and while it endures falls upon others rather than upon himself.

Research.—In addressing a university, as virtually I do to-day, I cannot forbear to warn my brother professors that even the blessed word "research" does not deliver us from the bondage of formula and routine. Much that goes to-day by this name is mechanical routine, of the more deadening effect in that it is a *corruptio optimi.* The mere plotting of curves, the mere watching of levers or thermometers, the mere piling up of undigested or promiscuous statistics, is clerk's work which may provide material for a professor, but—as we may read in many a published thesis — do not develop, perhaps scarcely stimulate, that germ of origin-

ality in which every normal man varies from his kind.

Another common error in "heuristic" methods, at all stages, is to tell the pupil what he is to discover; for he is then apt either to drop the research as soon as the end is in sight, and thus to fail in thoroughness, or his "cerebral eye" will persuade his "retinal eye" that the result, whatever it be, is that which he was told to look for. And if these be the defects of research in the inorganic sciences, they are still more apparent in the sciences of life, where the phenomena are more fleeting and less sharply distinguishable. We are prone to forget that research has two purposes, results being but one of them; the other purpose is method, which is itself an education in flexibility, ingenuity, dexterity, and perseverance. The more dogged the investigator, if he lacks openness and sensitiveness of apprehension, the farther he may err. Ingenuity, again, if partly original, may be quickened by practice and example. To see how, in his best days, the late Professor Roy would pounce on a machine which would not work, and with a few bits of stick, quill, string, and indiarubber set it a-going, was a brilliant lesson to all his pupils; a lesson which for his own part he used gratefully to attribute to Ludwig and Cohnheim.

Although thus the perils of didactical and dialectical modes of education have happily become manifest, yet by no means does it follow that all teaching can be experimental and socratic. Much teaching, especially of children, must be didactic

still; children must be taught habits by rule and authority. To take a plain example, the rules of health must be inculcated as habits long before a physiological inquiry into their validity; that is to say, long before adolescence: and from this instance we may reflect upon the scope of didactic teaching in other departments of knowledge. If, besides this training and drilling, the methods of research and verification are pursued also, and the principles of the kindergarten carried on through all stages, the pioneer qualities of the mind and imagination will be developed to no little extent, and the acquired didactic formulas will be quickened. And even concerning logic, intolerable as its tyranny became, and deadening as was its supremacy upon the spontaneous energies of the mind, yet in our revolt for originality we must forbear to throw sequence and symmetry out of the window.

Clinical instruction.—The clinical teaching of the hospitals is so much improved of late years that on this subject I have little advice to give either to teacher or to student. But there is still too much trooping after eminent professors, too little quiet study of the patient. Reading of text-books at home is eating sawdust: I counsel you to carry your treatise into the wards, moving from bed to bed as you read; thus you will get living knowledge, to make you into another man. The close neighbourhood of the clinical laboratory, whereby disease is studied, in its dynamic aspects, from rudimentary perturbations to perilous storm and even to wreck, will teach you a lesson, which the lay managers of a

hospital apprehend with difficulty, and never learn; namely, that Medicine is not a Summa or Corpus of fixed principles or aphorisms, better or worse applied by this physician or that, nor again consists in "surgery and placebos," but is a living and progressive organ, only to be kept vigorous by incessant growth and renewal. And is not this living medicine educating not us only, but also the butcher and the milkman, the family and the Councils, nay, the State itself and its rulers; shaming the complacencies of the unidea'd and dissolving the customs and formulas of the "practical man"? For clinical medicine has always been not only itself a sphere of scientific discovery but also the cause of discovery in other spheres. Over and over again clinical medicine leads the way for the physiologist as well as for the pathologist, and day by day is demonstrating interlockings of processes and sequences of events which no experimental work could compass, even if such combinations could be foreseen. Every hospital, large or small, if its work is to thrive, and its patients are to reap the benefit, should be open to students. In teaching his pupils the teacher educates himself—reveals to himself his own latent capacities. Thus not only should the London hospitals enter into a union of free interchange of students, but the larger country hospitals also should be gathered into the system. I often urge our own men to escape for a few weeks from the hustle of a great metropolitan hospital into the quiet wards of a county institution where a few cases can be thoughtfully considered, and not rarely are shrewdly interpreted

by an efficient and unassuming physician or surgeon of the staff who is glad of an intelligent hearer.

THE OUTLOOK OF MODERN MEDICINE. — Never was there a time when the study of medicine offered such visions of reward—social, scientific, and beneficent — as at present. From these manifold visions it is bewildering even to choose a few illustrative glimpses. As from the molecule and the atom to the electron the physicist is hunting down the secret of matter itself, so the biologist, having searched the organ and the tissue, is ardently pursuing the secret of life in the cell. And already his search is rewarded. This tiny universe is a microcosm of various activities, which we may well call wonderful if we do not forget that it is wonderful only as all things are wonderful. A recent address by Sir John Burdon Sanderson revealed to us a far wider significance of oxidation in the animal body. Each in his own direction, physiologists such as Langley and Sherrington, have traced the intricacies and yet the integration of parts and functions; while others such as Starling and Bayliss, have pursued the subtle functions and reciprocities of internal secretions. Allied to these are the specific products of cells, every cell of the body a microbe with its own juice—its toxin, if you will—each playing against all, in mutual attractions and repulsions, and not thus only but, in marvellous fore-ordination, with extrinsic agents capable of coition with this or that specific tissue or cell, for good or evil; and, if we can but tame them to our uses, potent for

therapeutical ends. We are shown how digestion is but one phase of these equivocal processes—food or poison as conditions may determine; and, by Croft Hill, how a ferment in one phase undoing molecules, in another is no less efficient in constructing them. The busy, curious spirit of modern physiology is not arrested even before the riddle of the albuminous molecules, probably a finite series; and is interpreting them, as Ehrlich, Fischer, and Hopkins are doing, by analysis or synthesis, reading not their own constitution only but, as Pavy also is demonstrating, their relation to the molecules of carbohydrate and fat. How, again, with the disappearance of foolish medieval schisms of the practice of our profession, the influence of workers in all branches will reinforce each other, is remarkably illustrated by the light thrown upon some of the gravest problems of general disease in the sessions of the new Dental Section of the British Medical Association. Dietetics again, which had made some indefinite advance by the empirical observations of the physician, has been raised nearer to the rank of a scientific study by the investigations of food values by Chittenden and Atwater, and of the purin bodies by Fischer, Walker Hall, and others. And if these brilliant prospects are opened out to the private physician, how far more dazzling are the promises of preventive and public medicine. By the hands of Koch, Manson, Ross, Bruce, Leishman, and their peers, plague-swept areas of the world are being restored to culture and civilisation; by the work of Nuttall and Haldane

and many others, as chronicled in the *Journal of Hygiene*, the standard of health is raised, dangerous occupations are made wholesome, and the conditions of childlife and education are moulded for infinite good by the physician who thus, from the private duties and modest social ambitions of a healer of the ailing individual, is rising to the functions and dignity of the statesman. Could I but touch, as hitherto I have failed to do, the imagination of a rich man, that he might see how much this progress would be accelerated if we could rise above our present anthropocentric medicine and establish a laboratory and professor of comparative medicine! For in disease, as in generation, all life is kin, and by a universal pathology our conception of these problems of the perversions of health would be infinitely enlarged, and our knowledge of them increased, not for man only but for our herds, our fish, and the fruits of the earth. The evil whose causes we know is half cured already. But no; the unimaginative Englishman is content to blunder along knowing little of the natural world about him, and content to bequeath his money in charity to mitigate calamity and suffering which by more timely aid he might have prevented. "For knowledge," said Sir William Wharton shortly before he was taken from us, "money is hard to get until the necessity for its expenditure is patent to the smallest intelligence."[1]

[1] For two years past I have noted the bequests for public purposes, as recorded in *The Times*. Twice only, and for small sums, have I discovered a bequest for education, or research into

But our progress is no summer's day sailing; when from year to year — I had almost said from hour to hour — science is swiftly on the march, customs are continually disturbed by bold speculations and great shiftings of opinion; the profession of medicine, and the public also, are agog for novelties of cure. To take advantage of this wayward excitement busy agents spring up in many directions, and large are the promises, true or false, which they hold out. Now it is true that as pathology penetrates more and more deeply into vital processes, therapeutics will follow a like elaboration, so that the humbler means of our fathers, the pill and the bottle, are menaced by new-fangled methods—by such methods as massage, the more intricate modes of electricity, hydropathy, the sanatorium, the Nauheim business, and so forth; methods which, both in their application and in the refinements of diagnosis which they imply, often exceed the scope of the family physician. Whether vaunted by enthusiasts, exploited by adventurers, or scrupulously and sagaciously practised by competent persons, these methods require special and costly plant, so that the patient is often invited to retire to some sort of diagnostical and therapeutical factory. Now such institutions, however beneficent, must in the first place be made to pay; and therefore, unless guided by independent advisers, and guided discreetly, they are liable to

the conditions under which we spend our lives. Thus we lack enlightenment even in our selfishness; we cannot even say, "*naturam colimus, inviti quoque.*"

capture by the commercial interests. The number of sufferers who can be persuaded to enter them will become at least as important to the manager as a precise selection of cases. Yet if, after any fashion, these agencies meet a public need they will not be quenched by the frowns of propriety; we must expect them to prevail more and more, and for good and evil they will collect more and more patients from the ordinary circles of practice. It is of pressing moment, then, that the Royal Colleges, rising above a policy of solemn opportunism, should with a wise foresight recognise that some such undertakings are necessary and inevitable, should distinguish what is good and useful in them from the speciousness of trade and charlatanry, and define broadly and clearly their scientific and ethical relations to the profession at large.

WE LEARN, THAT WE MAY DO.—In all this cry about learning you may ask me, Where is the wool? Where does action come in? Now, if I am earnest with you for learning, I would be even more robust with you for action; for the end of education is action. St. Francis, ecstatic as you may call him, spent all his ardour, and far more than his strength, in passionate labour for man. Even in the very thought of a new purpose he would spring forward, crying, "Here am I." Revolve, agitate, test continually the stuff of your knowledge till you have to act; then ponder no more. If you have made a good machine of yourself you will act better by your acquired nature, by the instincts you have truly constructed, than by looking

back for your learning. The man who has to walk a narrow plank across a ravine must fix his eyes on the other side and walk automatically. If he peers about him and below him, and interrogates his cerebellum, he is likely to fall. Whether as teacher or practitioner, come to a decision, and then stick to your course dogmatically and imperiously. The patient does not come to the physician to be consulted, nor the pupil to be the teacher. Whatever he may profess, the patient knows it is best for him to be told plainly, so far as discretion permits, what ails him, and to have his course dictated to him. In the discussion of doubtful points of diagnosis or treatment, do not lean upon the patient, but state alternatives categorically, and the modes by which a decision is to be arrived at. An ailing man is tired, and must be spared all puzzles. To pretend to know more than we do is one thing; to be vague and indecisive in counsel or action is another. Vacillation spells failure. Doubt breeds diffidence. Study without enforced experience of the operative values of things, thoughts too fine to work, will not stand the test of God or man. There are few stories so strange and pathetic as that in the life of St. Catherine of Siena, when this saint, thwarted by the wiles of the Papal Court and abhorrent of its vices and its pride, called to the convent and to the wilderness, for the succour of holy men who had devoted their lives to the contemplation of righteousness and wisdom. Many of them found themselves too inert, or too diffident, even to answer the call; those that

painfully gathered themselves together became to her a new burden rather than a succour; sad-eyed grey shadows, halting and hesitating, yearning in sympathy, pure in desire, but for practical help as ineffectual as moths.

When tried by an anxious case do not keep turning it over and over again in your mind. To carry a second best course through is better than to falter in the best. Professor Bradley says: "The actor who plays Hamlet must make up his mind as to the interpretation of every word and deed of the character. Even if at some point he feels no certainty as to which of two interpretations is right, he must still choose one or the other. The mere critic is not obliged to do this." To let the case hang about your mind while neither observing it nor reading it up, and especially to do this by night, throws the facts out of perspective, and harasses you, when your mind with a little rest would create a truer conception by itself. If you want more information, if events be not as expected, seek more light by book or bedside. If after all you are in doubt, go back formally to the beginning; examine the patient without bias as if you had never seen him before, if possible with an intelligent medical friend. Some forgotten fact of the early history, or some elusive sign, such as a round, white, depressed scar not so big as a threepenny bit, may thus be brought to light, and bear significantly upon the subsequent events.

Education and Ethics.—We have dwelt upon education as progress from ignorance to knowledge,

from feebleness to strength; but as we could not regard intellect apart from imagination so we cannot separate the mental from the moral part of man. Either without its supplement is incomplete. None knows better than the physician that emotion, religious or other, must have a strong skeleton of intellectual principles; conscientiousness without enlightenment has to account for some of the darkest chapters of human history. At my time of life I feel that I may never again address so important a body of students as those of this great college, and if I do not thrust upon you thoughts of a kind which at the moment we may scarcely be in the mood for, I cannot conclude without touching upon some matters of that higher life without which we can never prosper either as a nation or as individuals. It was by what Sir Philip Sidney called "the ancient piety and integrity of the English people," rather than by far-seeing wisdom, that this nation weathered the storms of the last two centuries. There are now many rich men among us, and there has never been a time when in their monotonous amusements they have seemed—to us poor men—farther from the kingdom of heaven. But as a nation England will never dance to the pipe of Omar Khayyam, nor take for its motto—

> Sapias, vina liques, et spatio brevi
> Spem longam reseces.

If there be some ominous signs about us of corruption of moral habits, on the other hand we may see still more vividly the signs of a new ethical earnestness and insight as pure and intense as the

awakening of Wesley and Newman, and far more permanent in its elements. It is your great privilege to be born in a time of breaking up of dogma, of the deliverance of the spirit from the bondage of the letter, of the scrapping of the machinery of religion for the recovery of its essence, and for a new embodiment of it. Such was the breaking up of ancient ritual by Christ himself, and, in their measure, by Wycliffe and Luther. The form is so easy, the spirit is so difficult! Now in this our time we are set free to return not to the sixth century but to the first, to the original source of the Christian life. The notion that Christianity consists not so much in a life as in doctrines was the notion of hellenistic philosophers. As to dogma, then, hear what all men say, but follow no man; follow the light which you will find within you. In the growing purity of your hearts you will not fail of your revelation, and by this touchstone you will distinguish, even in your contemplation of nature, the true from the false; you will interpret that higher secret which by her eyes you see that she knows but cannot express, and will read into her message ideas which no analysis, scientific or even philosophic, can reveal. Remember, if you are ever bored with your own self there is something wrong with you. Physiology tells you that you must always be growing or must degenerate; no impure, petty, or rancorous thought but makes a mark not to be undone, and weakens the habit of virtue. Our decisive moments, George Eliot says, are not those of our better hours, protected by wholesome

happier dispositions, but when we have in us less devotion—for so we vary, when we give way to little insincerities, little uncharitablenesses, shiftinesses, low standards, tampering with worldly folk, little tempers, and jealousies. Let us desire, then, higher motives and worthier interests; let us fill our minds with more and more precious contents. It has been said, and with some truth, that men of science are apt to forget we cannot play curiously with base and shameful things and then wipe them away as if we had never been occupied with them. Upon those physicians then whose painful duty it may be to turn over psychological garbage rests the heavier responsibility of a jealous concern for the purity of their own hearts, lest they should seem to make terms with uncleanness.

To a certain temptation which besets us, but rather the richer and more self-indulgent of us, I can do no more than allude—I mean the temptation to profess easy morals, to be facile in condoning vicious habits, to give or imply immoral medical counsels, to be "wise men after the flesh." Now to teach ethics is not our business, and to pretend to it may disconcert a visitor who comes to us for medicine, and reasonably expects an undivided attention to his bodily ailments. But although in this he is reasonable, and ethics is not our purpose, we shall do ill if we empty our advice of ethical contents; and if, in a weak compliance, we insinuate immoralities, or even acquiesce in them, we shall do wickedly. "Feed no man in his sinnes." Minister honestly to the poor rather than render ignoble service to men of pleasure.

Let us not go back upon nature herself who is ever striving to weave the uppermost tissues of the brain for the inhibition of the lower. Professor Sherrington tells us there is great competition in the cerebral centres for the path of action; and if two stimuli—a better and a worse let us suppose—would employ the path, one or other is suppressed; "there is no compromise." And a frequented circuit soon becomes "canalised."

In the *Phaedrus* we find the profound truth that if the soul be not destroyed by its own proper evil it cannot be destroyed by any other; a lesson there enforced by the figure that the soul is the charioteer of two winged horses, the one of noble the other of ignoble breed; and sooner or later the soul may be dragged to earth by the baseness of the ignoble steed, and there lose its own wings also.

The opinion is current, since the time of William Henry Green, that spiritual goods are essentially non-competitive; that the survival of the fittest does not apply to the field of the highest ethics, which is a field rather of inward than of outward occupation. This has always seemed to me a shallow distinction; surely a race is set before us, and we run all. Competition is, indeed, now rather between large social than between individual units, but the strongest bond of the parts of the social unit, that indeed by which it survives, is surely the higher ethics. We can no more get out of nature's methods than out of our own skins. That progress comes by adversity has been told to us by Christ and Paul, by Tauler and Herbert, as well as by Darwin

and Haeckel. Tauler says: "If we were wise and industrious the devil's opposition and his discipline would be more useful to us than those of the good angels; for were there no conflict there could be no victory." A knowledge of the highest endowments, deeds, and creations of man must therefore form not only a part of universal education but also of our personal meditation, whether it be found in Greek, Latin, or Hebrew.

The physician is wont to hear how noble is his profession, how profound the debt of the public to him, and how devoted society is to his lofty calling, in after-dinner speeches. But it is true that our calling is gentle, unselfish, wise in its intimate converse with nature and mankind; *humanumque genus communi nomine fovit.* Hippocrates says in his lofty way, that where there is the love of man there also is the love of art. And we know, with George Herbert, "it is even some relief to a poor body to be heard with patience." Furthermore, our calling teaches us the secret of the "simple life," which for society too often means but a clean slate on which to daub new excitements; for there is no *ennui* like the *ennui* of the man of pleasure. By the "realism" of its daily practice it hardens us against carnal temptations. It saves us from the withering sin of cynicism, for it inspires us with the building of a world ever better and better, a work in which we are the artificers; if the world may not be very good we rejoice that it is possible for us to make it so. No good physician was ever a misanthrope. Yet

if all professions have their safeguards they have also their temptations, and our own is no exception. Laymen, even those most friendly to us, tell us of our testiness, of our jealousies, of an angularity in our relations with our brethren, especially with those who live near us and ought to be our colleagues, but whom we are too apt to call our "opponents," and so to regard as such. This, to say the least of it, is bad policy; it gives our enemies a handle against us, and grieves even our friends who discern our fault but not our temptations. That members of other professions are free from this mutual distrust comes of the different conditions of their engagements. Unfortunately the game of medicine is played with the cards under the table. Whether a clergyman be a good preacher or pastor, whether a barrister conducts a case well or ill, whether a tradesman sells good soap or bad, is not only a matter of which the public can form some fair judgment, but also these transactions are, so to speak, in market overt. In the intimacies of medical counsels, on the other hand, who is there to note the significant glance, the shrug, the hardly expressed innuendo of one or other of our brethren of whom it might be said, as it was said of Roderick Lopez—Queen Elizabeth's physician—that "he is none of the learnedest or expertest physicians, but one that maketh a great account of himself"? Thus we work not in the light of public opinion but in the secrecy of the chamber; and perhaps the best of us are apt at times to forget the delicacies and sincerities which under these conditions are

essential to harmony and honour. But the more careful we make ourselves of these loyalties the less we shall suspect others; the more candid and sincere we become with our brethren the less they will suspect us. Most of such offences are due not to malevolence but to want of imagination or good-breeding. There is none more prone, when alarmed by illness, to scatter medical etiquette to the winds than the doctor himself; he will run about between half-a-dozen physicians in a week, keeping his own counsel. Can he not then put himself in the patient's place? Life is dear, even to a layman. In any case let us always remember that as we have many benefits, so we must be vigilant and forbearing in the perils to which the temper of the physician is exposed. For such trial and unrest as we must have, let us dwell on the words of Montaigne, that "we have the most sweet and gentle medicine in philosophy; for of others no man feels the pleasure of them but after his recovery, whereas she pleaseth, easeth, and cureth all at once."

Before Chaucer it was said that the physician is no ritualist; in this audience I am addressing men of many creeds, and some, perhaps, who fondly think they have none. At any rate, the physician learns to follow a true instinct in seeking the ideal not in dreams, emotions, or transcendencies, but in the actual, in the high choice and promise of the real. No delicacy, or remoteness, or fantasy can make a false idea into a true one. Yet Professor Lloyd Morgan has well said, "the prime condition of progress is to believe more than can be demonstrated";

and the condition is true of all natural growths. In the rough and tumble of all callings, however, the higher life gets obscured, and we have to seek quiet moments when we can enter into that inner chamber of the mind wherein dwells that self by which we differ from all other individuals, for which we are responsible, and yet wherein, by this difference, even those of us whose hearts are warmest are alone. To this end, whether I could or would go to church or not, I have always "differentiated" my Sundays. If I stay away from a place of worship the greater my responsibility, the more my duty to the higher life. Whether your "studie be then on the Bible," or on Shakespeare, is for each of you to choose—on both perhaps; but for that one day of the week be thankful to eschew idle books and newspapers, petty cares and business, and even professional usages which can be postponed; so that we may live one day at least in the presence of men greater and purer than ourselves. And what I say of one day in the week I say also of some minutes in every day; in that inner chamber store for the day some sweet verse, some line of gentle wisdom or lofty thought which—to repeat a phrase with which I began—shall still make the habit of virtue and reason easy and pleasant to us. Then when the new song is sung we may find ourselves among those who could learn that song, for they were redeemed from the earth.

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