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RUSH MEDICAL COLLEGE.

Valedictory Address

TO THE

GRADUATING CLASS,

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BY

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VALEDICTORY ADDRESS.

I was, lately, greatly interested in a copy of a rare old picture called "The School of Anatomy," intended to represent the first human dissection. The mingled sentiments which must have found place in the minds of the actors, in that then strange scene, were forcibly portrayed. Deathlike and expressionless lay the form which but recently had been the temple of the living spirit, and which, by that principle or force, had been actuated to deeds of might and valor, or had been the medium through which sentiments of love, hate and revenge had been manifested. Its deathlike aspect was heightened by the speaking attitudes and countenances of the awed, but intensely interested actors in that then unparalleled drama. The deep mysteries of the wonderful mechanism are about to be revealed. Not even the sacredness of the human form, the image of the great Creator, can longer withhold the overmastering desire for knowledge which has long yearned for the revelations of the analysis about to be made, until the barriers of human prejudice have at last fallen before it. But though mind triumphs over prejudice and directs the inquisitive scalpel in its invasion, still the idea that the ground on which they are entering is holy and not to be pressed with shodden feet, lends to the countenances of the actors a seriousness which adds to, and beautifies their earnestness. Sounding yet in their ears, "the temple of God are ye," they feel that they are entering the holy of holies, and with faces veiled with gravity and hands washed in innocency, they come up to their longed for, yet dreaded work. Strangely beautiful must have been the original scene which the artist has conceived and so successfully transferred to his canvas. Strangely it contrasts with our own rich and varied experience in anatomical research. Unfavorably does it contrast with the degree of gravity and earnestness with which we, at the present day, approach the subject. How little like a modern dissecting room scene! Mature and earnest men, who had already attained to the front rank in their profession, bent intently over that wonderfully laden table. What we now regard as the starting point in medicine, was to them an advanced study. Their starting point was not found in anatomical investigations, but in a strict empiricism. In fact, empiricism underlies the whole chronology of medical

science. The effort to learn by experiment what was salutary, beneficial and curative in diseased and disordered states of the human system, was the first step in what became, in process of time, medical science. This system of empirical medicine, crude, uncertain and oftentimes erroneous as it was, and founded only in that innate disposition to preserve health, prolong life and increase the comfort of existence, led gradually and necessarily to the resultant desire to know the wherefore. The wherefore could only be found through a knowledge of the machine experimented upon, and that was enveloped in sacredness as well as shrouded in mystery. Resort to study, upon the structure and functions of that portion of the animal kingdom which most nearly resembled humanity, was naturally had; and thus the sciences of anatomy and its handmaid physiology, were commenced and attained some development, while ideas of pathology were yet as wild and visionary as the dream of delirium. But gradually and certainly grew the desire for, and love of knowledge. Like that divine sentiment which the immortal poet styles an appetite which grows by what it feeds upon, so the love of knowledge knows no satiety, but ever increasing in fervor and earnestness by additional acquisitions, like the mountain stream its course is ever onward with still increasing volume, till at last it shall be swallowed up in the vast ocean of truth. Thus the early dissections upon the lower order of animal being augmented knowledge and stimulated the desire therefor, till finally the sanctuary of the immortal soul, rendered still more mysterious and awful by the flight of that essence, was fearfully and tremblingly invaded. Solemnly, as if in the presence of the disembodied spirit, which might be viewing the desecration of its former tenement, were those dissections made. Nought, save an overpowering thirst for the especial knowledge revealed by those investigations, could have prompted and impelled them. And when that indifference which is the offspring of familiarity was attained, there still remained that prejudice to overcome which, even yet, is not fully conquered. But the science of human anatomy was established, and that of physiology commenced its vigorous growth, while close upon it followed a knowledge of pathological changes which soon began to take the form of a system. Then commenced comparative studies ranging from the lowest form of animal existence to the crowning work of earthly creations, for the purpose of developing to the highest degree a knowledge of that crowning work. Minute structure at last claimed attention, and the science of optics was invoked to lend its aid in the investigation. Histology of the present day is the result; and the anxious, earnest search after the yet unknown, through the object-glass of the one-fiftieth of an inch focus, with all the appliances and accessions of the modern microscope, only indicates our present status, not that to which we may yet possibly attain.

While this ever increasing scope and extension of study has gradually raised the standard of practical medicine and benefited mankind, it has been charged that its tendency has been towards a materialism which has often shocked spiritual sense and debased moral nature. Without here stopping to consider the truth of this statement, let us glance at some of the theories which have been advanced, and have seemed to warrant the charge, coming as they did from a scientific source, and claiming the merit of a refined philosophy. Not to go farther back than a period within my own recollection of scientific matters, the complacency of mankind in its manhood was not a little shocked by the statement that man had attained his present position at the head of animal existence, only as the last development in a progressive autogeny; that this self-development or plastic force in nature first brought forth the lowest forms of animal life; and that gradually acquiring power, and operating under ever improving circumstances and upon products which were ever advancing toward a higher degree of perfection, grade had succeeded to grade in an upward scale through the vast cycles of time, until mankind appeared upon the earth, the latest and most perfect in the series. That this last and crowning existence, in its individual embryonic life, passed rapidly through all the phases of a development representing successively all the inferior grades. That a constant improvement marked the ever succeeding generations, and that in the dim and distant future, out of the loins of the present type of humanity there might spring an order which should outrank it, as it now does the orang-outang and the gorilla.

Human pride had been well rebuked by the satires of Swift, but the satire was patent; here, however, under the garb of philosophy, was a theory which might well have been taken as a sarcasm more subtle and cutting than the trenchant wit of the eccentric Dean. But such was not its aim. It was put forth as a pure philosophy, and while its author protested against the charge of infidelity, and still spoke of the Creator and creative wisdom, he so shrouded the first great and Adorable Cause in such a mysticism as to be unrecognizable by the student of revelation, even though that revelation had been studied as an allegory with the light of science illuminating its pages.

Perhaps it may be considered by some a work of supererogation to reply to such vaporings, while others may consider a successful reply not within the range of human effort; nevertheless, it may not be amiss to look about us for some firm rock on which to place ourselves; some anchorage sure and reliable where our barque may ride in safety while the storms of a mad philosophy sweep ragingly past us.

Is the scale of animal being graduated with such regularity as to place man at the head, separated from the grade next below

only by a single step or grade? Or, is there between man and the whole of the brute creation a chasm so deep and wide as to justify a faith in the statement that he was created but little lower than the angels? I propose to consider these two questions from stand-points which are more or less intimately related to your professional studies.

1st. From an anatomical stand-point. Is the step or grade from the highest type of the brute creation to the lowest type of the human family only equal to that which marks the difference between the highest, and the grade next below it of the brute creation? or, does the *tout ensemble*, as well as several specific anatomical points, mark a separation so wide as to break the series?

It seems as though there could be but one answer to the idea expressed in these two forms of the same question. There is no fear that the author of "The Vestiges of Creation" himself, would even for a single moment mistake, at the most casual glance, an average specimen of the lowest human type for the most perfect specimen of orang-outang or gorilla. That indescribable impression made by individual presence is so widely different in the two examples, that a willing proselyte to the so-called philosophic creed would start back amazed at the difference which separates them. In the one he sees, emphasized in every attitude, glance, gesture and expression, only the brute; in the other, he cannot shut his eyes upon that spark of humanity which gives the hope of something beyond and better than the present; which lifts him to the pedestal on which stand, also, hope and aspiration.

But to pass from the whole to constituents: look at the form of the head, and its development, as compared with the face in the two specimens, and here, too, we see a longer step than any taken in the brute series. The length of the superior extremity; the four hands; and the facility, if not necessity, of quadrupedal locomotion in the brute, leaves a space between it and humanity too great to be spanned save by poetic fancy.

2d. From a psychological stand-point. Without denying to the brute creation a mental capacity superior to mere instinct, and even admitting that in some instances the brute may give evidence of a reasoning power that closely approaches true induction, still, in the results attained, he falls so far below the standard of the lowest humanity as to leave even a greater space between them, than that which separated them in anatomical development. The dominion over the "beasts of the field," which was given to man, according to revealed history, is enjoyed by the lowest example of the human race. His mental endowments enable him to construct implements and weapons for their capture, control and destruction. In this dominion, man, even in his lowest estate, proclaims his title to manhood, and indicates the

vast space which separates him from the highest order of brutes. But in the ability to construct and speak a system of language; in the ability to learn and speak the language of other systems than his own; in his power to attain, by intercourse with, and instruction from others more learned than he, to still higher mental improvement, man asserts, incontrovertibly, his immense elevation above all other animal existences. No mere grade in a series is here marked; but a new series, with heavenward tendencies, is established. But it is neither in anatomical nor mental characteristics that the distance which separates man from all inferior orders is most clearly appreciated. Vast as it seems from the views which we have taken, let us proceed to our

3d. Stand-point of moral attributes. It is here that we shall obtain a still more convincing view of the intervening distance that, from our previous two stand-points, we have contemplated as separating humanity from all below it. It is here that we see, sharply drawn, the boundary lines between instinct and reason, because here, in obedience to his moral nature, man subordinates his instincts to his reason. The brute is a creature of instinct alone. Whatever of reason he may occasionally evince is in strict subordination to instinct. Natural instincts control and govern all his actions; and if he reasons at all, it is in furtherance of his instinctive desires. Man has, also, his instincts. Self-preservation, self-gratification, sexual love, hate, and revenge, are instinctive. But not as in the brute does man's reason minister to, and subserve these instincts. On the contrary, these natural instincts are subordinated to his reason; and just as he succeeds in such subordination, does he assert the divinity of his humanity. We sometimes say, figuratively, that a man is a brute; what do we mean by this speech, but that such a man is, to a great extent, following his natural instincts—failing to control them by, or subordinate them to, his reason? There is, probably, no example of humanity however low (unless bereft of reason) which does not, in a greater or less degree, control and govern his instincts. This is the prerogative of humanity. The power to subordinate instinct to reason is absolutely wanting in the brute; in fact, as has been already stated, whatever of reason the brute may have, is the slave to animal instinct. Instinct is the master in the brute, but the subject in man. And man, in his mastery over his instincts, where they interfere with his higher aspirations, asserts his humanity and vindicates his claim to immortality. Whatever belief may be entertained as to my former two positions, whether coinciding with the sentiments which I have advanced, or regretfully distrusting them, it would seem as if there could be no doubt upon this last proposition. It is here that we *feel* ourselves to be more than the beasts which perish. In our love of the beautiful and the true, in our admiration of the mighty and the noble, in

our appreciation of the grand and the sublime, in our conception of the vast and the awful, in our desire to grasp the infinite, in our adoration of the Omnipotent, in our aspirations to a still higher life, we realize our God-given dignity and lay hold upon our heavenly birthright.

From this expression of faith which rises in my own mind from a contemplation of the facts to which I have called your attention, let us recede to a strictly logical conclusion, and ask what they actually prove? To this I reply: They prove that the order of animate being is not an unbroken series of uniform gradation; and, consequently, it affords no evidence of an autogenous force, the assumption of which is based upon such gradation.

This doctrine of an ever operative plastic force, which the author of the Vestiges of Creation believed had first brought forth the lowest forms of animal life, and improving upon its own work by a sort of cumulative energy, and the operation of elective affinities through the long ages of the earth's history until the present grade was reached, of course, regards that force as merely an inherent property of certain forms of matter. It is consonant, if not identical, with the theory of Darwin as to the origin of species; and an earnest advocate of Darwinism, Prof. Huxley, delivered, something over two years since, a lecture entitled "The Physical Basis of Life," which, as is indicated by its title, recognizes the same inherent spontaneous principle, property or force. I mention this effort of Prof. Huxley, not for its singularity—for he is but one of a numerous class of philosophers who entertain, and strenuously advocate, both in season and out of season, similar views—but because it has attracted more attention, both in this country and in Europe, than any other similar paper published for a long time.

Physical basis of life is used as entirely synonymous with protoplasm; and the meaning of the author would not be distorted by the expression: protoplasm is the physical basis of life. Now, if by protoplasm was merely meant a certain kind of material substance or pabulum, which constituted a physical basis or substance necessary to the support of life, a very correct idea would be very capitally formulated. And indeed, the way in which he talks some of the time in this lecture is, certainly, entirely consonant with such a meaning of the term; for example, when he says that "plants can manufacture fresh protoplasm out of mineral compounds, whereas animals are obliged to procure it ready-made, and hence, in the long run, depend upon plants. An animal cannot make protoplasm, but must take it ready-made from some other animal, or some plant—the animal's highest feat of constructive chemistry being to convert dead protoplasm into that living matter of life which is appropriate to itself." He also says: "this present lecture, whatever its intellectual worth to you, has a

certain physical value to me, which is conceivably expressible by the number of grains of protoplasm and other bodily substance wasted in maintaining my vital processes during its delivery."

He contemplates, also, the recourse which he shall have to savory roast mutton, to supply this waste of protoplasm, whereby ovine protoplasm shall become human protoplasm. His fancy, too, dwells upon the pleasure he might derive by supping upon lobster, but for the fear of putting his digestive organs to too severe a test, and thus converting crustacean protoplasm into the human article; and further, his possible shipwreck, and the feeding of lobster upon himself, whereby the compliment would be returned, and Huxley protoplasm become transubstantiated into crustacean protoplasm.

Now, all this might be good orthodox common sense and philosophic physiology. But Prof. Huxley takes good care that we shall have no excuse for so construing it; for he compares the properties of protoplasm and the changes which it may undergo to the changes wrought by the chemist when he effects that combination of oxygen and hydrogen which results in the production of water, and asks, "what better philosophical status has 'vitality' than 'aquosity'?" And again, he says, "If the properties of water may be properly said to result from the nature and disposition of its component molecules, I can find no intelligible ground for refusing to say that the properties of protoplasm result from the nature and disposition of its molecules. But I bid you beware that," he frankly admits, "in accepting these conclusions, you are placing your feet on the first rung of a ladder which, in most people's estimation, is the reverse of Jacob's, and leads to the antipodes of heaven. It may seem a small thing to admit that the dull vital actions of a fungus or a foraminifer are the properties of their protoplasm, and are the direct results of the nature of the matter of which they are composed. But if, as I have endeavored to prove to you, their protoplasm is essentially identical with, and most readily converted into, that of any other animal, I can discern no logical halting place between the admission that such is the case, and the further concession that all vital action may, with equal propriety, be said to be the result of the molecular forces of the protoplasm which displays it. And if so, it must be true, in the same sense and to the same extent, that the thoughts to which I am now giving utterance, and your thoughts regarding them, are the expression of molecular changes in that matter of life which is the source of our other vital phenomena."

I cannot refrain from the remark right here, though, of course, it is not offered as an argument, that, judging by the quality, Prof. Huxley's thoughts on this last named point might very possibly, figuratively speaking, emanate solely from protoplasmic molecular changes on a level with the "dull vital action of a fungus or a

foraminifer," though it is to be hoped that the thoughts of his audience in reference thereto may have had a higher origin; and that molecular change was the instrumental process through which they took, not the cause of their taking, form. I have made a quotation to show you, not only the nature of the mental protoplasm which Prof. Huxley offers, but also, that he does not disguise it by either flavor or condiment. He, evidently, administers his pills without sugar-coating. For this boldness let us sincerely render him our thanks.

The plain unvarnished question which is here forced upon our consideration is as follows: is protoplasm, in virtue of its physical and chemical composition, possessed of an independent organizing force? If so, it may well claim the prerogatives which have heretofore been awarded to vitality. If so, a mass of protoplasm ought to rise by its own inherent and independent energy or force into organizing activity, and assume, unaided, organic form, and display all the phenomena of life. Does it ever do so? Prof. Huxley and the school of philosophy of which he is a bright and shining light, have never shown us a single example of such action, and until they can do so, their protoplasm lacks its physical basis, and their claim is not worth a moment's credence, or hardly a moment's consideration.

The simple facts, that are at present established, are, that the so called protoplasm is a material which living organisms of the vegetable kingdom make by selecting and compounding elements from mineral compounds. This process of making protoplasm by living vegetable organisms, is a function possessed only by them. Art has never duplicated the process. There is no known instance of the elements combining to form protoplasm by their own power or elective affinity; but in every known instance a previously existing living organism seizes upon the elements and combines them to form protoplasm. Protoplasm when thus formed has no power or force by which, unaided, it can rise to a higher dignity; but it may be acted upon by a living organism, or it may fall under the influence of chemical force. If acted upon by the former, it becomes organized and forms a constituent of the organism; if not so acted upon, *i. e.*, if plant protoplasm, separated from the organic plant, or Prof. Huxley's roast mutton protoplasm is not consumed by some animal and thus brought in contact with a living organism, it becomes a prey to chemical force, and by it is resolved into its original elements, which elements may be selected by some plant and reconstructed into plant or vegetable protoplasm. Before protoplasm or protoplasmic elements can take the first step upwards in development, it or they must be selected and appropriated by a living organism; and in every succeeding upward step until it reaches the grade of living organic tissue, protoplasm derives whatever of force it displays from the organism

under whose auspices it is being advanced and into which it is becoming incorporated. However perfectly elaborated protoplasm may be, if left to itself, unaided by the influence of a living organism, it loses whatever of energy or force it may thus far have obtained, and, under the action of chemical law, begins a downward course. The exceptions to this rule will be found in the ovum of an animal and in the seed or germ of a vegetable. In these instances the egg or seed protoplasm has enjoyed an additional advantage from impregnation, which gives it a power of remaining for a variable period of time in *statu quo* until, under favorable circumstances, it springs into independent, organizing action. If such favorable circumstances should not surround it, chemical force at last overpowers the latent independent spark, and, by its action, sends it down again to the bottom of the series

But in this endowment of the ovum or seed with a certain degree of independent force, another interesting and important process is seen, which sheds a flood of light upon our subject. For example, the egg of an oviparous animal is a very capital specimen of animal protoplasm. It may be consumed and appropriated by another animal. Prof. Huxley, for instance, may partake of it in lieu of roast mutton protoplasm, and in the changes which it will undergo, and in the support to his exhausted energies which it will afford, it will fully vindicate its title to first-class protoplasm, even though it may never have enjoyed the advantage of impregnation. But what would be its fate, if, under the last supposition, an effort were made to hatch a chick from it? The answer is found in two simple words, viz.—*addled egg*. Where, then, are those properties of this protoplasm which result from the "nature and disposition of its molecules," which Prof. Huxley could find no intelligible ground for discrediting, and which to him stand in place of all vital action? Has not the first rung in his anti-Jacob's ladder broken under the step? and is it not fortunate that it has broken? for he acknowledges that, in most people's estimation, it reaches not to heaven, but to the other place, as Hamlet has it.

But let us suppose that another specimen of egg protoplasm has been impregnated and placed under favorable circumstances for hatching. Mark the interesting and mysterious change! A new being springs into existence, endowed with all the powers of the parent. Whence the force which this mass of protoplasm now displays and which it did not possess before impregnation? Some animals deposit their unimpregnated eggs in places favorable to their development; now if these eggs are not found and impregnated by the male, they soon decay under the operation of chemical law, although they are surrounded by the physical forces which are not only favorable to, but necessary for their development; if, however, the male finds them and performs his function,

they thereby become the recipients of a force through which they spring into energetic, organizing activity. Whence, and what, again I ask, is the force which this mass of protoplasm now displays? It must be acknowledged that, as mere protoplasm, it had it not; nor can it be claimed that the impregnating fluid is protoplasm; and if it were protoplasm, there being only contact between it and the egg protoplasm, and no mingling of the two forms of protoplasm, the vivifying influence which is imparted by the one and received by the other must be regarded as a force which the most perfect form of protoplasm did not, by the "nature and disposition of its molecules," possess. But as impregnating fluid is not protoplasm, the vivifying force must be looked for elsewhere than in protoplasm, notwithstanding the "nature and disposition of the molecules" of that substance. Protoplasm is a good physical basis or material for the support of life; but before it can live and grow it must become vivified from another source than itself.

Another disciple of the so-called new philosophy is Prof. Barker, of Yale College, who delivered a lecture in New York before the American Institute early in 1869, which elicited from the press of the country pretty general discussion. The subject of this lecture was: *The Correlation of Vital and Physical Forces.* Surely this is a pretentious title. To establish a reciprocal and convertible relation between physical forces and that mysterious force which constitutes life, and for which the term vital is so apt an adjective that even the new philosophers themselves continue to use it while denying the quality which it represents, is, certainly, a work which challenges boldness of enterprise and confidence of power. But Prof. Barker's boldness and enterprise are first displayed in an attempt to level vitality down to the grade or status of a physical force. He says: "Every particle of matter within the body obeys implicitly the laws of chemical and physical attractions. No overpowering or supernatural agency comes in to complicate their action, which is modified only by the action of the others. Vitality, therefore, is the sum of the energies of a living body both potential and actual."

Now, is it true that the matter of a living body obeys implicitly the laws of chemical and physical attractions? If so, what law of attraction does the matter of a dead body obey? Certainly the matter acts very differently in the two conditions. It is not unrestrained chemical and physical attractions in both instances; and no one can deny that a dead organism is the seat of chemical and physical actions alone. And, if this is true, there must be an overpowering force in the living body which does exert a restraining and controlling inflence over chemical and physical attractions.

The manner and mode of death, and the circumstances which

surround the change from life to death in some rare instances, afford a striking illustration of this fact. For instance, a soldier upon the field of battle, in full health, kneeling upon the right knee with the left foot advanced and firmly planted, while taking aim in this position receives a shot which instantly destroys life, and leaves the body rigid in the position described. Here is the same physical body or substance, vigorously living in one instant, in the next dead. Now let us contrast the changes which begin to occur immediately after death, with those which were in active operation just before. And first let us notice a change which is due to the physical force, gravitation. The fluids of the body begin, in obedience to this force, to settle into the lowest portions; and so far as anatomical structure will permit, they will find their way thither. This hypostatic accumulation of fluids is familiar to all who have had much to do with the cadaver. But while life was present no such gravitation of fluids took place. On the contrary, the blood in the veins below the heart and the lymph in the lymphatics and thoracic duct mounted upwards in direct opposition to the force of gravity.

In reference to this point, Dr. Beal asks: "Does the tree grow away from the earth, or its roots into it, in obedience to the laws of gravitation? * * * * Of course, it will be said that capillary attraction, osmose, and other forces, contribute in a highly complex manner to bring about these results; but every one at all acquainted with the subject knows, that the facts have not been, and cannot be, explained." Dr. Beal might have added that the dead organism of a tree afforded the same physical facilities for capillary attraction and osmose, as did the living; yet, here, these physical forces fail to operate; no sap laden with the elements of plant protoplasm mounts toward the topmost branches.

As to the operation of chemical force, our poor soldier who fell at Seven Pines, under the favoring influence of a Virginia summer, became at once the seat of a vigorous breaking up of former combinations, and a recombination of the liberated elements. But before death these combinations were undisturbed. Elements of tissues and fluids which began to shun one another immediately after death, before that change, had remained in a firm and harmonious combination. Some force must have been present and operative, before death, which *was* "overpowering," and which *did* "complicate" the action of "chemical and physical attractions."

Prof. Barker's "therefore," then, falls to the ground, and vitality is something more than the sum of physical energies. Vitality is not the sum of any energies whatever, but the mainspring and source of those energies. It is the cause of energy, not its manifestation.

Prof. Barker illustrates, or rather adduces instances of, the cor-

relation of physical forces, i. e., their reciprocal relation to one another, as evinced in the conversion of heat into motion and motion into heat; heat into electricity and electricity into heat, etc. He then shows that the various changes going on in a living animal organism under the inspiration of, or in obedience to, vital force, are accompanied by, or result in, the development, simultaneously, of certain physical forces; as for example, heat, motion, and in some instances, electricity. He shows, also, that the brain changes which take place in mental operations, develop heat; and even goes so far as to measure the different degrees of heat developed by different mental operations or conditions. And this he calls a correlation of physical and vital forces! Surely this is correlation with a vengeance! Such a correlation is a correlation which correlates in one direction only. It sounds very much like the proposed division of game between the pale faced and Indian hunters, who together had shot only a turkey and a crow. Pale face says: "I'll take the turkey and you may take the crow; or, you may take the crow and I'll take the turkey." But the copper skin was smarter than Prof. Barker deemed his audience, for he replied: "It's turkey you and crow me all the time." With Prof. Barker, it is vital force developing physical force all the time, with no instance of physical force begetting vital force.

Until the disciples of the new philosophy are able to convert light, heat, electricity, motion, gravitation, and other forms of physical and chemical attraction, one or more, or all of them, into vital force, there can be no proof of a correlation between physical and vital forces. As yet, they have not been able to accomplish this; and we must, for the present at least, continue to procure our new supplies of living organisms by the same old method; each must beget its kind according to methods which have obtained from the beginning. We must wait patiently till the new philosophy succeeds in taking its first sure step in this direction. That accomplished, we can, perhaps, look confidently forward to the time when additional skill and increased facilities will enable them to reproduce extinct forms. Then museums of fossil remains will indeed become *passeé;* for the trilobite, the plesiosaurus, the megatherium, and the mastodon, reappearing under the magic touch of science in all their pristine vigor and beauty, shall lie down together, and a little philosopher shall lead them! Then, forsooth, the millennium of science will have dawned upon a startled world.

Gentlemen Doctors: It may, perhaps, strike you that this lecture is but a dry morsel to offer you on this parting occasion; that the last hour of the session should not have been devoted to the consideration of a scientific subject, but rather have been used for the purpose of giving such sage advice upon general subjects as my experience might warrant. How, for instance, to so deport your-

selves as most surely to insure professional success. I confess that I should shrink from grappling with this subject. Professional success will depend entirely upon your individual selves; upon your individual adaptiveness to the discharge of professional duty; and according to this adaptiveness, will the degree of success to which you may attain, be measured.

The parting injunction, which, above all others, I would lay upon you, is expressed in these four words: *endeavor to deserve success.* Your endeavors in this direction must relate to the earnest and thoughtful cultivation of science; to the diligent and honest discharge of your duties to your patients; to the equally honest, and, sometimes, fearless performance of your duty to community.

Thus far, it is probable, that you are all debtors to the world, having received from, more than you have been enabled to render to, your kind. I know of no one thing more healthy in its influence upon individual character than a full appreciation of this fact, if it stimulate to efforts to transfer the balance to the credit side of your account.

And, gentlemen, when finally you shall

> "Wrap the drapery of your couch about you
> And lie down"—

in your last, long sleep—that your account shall show that you have lived for the betterment of the world, is the earnest hope of your Alma Mater.