

An address delivered at the Birmingham Royal School of Medicine and Surgery, at the third anniversary meeting August 29, 1838 / by Vaughan Thomas.

Contributors

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AN ADDRESS

DELIVERED AT THE

BIRMINGHAM ROYAL SCHOOL

OF

MEDICINE AND SURGERY,

AT THE

THIRD ANNIVERSARY MEETING, AUGUST 29, 1838,

BY

VAUGHAN THOMAS, B.D.,

FORMERLY

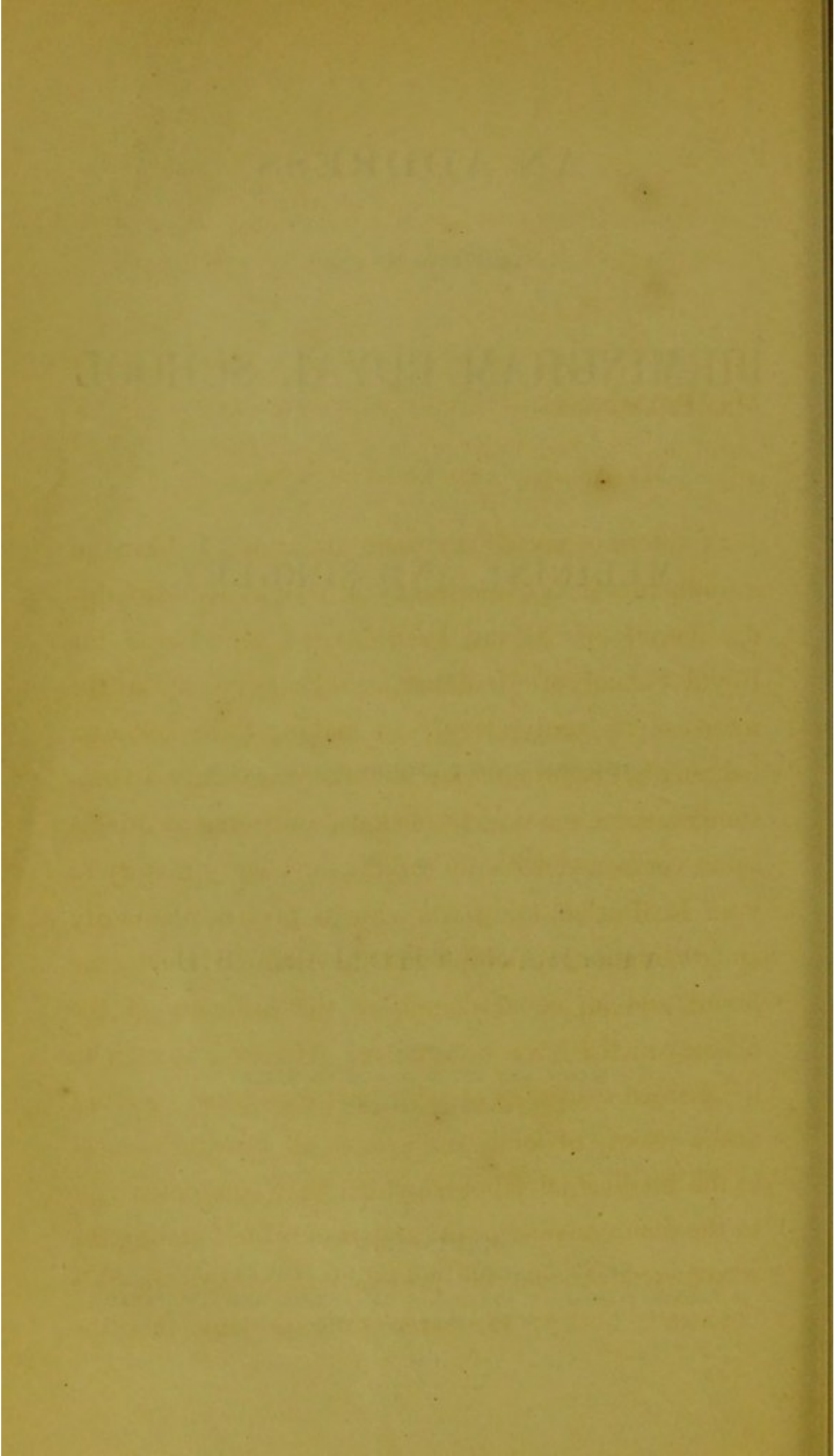
FELLOW AND TUTOR OF CORPUS CHRISTI
COLLEGE, OXFORD.

BIRMINGHAM.

H. C. LANGBRIDGE, BULL-STREET;
J. H. PARKER, OXFORD; T. STEVENSON, CAMBRIDGE, AND J. W. PARKER,
WEST-STRAND, LONDON.

1838.

C



MR. PRESIDENT,

MY LORDS, AND GENTLEMEN,

^a IN offering myself to your attention, I have an introductory duty to perform. I have to acknowledge the honor of having been invited to address the Royal School of Medicine and Surgery, upon the return of its anniversary. In making these acknow-
^b ledgments, I cannot but feel, that there are many circumstances, some relating to persons, and some to things, some connected with the origin, and early history of your Institution, and some with its present prosperity and reputation, which, whilst they largely add to the
^c honor, add an equal degree to the difficulty of the office, which I have undertaken. If I were to refer to the printed evidences of your past exertions, I should find a variety of facts, and events, all bearing witness to the intellectual labours, which have conducted you to the distinguished position you now hold among the
^d recognized schools of professional science in this country; but, at the same time proving that the

duties, which I have been called upon to discharge, ^A are as arduous, as they are honourable. The virtues, and talents of those who have addressed you on former anniversaries, would alone be sufficient to prove the truth of my observation. For when I call to mind the exhortations of that* able divine, and ^B pious philosopher, whose “eloquent, and affectionate address,” you lately rewarded “with your warmest thanks,” I cannot but feel sensible of the disadvantages under which I labour upon this occasion. I find the like causes of apprehension in the luminous ^C discourse of the elegant scholar and learned physician (now no more) who preceded him the year before.† I find them in the addresses of your venerable President,‡ and in his able and judicious labours to promote the welfare of the Royal School. I find ^D them even in those tributes of affectionate respect, which were recently paid to his personal, and professional worth, by|| trustees, governors, professors, and pupils, upon his attainment of his 80th year. If

* The Rev. James Thomas Law, chancellor of the Diocese of Lichfield, addressed the anniversary meeting, 1835.

† John Johnstone, Esq., M. D., fellow of the Royal Society, and of the Royal College of Physicians, addressed the anniversary meeting, 1834.

‡ Edward Johnstone, Esq., M. D.

|| See Report of the Royal School, for 1836, pp. 11, 12.

^a I were to enlarge the field of my retrospect, I should discover further proofs of the difficulty, as well as dignity of my office, in the general efforts of all, who, by patronage,—contribution,—personal ministrations,—professorial services, have recorded their devotion to
^b the cause of improvement in medical, and surgical education, and who, in the prosecution of their common purpose, have never lost sight of that combination of christian principles with scientific pursuits, which brings blessings upon human know-
^c ledge, and makes medical and surgical studies, acceptable to God by their spirit, as well as beneficial to man by their success.

If from this general survey I were to turn my attention to some circumstances of a peculiar nature,
^d I should find fresh reasons for doubting and distrusting my own competency to do justice to the great cause which has brought us together. I should find them in that disinterested love of anatomical and physiological science, which, (about 10 years ago,)
^e determined an* accomplished surgeon of this, his native place, to enter upon a new career of fame, and to endeavour to establish in the Town of Birmingham,

* William Sands Cox, Esq., F. R. S., R. C. S.

what was so loudly called for by the wants of pro-^A fessional life, and the increased, and increasing rigour of the metropolitan examinations, I mean a School of Medicine and Surgery, with the necessary accompaniments of a Theatre of Anatomy, a Museum, full Courses of Lectures, and a regular attendance upon^B the Practice of a recognized Hospital. Happily for the improvement of these branches of a learned education, and happily too for the relief of human nature, suffering under those dangerous, and unhealthy labours, without which, (in these great seats of com-^C mercial, and manufacturing enterprize,) none of the greater operations of trade can be carried on, his philanthropic endeavours,* forwarded as they were by so many able, and zealous, professional and non-professional coadjutors, were crowned with complete^D success; a success, which is now attested by the lectures which are here delivered in every branch of Therapeutic science, by the talents, and learning of the lecturers, by the attainments of the pupils, by the annual examinations of those pupils for medals, and^E by their compositions for those prizes, which have been from time to time proposed by the lovers and

* See the account given of the origin and progress of the Institution, by the late Dr. John Johnstone, in his anniversary address, Oct. 6, 1834., pp. 4, 7.

^a promoters of scientific literature. For, let me ask of those who are competent to make the comparison, whether there can be found in the Reports of any School of Medicine and Surgery, metropolitan or provincial, better proofs of successful study, and exact

^b enquiry, than those furnished by the printed essays of your students?—by that for instance of MR. JAMES WILKES, *on the great Sympathetic nerve*, wherein the young essayist, has taken an historical, as well as anatomical view of the whole Ganglionic system, and

^c most justly, as well as learnedly maintains the title of* DR. JAMES JOHNSTONE to the honor of having preceded others in some of those paths, which have so happily conducted later enquirers to the most important discoveries in these dark regions of profound anatomy. The like evidences of successful

^d diligence are to be perceived in the Essay of MR. WILLIAM HAMMOND, *on Inguinal Hernia*, as also, in that of MR. ALEXANDER WRIGHT, *on the Influence of air, and soil on health*; and of MR. EDWARD TURNER, *on the Influence of Alcoholic Drinks, as articles of*

* See Mr. Wilkes's Essay, p. 43, for a reference to Johnstone, on the Ganglions of the Nerves, with Baron Haller's Letter to him. See Lobstein's and Vic d'Azyr's opinions, p. 33. The title of Dr. Johnstone's Work was "An Essay on the Use of the Ganglions of the Nerves, by James Johnstone, M. D., Shrewsbury, 1771;" but his first work was a Paper in Phil. Trans., 1764, 35 years before Bichat.

diet. After such proofs of power in the teachers, and a proficiency in the taught, it can be no matter of surprise, although as a fact, it must be gratifying to every parent of every pupil sent here for education, that no candidate from this Royal School of Birmingham, has ever sought in vain for his diploma, from the B College of Surgeons, or for his license from the Company of Apothecaries. The honourable distinction rests not for its truth, upon current report, nor private information—it has been proved by authentic evidence—it appears upon the minutes taken before a Com- c mittee of the House of Commons—it has become a parliamentary record.* Such are some of the facts, and some of the considerations arising out of them, all interesting in themselves, all most encouraging to the well-wishers to improvement in Medical and D Surgical education, which, by adding to the fame of your School, have added to the celebrity of your anniversary, and to the importance of the duties, which belong to it, and to the apprehensions of him, who has been called upon to take part in the per- E

* See p. 15, Appendix to Report on Medical Education—*Surgeons*, part 2—See 134, App. to Report on Medical Education—*Apothecaries*, part 3.—The account of candidates admitted and rejected is there given, and though rejections have been frequent, there is not a single instance of a Birmingham Pupil having been rejected.

▲ formance of them. For how can I reflect upon all
 these combinations of intellectual power with moral
 worth, of philosophic zeal, with religious principle,
 of pious, with patriotic endeavours, all working
 together for the accomplishment of a good, and
 ▸ great design, and realizing, even more than was
 anticipated, without feeling that the sphere of my
 duties has been raised, as well as enlarged by the rise,
 and enlargement of your reputation, prospects, and
 purposes?—That a higher level, as well as a wider
 c range has been given to the topics of my argument,
 that they ought to include matters, even higher, than
 the dignity or professional studies, and in amplitude,
 wider than the whole circle of natural science. For
 religious truths and duties demand attention—Divine
 ▸ Providence has claims upon our gratitude—it has
 claims upon the gratitude of all, who take an interest
 in the success, and reputation of your establishment.
 And how can these claims be better satisfied, than by
 upholding the principles, which have given stability
 e to your School, and brought a blessing upon its
 instructions; principles, which operating in many
 ways upon many persons, have led some to bestow
 their time and talents as teachers; others to con-
 tribute the aids of money as subscribers; others the

influence of hereditary rank and personal integrity as patrons, as well as subscribers; others assiduously to watch over the working and welfare of the institution as managers; and so many to shew, by their presence at its anniversary, the lively interest they feel in its growing greatness, and future fortunes? After such a representation, will it be necessary for me, to denominate the principles, which have produced such good effects? Could any but CHRISTIAN principles, and a CHRISTIAN spirit have given birth to such diversities of harmonious co-operation? Could any influence, but that of Christianity have produced so rich, and various a harvest of intellectual, and moral, scientific and benevolent exertion in so many individuals, from so many classes of social and civil life, from so many ranks and orders in Church and State? It is my happiness to know, that I am addressing A CHRISTIAN SCHOOL OF MEDICINE AND SURGERY. There was a time in the history of Therapeutic instruction, when every School of Medicine and Surgery was *Christian*, and during that period it would have been an unmeaning, or rather an invidious application of the term, to have bestowed it upon any school in particular. But unhappily for the present, and eternal welfare of those who are sent to some of the metropo-

^a litan schools, that time exists no longer. What was
 once a common denomination, has become an honorary
 distinction. What was formerly the property of all,
 is now the privilege of some. But, be it title of
 honor, or term of distinction, or common appellative,
^b the name of *Christian*, belongs to you, and to your
 School.—It belongs to its spirit, principles, and objects
 —to the whole constitution, and economy of your
 association; and, under these convictions, I think, that
 I shall best fulfil the expectations of those, to whose
^c good opinion, I feel myself indebted, not only for the
 honor of appearing before you upon this occasion, but
 the still higher honor of a permanent connection with
 your Institution, (as one of its trustees,) Rev. V. Thomas,
 appointed a trustee
 Nov. 11, 1837.
 if I take advantage of the present oppor-
^d tunity, not to enter into the boundless argument upon
 medical and surgical education, (although the general
 subject loudly calls for re-consideration, and would
 amply repay the labours of another * Gregory, or
 Percival, or Gisborne); but, that I may examine some
 of those special matters belonging to the general

* Dr. John Gregory, M. D., on the duties and offices of a physician, 1769.
 Dr. Thomas Percival, M. D., code of ethics and institutes adapted to physicians
 and surgeons. Principles of moral philosophy,—an enquiry into the duties of
 men in the higher and middle classes of society, resulting from their professions,
 by Rev. Thomas Gisborne, 1794. 2 vols. 8vo.

subject, which have been recently pressed upon my ^a attention, by the endowment of an annual prize-essay in your institution.

The REV. DR. SAMUEL WILSON WARNEFORD, its founder, by permanently securing these honors, and rewards to successful competition, wished to direct the ^b attention of students to the truths of revelation, as well as the phenomena of nature, and to induce them, to combine a *Scriptural* apprehension of God's wisdom, power, and goodness, with a practical knowledge of the structure and functions of the human body. ^c

That friend of man, and faithful servant of God, whose munificence it has been my happiness to witness, under so many different relations to the wants and woes of mankind, perceived, or thought that he perceived, but very few resting places for sacred ^d meditation in any of those wide fields of natural science, which the medical and surgical student is obliged to traverse. He well knew that nothing could be done by legislative enactment. That nothing had been done by the corporations, whose privilege it is to ^e pronounce upon the qualifications of students, in order to give a christian character to professional pursuits,

^A nothing to connect the Creator with his creation ;
nothing, to throw the rays of *revealed* light upon the
paths and passages that lead into the recesses of
nature. He was also led to apprehend, from recent
publications, that there were some, who, by inter-
^B mingling lessons of infidelity, with anatomical and
physiological instruction, were doing what they could
to rob God of his glory, and man of his gratitude ;
moral virtue of its best support, human reason of its
surest guidance, and professional attainments of their
^C brightest honor. He was therefore, the more anxious
to testify to CHRISTIAN SCHOOLS of Medicine and
Surgery, his sense of their services in the holy cause
of religious and scientific education. In the King's
College, of London, he found a corporate body ; and
^D in this Royal School of Medicine and Surgery, a
voluntary association, able by intellectual strength,
and willing by religious conviction, to uphold the
attributes and will of God, by the testimonies of
Scripture, as well as the deductions of philosophy ;
^E and thus, by the joint evidences of revealed and
natural truth, to counteract *the oppositions of falsely
called science, and of every thing else* (by whatever
delusive name dignified, or distinguished,) *which ex-
alteth itself against the knowledge of God,* (2 Thess.

ii. 4.) It is not however to be supposed that our ^A judicious benefactor, was so regardless of the special objects and purposes of a School of Physic, as to propose anything that should interfere with, or militate against professional studies, by calling off the attention of students, and directing it to profound ^B disquisitions in positive, or controversial divinity. But as DR. WARNEFORD has annexed to his grant, a specification of his intentions, I will now, (under the privilege of ancient friendship,) take upon me the office of commentator, and (under your indulgence,) ^C will proceed, (as briefly as the important matters involved in that specification will permit,) to explain, or rather expand the views of my pious and benevolent friend.

And first, as to the subjects of the proposed prize-^D essays:—They may be selected from any of the divisions or subdivisions of those professional studies, which in the printed *Curriculum* of your lectures, are set forth under the heads “*anatomy, general, descriptive, and pathological—and physiology.*” ^E

The Theses in short may be supplied by any of those branches of physical science, which are oc-

^a copied upon the healthy, or morbid condition of the human body, and if, for the fuller developement of what belongs to *human* anatomy, it should be thought advisable to take *comparative* views of structure, and function, sound, or sickly
^b in the lower grades of animal life, the range of choice may be so extended as
 to include all those instructive fields of *comparative* anatomy, and physiology, which bear witness to the labours, or rather record the triumphs of JOHN
^c HUNTER and CUVIER.

Subjects from comparative anatomy admissible, if to illustrate human anatomy.

But though so great a *width* has been assigned to the compass, or circuit of the subjects to be selected, a limit has
 been put to the *depth*, from which they are to
^d be drawn.

The depth of the subjects limited and restricted to the material world.

The subjects must all belong to the sensible world; they must all lie within the boundary lines of material nature. They must relate to things that are, and appear to be; to facts and phænomena. They must not
^e be such, as those which Boyle was wont to call *hyper-physical*, as being above the world of matter, and others *metaphysical* as lying beyond it.

They must not be metaphysical.

Without assigning other reasons for this restriction, ^A it will be enough to say, in support of its propriety, that it would militate against the necessary ^B pursuits, the present studies, the future interests of the students, to propose subjects which would have the effect of diverting their diligence from those things which they came to learn, (and which they do learn with such distinguished success,) in order to direct it to the metaphysics of mind or matter. There is however one subject, ^C (and one which forms a most important branch of practice,) which, if this restriction were carried to its full extent, would be excluded even from transient notice. It is the pathology of the mind. It is the science of diseases, caused either by hereditary crisis, or by the predominance of some evil passion or ^D appetite, which, (by that eternal law which binds together sin and suffering,) often operates in such sort; sometimes on the body, sometimes on the mind, and sometimes on both, as to produce a fearful variety and succession of derangements, mental and corporeal. ^E But how can I characterize these maladies of the mind, and the very prevailing causes of them, better than by citing the words of the Reverend and Worshipful Chancellor of the Diocese of Lichfield, and saying, that

Metaphysical subjects are foreign from the studies and interests of the pupils.

An exception made in favor of the pathology of the mind.

^A they arise in numerous instances, from* “the hidden
 working of some master passion acting sympathetically
 on the nerves, and baffling the utmost skill of the ana-
 tomist and demonstrator?” These important subjects,
 and such as these would, (if too close a construction were
^B put upon the words of the specification,) be excluded.
 Alive to this apprehension, I beg to submit, whether
 mental pathology, connected as it is with widely-
 spread and desolating afflictions, (afflictions for the
 care, relief and cure of which, my benevolent friend
^C has administered at different times, and for the most
 part through my hands, no less a sum than £7,450,†)

* See Chancellor Law’s address, 1834, p. 10.

† Donations by the Rev. Dr. S. W. Warneford, to the Radcliffe Lunatic Asylum, near Oxford:—

1825	..	..	..	..	..	£ 200
1826	..	..	..	..	..	300
1828	..	..	..	..	..	50
1829 and 1830	..	..	..	..	..	550
1831 and 1832	..	..	..	..	..	500
					(And by a benevolent Lady)	100
1832	..	..	..	..	..	1000
1834	..	..	..	..	..	100
1836	..	..	..	..	..	100
1838	..	..	..	..	..	4000
						<hr/> £ 6,900
					Miss Warneford’s Donations, up to	
1825	..	..	..	..	..	200
1826	..	..	..	..	..	300
1828	..	..	..	..	..	50
						<hr/> £ 7,450

This Institution has been placed under the medical superintendence of Dr. J. A. Ogle, who, to his exact knowledge of entomology, comparative anatomy, and clinical medicine, and his zeal and ability as a lecturer in these branches of science, has also directed his studies to mental pathology, and his benevolent attentions to the relief and cure of the afflicted.

ought not to be taken out of the foregoing restriction, ^A but so as to leave it in full force against all general investigations in psychology. But though metaphysics be excluded from the subjects of these compositions, they are admitted to be useful for the developement of the evidences of design in the intellectual and moral ^B economy of man.

But, whilst I am endeavouring to shew the propriety of excluding subjects which lie above or beyond the realities of tangible, visible, sensible existence, I would not have it supposed, that I thought that no knowledge ^C of the Divine perfections, no evidences of religious truths and duties, were to be derived from the contemplation of the acts and phœnomena of the human mind; on the contrary, if from among the signatures every where impressed by the hand of the Almighty upon the works of his ^D creation, it were permitted man to say of any, that they were superior proofs of the excellency of his wisdom, I should be disposed to place the faculties and functions of the mind, before those of the body, as natural evidences of the boundless power, the ^E supreme intelligence, the ineffable goodness of God. I see in the mental powers, acts, habits of apprehending and judging, distinguishing and comparing,

A reasoning and inferring, foreseeing, reflecting and remembering, willing and resolving. I see in all these things, and in their relations to the external world, and in their subserviencies to the wants of man, (especially to his wants as a social and moral
 B creature, accountable for his conduct in this world to his fellow-men, and to his Maker in the next,) abundant reasons for giving precedence to what the Almighty has done for us, in the constitution of our intellectual and moral powers; and, for placing in
 C the second place, that other class of wise and merciful adaptations, which the body of man exhibits from the hair of his head to the sole of his foot; from the superficial tissue of the epidermis, to the innermost textures of the vital organs.

D So too with respect to the metaphysics of matter as well as mind, they are excluded from the circle of approved subjects, not because they administer no materials for devout contemplation, no
 E arguments for the refutation of philosophic errors and impieties; the metaphysics of matter as well as mind, in the hands of Bramhall, Locke, Stillingfleet, Cudworth, Clarke, (in former days,)

So also, as to the metaphysics of matter, in the hands of Cudworth, Clarke, Dugald Stewart, &c.; they have established the essential attributes against unbelievers.

and of Browne, Reid, Beattie, Dugald Stewart, in ^A later times, have been found to be all sufficient to establish against all opposition, the existence, unity, personality, essential, and moral attributes of the Creator, and the never ceasing energies of his superintending, governing and upholding Providence. ^B

But they are excluded in this, as in the former case, because they are foreign from the studies, and adverse

But all metaphysics are excluded as subjects for these prize-compositions, because adverse to the interests and studies of the pupils.

to the interests of those who have been confided by parental to professorial care, that they might acquire the greatest quantity of suitable knowledge in the shortest time, for the able discharge of their future duties, either as practitioners in pure surgery, or generally in all branches of medical and surgical attendance. ^C

The optics, hydraulics, mechanics and chymistry of anatomy, admissible—and why.

If these limitations be not carried farther ^D so as to exclude what have been called the optics, the hydraulics, the mechanics, the chymistry of anatomy, it is because it may happen, from time to time, that the course of an argument, or the nature of a thesis, may necessarily lead the writer ^E to the consideration of those physical laws, which the Ruler of the world has ordained, and actuates, for the determination of the conditions, functions, changes, and

^A effects of parts, or particles belonging to the different systems constantly at work within the compages of the human body. The essayist would never be able to enter into any of these provinces of Divine speculation, without the aid of the sciences, which are taught
^B by your able and assiduous professors of chymistry, mathematics, and natural philosophy.* By the aid of these branches of general physics, it may be demonstrated that all these laws, though they may appear to be very far removed from the nature and character of
^C religious truths, bear as clear and conclusive evidences to the unceasing energies of Divine Providence, as the facts which they produce, or the phœnomena which they set before our eyes, or bring within the reach and cognizance of our senses or understanding.

The last particular which I shall submit
^D to the judgments of the learned gentlemen, here present, (as not coming within the purview of Dr. Warneford's specification,) is one, which, though closely connected with anatomy and physiology, is
^E occupied upon the structure and functions of the human body : not so much *ad intus*,

Views of the external relations of the human body to the works of creation, are too large and general; they would interfere with the study of minute anatomy, and call off attention from the proper subjects of study in a School of Medicine and Surgery.

(that is, as they are in themselves,) as *ad extra*, that is

* The Rev. W. M. Lawson, M.A., Incumbent of Moseley; appointed January 26, 1836.

in a relative point of view, as connected with the ^A general constitution of things in the external world, and with those ends or designs of the Almighty, which lie beyond the *microcosm* of the human body. These

The cosmical relations of the structure and functions of the human body.

ends and relations have been called by our great christian physiologist,* *cosmical*, ^B as extending to and embracing the whole natural and moral world.

Theses of this sort would lead the student away from minute and patient enquiry into the details of anatomy, physiology, and pathology, for the purpose ^C of taking broad and general views of those adaptations to external nature which are visible in the physical

Such views are very philosophical, and may be made very pious and profitable for instruction.

condition of man. I readily admit that no views can be more philosophical, none more demonstrative of God's merciful ^D

provisions for the being, and well being of his creatures.

To bring within the field of one capacious survey, the relations and affinities of all things created, and all the various correspondencies and adaptations of parts to parts, provisions to provisions, purposes to pur- ^E poses, is an exercise which will well repay the best efforts of pious philosophy; but still it is an exercise,

* The Hon. Robert Boyle.

^A which requires the *ripest* as well as the ^{But requires rich and ripe stores of knowledge.} richest stores of physical and metaphysical knowledge, and belongs rather to those who have completed, than to those who are but entering upon their physiological studies. The subject has been ^B admirably treated in that* Bridgewater discourse, which (with great felicity of style and arrangement, and with abundant illustrations from the volumes of nature, and the records of ancient and modern science) has brought all these harmonious adaptations to the ^C notice of general readers. The learned writer, by stripping his essay of the swelling robe of philosophic language, has made it more attractive, and better adapted to the purpose it was intended to promote, which appears to have been to diffuse, (in a popular ^D way) a sound and christian knowledge of the Divine attributes, as manifested in the reciprocating fitnesses of the constitution and condition of the universe, to the constitution and condition of man, and conversely, of man's constitution and condition to those of the ^E universe. The work, both as to matter and manner, is worthy of its judicious author—of him, who to the

* The subject has been most judiciously treated in a Bridgewater Treatise, by John Kidd Esq. F.R.S.—Reg. Prof. of Medicine in the University of Oxford.

largest and most solid attainments as chymist, anatomist, physician, unites the christian piety of Boyle, and Linacre's love of classical literature.

Enough has been now said to designate the subjects, which lie beyond the boundaries of the specification; but not quite enough to characterize those which lie within them. For their shorter and clearer description, I will take advantage of the distinctions which were made by an* eminent surgeon, who in

Anatomy, gross,
minute, transcen-
dental.

his evidence before the late committee on medical and surgical education, speaks of three sorts of anatomy, GROSS, MINUTE, and TRANSCENDENTAL. In adopting his terms, I ought to say, that I do not confine myself to the things which he comprises within the meaning of each; he used them incidentally and without regard to philosophic distribution, but I borrow them for the purpose of classifying the several matters in anatomy: as things above, things below, and things fit and suitable to the nature of these essays. Of these, the first, that is ^{Gross anatomy} *gross anatomy*, ^{—what?} may be said to be confined to the surface of things, and though most important as

* George James Guthrie Esq. See evidence taken on medical education, part 2. *Surgeons*, pp. 35, 36.

a a branch of general education, and for the diffusion
 of a useful general knowledge of such subjects; and
 useful too to those, who, as sculptors, would give to
 marble the energies of muscular effort, or, as painters,
 to canvass, the softer semblances of facial or bodily
 b expression, is worse than useless for every professional
 purpose.

The last sort of anatomy as the name Anatomy trans-
 cendental—what?
 implies, by soaring too loftily, or plunging too deep-
 ly, or expatiating too widely, soon loses sight of every
 c thing visible, tangible, sensible, in the economy of the
 human body; of every thing discoverable by the
 knife, the lens, or the chemical agent; and often
 blindly rushing beyond the ultimate facts in material
 existence, becomes involved in the depths and dark-
 d ness of hyperphysical speculations.

Midway between these extremes, that is, Minute anatomy
 —what?
 between the common footpaths of a trivial or quad-
 rivial anatomy, and the unknown regions, to which
 the transcendental aspires, lies the extensive province
 e of *minute anatomy*, the same, which has supplied your
 professors with the ample and* admirably-arranged
 materials of their 140 lectures.

* See printed syllabus of the Birmingham lectures.

Subjects for Dr. Warneford's prize-essays to be taken from minute anatomy.

In the character then of commentator ^A upon the specialties of DR. WARNEFORD'S statement, but with great deference to the exact and profound anatomists and physiologists here present, I submit it to your judgment, (regard being had to the studies of this Royal School, and to the ^B objects of those studies as preparations, first for the metropolitan examinations, and afterwards for professional duties) whether the subjects of these essays ought not to be taken out of some of those *middle* grounds, which, lying between the obvious and the ^C unknown, the manifest and the mysterious, invite and reward enquiry, by the abundance, the certainty, the usefulness of the knowledge which may be acquired.

Minute anatomy the special province of surgery.

With respect to surgery, minute anatomy may be said to form its ancient ^D hereditary domain. It is this minute knowledge, which, when the pupil becomes a practitioner, is to direct his hand, and (with God's assistance,) his heart too, through the intricacies of hidden structure, in cases of deeply-seated organic lesion, from accident ^E or disease. It is this, which is to enlighten and direct his judgment under the anxieties, it may be the perplexities of a perilous operation. This is the sort of knowledge,

A knowledge of it conducts the surgeons hand, and imparts moral courage in operations.

^A which, like the pole-star to the mariner, is to conduct him, I do not say through trackless deeps ; (for to a minute anatomist, no deeps are altogether trackless, none are without some *indicia*, none without some remembered organizations to guide manual skill, and
^B confirm moral and intellectual courage) but to conduct him through conflicting difficulties and surrounding dangers, and bring him at last to the haven of his rest, even to the happiness of knowing and feeling that he has done well, what he had warily undertaken, and
^C to the still higher happiness of knowing that he has done an act of humanity well pleasing to God ; and as a professional service, productive it may be of present emolument, but certainly of personal honor, and what is of still higher value, self satisfaction and
^D the approbation of his own conscience.

I should now proceed to those parts of the specification which relate to the christian religion, were I not desirous of making two observations upon the form and style of the proposed essays.

After the consideration of the matter of the prize essays, two things are to be observed as to their manner.

As I have said so much on their matter, I must confine myself to short general statements as to man-

ner. Under that necessity, I would say, that these ^A subjects in minute anatomy or minute physiology,

1st. They should be written as monographs. (integral or morbid) should be handled *monographically*, as to the general form or

structure of the argument, and *technologically*, with

2nd. They should be written according to the nomenclature of anatomy, or technologically. respect to the nomenclature of anatomy. ^B

In both of these particulars, they should be made to differ from essays exoterically

written for popular use, such as Dr. Paley's natural theology, and other works of that sort, wherein great care has been taken to avoid the language of the ^C

Dr. Paley and others avoid technology. dissecting room. In his work, Dr. Paley, that great master of perspicuity of style,

has, by the exercise of his known power over parallel and periphrastic expressions, translated scientific into vernacular language, sometimes homely, but always ^D happy, in order to make unknown things familiar to common understandings.

The same, or any other of the numerous books or parts of books, written for the proof of the Divine perfections, from the evidences of wise and merciful ^E

So also for popular use, structures and functions are discussed in a large loose, and cursory. contrivance, discoverable in parts or in the offices of parts of the human body, might be referred to, for the illustration of

^a what is meant by the monographical construction or composition of these essays. way, and not monographically. In treatises for popular use, it has been the object, or more properly the necessity of authors, to range over the wide plains of natural science, gathering ^b facts and phenomena from anything and everything which presented itself, that by the accumulation of all sorts of instances, from all sorts of subjects, they might confirm their reasonings from final causes; or, if at any time they have tarried a little longer upon ^c the anatomical or physiological evidences of design, it has still been for the purpose of taking broad and general views of them. But such are not the views suitable to the habits or the studies of the minute anatomist. It is his to pause and ponder upon those ^d passages in the book of nature, which a popular writer would be obliged to despatch with a few pointed observations.

To write *monographically*, is to write The use of monographs. profoundly, it is to write professionally. ^e Nothing has been ever effected in any department of medical or surgical science, either for the discovery of things unknown, or the exacter verification of things known, or the better application of what was well known,

without the fixation of thought upon a single subject, ^A resolving it into its parts, studying it in its relations, and then *synthetically* in a well-ordered monograph, communicating the results of individual observation to the experience of others.

The more the energies of mind and the acquirements ^B of diligence are concentrated in this way, and the more special the purpose of that concentration, the greater has been the success of the enquiry, the more

Nothing great was ever effected in anatomical and physiological science, but by concentration of thought and monographical argument. splendid the conquests of industry and talent. If it were necessary to confirm by ^C instances, the truth of my observation, I would refer to any one of the various increments which have been made from

time to time, in the previous amounts of anatomical, physiological, or pathological knowledge; and I would ^D ask, whether any facts or laws have been ever discovered in the structure or functions of the body; whether any new verities have been ever established in anatomical or physiological science; whether any new methods have been ever invented in medical or ^E surgical practice, without a previous application of the powers of thought to one thing at a time, and making it the special subject of some sort of inductive

^A investigation, and afterwards of an orderly argument, like some of those we find under the name of *papers* in the transactions of learned societies, or as single and separate monographs in *Le Clerc's Bibliotheca*.

And though it may be too much to expect, that such results can be obtained by the concentrated studies of any but proficients in anatomy and physiology, still it remains an unquestionable truth, that by circumscribing the range of study,

Though no new discoveries or inventions are to be expected, the method of thinking on one subject at a time, and writing monographically are sure to be serviceable to the essay-writers.

^C the field of observation, and the course of argument, and directing them all towards a single subject, those habits of close attention, patient enquiry, and consecutive reasoning are acquired, which give firmness and fixedness to a student's knowledge; and whether he ^D succeed or not in the scientific contest, which may have led him to this sequestration of thought from general to special subjects, he will be sure to find the future benefit of it, both in the *quantity* and the *quality* of the information he has obtained; in its ^E serviceableness for use, as well as in its amount for distinction.

The concluding part of this, my endeavour to do justice to the intentions of

The religious character of the proposed essay.

my excellent friend, will be confined to a subject, ^A
 which, if its place in this address had been settled by
 the closeness of its connection with man's present and
 eternal welfare, would have taken precedence of all
 other topics; it is the consideration of the religious,

It ought to be scriptural and christian. that is the scriptural and christian man- ^B
 ner, in which these monographs on points
 of minute anatomy are to be written, with respect to
 those parts which refer to the wisdom, power, and
 goodness of God, and whatever else may appertain to
 religious truth and duty. ^C

Some Treatises on Physico Theology, are very equivocally written as to matters of religion. It is felt as a painful necessity, to be obliged
 to say, that there are treatises on those evi-
 dences of design, which anatomy and phy-
 siology so abundantly supply for the demonstration of
 the Divine perfections, which, on points of religion, are ^D
 so questionably written, as to make it very doubtful
 whether the writers (in their religious opinions,) have
 made any advances of importance, beyond
 the creeds of Plato, Socrates, or Tully; al-
 though those philosophers might have taught them better ^E
 things,—for by their honest confessions of ignorance,
 by the anxious hopes they have expressed of a future
 revelation from heaven, and of some Divine assurance

Socrates, Plato, Tully, confessed their ignorance of Divine things.

^A of a life to come, they have given an unexceptionable testimony to the fact, that natural religion, left to its own efforts, has never yet been able, not even under its highest culture and in its most anxious aspirations, to think, or speak of the Almighty in any
 ^B manner, worthy of his power and providence, or worthy of the revelations which
 ^C exist between the Creator and the created; I do not say worthy of the relations which exist between our Father in heaven and his children on earth; I do not
 ^D say between the Redeemer and the redeemed, between the Justifier and the justified, between the Sanctifier and the sanctified, because these relations not discoverable by human reason, and lying far beyond the most forward anticipations of heathen philosophy,
 ^E were reserved for the last and brightest revelations of the will of God.

Natural religion did not give worthy representations of the Almighty and his attributes.

DR. WARNEFORD then, to save his intentions from misapprehension upon so important a particular as the nature of that religion, whose spirit he wished to
 ^E breath, and whose voice he hoped to hear in these compositions, thought it due to his holy office, as a minister of our church, and to his conscience as a doer

Dr. Warneford wished these essays to shew the writer's faith in revelation, by the citation of scripture testimonies.

of good upon the principles of the gospel, and to this ^A
 great and honourable association, as believers in that
 gospel, to state specifically his hopes, and intentions
 upon so momentous a concern. He says
 in his specification: "the great ends I
 have in view, are to combine religious with scientific ^B
 studies and pursuits, to make medical and surgical
 students good christians, as well as able practitioners
 in medicine and surgery, and for the more effectual
 advancement of these purposes, it is my farther wish
 that the compositions written for these prizes, may be ^C
 of a religious as well as scientific nature, that the sub-
 ject of them be taken out of any branch of anatomical,
 physiological, and pathological science, that they may
 be handled in a practical or professional manner, and
 according to those evidences of facts and phœnomena ^D
 which anatomy, physiology and pathology so abund-
 antly supply, but always and especially with a view
 to exemplify or set forth by instance or example, the
 wisdom, power, and goodness of God, AS REVEALED
 AND DECLARED IN HOLY WRIT. ^E

The directions
 for writing on these
 arguments differ
 from those which
 have been given by
 others who have

There is in the concluding sentence,
(as revealed and declared in Holy Writ,)
 an advised, and purposed departure from

^A the course* generally pursued in argu- proposed subjects
for prize essays.
 ments framed upon the phœnomena of the material
 world, for the proof of the divine attributes, and from
 the instructions which have been drawn up for the
 regulation of these arguments, by those who have
^B given, or left money to reward the writers. In those
 instructions, and in the arguments built upon them,
 as Nature was made to supply the premises, so too
 was it so ordered, that there should be no other sort of
 guidance to religious conclusions, than that which

* Thus the Earl of Bridgwater, by Will Feb. 25, 1825, directed that the
 treatises under his bequest, should be on the power, wisdom, and goodness of
 God, as manifested in the creation; illustrating such works by all reasonable
 arguments. So also in the Boyle lectures, the Honble. Robert Boyle, by Will dated
 July 28, 1691, directs his sermons to be directed against atheists, theists, pagans,
 jews, mahometans, and not to descend to any controversies among christians;
 which shews that the arguments must be built on natural, not revealed principles,
 on reason, not scripture. Mr. Thomas Fairchild, who died Oct. 10, 1729, by
 Will directed an annual sermon to be preached every Whit-sunday in Shoreditch
 Church, on the Wisdom of God in the Vegetable World. But the preachers of
 this lecture have very properly availed themselves of the testimonies of Scrip-
 ture :—see the sermons of Dr. Stukeley, 1760, 1763; and of Dr. Denne, 1730,
 1745; and the four discourses of the Rev. W. Jones, of Nayland, 1784, 5, 6, 7.
 It must be also added that John Shute Duncan, Esq. has in his *Botano-Theology*
 shewn that his piety is christian, by the free use of textuary evidences and illus-
 trations. Mr. Burnett, a Scottish gentleman, by Will left £1240 for two treatises
 “on the evidence that there is a Being all powerful, wise, and good, by whom
 every thing exists; and particularly to obviate difficulties regarding the wisdom,
 and goodness of the Deity; and this in the first place from considerations inde-
 pendent of a written revelation, and in the second from the revelation of the
 Lord Jesus.” This is much more satisfactory to the Christian, as a direction for
 such arguments, than those which make no allusions whatever to the fact of a
 written revelation.

Arguments framed on natural principles to convince unbelievers are generally left destitute of all support from scripture.

Nature, independently of revelation, was ^A able to afford. Such methods may be very fit and suitable in a Boyle lecture, or a Bridgewater treatise, or in any of those works, which are intended to establish by physical, or metaphysical arguments, the truths of natural ^B religion, against the atheist, the infidel, or the sceptic; although even with such objects in view, I cannot but think, that it is an imprudent condescension, if not a

It is wrong to take lower ground in this argument when the best and highest is so close at hand.

dangerous concession, to philosophical infidelity, for the soldier of Christ to quit ^C the 'vantage ground of his evidences, internal and external, miracle and prophecy and testimony historical, to the fact of the gospel revelation, and to plunge into mathematical or metaphysical speculations, upon principles prescribed by the adversary. ^D

Some writers pretend that it is bad logic to mix declarations of scripture with natural arguments.

Writers of this sort too studiously avoid even an occasional allusion to the testimonies of scripture, however appropriate, because they hold it to be against the rules of good ^E logic, in a natural argument (directed against infidelity or atheism,) to blend together the declarations of revealed truth with rational deductions from the

^A principles of nature ; but whatever reason there may be in these remarks, (as to discourses levelled against the errors, and impieties of the unbeliever) they do not apply to the compositions under consideration : for these essays are
 Whatever truth there may be in this, it is not relevant or applicable to the compositions under consideration.

^B not to be clothed with the apparel, nor to assume the attitude and aspect of controversy : they are to be written philosophically, but not
 These essays not to be written in a controversial manner.

^C polemically : they are to be written to shew the progress, and promptitude, and power of a student's knowledge in all that relates to anatomy, physiology, and pathology ; but without strife, without animosity—and, with respect to religion, it was Dr. Warneford's wish that they should be
 But they must boldly speak and affirm the truths of the gospel with Boerhaave & Haller, Bacon, Boyle, Locke, &c.

^D written in the spirit of peace and good will to man ; but still with a true *Bercean* readiness of mind, (*Acts*, xvii. 2.) **A** christian devotion to the written word, and with that freedom of spirit which shews that the writer, so far from *being ashamed to confess his faith* in revelation,
 But they must boldly speak and affirm the truths of the gospel with Boerhaave & Haller, Bacon, Boyle, Locke, &c.

^E is resolved with Boerhaave and Haller ; with Bacon, and Boyle, and Locke, and Newton, and all the great leaders of general or professional science, *to speak boldly as he ought to speak*, (*Eph.* vi. 20.) *to affirm constantly*, (*Tit.* iii. 8.) as he ought to affirm, whatever
 But they must boldly speak and affirm the truths of the gospel with Boerhaave & Haller, Bacon, Boyle, Locke, &c.

the Bible declares, and by heartfelt reminiscences and citations, to interweave the declarations of scripture with the conclusions of reason, whenever he should have occasion in his essay to declare, maintain, uphold the nature, attributes, or will of God. It

Dr. Warneford thought that controversies or topics connected with natural religion should be left to men of mature years and exact knowledge and experience.

may be true, that this is not the way to produce conviction in the unbeliever—that it is not the way to convince gain-sayers, (*Tit. i., 9.*) or stop the mouths of (*Tit. i. 2.*) adversaries. But these essays were not designed for such purposes. It appeared to our benefactors' experience, that controversial discussions of this sort should be left to those whose long familiarity with the questions involved in them, had given increased power to maturity of judgment, and so enabled them powerfully, as well as prudently, to

He wished these essays to set forth anatomical, physiological, pathological facts, and phenomena, as instances of what scripture reveals relating to the wisdom, power, & goodness of God.

perform these necessary duties of the christian's warfare. But it has been the expressed hope, the earnest wish of Dr. Warneford, that those facts, which by close attention and exact research have been elicited from some of the recesses of our mortal frame, should not be left, as they generally are left, in anatomical and other treatises of that sort, simply as useful truths, things subsidiary to medical

A or surgical practice; but that they should And profitable for christian instruction.
 be made *profitable for instruction* of an-

other, and a higher sort; even for the illustration of what the Almighty has been pleased to reveal upon the pages of the Old and New Testament, concerning

B his essential and moral, absolute and relative attributes. These phenomena, and the laws of these

phenomena, (as far as it has pleased God to place them within the reach of inductive sci-

ence) are not to be viewed in a state of

C severance from scriptural instruction. The laws and phenomena anatomical are not to be viewed in a state of severance from scripture.

They are not to be looked upon, and treated as so many independent evidences of contrivance and design, or as mere physical data from which we are to infer (by unassisted reason) the being and attributes

D of some great first cause supremely intelligent: such

laws and phenomena in these essays are to be in-

vested with a much higher character; they are to

perform a better part; they are to be adduced and

applied as instances taken out of the book

E of nature, for the exemplification of truths But are to serve for the exemplification of what is revealed and declared in the written word.

recorded in the Holy Writ:—The things

that appear are to be converted into notes and com-

mentaries upon the things that are written, which in

their turn are to perform the like service to the things

that appear. The verities of scripture, and the verities of nature, in this manner, (by a reciprocity of elucidation) are to give and receive light to and from

Nature and scripture are to be made to reflect light reciprocally upon one another. each other, proving by their analogies, their common origin, as proceeding from the same *Father of lights with whom there is no variableness, neither shadow of turning* (James i. 17.)

It is thus that anatomy, and physiology, and pathology, may be made to serve as hand-maids to revealed truth. It is thus that the word of God may receive an increase of power and profitableness from the unwritten language, and silent voices of the vein and its valves, the nerve and the fibre, the nutrient and digestive juices; from every thing chymical, every thing mechanical; every thing voluntary, every thing

And especially as to what scripture reveals concerning the divine attributes. involuntary; in form or function, rest or motion, in the economy of the human frame: all that is beautiful, all that is *wonderful*, all that is *fearful*, in the organizations of the body, are in these essays to be made use of for the visible demonstration of whatever has been declared in scripture concerning the wisdom, power, and goodness of God, for the brighter and fuller manifestation of his glory by the concentrated rays of his word and works.

A Neither are these irradiations and reflections of light from the pages of scripture upon the pages of nature, and from those of nature, back again upon the pages of Holy Writ, to be confined to things appertaining
 But not to them alone, but also as to what scripture declares concerning the body and bodily condition of man.

B to the Divine attributes : for are there not many sacred precepts relating to man, and to the bodily form and condition of man, in this life, (for it is to this that my argument obliges me to confine my observation) which may both throw light upon, and receive it from the

C facts that are discernible in our mortal frame? Are there not many passages in Holy Writ concerning life, death, youth, age, sickness, health ; the endearing but mysterious relations of paternity and maternity, which, as divine testimonies, may be suitably cited

D and applied in these essays ; and which, as texts of scripture, may be exegetically illustrated and confirmed by the living and breathing commentaries of the human body. When we are told in the word of God, *that man is fearfully and wonderfully*
Instances of scriptural declarations as to the human body.

E *made, (Psalm cxxxix., 14.) that the eyes of the Lord did see his substance, yet being imperfect—that in his book were all his members written, when as yet there was none of them—that the Lord hath set the members, every one of them in the body, as it hath*

pleased him, (1 Cor. xii. 18.)—that he hath clothed ^A a man with skin and flesh, and fenced him with bones and sinews, (Job x.,¹2.)—that the hearing ear, and the seeing eye, the Lord hath made even both of them, (Prov. xx. 12.)—that the Lord breathed into man's nostrils the breath of life—that the days of our age are three score ^B years and ten, and though men be so strong, that they come to four score years, yet is there strength then, but labour and sorrow, (Psalm xc., 10.)—that this corruptible must put on incorruption, and this mortal must put on immortality, (1 Cor. xv. 53.)—and that with ^C respect to the power of man over the physical laws of his organization, he is not able to make the hairs of his head white or black, (Mat. v., 36.) When these, and things such as these, have been revealed to us by our Heavenly Father, we cannot but feel that there is a sort ^D of reality in the observation, that men's persons are sacred things—that there is a sanctity in anatomical and physiological truths far beyond and above any which unassisted philosophy could discover, when most anxious to raise the dignity ^E of human nature. That the facts and phenomena of man's life and substance partake of the nature of things divine, organized as they were by God's creative power, and upheld as they are by his providential

Scripture gives
a sanctity to ana-
tomical and physi-
ological truths.

A wisdom and goodness; and destined, too, by our
Saviour's mighty working to be fashioned like unto his
glorious body, (Phil. iii., 21.) But is it possible for
 him who ponders upon all these coincidences between
 the things seen, and the things written to prevent his
 B affections from carrying out the conclusions of his
 reason? Will he not be anxious to trans- Pious and prac-
 form into religious sentiments the convic- tical results upon
 tions of his understanding, and the dis- the heart and con-
 coveries of his philosophy? Is it possible for any duct, the thoughts,
 C one to be sensible of these joint attestations of the words, deeds.
 works and word of God, and not go forward and
 gratefully acknowledge that the Lord's mercies are
 over all his works, (*Psalms cxlv. 9.*) Will he not ask
 with the Psalmist's humility, *Lord! what is man that*
 D *thou hast such respect unto him?*—Will he not confess
 and declare with the Apostle, *that in him we live, and*
move, and have our being, (Acts, xvii., 28.) Will he
 not strive to shew the strength and sincerity of his
 gratitude, by endeavouring to *glorify God with that*
 E *body and with that spirit which are his?* (*1 Cor. vi. 20.*)
 But there would be no end of such interrogatories,
 if they were to cease only when the scriptures ceased
 to supply matter for them. I will therefore return to
 the consideration of Dr. Warneford's principle: I

mean principle of combining scriptural testimonies ^A with natural deductions in disquisitions upon the phenomena of our corporeal nature.

Nothing which has been said, is meant to detract from the duty or profitableness of studying nature by itself for religious instruction.

When, in this specification, holy scripture is made the paramount authority for the attestation of the Divine attributes, it ^B is not meant to detract from the didactic power, the independent instructiveness of any, even the minutest of things created; still less to call in question the lawfulness of studying nature by itself, for the improvement of religious knowledge—for who ^C can doubt the lawfulness of these separate and distinct contemplations, who bears in mind the injunctions of scripture, *to stand still*, (*Job xxxvii, 14.*); *to consider*, (*ib.*); *to regard*, (*Ps. xxviii, 5.*); *to observe*, (*Prov. xxiii, 26.*); *to talk of*, (*Ps. cv, 2.*), the works of ^D creation ?

The physiologies of Job and David.

Who would ever dispute its profitableness for religious purposes, who has pondered upon the sacred physiologies of Job and David, and especially upon the interrogatories put to the afflicted ^E patriarch at the close of his holy controversy, or who has weighed St. Paul's natural

^a arguments to the philosophers of Athens, cal or natural arguments.
 (*Acts* xvii, 18.), and the people of Lycaonia, (*Acts*
 xiv, 11.), and others, in his epistles to the con-
 verts of Rome and Corinth; or who has devoutly
 laid to heart his Saviour's appeals, to Our Saviour's ap-
 peals to natural
^b the rains of heaven, to the fowls of the evidences.
 air, the lillies of the field, the hairs of the head, the
 height of the stature, as independent natural evidences
 of the universality of God's providential wisdom,
 justice, mercy, and long suffering? Job, David,
^c Solomon, St. Paul, our Saviour himself, all had re-
 course to the works of creation, as evidences of sacred
 truths and sources of religious knowledge; therefore
 the independent contemplation and use Nothing which
 has been said is
 meant to detract
 from arguments
 drawn a *causâ fi-*
nali.
^d of them for profit or instruction, are
 sanctioned by authorities which the
 christian will not be disposed to dispute. But it is
 equally clear, that since the Divine attributes have
 been in scripture expressly revealed to us, and in
 language mercifully accommodated to the narrowness
^e of man's comprehension, we ought not to turn our
 eyes from such instruction: we ought not to choose
that lesser light, which ruled the night of Gentile dark-
 ness, and neglect *the greater light*, which now rules
 the day of christian grace and salvation. Neither is it

intended by this especial reference to the word of God, ^A to disparage the argument *a causâ finali*, or to diminish the influence which it rightfully exercises over the minds of all but those, who, like Descartes, bewilder themselves in the metaphysics of finality, or those, who like Hume, equally bewilder themselves in the ^B

Nothing that has been said is meant to countenance the opinions of Hutchinson. metaphysics of causation. Neither is it meant to patronize the fond opinion that the word of God was intended to furnish

data for the discovery of scientific truths. This was the error of Hutchinson and his followers, who were ^C wont to insist upon the philosophy of scripture, (especially that of Moses,) against the truth of the Newtonian philosophy. This too was the folly of Paracel-

Or Paracelsus. sus, "who (as lord Bacon observes,) pretended to find the truth of all natural philosophy in ^D the scriptures, scandalizing and traducing all other philosophy, as heathenish and profane." The same sort of error, but in an inferior degree, has been committed by the once celebrated author of the book

Or Newentyt's erroneous way of citing scripture. entitled, "The Religious Philosopher," of ^E whom * Dr. Desaguliers observed, "that it was to be wished that he had applied the texts of scripture which he quotes, as properly as he had done

* See Dr. Desaguliers's præface to his translation of Newentyt.

his philosophical considerations," he having wrested them from their right sense, that he might give the semblance of support to his anatomical or physiological observations.

In short there is nothing in the specification, which will lend any sort of support to the notion, that "Philosophy should be made the interpreter of scripture, or should be viewed as a treatise on natural philosophy.

Scripture does not teach Philosophy—nor should Philosophy be made the interpreter of scripture.

If more were wanting for the exposition of the great master-principle laid down in the specification, I should be able to cite passages from several authors, which represent the scriptures as designed (besides other sacred purposes) to be commentaries on the works of God. And if these were not enough, I would refer to the works of BOYLE—BENTLEY—BARROW—RAY—DERHAM—and I would put it to the exact judgment as well as religious feeling of this meeting, whether their eloquence has not been made more persuasive, and their arguments more powerful and convincing, by the textuary precepts which have lent their aid to physical

Dr. Warneford's master-principle might be farther explained by quoting passages from the writings of those who entertain his views as to this use of scripture.

It might also be illustrated by the example and practice of writers who have used scripture in this way.

evidences and rational deductions. Their writings, if ^A appealed to, would tell of the profitableness of *the sure testimony*, of the sacred "*scriptum est*" of the Recorded Word, for the fuller developement of the Divine will, as well as attributes in arguments of this nature. B

The unsearch-
ableness of God is
to be contemplated
upon this occasion.

If from the glorious constellation of those attributes, I were, upon this occasion to select one, to throw its starry light upon the path of those, who, in the energy of youthful intellect and the power of acquired knowledge, may not be ^C sufficiently alive to that law of God, which withhold his *deep and secret things* from man's discovery, I would select his UNSEARCHABLENESS as an attribute, not only declaratory of his power over all the *penitiora naturæ*, but most expressive of his will, that we ^D should learn to walk humbly and speak warily, as soon as our ignorance tells us that we have reached *the clouds and darkness which surround his throne*, (*Ps.* xviii, 11. lcvii, 2. lxxvii, 19.)

Pious and practical
use to be made
of the attribute of
God's unsearch-
ableness.

Let a proper sense of the *unsearch-* ^E
ableness of God accompany the student
in every analytic, every synthetic process

A of his philosophy, in all that he does for the verification of facts, in all that he writes in discourses upon them. The deep conviction that the ways of the Almighty are unsearchable, need not damp, nor destroy his thirst of knowledge. It ought to do no
 B more, than chasen the spirit of enquiry, check its excesses, and correct its aberrations. The assurance that "*the Almighty is wonderful in counsel and excellent in working, (Is. xxviii, 29.); that we cannot find out the Almighty to perfection, (Job xi, 7.)*" ought
 C not to prevent *our feeling after and find-* The practical use of our knowledge of God's unsearchableness, especially in the investigations of minute anatomy.
ing (Acts xvii, 27.) his wisdom, power, and goodness, even though the search should conduct us into the minute and
 D deeply-seated wonders of our corporeal nature. For it may be said, that the Divine perfections are exhibited to our apprehension with greater brightness, and proclaim their glory with a louder voice, the more profoundly we investigate his provisions for the well-being of man, in the minuter structures of his bodily
 E fabric. What Pliny said of the insect, may be applied to every thing minute in the offices and organizations of the body. "*In his tam parvis, atque* Pliny's exclamation, concerning things minute.
tam nullis, quæ ratio! quanta vis! quam
*in extricabilis perfectio!"** and again, "*rerum natura,*

* Plinii Hist. Nat. Lib. xi. Cap. 1. & 2.

nusquam magis quam in minimis tota est." In ^A
 this passage, let God's holy name be substituted for
 that of nature ; and instead of an insect, let an instance

May be adopted
 by the christian,
 mutatis mutandis. be taken from any of the minutiae of ana-
 tomy, and we too shall be disposed in
 like manner to exclaim " what infinite wisdom ! what ^B

amazing power ! what inextricable perfection ! The
 Lord no where appears in greater glory, than in things

Cowper's admi-
 ration of minute
 objects in nature. of the smallest dimensions, or perhaps we
 should feel disposed (with the poet Cow-
 per) in silent admiration to ponder upon ^C

" Muscle and nerve miraculously spun,
 His mighty work who speaks, and it is done—
 The invisible in things scarce seen, reveal'd
 To whom, an atom is an ample field ! "

The transcen-
 dental anatomist
 will be the first to
 admit the un-
 searchableness of
 God, if he have an
 honest and good
 heart. He who shall have penetrated farthest
 into the intricacies of organic structure,
 who, not satisfied with microscopic en-
 largements of his field of vision, passes
 onwards to the chymical solution of whatever stops ^D
 his way, (be it solid, fluid, or gazeous,) and who by
 the help of still more subtle agencies, has advanced
 even to the very borders of corpuscular existence, even
 he, if he possess *the good and honest hear* of a chris-
 tian philosopher, will be the first to confess with the ^E

^A patriarchal physiologist, that *there is a way which the vulture's eye hath not seen—a wisdom which is hid from the eyes of all living, (Job xxviii., 21.) that no man can find out the work that God maketh from the beginning to the end, (Eccles. iii. 2.) that he doeth things which*
^B *we cannot comprehend, (Job, xxxvii. 5)* even the transcendental anatomist, however searching the solvent; however subtle his electric or galvanic current, will be obliged to acknowledge that he who can bind the sweet influences of the Pleiades, and loose the bands
^C of Orion, (*Job xxxviii. 31*) can so bind and loose the influences of galvanism, electricity, and every other law or principle, atmospheric or cosmical, for the oxygenation, calorification, vitalization of the blood and body. The christian transcendentalist will be the
^D last to say, that caloric in the body must follow the same laws as caloric out of the body"; * on the contrary, convinced that he knows *but parts of God's ways, and those parts but darkly, he will take care neither to darken the Divine counsel by words without knowledge,*
^E (*Job xxxviii, 2.*), nor give such instruction as may cause to err from the words of knowledge, (*Prov. xix, 27.*) But why should I accumulate the testimonies of scripture upon the unsearchableness of God, and

* Elliotson's 5th Edit. of Blumenback's Physiology, Vol. 1st pp. 238.

the duty of speaking warily in respect of those things ^A which he has been pleased to call, *the treasures of his wisdom*, (*Job xxxviii, 22.*) It is a fact, a truth, a doctrine forced upon the admission of reluctant philosophers, by whatever ascent, or by whatever descent they may seek to enter into the counsel-chambers of ^B Omniscience.

Of such philosophical adventurers and their opinions and controversies, let him* speak, who may be said to have dedicated the last energies of his great talents and extensive benevolence to your service, who, though ^C dead, still speaketh concerning the foolishness of presumptuous wisdom in that oration, (so purely classical in language,) which he delivered before the college of physicians. Such advice, when it comes recommended to your attention by the name of JOHNSTONE, ^D will not fail to exercise a twofold influence. First, by its own weight and value, and then by the worth and wisdom of the giver of it, and especially by his affectionate concern for the welfare of this institution. † When (says the Harveian orator, in language far ^E

* Dr. John Johnstone died at Monument House, near Birmingham, Dec. 28, 1836, having spoken the anniversary address, Oct. 6, 1834.

† Est etiam, ubi res ipsæ ab intelligentiâ et sensibus humanis longè semotæ, non nisi umbras falsæ scientiæ consecrari nos sinunt. Fatendum est tamen,

^a superior to any that a translation can substitute.)

When these things are far removed from the senses and understanding, they permit us to do no more than hunt after the shadows of a false and delusive philosophy. It must however be admitted, that for many ^b ages wise and good men have applied all the energies of their genius and industry to the subject, which has very recently engaged public attention. In my opinion however, these profound enquiries have by their excessive desire of understanding every thing, ^c reduced themselves to the state and condition of knowing nothing at all, and general readers, ever accustomed to applaud what they do not understand, have by these pretended demonstrations been made

*per multa retro sæcula, virossapientes et bonos, in re quâ de inter mortales nuperri-
mè agebatur, omnes et industriæ et ingenii sui nervos intendisse. Me autem
iudice nimis intelligendo fecerunt, ut ipsi nihil intelligerent, lectoresque quod
nescirent plaudere solitos, monstrationibus istis suis, redderent, multò quàm antea
fuissent, incertiores. Quibus igitur in deliciis est, res quas caliginosâ nocte
presserit Deus, anxie ne dicam audacter rimari, auctor fuerim, ne oleum,
operamque perdant. Etenim argumenta ab utrâque parte tantopere jactata,
nullis innituntur germanæ philosophiæ principiis—nullam ab Anatomiâ fœne-
rantur lucem—nullum quo se tueantur testimonii pondus è sacris litteris
eliciunt, nullo—cum officiis hominum vinculo astringuntur, neque ut exitum
ullum reperiant, qui disputatores animosè, et quidem acerbè inter se digladi-
antes conciliaturus sit, naturæ humanæ imbecilitas pati videtur. In aliis sanè
artibus, ut se res habet, controversiæ de quibus loquor minimè inter ea ponendæ
sunt, quæ ut Celso visum fuit, “cùm ad Medicinam propriè non pertineant, tamen
eam adjuvant excitando artificio ingenium.”—pp.52, 53., Joannis Johnstone, M.D.
Collegii Medicorum, London, et Societatis Regalis Socii Oratio Haroeiana,
MDCCCXIX.*

even more uncertain and unsettled than they were ^A before. To men of this sort, whose delight it is, with a too anxious, (not to say,) too daring spirit to explore the things which the Almighty has been pleased to conceal in the blackness of darkness, to them I would say, do not waste the oil of your midnight ^B lamp, do not lose the labour of your daily toil; as to the arguments of this sort, which have been so long and so much tossed about to and fro, they rest not upon any principles of sound and genuine philosophy—neither do they borrow any light from anatomy—^C neither do they derive any kind or degree of warranty from holy writ—neither are they connected by any tie whatever with the practical duties of life—neither does the weakness of human nature make it possible to settle these questions, so as to bring about a recon-^D ciliation between those who have engaged so warmly, not to say bitterly, in this controversy. Such questions are not to be classed with those, which Celsus represents as assisting medical science, though they do not properly belong to it, by reason of the ^E excitement and exercise of the talent which they produce.

More would I willingly extract, if beauty of style

^A and truth of observation, and soundness and sincerity
of advice, were the only things I had to attend to.
But in my character of clerical commentator upon a
clerical friends specification, and as a firm adherent to
the cause of religious education, and as an admirer
^B and advocate of your institution, and hearty well
wisher to its pecuniary as well as literary prosperity,
I have some last duties to perform, a few parting
words to deliver. I have first to thank this meeting
(distinguished as it is by rank and integrity, by piety
^C and learning, by professional knowledge and reputa-
tion, and I am bound to add by* academic worth and
wisdom,) for the patient attention they have been
pleased to bestow upon an address, which, by reason
of peculiar circumstances has been extended beyond
^D the usual length.

I have also to express the lively interest I have felt
in the various demonstrations of talents, attainments,
and assiduity which have been given by the pupils
upon this occasion, and assure them that my sincere

* The Regius professor of medicine of the University of Oxford, Dr. John Kidd, and the Clinical professor in the same university, Dr. James Adey Ogle, were at this meeting, and assisted in the presentation of medals to the students who had distinguished themselves, also the Rev. George Leigh Cooke, B.M., professor of natural philosophy, in the same university.

and earnest wishes will ever attend their intellectual ^A efforts to obtain literary honors for themselves, and add to the reputation of their School.* But I have another, a higher, a concluding duty to perform: It is that of a minister of God. In that character then I close my argument, with *a word of exhortation*, (*Heb.* ^B *xiii*, 22.) Sensible, my young friends as you must be of the great defectiveness of man's knowledge, even when he knows the most, and in the best way; sensible that there are millions of particulars in the mechanisms and chymistries of this mortal body, ^C beyond the utmost stretch of human intellect, you will do well to ponder upon that saying of the great instructor of human science, Lord Bacon, "Dignius

* The names of the students who distinguished themselves upon this occasion are as follows:—

<i>Prize—by whom presented.</i>	<i>Student.</i>	<i>With whom pupil.</i>
The Warneford Prize, by the Rev. Vaughan Thomas.	Mr. T. C. Roden, Birmingham.	Messrs. Lukis and Roden, Kidderminster
Gold Medals for good conduct, by the Hon. and very Rev. the Dean of Lichfield.	Mr. Edwin Chesshire, Birmingham, Mr. Edw. Smith, Derbyshire.	Mr. Pye Chavasse, Birmingham, Messrs. Cartwright and Waddy.
The Jephson Prize, twenty guineas, the Rev. J. Angel James.	Mr. G. M. Grant, Northampton.	Mr. Francis Elkington, Birmingham.
The Meredith Prize, five guineas, by James Taylor, Esq.	Mr. Joseph Hobbins, Wednesbury.	Mr. Underhill, Great Bridge.
Medal—Surgery, offered by William Sands Cox, F.R.S., by Dr. Kidd, Reg. Prof. of Med. Oxon.	Mr. George T. Cooper, Bilston.	Mr. Cooper, Bilston
Medals—Practice of Physic, offered by John Eccles, M.D., by Dr. Ogle, Prof. of Clin. Med. Oxon.	Mr. S. M. Grant, Mr. J. Randles, Overton, Flintshire.	Mr. F. Elkington, Mr. Hadley.
Medal—Materia Medica, offered and presented by James Johnstone, M.D.	Mr. Edward Smith, Derbyshire.	Messrs. Cartwright and Waddy, Birmingham.

^A quiddam est credere, quam scire qualiter nunc scimus.

Whenever the anatomist or physiologist is occupied upon the unsearchable ways, the unfathomable depths of God's wisdom and knowledge, it is better, (regard being had to the kind and quality of his information,)

^B to say I BELIEVE, than to say I KNOW—it is an expression more worthy of the piety of man, more suitable to his intellectual insufficiency, more declaratory of a christian spirit. *He that cometh to God*

is required to believe that he is, (Heb. xi, 6.) It is

^C *through faith that we understand that the worlds were framed by the word of God, so that things which are seen were not made of things which do appear, (Heb.*

xi, 3.) It is by an act of faith, that, (in those sound

words which have been supplied by most sure warrants

^D of scripture, and which set forth the universal belief of christians from the beginning.) We say, “we believe in one God the Father Almighty, maker of

heaven and earth, of all things visible and invisible.”

In like manner and still by an act of faith, we confess

^E that, “there is but one living and true God, ever-

lasting, without body, parts or passions, of infinite

wisdom, power and goodness, the maker and preserver

of all things; and, that in the unity of the godhead,

there are three persons of one substance, power and

eternity, the Father, Son, and Holy Ghost." These ^a Divine attributes and personalities of the godhead, not deduced by reason, but revealed to faith; not reasoned out from the works, but established by the word of God, have been committed by our Saviour to the keeping of His church, and the teaching of his ^b ministers; *and woe unto me if I teach them not in season out of season.* For they all rest upon the sure testimony of that written word which in the words of Locke,* "has God for its author, salvation for its end, and truth without any mixture of error for its matter." ^c The divine attributes in these essays are to be treated as matters of christian faith, rather than as matters of human knowledge—they are to be embraced upon the testimonies of the revealing spirit, rather than coldly received as the results of anatomical or physiological ^d speculation—they are to be admitted freely into the heart, to animate the affections, and call forth the best energies of love and reverence—not left to float upon the brain as things purely intellectual, unproductive of moral effects, and unaccompanied by practical im- ^eprovement. It was the hope and wish of our common friend, that the contemplation of the revealed

* See Locke's Posthumous Works.

^A attributes should lead to the knowing and doing of the revealed will—that the *doing of the will of God* should operate to the better understanding of his doctrine, (*John* vii, 17.) that a conscientious sense of obligation should lead to a practical performance of

^B duty: that the student should learn to venerate the wisdom he discovers in the human fabric, and love the goodness which he there beholds, and fear the power which he acknowledges, and obey the authority under which he lives, and worship him whose attri-

^C butes and perfections revealed in the word and exemplified by the works of God, cannot fail, with God's assistance, to awaken piety and prescribe devotion. In short, it has been Dr. Warneford's hope, that every student might have the happiness of being able to say

^D with the great Father and founder of all the natural sciences, "Thy creatures, oh Lord! have been my books, but Thy scriptures much more—I have sought Thee in the courts, the fields, the gardens, but I have found Thee in Thy temple."

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AN
INTRODUCTORY LECTURE

DELIVERED IN

The Queen's College,

BIRMINGHAM,

AT THE

COMMENCEMENT OF THE WINTER SESSION,

OCTOBER 2, 1843.

BY JAMES JOHNSTONE, M.D.,

FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS:

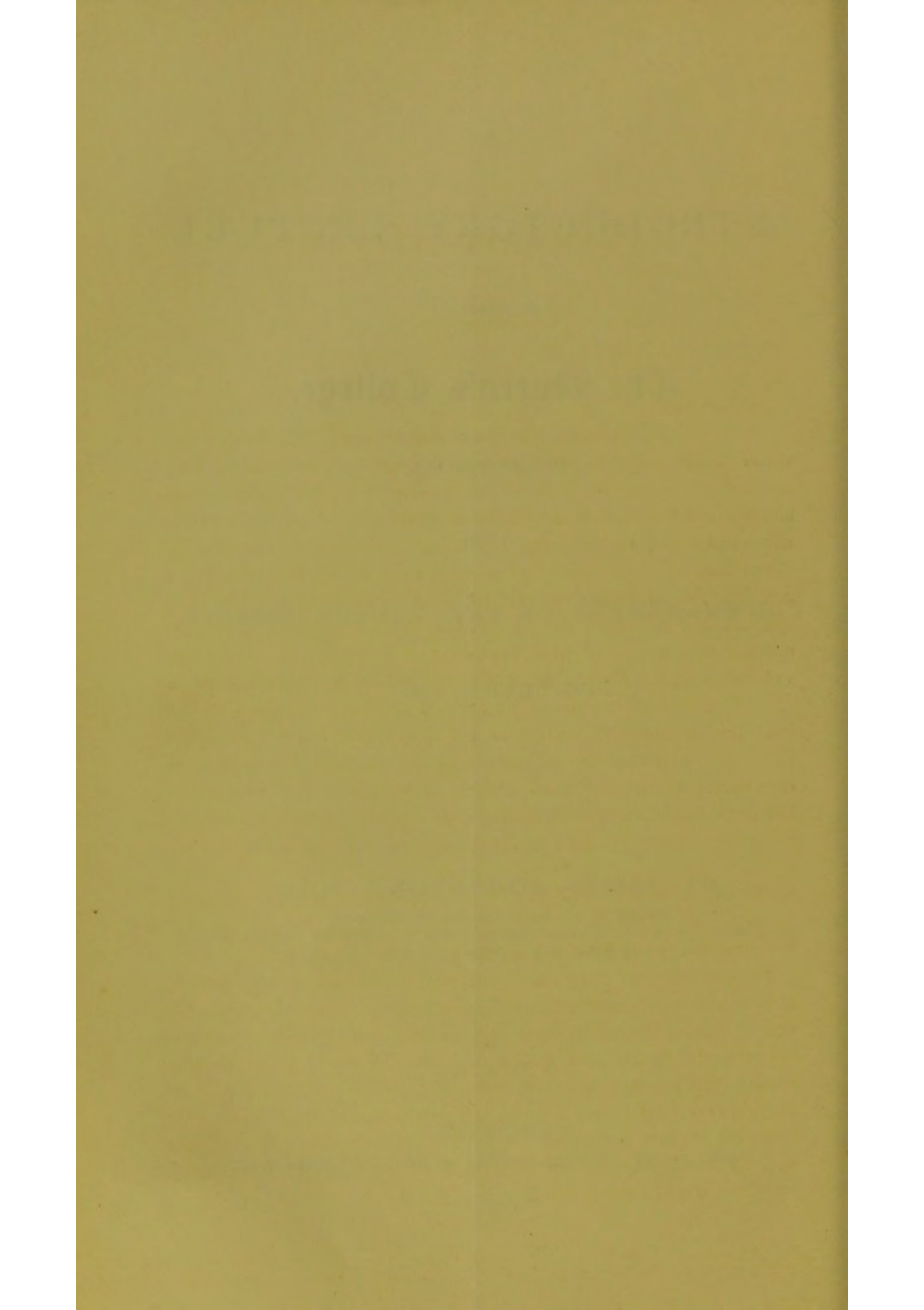
SENIOR PHYSICIAN TO THE GENERAL HOSPITAL; AND PROFESSOR OF MATERIA MEDICA
AND THERAPEUTICS, AT THE QUEEN'S COLLEGE, BIRMINGHAM.

BIRMINGHAM:

ALFRED ALLEN, PRINTER TO THE QUEEN, 3 COLMORE ROW.

MDCCCXLIII.

c



INTRODUCTORY LECTURE.

GENTLEMEN,

Eighteen years have elapsed since Mr. Sands Cox, whose name must be ever associated with this institution, first delivered a course of lectures on Anatomy in this town; thus laying the foundation of the School of Medicine and Surgery, which was established in the year 1828, and was almost immediately recognised by the Royal College of Surgeons, by the Society of Apothecaries, and more recently by the University of London.

From that time until the present day, it has pursued a constantly progressive course, and much has occurred to gratify its promoters and supporters. By the liberality and exertions of its friends, a good library and extensive museums have been collected, while from the enlightened conduct of the Guardians and Overseers of the Poor, opportunities of acquiring a practical knowledge of Anatomy have been afforded, such as scarcely any other institution possesses, and such as have rendered its students eminently successful in that department of medical science. The students, indeed, have for the most part done themselves great credit in the public examinations which they have been called upon to undergo, and we have the pleasure of numbering many of them among the *distinguished* members of our profession.

The last eighteen years have, however, formed an eventful period in the history of literature and science; for in no previous era was so much anxiety displayed by all ranks of the community to improve the means and disseminate the blessings of education. In the advancement of other sciences that of medicine has fully participated; and it has been the earnest desire of the council and lecturers of this institution to keep pace with the spirit of the age, by rendering our school second to none in the advantages which it offers to the student.

How far we have succeeded in this object it is not for me to say ; but that the lectures have been well attended, that the classes have gradually increased in proportion to those of the Metropolitan Schools, and that the institution had such reputation as to obtain the patronage of our late excellent sovereign, may, perhaps, afford some presumption that our labours have not been in vain.

But, even if it be admitted that we have little cause to be dissatisfied with the past, this is not an age when either institutions or individuals can stand still. If they do not attempt to advance they must lose their station ; and it is under the impression of this fact, that the council has determined to adopt that plan which the experience of our most ancient universities has proved to be the best ; to provide rooms for the residence of students, and in every other respect to introduce the collegiate system.

To ensure its permanency, an application has been made for a Royal Charter of Incorporation, which Her Majesty has been graciously pleased to grant.

The very able letter of our highly-accomplished friend, the Rev. Vaughan Thomas, to our munificent benefactor, the Rev. Dr. Warneford, on the Educational and Subsidiary Provisions of the Birmingham Royal School of Medicine and Surgery, altogether precludes the necessity of my entering into the advantages of this alteration ; and I will only add, that the council has been actuated by a profound conviction, that the collegiate system is alike conducive to the comfort of the student, and to the formation of those habits which are calculated to make him a valuable member of his profession and of society.

In commencing a course of lectures on any branch of medical science, it has been much the custom to trace its history from the earliest periods, and to give some account of its progress in former times. But as this part of our subject is ably treated by several writers on medicine, whose works are to be found in almost every library, I shall, on the present occasion, content myself with taking a hasty view of the circumstances by which the attention of mankind was first attracted to the study of medical science, and I shall then proceed to the consideration of the mode in which this science may be most effectively studied.

The science of medicine derives its origin from the miseries and infirmities of man ; and since disease exists in every state of society, so, as Cullen has remarked, “no country has been discovered, among the people of which, however rude and uncultivated in other respects, an art of physic and the knowledge of a great number of remedies has not been found.”

In a state of nature, mankind is liable to many and great privations, although as yet unacquainted with those luxuries and artificial necessities to which many diseases are justly attributed ; for if the wants of the savage be few, his means of supplying them are still more limited. His diet is confined to the fruits and vegetables which are spontaneously produced by the earth, and to the animals which may be taken in the chase. But, should these sources fail, should the trees and herbage be destroyed, and the birds and beasts forsake the haunts of man, the horrors of famine must follow, with pestilence as its inevitable successor. To this may be added, that constant exposure to the inclemency of the weather, which no human constitution can endure, and the frequent use of unwholesome and innutritious food, when nothing better can be obtained. No wonder, then, that disease should very frequently result from such a combination of circumstances.

This is precisely the condition of the North American Indians at the present day ; for we are informed by those travellers who have become conversant with their habits from a residence in their country, that they are peculiarly subject to the disorders which arise from a moist atmosphere and excessive fatigue, succeeded by decrepitude, and ending in premature death. It is scarcely probable that any means of remedying these calamities would ever have occurred in this primitive state of society, and perhaps the world might still have been edified by the wondrous powers of charms and amulets, had not the accidental use of some herb for the purpose of allaying the cravings of hunger, indisputably proved its influence in curing disease. There can be no doubt that the first discovery of medicines was the consequence of such accidents, or of the effects which were observed to be produced upon animals by deleterious plants which they had swallowed.

Thus, according to Geoffrey, the medicinal properties of Peruvian bark were discovered by chance. Some cinchona trees having fallen into a pool rendered the water so bitter that no one would drink it, until a person suffering under fever drank of it to allay

his thirst. Finding that his fever had been thereby cured, he persuaded others to try the same remedy: nor was this unsuccessful, for all who adopted it were restored to health. When, however, the trees decayed, the bitterness of the water and its febrifuge qualities alike vanished, and hence it was inferred that its medicinal effects depended on the bitter properties of the bark.

The medicines of all uncivilised nations consist either of simple herbs, unprepared by art, or of the juice expressed from them; these, and nothing more, being applied to heal the bite of the most venomous reptiles, and to cure the most virulent disorders. At first, then, the knowledge of the properties of medicines was dependent on accidental experience, and their application to the cure of disease was conducted on a system of pure empiricism. But as society advanced, and luxury began to produce its baneful effects on mankind, rivalry between different communities, and the wars which arose from their mutual jealousy, forced the inhabitants of the country to seek refuge within the walls of cities. Such a change in the habits of a people would be calculated to increase the number of their maladies, and perhaps even to introduce some which were previously unknown. This was more especially apparent, when by any circumstances the communication with the surrounding country was cut off, and the citizens were prevented from enjoying the advantages which the free circulation of air affords to the constitution.

Then it was that disease, in its most appalling form, spread around desolation and death. An awful example of this is recorded by Thucydides, in his eloquent account of the plague at Athens, which is moreover described by the poet Lucretius. This dreadful epidemic was supposed to have originated in Ethiopia, whence, passing through Egypt and Persia, it travelled to Lemnos, and afterwards to Athens.

At the time of its first appearance, the Peloponnesian army was ravaging Attica; it was the hottest season of the year, and the inhabitants of the country, who had taken refuge in the city from the invaders, not only filled every house, but many of the poorer families were crowded together in small, ill-ventilated huts, where the bad air, and unwholesome state of the atmosphere thus generated, were much increased by the want of common sewers, and by the difficulty of burying the dead. To these aggravating circumstances may be attributed the great mortality which occurred

in Athens; for the pestilence raged there more violently than in any other place, though it spread into other towns, and especially prevailed in those which were most populous. It is well to notice these facts, because the statistical reports which have been lately published, and especially those of the Registrar-General of Births, Marriages, and Deaths, clearly prove that the same causes of disease are still in operation, and show how much morbid effluvia, confined air, and want of drainage, influence the duration of life.

While, however, the maladies which affect our mortal frame were thus increasing both in number and intensity, that spirit of enquiry which had already enriched many other branches of knowledge, was about to illuminate the medical world. The same circumstances which produced the poison, afforded also the antidote. The helpless state of those who were afflicted with disease attracted the attention of some of the philosophers of Greece, until at length, by the genius of Hippocrates, the empirical art of medicine was transformed into a practical science.

Hippocrates was the founder of our profession; and his works are entitled to attention, as the earliest records of the physical condition of our race. It is not, however, merely for the sake of medical and historical information that his writings should be read, for many of his best doctrines have been copied or related by subsequent authors; but they are admirable from their enlarged views, and philosophical spirit. Hippocrates was doubtless a very acute observer, but the materials of which such works as his are composed could not have been entirely collected by the unaided exertions of one individual, and there were many empirics before his time, who were acquainted with various isolated facts relative both to the healthy and the diseased state of the human body; but his was the first system of medicine—the first effort to lay down general laws by which others might administer the healing art. On this truly rests his merit. The child can collect shells on the sea shore; but it is reserved for the mind of the philosopher to classify the animals to which they belong, and by assigning to each its proper order, to display their mutual relations, and what part they perform in the wondrous economy of nature.

In such a spirit, by arranging and comparing the facts which he had observed, or which had been already discovered, Hippocrates first showed how the organization and functions of the body are affected by disease; that the diseases of different parts modify each

other ; and that they are manifested by symptoms which naturally result from the disordered state. He makes some excellent observations, also, upon the influence of climate, food, and habits.

It is not my intention further to pursue the history of medicine, an account of which may be found in the lectures of Cullen, and the very learned works of La Clerc, and of Bostock ; but I shall now say a few words upon the departments of medical science with which the medical student must necessarily make himself acquainted.

The first object of the student of medicine should be to acquire a knowledge of man in the healthy or natural state ; the second, to learn the nature and indications of those errors of his functions, or changes of organization, which constitute disease ; and the third, to study the means by which health may be restored. To effect these purposes, he must learn, by the study of ANATOMY, the structure and composition of the human body ; and by that of PHYSIOLOGY the uses and actions of its various organs, fluids, and secretions. PATHOLOGY shows the character of diseases, and the changes of structure incidental to them. The PRACTICE of PHYSIC and the PRACTICE of SURGERY display the general phenomena of diseases and the mode of treating them ; while the sciences of MATERIA MEDICA, PHARMACY, and THERAPEUTICS, respectively explain the nature of medicines, the mode of preparing them, and their action upon the human body.

MIDWIFERY constitutes another very important department of medical knowledge ; and in this country, where the cause of death is so frequently the object of judicial enquiry, FORENSIC MEDICINE is a subject of the very greatest interest.

HYGIENE, which treats of the means whereby the health of communities, as well as of individuals, may be promoted, and preserved, likewise demands the attention of the student ; and the medical education would be very incomplete which did not embrace BOTANY, COMPARATIVE ANATOMY and PHYSIOLOGY, and NATURAL PHILOSOPHY, including CHEMISTRY. All these are indispensable accessories to the other branches of medical science, and their utility may be easily demonstrated ; the first rank among them being due to chemistry.

In addition to the service which it renders by elucidating the composition and functions of the human body, chemistry affords the means of detecting morbid conditions of the secretions,

not only in the dead, but in the living; while in some cases, moreover, it points out the most simple and efficacious treatment of the malady. The action of the alkalies in preventing the superabundant secretion of lithic acid, is a good illustration of the successful adoption of chemical views in the practice of medicine. Chemistry, is moreover, the very foundation of pharmacy, and to the zeal and industry with which the study of it has been pursued during the present century, are owing most of the recent improvements in our pharmacopæias. Without the aid of chemistry, we could neither ascertain the composition of the natural, nor prepare even the simplest artificial, salts; and thus many of our most efficacious remedies would be lost to mankind. Take, for instance, the salts of potash. Carbonate of potash is an antacid; but when potash is combined with sulphuric acid, a powerful cathartic is formed; and when fused, potash is converted into a powerful caustic. In like manner, mercury and silver, which in their natural state are perfectly inert, are by combination rendered not only useful medicines but virulent poisons.

Such are the wonderful changes that may be wrought by the chemist; and there are others of no less value. I allude to the analysis of animal and vegetable substances, by which many simple and excellent medicines have been discovered. Take Quinine, for an example. Formerly, when Peruvian bark was given in doses of half a drachm, or more, if it disagreed with the stomach of the patient so much that he was unable to continue taking it—which very frequently happened—recourse was had to arsenic or some other tonic; but since the discovery of quinine and cinchonine, the bark itself is seldom prescribed, being superseded by the sulphates of quinine and cinchonine, in doses of two or three grains, by which intermittent fevers, that would defy all other means of relief, may usually be cured in the space of a few days.

Again, from Opium, which, though a valuable narcotic, is very liable to cause giddiness, headache, and sickness, there have been obtained, besides the common ingredients of vegetables, several principles which are peculiar to itself; and among these is *morphia*, which possesses highly narcotic properties, while it does not produce any painful effects.

Here, then, we have a striking instance of the benefit which the *Materia Medica* has received from chemical analysis; for by this

means the narcotic principle, being freed from the noxious matter with which it is naturally combined, and to which the nausea and vertigo may be attributed, is placed before us in a pure and concentrated form.

These are some of the services which chemistry has performed for *Materia Medica*; and it is in this latter branch of medical science also that the assistance of botany is peculiarly required. When, indeed, it is considered how large a portion of the medicines which we prescribe are derived from the vegetable kingdom; that they are obtained from various countries and climates; that in many instances the plants which furnish them may be grouped together in classes, each of which is distinguished by properties peculiar to itself, and common to all the individuals belonging to it; and that by this means the naturalist is at once able to distinguish that which affords food from that which is poison; the utility of botany requires no further comment.

I have already referred to the important aid which is afforded to Anatomy and Physiology by chemistry; and while some of the functions, such as digestion, respiration, and the production of animal heat, are in great measure under the influence of its laws, there are others for the explanation of which a further knowledge of Natural Philosophy is required. The physiologist would understand but little of the phenomena of vision and of hearing without some acquaintance with the laws of light and of sound; nor could he give a very luminous account of the motions of the joints and limbs, unless he had devoted some little attention to mechanics; a knowledge of which also is most advantageous to the surgeon. But the same laws which govern the functions of man equally control those of other animals; for the general principles of their organization are in many respects similar, though the details vary in each different tribe.

It is this agreement between some organs and functions, and difference between others, which renders a knowledge of comparative anatomy and physiology so important to the student of human physiology. "The advantage," says Professor Owen, in his *Lectures on the Invertebrate Animals*, "the necessity rather, of combining a general knowledge of the organization of the lower animals with that of man, which ought always to claim the first attention of the medical student, is now universally recognised. A great part, often the best part, of the proofs of the most important physiological

doctrines, are derived from comparative anatomy. The increasing taste for the natural sciences, and the rapidly diffusing knowledge of zoology and geology, render it scarcely pardonable in a member of a liberal profession to be wholly unversed in them; and almost discreditable to a medical man to be unable to offer any sound opinion on a fossil, coral, shell, or bone, which may be submitted to his inspection, or on the other surprising phenomena of animal life, such as the animal origin of chalk and flint, which geology from time to time educes from the dark recesses of the earth, and makes a common topic of conversation. * * * * * It is very true, that by tracing the progressive additions to an organ through the animal series, from its simplest to its most complex structure, we learn what part is essential, what auxiliary to its office; and the successive series of preparations in Hunter's Physiological Collection strikingly and beautifully illustrate this connection between comparative anatomy and physiology. But it is by the comparison of the particular grades of complication of one organ with that of another organ in the same body, by considering them in relation to the general nature and powers of the entire animal, together with its relations to other animals, and to the sphere of its existence, that we are chiefly enabled to elucidate the uses of the several superadditions which are met with in following out the series of complexities of a single organ. Comparative anatomy fulfils only a part of its services to physiology, if studied exclusively in relation to the varieties of a given organ in different animals; the combinations of all the constituent organs in one animal must likewise be studied; and these combinations, with the principles governing them, or the correlations of organs, must be traced and compared in all their varieties throughout the animal kingdom."

While investigating the anatomy of animals, the student of medicine should not be unmindful of the many particulars with regard to their appearance and habits which belong to the province of zoology. Such information is of great importance, not only on account of the interest which it imparts to physiology, but inasmuch as, without it, the student could not know in what part of the world to seek for the various animals from which medicinal substances are obtained. In fact, zoology treats of the animal, as botany does of the vegetable kingdom; and both are alike essential to a scientific knowledge of *Materia Medica*.

I have spoken at some length of the sciences, which (with other objects of the highest importance) are accessory to the study of medicine, because the endeavour to extend as much as possible the sphere of medical education, has been a leading feature of this institution. With this view, in addition to chemistry and botany, which have been long taught in every school of medicine, we have introduced the other subjects that I have mentioned.

There are, perhaps, some who may think that the attention of the student should be exclusively directed to the routine of study required by the chartered boards of examiners, and that the hours devoted to more general reading are needlessly abstracted from the time which ought to be employed on objects of greater moment. But to attain perfection in those branches of medical science which are of most importance, it is by no means requisite that all other studies should be neglected. On the contrary, since the intellectual capacity is enlarged by education, all those pursuits which, by increasing the number and association of ideas, invigorate the memory and assist in maturing the judgment, prepare the understanding to receive and digest the more weighty professional matters. The perceptive faculties, it is true, are very effectually sharpened by medical investigations, yet even the most accurate observation of facts, and the most extensive erudition, are of no avail to the physician or surgeon, unless he know how to use the materials which he has collected; and this depends not upon the measure of his acquirements, but upon his mental powers, and especially upon soundness of judgment. The more abstruse studies are certainly instrumental in forming great reasoners; and in my own experience as a lecturer I have most commonly found that the seeds of knowledge have taken the deepest root, and produced the best fruit, in those minds which had been previously cultivated by general literature and science. It is a remark, indeed, of Sir Joshua Reynolds, in his admirable "Discourses on Painting," that "the great business of study is to form a mind adapted and adequate to all times and all occasions, to which all nature is then laid open, and which may be said to possess the key of her inexhaustible riches."

Nor is the extensive insight into human character, which general reading gives, of small utility to the medical man. Society offers opportunities for intercourse with the living, but it is only through the medium of books that we can hold converse with the dead;

and by this means alone have we the power of communicating with the greatest intellects of all ages and of all nations. But to understand the literature of a people, it is necessary to be master of their tongue; and for this reason an acquaintance with ancient as well as modern languages is an accomplishment of the greatest value. From the time of Hippocrates until the middle of the last century every standard medical work was written either in Greek or in Latin; and in the present day books of high authority are constantly issuing from the presses of France and Germany, so that he who does not know some languages besides his own must either be ignorant of a large portion of medical as well as of general literature, or trust to translations which are often fallacious. Laying aside all other considerations, since no man can constantly dwell upon one subject alone with any degree of benefit to himself, what can afford more rational or agreeable relaxation than classical and modern literature? or, together with the fine arts, be more conducive to refinement and elegance of taste?

If, indeed, the sole object of a medical education were to qualify the student to pass certain examinations, nothing more, perhaps, would be wanted than what the most contracted plan of instruction could teach; but let him who wishes to become an accomplished and successful practitioner consider man not only as a complicated machine, but as a social and intellectual being. When studying the physical functions, the phenomena of their diseases, and the mode in which medicines operate upon them, let him not forget that the body and its maladies are much influenced by the feelings and passions of the mind.

All impressions upon the cerebral nerves of sensation are transmitted to the brain, wherein are formed those numberless combinations of ideas, whence emanate all the creations of human intellect. But as one set of nerves conveys impressions to the brain, so another transmits the impressions from the brain to the other organs. Considering, then, the connection between mind and body, which is established by the brain and the nerves; it is not surprising that corporeal disorders frequently affect the mind, while mental emotions and passions also possess considerable influence over the body and its diseases.

In many disorders, and particularly those of the nervous system, more relief may often be afforded by skilful management of the feelings and passions, than by any medicine which could be prescribed.

This subject, as well as the others of which I have made mention, might be much further pursued; and much also might be said upon Clinical Instruction, which indeed would of itself fill a lecture; but upon this my limits will not allow me to touch, and I must now hasten to conclude the few observations that I have yet to offer.

We are assembled in the first college which has been established in this country for the exclusive education of medical students; and it now remains for us so to maintain it, as to fulfil the important purpose for which it is intended. Time, in his flight towards eternity, lays a heavy hand upon all human works, as well as upon man himself; and even those institutions which have been founded with the most consummate prudence speedily decay, unless they be wisely conducted and energetically supported. In the present instance, as much rests with those who are here instructed as with those who direct their studies. The reputation of this institution, as well as that of its professors, mainly depends upon the proficiency of the students; and it affords me much gratification to acknowledge, that from the spirit which they have hitherto evinced, I place the most entire reliance upon their exertions.

We are about to perform a very pleasing task;—to confer prizes upon those who have been distinguished by their regularity and attainments during the last winter and summer sessions; and while in so doing we bestow well-merited rewards upon industry and talent, we hold forth an example and a stimulus to others. But, if a further and higher inducement to study be required, let the student reflect upon the vast interests which will be placed in his hands, when he shall be engaged in the practice of his profession. Let him remember, that the lives of thousands of his fellow-creatures may depend upon his skill; and I will then ask, whether it does not become a duty of the most imperative kind to use the opportunities which he may possess of preparing himself to meet the difficulties that may occur, and to act in the time of need with that coolness of judgment and decision which the consciousness of knowledge can alone give?

I must say a passing word upon one more point, and then I shall have done.

In the works which are attributed to the Father of Medicine, much stress is laid upon the conduct of medical men; and beyond a question, nothing is of more consequence to the honour and utility of our profession than good faith in the intercourse with one another, as well as with our patients.

There is no situation of life in which unsullied principle is of more consequence than in ours. The most private affairs of families are often unavoidably communicated to us; and, as an abuse of the confidence with which we are entrusted may be productive of the greatest domestic misery, it becomes a sacred obligation never to divulge what we have thus seen or heard.

Upon the necessity of humanity and kindness to those who are placed under our care, whether they be rich or poor, I am sure that it would be superfluous for me to insist; since the tacit engagement implied by such a connection renders it obligatory upon us to do every thing in our power to ameliorate their condition; and nothing gives more confidence to the invalid, and more effectually soothes his sufferings, than the belief that his medical attendant sympathises with him, and really has his interest at heart. In this respect, all classes have an equal claim upon us; for the poor man has the same feelings as the rich, and is entitled to the same attention; and surely we should guard against the possibility of adding to the misery of sickness, the galling suspicion that he has not those advantages from medical skill which wealth might procure.

The neglect of this duty could only arise from want of feeling, and would well illustrate the saying of a celebrated theologian, that "bad manners are bad morals."

This, however, is matter for future consideration. For the present, the business of the session, commencing this day, will claim our attention; and I earnestly hope that the system which we have adopted may prove conducive to the welfare of the students; that it may tend to promote all the best objects of medical education; and that thus our anticipations may be realized, by the lasting prosperity and extensive usefulness of this college.

After the LECTURE, the following Prizes were presented :—

CLASS.

Mr. Wm. Hinds, Birmingham	First Medal	Anatomy.
Mr. John Clay, Sutton, Notts	First Medal	} Materia Med.
Mr. Edmund Day, Worcester	Second Medal	
Mr. J. Snelling, Upton, Northamptonshire	Certificate	
Mr. Edmund Day	First Medal	} Chemistry.
Mr. George Payn, West Bromwich	Second Medal	
Mr. Josiah Clarkson, Birmingham	First Medal	Surgery.
Mr. Thomas Underhill, West Bromwich	First Medal	Medicine.
Mr. John Moore, Moreton-in-Marsh	First Medal	Midwifery.
Mr. John Clay	First Medal	} Botany.
Mr. F. Wilmshurst, Warwick	Second Medal	
Mr. Josiah Clarkson	First Medal	} Forensic Med.
Mr. James Johnston, Birmingham	Second Medal	
Mr. Wm. Hinds, Birmingham	Book	} Demonstrator's Prize.
Mr. Josiah Clarkson	Twenty Guineas	Jephson Prize.
Mr. John Clay, Sutton, Notts	Gold Medal	} General good conduct.
Mr. Beckett, Handsworth	Gold Medal	

*with the Author
Sincerely*

A LECTURE

DELIVERED

TO THE STUDENTS OF THE QUEEN'S COLLEGE,

(LATE ROYAL SCHOOL OF MEDICINE AND SURGERY,)

BIRMINGHAM, MARCH 29, 1844,

BEING THE INTRODUCTION TO

A COURSE ON BUTLER'S ANALOGY,

BY

JOSEPH WOOLLEY, M.A.,

FELLOW OF EMMANUEL COLLEGE, CAMBRIDGE: WARDEN OF THE QUEEN'S COLL.,
AND CHAPLAIN OF THE QUEEN'S HOSPITAL, BIRMINGHAM.

BIRMINGHAM:

H. C. LANGBRIDGE;

T. STEVENSON, CAMBRIDGE; J. W. PARKER, LONDON.

1844.

Lately published by the same Author, Price 2s.—The Writings of the New Tes. afford indications that this portion of the Sacred Canon was intended to be a complete record of Apostolical Doctrine. An Essay which gained the Norrisian Prize for 1843. J. & J. J. Deighton, and T. Stevenson, Camb.; J. W. Parker, Lond.

PREFACE.

TO THE STUDENTS OF THE QUEEN'S COLLEGE, BIRMINGHAM.

ALTHOUGH honoured by a special request from all the Professors who were present at its delivery, to publish the following Lecture, I for some time hesitated to do so, on the ground that, however suitable it might be in their estimation to the occasion on which it was delivered, it was scarcely likely to command sufficient attention to justify my obtruding it upon public notice. Subsequent consideration, however, upon that portion of the requisition which stated that "the publication of it will materially assist the Students in the future prosecution of the subject," convinced me that I was bound, in point of duty, to submit it, notwithstanding its many defects as a composition, (the *wording* of some passages slightly altered,) to your more deliberate examination. The pretension to originality in a Lecture, the professed object of which is to explain the design of an Author like Butler, would be ridiculous, but I may take this opportunity of stating, that in all my future instruction, I hope to act upon the plan of the following passage, which occurs in the introductory Lecture to the course just delivered before the University of Cambridge, by the distinguished Regius Professor of Divinity—"My duty, then, must be to point out

sources of information for the benefit of my younger hearers; to condense the arguments, and combine the statements of those who have preceded me; and rather to repeat what may be useful, though it may often have been said before, than by the affectation of originality, to defeat the very end and purpose which I ought to keep in view."

That the importance of the subject may commend the following pages to your serious consideration—that you may gloriously persevere in the conscientious endeavour to acquire that knowledge which will enable you, under God's blessing, to relieve the many maladies to which human nature is liable—and that, above all, the *diseases of your own souls* may be healed by the "*wholesome medicines*" of religion, is the ardent wish and prayer of your very sincere friend,

THE AUTHOR.

THE QUEEN'S COLLEGE,
BIRMINGHAM,
APRIL 12, 1844.

LECTURE,

&c.

I must bespeak your indulgence whilst I dwell for a few minutes on the circumstances under which I am about to take in hand your religious instruction, and on the nature of the instruction, which I hope to be instrumental in imparting.

It is unnecessary to call your attention to the lamentable fact, that as to religious and moral education, connected with Colleges and Schools of Medicine, the quantity has, in most of them, until very recently* been most narrowly limited, in some of them alas! to this day, ON PRINCIPLE excluded. I trust that in this Institution, founded as it is on sound and Christian principles, we shall be instrumental in removing to some extent the reproach which lies upon us, for reproach it is, and one of the most grievous kind. It is clear however, that in an institution, founded expressly for the study of medicine and kindred subjects, the study of Theology, and consequently the lectures upon it, must be confined within limits, within limits so narrow as not to defeat the end which we have in view, viz.: in the words of our great and munificent Benefactor,† “making you good Christians as well as able practitioners in medicine and surgery.”

* We refer to comparatively modern times, inasmuch as “There *was* a time in the History of Therapeutic instruction, when every School of Medicine and Surgery was *Christian*.” See Eloquent Anniversary of Address of 1838, by Rev. V. Thomas.

† Rev. Dr. Warneford, in his foundation of the gold medals which bear his name.

This however would be the case, we should defeat the end which we have in view, were we to draw extravagantly on your time and patience, and cause your theological studies to interfere with your strictly professional. "There is however (says Solomon) a time for all things," and it is on this principle, as bearing in its practical application upon ourselves, that we must endeavour to proceed. The lectures which I hope to deliver, will be such as all of you may find time to attend upon without any interference with other duties, and they will be so timed, as not to clash with the convenience of the different learned Professors, my fellow-workers. Once in the week, I trust, will not be deemed too great a draw upon your time and patience, if you consider the vast and vital importance of storing your minds during youth with those seeds of faith and virtue, which, candidly received and carefully cultivated, will blossom and bear fruit, not only in your future career, as those who will administer to the relief of bodily pain and suffering, but, after being transplanted to the Paradise of God, will eternally blossom in that place, where pain and suffering shall be no more, and where sorrow and sighing shall be far away. I feel that I shall have no difficulty in insuring your attendance. On the other hand, may I not flatter myself with the hope that you will ever deem it a blessed privilege to have your thoughts and feelings diverted occasionally from your exclusively so called professional studies—studies relating to man's physical nature, and refreshed for a short season by a contemplation, of what is equally professional—studies relating to man's spiritual and eternal nature?

You are all aware that for the encouragement of your studies in this respect, the Christian and munificent Benefactor before referred to, has founded Theological Scholarships: the candidates for which, to use his own language, must be students

“distinguished for their diligence and good conduct, who have been regular in their attendance on divine service, and who have availed themselves especially of the religious instruction of the Warden.” These are an encouragement for your regular attendance on my theological lectures and examinations,—an earthly encouragement indeed,—but still an encouragement, and such an one as I trust will lead you on to see the beauty and grandeur of a path hitherto untrodden by you, and generate a desire of following up these holy and sanctifying pursuits, not from a desire of gaining earthly distinction, but from what is far more valuable, the calm pleasure and satisfaction imparted by the pursuits themselves.

In reference to your course of theological reading, I must especially urge upon you the indispensable necessity of not forgetting the Holy Scriptures, as the only sure foundation upon which all Theology and Moral Philosophy can be built. You will feel no surprise at my urging this recommendation so forcibly, if you call to mind that Theology in its primary idea, is the science which teaches us the knowledge of the great God in his relation to man. And let me further add, that, in your study of the words of Inspiration, it will be your duty and your blessing to lay aside as much as possible the arrogance of a captious understanding, and to make your hunger and thirst after righteousness predominate over the wanton curiosity of the intellect. It is thus, and thus only, that you will find that the clouds which may overspread your natural horizon will gradually clear away, and that your intellectual vision will gradually become enlightened with brighter glimpses of knowledge, and your heart enlivened with warmer beams of sanctity. It would be well for you to cultivate the spirit of this recommendation in all your studies, but especially in your theological, where you must be willing to admit truths which might to a carnal mind and a super-

ficial reason appear to contradict each other, and which must nevertheless be received and digested with a willing heart, and an intelligent faith. Should you not make such advances as you could wish, beware how you seek to forbidden arts, and call in the aid of those gross and material theories, in which too many alas! of your profession have been apt to indulge themselves: for as I quoted to you a few sundays ago, "these theories will not help you in an emergency, neither will they make you simple, true-hearted, warm-hearted men."

But there are those who would deprive you of the healthy pulsations (to use a term of your own) which a knowledge of Scripture, sought in the manner recommended above, would cause to beat throughout the whole of your Moral System, and hence arises the necessity of your being enabled to ward off so fearful a disorder. Reserving therefore my explanations of Scripture for the more solemn occasions on which we are wont to meet together, I shall in these lectures endeavour to conduct you to that knowledge which will enable you to "give a reason of the hope that is in you," and to guard against the fearful derangement, which might otherwise result to your Moral Nature, from the brow-beating of the materialist, the infidel, or the sceptic.

After mature and earnest consideration, I have arrived at the conclusion that I cannot direct students of medicine to a more profitable course of theological reading, than that derived from an examination of the argument drawn from the analogy of religion to the constitution and course of nature.

This conclusion, I rejoice to say it, has met with the approbation of the venerable Principal of our society, as well as of the rest of the members with whom I have conversed upon the subject. This argument has long been identified with the name of that distinguished Prelate who first handled it fully and satisfactorily. The work well known under the

title of Butler's Analogy therefore I earnestly recommend to your notice, not as a production to be glanced through, or read superficially, but to be studied with care and thoughtfulness. It contains a mine of wealth, but you must go beyond the surface if you would reach it, and it is with a view of sharpening your appetite for this labour, that I have thought well to invite your attendance this evening. I trust that I shall be able to lay before you such an account of our Author, and of his design, as will serve to convince you that, in studying his Analogy, you will not be wasting your strength upon a production which is the offspring of little thought or little knowledge; but that, on the contrary, the whole compass of Theology would scarcely contain a volume upon which you might with more profit bestow the limited time allowed for subjects of this nature, by the duties of your profession.

The unanswered and unanswerable Analogy has now been before the world for a century and odd, studied and admired, and will doubtless, on supposition of the world's existence, be studied and admired for centuries to come. It is the production of "one of those creative geniuses who give a character to their times," and treating upon a subject, not only of infinite importance, but absolutely requiring that patience of research, profound skill, prudent discretion, and penetrating sagacity, which we rarely meet with in a single individual. These qualities however you will discover to have been admirably united in the masterly mind of Bishop Butler. It is impossible for you to study his work carefully without making this discovery. In the words of a learned and living Bishop,* "There is in his writings a vastness of idea, a reach and generalization of reasoning, a native simplicity and grandeur of thought, which command and fill the mind—at the same time, his illustrations are so striking and

* The Lord Bishop of Calcutta.

familiar as to instruct as well as persuade. Nothing is violent, nothing is far-fetched, nothing pushed beyond its fair limits, nothing fanciful or weak; a masculine power of argument runs through the whole. All bespeaks that repose of mind, that tranquility which springs from a superior understanding, and an intimate acquaintance with every part of his subject. He grasps firmly his topic, and insensibly communicates to his reader the calmness and conviction which he possesses himself. He embraces with equal ease the greatest and smallest points connected with his argument. He often throws out, as he goes along, some general principle which seems to cost him no labour, and yet which opens a whole field of contemplation before the view of the reader."

Should experience prove to you, as it will prove to you, that a spirit justifying the assertion made in the above quotation pervades the "Analogy," you will not be surprised at the urgency of my present appeal to you respecting a work, which has independently of its intrinsic worth, though arising out of that worth, a *further* claim upon *our* attention. I allude to the fact of its having met with the nobly expressed approbation of the benefactor to whose Christian munificence we are so much indebted. For in his foundation of certain theological prizes in a kindred institution,* an institution based upon similar sound and solid principles, though not devoted like our own to the exclusive training of those who are engaged in medical science, he has expressly stipulated in the very foundation deed, that the candidates are to be examined in the Analogy of Butler.

Our Author was born at the close of the seventeenth century, in the reign of our second Charles, an age in which you are all aware that the spirit of fanaticism had, as usual, settled down into the far more diabolical one of infidelity and scepti-

* King's College, London.

cism. Piety and zeal had as it were been banished from the land:—for if they were not extinct, the signs of animation were lamentably languid, and the breath and pulse of life scarcely discernible, and it seemed almost as if the country were destined to descend, step by step, into the dark and gloomy abyss of hopeless scepticism. “It is come (says Butler with his accustomed calmness,) I know not how, to be taken for granted, by many persons, that Christianity is not so much as a subject of inquiry; but that it is now at length discovered to be fictitious. And accordingly they treat it, as if, in the present age, this were an agreed point among all people of discernment; and nothing remained but to set it up as a principal subject of mirth and ridicule, as it were by way of reprisals, for its having so long interrupted the pleasures of the world.”*

The systematic plan upon which these despisers went in their attempt to overthrow Christianity,—for systematic plan they had, though differences of vast importance existed amongst themselves—was this: they urged that the particular doctrines, which they represented as forming a part of Christianity, contained such a tissue of paradoxes, and were open to so many difficulties and objections, as to exclude it from even a worthiness of consideration by any one of common thought and enlightenment: along with this contemptuous rejection of the Christian scheme, they professed to hold the existence and attributes of a supreme and intelligent Author of nature, but, in perfect consistency with their principles, asserted the sufficiency of that talent which is vested in the human mind, for an effectual acquisition of this fundamental truth, as well as of the moral position and relationship in which man stands with reference to his Creator. Principles of this nature were easily dressed up in a garb of plausibility,

* Advertisement to the Analogy.

and were soon made to tell disastrously amongst the thoughtless and the half informed. The land was overrun with the vilest productions, and it required the raising up of a man like Butler, a man with a mind of extraordinary strength and grandeur, to be instrumental in rolling back the flood which had been let loose, and which threatened to sweep away religion from the earth.

Accordingly the Author whose great work upon this subject I am urging you to study, and in which, as an inducement for your study, part of the examination for the Warneford Scholarships will consist, came forward with a thorough knowledge of what he was about, to fight the demon of infidelity with his own weapons:—he was well fitted for the task, and the dexterity and skill with which he used them, caused the demon to shrink and cower like a guilty thing before his masterly thrusts, and never to this day, has he ventured a return to the contest,—the infidel has never dared a reply.

The unbeliever, we stated, admitted the existence of a supreme and intelligent Author of nature; from this admission, the Bishop starts, and pursues a line of argument with a calmness, a caution, and a force, but at the same time with an originality and a diversity, which cannot fail to convince and carry along every one who is calm, candid, and teachable. Into the constitution and course of nature he seems to have, as it were, an intuitive perception, and applies his knowledge with such dexterity and skill, as to scare the sceptic and leave him without a reply. He never injures his cause by taking up a false position, by false excitement or over-statement. The best taste and greatest power of discrimination is discernible in the expression of his feelings. He brings forward nothing of imagination which is not based on experience and fact. He handles with an equal degree of judgment and talent the greatest and smallest points of the seeming para-

doxes and objections with which he deals—traces them out to their fountain head, and, with an over-powering precision, shews the fallacies from which they take their rise. “Accordingly” to use the words of a learned and living bishop whom I have before quoted, “students of all descriptions (those of medicine included) have long been united in the praise of Butler. He is amongst the few classic authors of the first rank in modern literature. He takes his stand with Bacon, and Pascal, and Newton, those mighty geniuses who opened new sources of information on the most important subjects, and commanded the love and gratitude of mankind. If his powers were not fully equal to those of these extraordinary men, they were only second to them. He was in his own line, nearly what they were in the inventions of science, and the adaptation of mathematics to philosophy founded on experiment. He was of like powers of mind, of similar calm and penetrating sagacity, of the same patience and perseverance in pursuit, of kindred acuteness and precision in argument, of like force and power in his conclusions. His objects were as great, his mind as simple, his perceptions of truth as distinct, his comprehension of intellect nearly as vast, his aim as elevated, his success as surprising.” Such are the words of a learned and living prelate respecting our author. You will find them, I doubt not, a correct description in every respect. I may here mention with a view of showing the correctness of a statement made in a former part of my lecture, viz., that it is no production which is the “offspring of little thought” to which I am inviting your attention, that the Analogy may be called the work of Butler’s life. At the age of twenty-one years he had made an extraordinary progress in Divinity,* and his attention was directed to this and kindred subjects. At the age of twenty-six, he was appointed to be

* See Butler’s Life by Bp. Halifax.

preacher at the Rolls, and continued in that position till he had attained the age of twenty-nine. He then in 1718 published his "fifteen sermons preached at that chapel," a volume containing the germ of his great work, and which I would earnestly recommend to your notice. At length however, in 1736, he was appointed clerk to the closet of Queen Caroline, and in the same year presented to her Majesty a copy of "the analogy of religion natural and revealed, to the constitution and course of nature." In all his subsequent writings, even the last of them,* we can easily discover the like train of thought, and thus we see that through the long period of forty years, our author devoted the mighty powers of his mind to the illustration of the subject before us. And what is the consequence? It is what I have in substance stated already, that the strong hold of Butler's argument has never to this day been attacked, the sceptic has never dared a reply. Think not then, I repeat, that it will be wasting your time to study this unanswerable work.

I must admit to you however, that the Analogy is open to a charge which I have heard some of you bring against it, since you knew that it was to be a text-book of our college—a charge which has been brought against it before, and the justice of which, has been admitted even by those who are the loudest in our author's praise,† viz., that the argument is not sufficiently intelligible and clear to a youthful student. I may also admit that the style is somewhat obscure and negligent: it is marked by a carelessness into which first-class men are apt to fall when their intentness upon their great subject leads them to make use of the first words that occur to them, should they be such as will serve to register their thoughts. The grounds however upon which you make the charge

* His charge to the clergy of his diocese.

† See Bishop Wilson's Essay.

against our author will be found to disappear in proportion to the attention which you bestow upon his works. Familiarity with his style will convince you that it is not one which in any sense can be said to "breed contempt"; and a more intimate acquaintance with his arguments will enable you to comprehend conclusions which at first sight may have appeared anything but clear from the very vastness of idea which they contain.

With a view of assisting the young reader, several analyses of Butler have been published. That prefixed to the edition of his works by Bishop Halifax is probably the best: but I would earnestly recommend you to make the trial of understanding him without availing yourself of aid that might lead to a bad habit:—for abstractedly considered, the using an analysis *is* a bad habit. This I trust you will be enabled to do by the detailed summary of his arguments which I hope to bring before you in my lectures, and by the explanations which I shall have great pleasure in endeavouring to give to any gentleman who will take the trouble of asking for it. At the same time I would impress forcibly upon you that you cannot possibly gain a knowledge of Butler by attending a course of lectures, however clear and lucid they may be, for, as you find that medical science cannot effectually be acquired without giving yourselves up bodily to the mastery of it, in the secrecy of your own study, the dissecting room, or the laboratory, so it is with theological.* I shall accomplish the utmost that I aim at, if I succeed in giving you *some* notion of Butler's reasoning, and thus stimulate you to the practical application, under God's blessing, of your own powers to the mighty work itself. With this object in view I shall hope in

* "If you would possess real excellence, it must be 'Apis Matinæ more modoque.' It must be at the expense of much time and study, there is no royal road to knowledge, whether in divinity, law, or physic."—*Rev. Chancellor Law's Eloquent Address to the Students in 1835.* "Hand facilem esse viam voluit is still true of the approach to every thing that is valuable."—*Professor Blunt's Lectures on the early Fathers.*

succession to state the general argument which the Bishop pursues in the work before us—to go through the principal steps in his reasoning—to point out the connection existing between this portion of evidence for the truth of Christianity and that which we derive from other sources—to explain what connection the analogical argument has with practical religion.

This evening I shall confine myself to giving you a statement of the Bishop's general argument. "All things are double one against another, and God hath made nothing imperfect." On this single observation of the son of Sirach, (truly remarks Bishop Halifax,) the whole fabric of our Prelate's defence of religion, in his Analogy, is raised. His design was, not to prove the truth of religion by its direct evidences, such as prophecy and miracles—these you must learn elsewhere. The main end which he had in view was this, to answer and silence objections which had been urged by the sceptics of his day, and which are still urged by the sceptics of our day, against religion natural and revealed, and thus confirm the proof of it, by considering the analogy or likeness existing between it and the acknowledged constitution and course of nature.

He enters into a comparison between that government of God which we find ourselves actually under in this world, with that government of God which Christianity teaches us to expect in another world—the acknowledged dispensations of Providence with the appointments of religion—the scheme of the natural world, as known by experiment and fact, with the scheme of the moral world as revealed in the Bible: and by means of this comparison, he shews that the natural and moral schemes—notwithstanding the vastness of each, a vastness incomprehensible to our finite faculties—bear to each other a most striking and remarkable analogy,—an analogy so striking and remarkable as to demonstrate that

they spring from the same general laws and principles—so striking and remarkable, as to forbid at once the supposition that they can be other than two separate portions of one mighty and stupendous scheme, having for its author, that supreme and intelligent Being who is the acknowledged Creator and Governor of the world.

I say, who is “the acknowledged Creator and Governor of the world:”—for it is necessary to impress forcibly upon you, that this is a fact which the whole analogical argument of Butler takes for granted, not only as proved by an accumulation of evidence, but as allowed by those with whom he supposes himself to be arguing. With the consistent atheist therefore, the analogical argument can have no weight—it was never intended that it should, inasmuch, as he denies the very foundation upon which the whole of it rests, viz.: the existence of a wise and intelligent Creator; neither does Butler profess to argue with those who assume, upon the ground of any abstract theory or capricious surmise, that God’s creation ought to have been different from what it is; *—for if a man will be inventing theories and suggesting modes by which he conceives that the ends of Providence might have been more easily accomplished, than those which he experimentally finds to have been adopted, there can be no arguing with him. Like Descartes, he is building the world upon hypothesis. He professes himself to be wiser than God; the notions he takes up are mere phantoms of his own imagination, without a fact to rest upon. By this, he denies the natural government of God, which is the second part of the analogical hypothesis. On the other hand, Butler supposes men, “instead of that idle and not very innocent employment of forming imaginary

* An error much like this is the forming our notions from the applications of *correct* principles to cases where we have no right to apply them, e.g. explaining the structure of the human body, and the nature of diseases and medicines, from mere mathematics, without sufficient *data*.

models of a world, and schemes of governing it, to turn their thoughts to what they experience to be the conduct of nature with respect to intelligent creatures; which may be resolved into general laws and rules of administration, in the same way as many of the laws of nature respecting inanimate matter may be collected from experiments," and he then argues from that part of God's works and dispensations, the knowledge of which is thus experimentally arrived at, to that part which is denied and objected to—from the world of nature to the world of revelation—from the confessed order of Providence, to the disputed appointments of Grace,—from Creation to Christianity; and, he shews by this line of argument, that the objections brought by the sceptic against Christianity, have no real weight, because, the very same objections might be raised, with the very same degree of plausibility against the experimentally discovered government of God in the kingdom of nature. This then, is the Bishop's line of argument: he reasons from that portion of the divine proceedings which comes under our view, to that larger portion revealed by religion, and beyond our view; now that the world is governed by the ordinary Providence of God, is a fact experimentally known and allowed, and if by any means it can be made to appear that the government of God by religion is analogous to this,—analogous to such a degree as to allow of no other objections than this,—then, this analogy gives us a probable argument, independent of other considerations, in favour of the truth of revelation. Thus objections are satisfactorily answered, however obstinately they may be persisted in—answered from the data allowed us by the sceptic himself.

In short the Bishop shews that the dispensations of Providence we are under now, considered as inhabitants of this world, and having a temporal interest to secure in it, are

analogous to, and of a piece with that further dispensation, which relates to us as designed for another world, in which we have an eternal interest. It thus appears that the natural and moral schemes of God's government are, like the corresponding portions of a tally, intimately connected with each other-parts of one vast and mighty whole: a fact sufficient to convince any one, who has but practical sincerity and modest prudence, that sceptical objections against the latter are ridiculous and false, inasmuch as the former, confessedly the work of God, is equally liable to the very same objections, and "that he who denies the Scripture to have been from God, upon account of these difficulties, may, for the very same reason, deny the world to have been formed by him." Nay, we may give the argument an *a fortiori* force and say, that if objections are without weight when urged against the outward and obvious scheme of nature, much more are they without weight when urged against the moral and mysterious scheme of revelation.

The whole analogical argument is indeed confessedly only a probable one. There is nothing of demonstration in it, in a Euclid sense of the term: but then it is a probable argument of the highest imaginable kind, such as is sufficient to convey a moral conviction. We must bear in mind that there are very few things for which beings of limited capacity like ourselves can obtain that evidence which will prove them to be "certainly true or certainly false." Nothing indeed which is the possible object of knowledge can be probable to an infinite intelligence, but to us "probability is the very guide of life." The slightest possible presumption may not be without its weight, and presumptions, however slight in themselves, if frequently repeated, often amount to moral certainty. Thus a man having observed for one day the ebb and flow of the tide, the observation only affords some sort of

presumption, though the lowest we can imagine, that it may happen again to-morrow; but the observation of this event for so many days and months and ages together, as it has been observed by mankind, gives us a full assurance that it will happen to-morrow. No man in his senses thinks that the tide will not ebb and flow to-morrow. But the evidence upon which a man feels assured of this fact is only probable evidence, he has no demonstrative proof. Again, no one doubts but that the sun will rise to-morrow, and will be seen, where it is seen at all, in the figure of a circle, and not in that of a square* In like manner, when we observe in human affairs generally, that any thing does regularly come to pass, we infer, that other things which are like it will also come to pass, and we act upon the inference which we thus draw. Thus we believe, and believe *practically*, that a child, if it lives twenty years, will grow up to the strength and stature of a man, that food will contribute to the preservation of its life: and the want of food, for a certain number of days, be its sure destruction. It is upon this natural process of reasoning that gentlemen of your profession act in their daily concerns. It has been observed, either by themselves or others, that a particular vegetable or mineral production has a certain effect upon the human body, when administered in a certain way. A single observation of this fact would give the very lowest presumption possible, that such production would have such an effect, when administered in such a way; but if this event has been observed time after time—and time after time, without exception, the same effect has been produced, then, I think it will be allowed that a physician must be either

* These, it will be seen, are Butler's own instances.

out of his senses, or very reckless of the lives of his fellow-creatures, who would omit to use such production for producing such effect, were it required upon the body of a patient.

It is thus men go on continually, they judge and act by what is probable, and never think of requiring further evidence. The rule of their hopes and fears—of their calculations of success in their pursuits—of their expectations that others will act so and so in such circumstances—and of their judgment that such actions proceed from such principles:—all these rest upon the analogical argument; i. e. on their having previously observed the like things with respect to themselves or others.* Especially would men take this course respecting any complex scheme which might be laid before them, professing to be such a person's workmanship, and claiming no common-place assent of the heart and understanding.—They would first ascertain whether there existed any acknowledged productions of this person, and on supposition of their discovering such existence, they would compare this new scheme with these acknowledged productions, in order to form a probable opinion whether it were his or not. If, by a careful comparison, the same mind could be traced in both plans, the same ends, the same general laws and principles, the same wisdom, the same vastness of intellect, the same apparent perplexity working the same good results, the same moral features, and above all, a dependence and connection between the two—they would conclude that they both proceeded from the same author. And any objections, that might be raised against this new scheme, to which, on candid inquiry, the acknowledged scheme appeared equally

* See Bishop Wilson's Essay.

liable, would be rejected as worthless, i. e. they would be answered by the resemblance existing between the one scheme and the other.

Surely, if there were a doubt respecting the force of a probable argument in religion, the practice of men in the daily and hourly business of the world would be sufficient to remove it. With regard to their most important temporal interests, we find persons acting upon evidence much lower than that which we are wont to call *probable*. Numberless instances might be mentioned respecting the common pursuits of life, where a man would be thought, in a literal sense, distracted, who would not act, and with the greatest application, not only upon an even chance, but upon much less, and even in those cases where the probability is greatly against success. Men "make such provision for themselves as it is supposable they may have occasion for, though the plain acknowledged probability is, that they never shall."* Indeed, as the Bishop remarks, † "it is as real an imperfection in the moral character, not to be influenced in practice by a lower degree of evidence when discerned, as it is in the understanding not to discern it." Men are under an absolute duty, in point of prudence and interest, in practical matters, to act on the side which has the greater presumption in its favour, though greater in the lowest possible degree.

"If then, the analogy of nature only showed us that there was the lowest presumption possible of the truth of religion, notwithstanding difficulties, men would be formally and absolutely bound to believe and obey it; but, if this analogy shows that there is not merely a low

* Analogy, Part II. Chap. 6.

† Ibid.

presumption, but the highest probability of its truth, and that the very objections to it, rest on such matters as are apparently inconclusive, when applied to that system of things in providence which is acknowledged to come from an all-wise and almighty Creator: nay more, that these very objections may, for any thing we know, be really benefits, yea, most important instances upon the whole, of the divine goodness, the duty of obedience to it becomes still more imperative. And when it is considered, that besides this argument from analogy silencing our scruples, the numerous direct evidences of Christianity remain what they were before, unanswered and unanswerable, the obligation to receive the Christian doctrine becomes, in fact, the first and paramount duty of a reasonable and accountable creature; and the rashness and guilt of rejecting it become criminal and absurd, in a degree which no words can express."

This then, is the Bishop's general object—he undertakes to prove that a rejection of Christianity, on the ground of objections, involves a violation of every rule of probability, by which men are guided and must be guided every moment of their lives. If I have been longer in my endeavour to explain it than you imagine to have been necessary, you must bear in mind that it is a knowledge of Butler's design that can alone unlock to you the work itself;—and if I have been what you may feel disposed to call somewhat *dry*, you must remember that I have not invited your attendance for amusement or curiosity, and moreover, that I have not the power of bringing before you, like the learned Professor of Anatomy or the learned Professor of Chemistry, *material* specimens, in illustration of the subject upon which I

have been treating, and thus rendering it as amusing as you find the Lectures of those learned gentlemen to be. Let me impress upon you however, that, though the subject may not appear so interesting as Anatomy or Chemistry, it is fully as important, and is intimately connected with that portion of your being, which will survive, when, what I may call the Anatomical portion shall have gone to a decay and dissolution, from which, no earthly chemical preparation shall avail to restore it.

But I should scarcely feel myself justified in concluding this first lecture to you—I mean the first in this place, where you are accustomed to attend lectures of a different character—without making some further allusion to the position which I occupy as your Theological Instructor. Every generous feeling must lead me, and indeed all well-wishers to improvement in medical education, to rejoice in the rise of institutions like this. Confidently may we anticipate the success of these institutions, inasmuch as they are not the feeble creations of any visionary projects, of which we see so many in these days, but called into being by the demands arising from the actual state of society, and founded on the plan of the long tried and invaluable Universities of our land. I may *emphatically* apply to your noble profession a remark which has been made with respect to education generally, * viz.: that, with reference to it, there seems to be in the country a spirit similar to that which distinguished the partial outburst of literary aspiration in the 12th and 13th centuries, (an era which may justly dispute with the 15th, the honourable title of that of the revival of learning,) and which crowded with eager pupils the lectures of Abelard at Paris, of the Croyland

* Rev. W. D. Conybear's Theological Lectures.

Monks at Cambridge, and of Vacarius at Oxford, and thus appears to have laid the foundation of that celebrity which those noble Universities afterwards acquired. Far be from us, and from all modern institutions, however precious, any pretensions of rivalry with those venerable academical establishments, but the analogy which I have pointed out is sufficient to justify the hope and the expectation, that these institutions will, like their illustrious predecessors, ever meet with the aid and the approbation of the great and the good, and be valued as amongst the richest blessings which modern times have bestowed upon our country.

But if I am induced by common philanthropy to rejoice generally in the rise of institutions which have for their object, the relief of human suffering; I am further induced by individual considerations to rejoice in the particular institution, the members of which I am addressing. The frank and cordial kindness which I have experienced at the hands of our venerable Principal; and of the different members of that body to which is entrusted the authoritative government of our proceedings, of which to mention individuals would be invidious, and of that body which are the authorized superintendents of your various professional pursuits, must engage every warm feeling of my heart in favour of an academical establishment, which appears so well calculated to realize their earnest and anxious hopes.

But a higher, and I trust a holier feeling still, induces me to exult in the rise, and to anticipate the future glory and success of *this* Royal Institution,—a feeling sufficiently explained by the very object for which we are now assembled, inasmuch, as that object proves, that while the friends of our institution have been anxiously

engaged in taking those measures which will secure your distinction hereafter in the honourable profession of Medicine and Surgery, they have not “lost sight of that combination of Christian principles with scientific pursuits, which brings blessings upon human knowledge, and makes medical and surgical studies, acceptable to God by their spirit, as well as beneficial to man by their success.”* The very purpose for which we are now assembled is, to endeavour to give a Christian bias to your professional pursuits—to direct those noblest faculties by which your scientific studies are cultivated to their highest possible object, the knowledge of their Divine Author: the purpose for which, in the words of inspiration addressed to the most intellectual people of old, “God created of one blood all nations of men to dwell on all the face of the earth, determining the times before appointed, and the bounds of their habitations, that they should seek the Lord if haply they might feel after Him and find Him.” In connection with those lectures on the Greek Testament, which I have the pleasure of giving you on Sunday evenings, I may here remind you, that the most highly distinguished of the Philosophers thus addressed by the Apostle, when under the light of natural reason alone, without having had the blessed privilege of seeing and hearing those things which we see and hear, and even when most warmly urging the necessity of removing the impure dross of mythological fable from the great principles of religion:—I may, I say, remind you that this distinguished philosopher, with a zeal and earnestness worthy of a better faith, inculcated the absolute

* Rev. Vaughan Thomas' truly learned and eloquent address delivered at the Anniversary Meeting in 1838.

need of laying these religious principles as the corner and foundation stone of every sound system of education. I may here adduce a striking instance of the manner in which the blessed influence of revelation hallowed these dictates of a sound philosophy, from Philo Judæus, a most distinguished writer of Alexandria, in whom were united an intimate acquaintance with the speculations of the philosopher last quoted, and the faith of his progenitor Abraham. There is in his writings the following passage, the very words of which are most remarkably applicable to an institution like ours.

“It is proper for persons who form themselves into a society for the advancement of knowledge, to desire eagerly to behold the Supreme Being; and since he cannot be discerned, to study his image the most sacred Word (by whom he has revealed himself to us,) and in due subordination to Him, the most perfect among the objects of sense.”* And thus may the philanthropic endeavours of the Christian and munificent Benefactors of our College to advance the noble cause of Therapeutic science be blessed, and if I may so speak, hallowed by their regarding as their great ultimate aim † the acquisition of that heavenly science, which is to qualify you for the high destiny to which, so qualified, you will hereafter attain, and to which every sound and healthy system of disciplining immortal beings ought to be rendered subservient.

* Philo Judæus, lib. ix.

† The following resolution of the Council passed on the Wednesday previous to the delivery of this lecture, will explain the principles upon which the Queen's College is founded. “That the most cordial and grateful thanks of the Council be presented to the Rev. Dr. Warneford, for his munificent donation of £500 towards the erection of a Chapel to this Institution; and for the interest he has thus shewn in the promotion of the religious welfare of the students, *immeasurably superior as that object is to all other objects contemplated by this foundation.*”

“The former part of life (says the great author whose general design I have endeavoured to explain to you,) is to be considered as an important opportunity, which nature puts into our hands, and which, when lost, is not to be recovered. And our being placed in a state of discipline throughout this life, for another world, is a providential disposition of things, exactly of the same kind as our being placed in a state of discipline during childhood, for mature age.”* Does not this analogy teach us what ought to be the true and recognized principle of our education—that our preliminary stage of instruction ought not to be deficient in that which will direct to the great end of our being—that religion, in short, should enter as a component element into all our educational institutions, and into none more so than Colleges and Schools of Medicine? I say, Colleges and Schools of Medicine, on account of that strict and striking accordance,—an accordance which has been ably and beautifully pointed out in those nervous and truly eloquent addresses which have been delivered at your different anniversaries,—between those subjects which are brought before you by their respective Professors—instance Anatomy, Physiology, Chemistry, Botany—and their application to the great truths of religion. Let us take anatomical science for instance, and fancy ourselves two stories higher, in the midst of those *subjects*, as you are pleased to term them, which are now in your dissecting room. We here see the world of wonder and mystery which is daily brought before you. You have here an opportunity of taking to pieces the strangest piece of mechanism in the world, one compared with which, it has been well remarked,

* Analogy I. v. ii.

“every other is a mere child’s toy.” * Can we conceive it possible for any one to take this mechanism to pieces without pausing at every instant to admire, with the entire devotion of his every faculty, the countless proofs of contrivance and design—the thousand combinations, each regulated by supreme intelligence, and directed by boundless benevolence, which they every where exhibit? But again, when you have taken this mechanism to pieces, and beheld all these delicate contrivances, you are only introduced to a more marvellous wonder still. You discover, in order to make these contrivances subservient to any purpose whatever, that there must be a something else present which you have no instruments for taking to pieces. Are you not naturally led therefore to think of that which set all this machinery in motion—led to feel the difference between mind and matter—the awful difference between life and death? And if your anatomical studies lead you into trains of thought like this, how insensible must that mind be—how void of every high and holy feeling—which can scientifically survey all this, and not be led to adore that Divine Author, who has thus fearfully and wonderfully made it. I say scientifically survey, for although these glorious works speak plainly to all, even to the illiterate, and I have therefore sometimes, without scruple, addressed you upon them, at our Sunday service, before the poor, sick, and suffering beings at our Hospital, feeling, that while I expressly spoke to *you*, the words, under God’s blessing, would not be lost upon the least learned of the patients: yet undoubtedly much of the irresistible force of the inferences derivable from subjects of this nature must be comparatively lost upon minds which have not

* Maurice—Where see these remarks beautifully illustrated.

been trained like yours to their scientific examination.

I might expatiate in a similar way, did not language almost weaken the force of the argument, upon those branches of your professional pursuits, which lead you to investigate the different animal, and vegetable, and mineral departments of Creation, and the services they may render to man, and I might shew how these studies, as well as your anatomical, would, if cultivated aright, lead your thoughts into a similar channel of holy meditation. I would only add a quotation relating to scientific pursuits generally, from that pious and learned Father of the Church, St. Augustin,* who after eloquently enlarging on the gratification derivable from them, thus concludes:—

“For it is not the authority of the divine books alone which proclaims a God: but every argument from things surrounding us, and to which we ourselves bear relation, attest it likewise; since universal nature declares itself to have proceeded from a supremely excellent Creator, whose Eternity is understood from its perpetuity; his Omnipotence from its greatness; his Wisdom from its order and disposition; and his Goodness from its government.”

But it is to be borne in mind, to use the words of the greatest modern philosopher,† that though “the testimony of natural reason places the existence and personal attributes of the Deity on such grounds, as to render doubts absurd and atheism ridiculous, yet it must of necessity, on whatever exercised, stop short of those truths which it is the object of revelation to make

* August. de Vera Rel. Cap. 28: de Trin. l. 15, c. 3.—I might have brought forward on this point the evidence of Holy Writ. See Rom. 1. 20.

† Sir T. W. F. Herschel in his Discourse on Natural Philosophy.

known:" and it is on account of this *stopping short*, that you must go to *other* sources of information on these things. Thus arises the necessity of providing expressly for your instruction in them, and this the noble and munificent benefactors of our College have endeavoured to do. To me has been entrusted the great responsibility of being the immediate channel by which such instruction is to be conveyed, and I trust that my feeble powers will be so employed, as never to lose the honourable confidence which has been placed in me. It will be my anxious desire, as long as I remain amongst you, claiming at the same time some indulgence for novelty of position, to inculcate with faithfulness, zeal, and discretion, such moral and religious principles, and such applications of science as will tend to heighten and sanctify the intellectual gratification which your therapeutic studies are so well calculated to yield. Without such principles and such an application, however they may benefit the sick and suffering, what ultimate advantage can they yield to you? A sad and fearful reply to this question is contained in the following passage from an author, which, in the estimation of most of you, has some time ago yielded to Galen and Gregory. You may however remember so much of your school-day lore, as readily to call to mind the following passage of the beautiful ode of Horace addressed to the Philosopher Archytas,

"Nec quidquam tibi prodest
Aerias tentasse domos, animoque rotundum
Percurrisse polum, *morituro*."

But with such an application of your professional studies as is anticipated by the Benefactors of our College —when your medical pursuits are cultivated with a

constant reference to your great Creator, and when through them you endeavour to habituate yourself to the contemplation of “the wisdom, power, and goodness of God, as revealed and declared in Holy Writ:”—may we not trust with a better hope, than that expressed in the words of the Heathen Poet, that such studies as yours may be productive of advantages which will not thus desert you when *about to die*, but which will follow you into that place where you will have no need of attending lectures on Theology or Morals, inasmuch as you will possess an intuitive knowledge of the eternal rule of right and wrong, without a wish to violate it:—no need of those Collegiate regulations which you now feel to be a restraint, a wholesome restraint, most of you I trust, but still a restraint, inasmuch as there will be there no temptations to lead you astray—no need of the knife and the dissecting room, as you will have no surgical operations to perform with the former, and neither death nor workhouse wherewith to supply the latter—no chemical laboratory, inasmuch as the elements of the new heavens and the new earth will admit neither of decomposition nor dissolution—in short, nothing, which will serve to remind you of the glory or decay of the terrestrial body,—for though, notwithstanding its decay, the glory of the terrestrial body is one, your boundless and expanded faculties will then derive infinitely more glorious satisfaction from a realization of the fact, that the glory of the celestial is another?—

AN
INAUGURAL
LECTURE ON CHEMISTRY,

IN WHICH THAT

SCIENCE IS CONSIDERED GENERALLY, AND AS A BRANCH
OF MEDICAL STUDY,

READ IN THE

QUEEN'S COLLEGE, BIRMINGHAM,

ON

MONDAY, OCTOBER 7, 1844.



BY

THOMAS GEORGE TILLEY,

Member of the Chemical Society of London; Fellow of the Botanical Society of
Edinburgh, &c.

PROFESSOR OF CHEMISTRY, IN QUEEN'S COLLEGE.

LONDON:

JOHN VAN VOORST, PATERNOSTER ROW.

J LYON, BIRMINGHAM.

TO
THE RIGHT HONOURABLE LORD LYTTELTON,

LORD-LIBUTENANT OF THE COUNTY OF WORCESTER,

THIS LECTURE,

READ IN THE QUEEN'S COLLEGE,

AT

BIRMINGHAM,

IS

RESPECTFULLY DEDICATED,

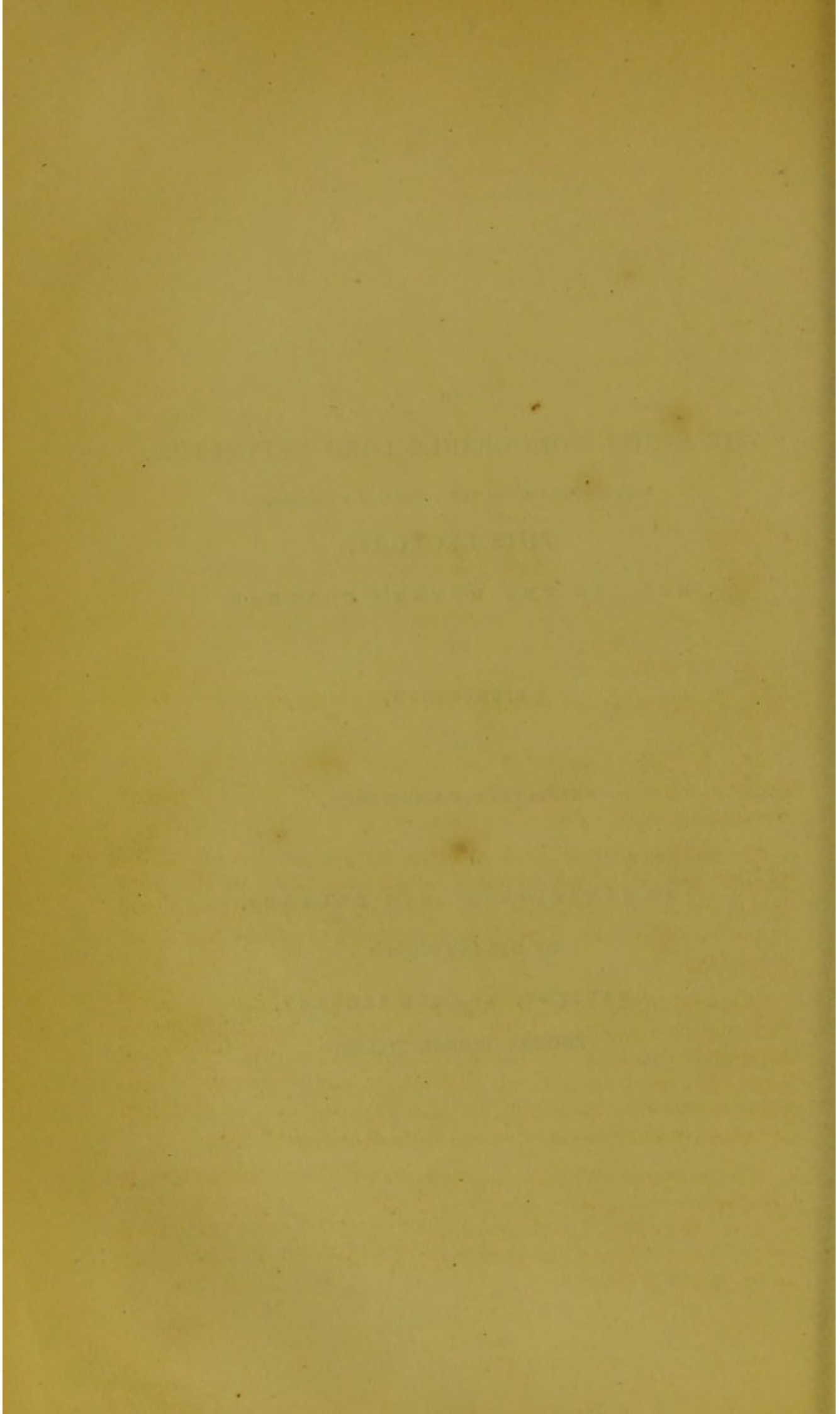
IN

ADMIRATION OF HIS TALENTS,

BY HIS LORDSHIP'S

OBEDIENT, HUMBLE SERVANT,

THOMAS GEORGE TILLEY.



LECTURE.

MR. PRINCIPAL, MY LORDS, AND GENTLEMEN,

IT being customary for the most recently elected professor in Queen's College to deliver the opening Lecture of the session, that honourable duty has devolved on me.

On becoming connected with this institution it is one of the highest sources of my pleasure to be associated in the joint duties of teaching Science with those, who, notwithstanding all opposing difficulties, have placed the school in so respectable a position.

Situated in the midst of one of the most densely populated districts in England, and in a city rendered famous by the immense extent of its manufacturing enterprise, the good likely to arise from such an institution, cannot better be estimated, than by considering the numbers who can be benefitted by those opportunities of instruction which it affords.

The Queen's Hospital, forming part of the establishment, is the means of restoring health to hundreds; at the same time it gives students of medicine opportunities of seeing practised those plans of cure, the theoretical foundations of which they have heard professed.

Moreover, where the genius of the people has taken a mechanical turn, they may derive great advantage from the study of Natural and Physical Science. The human body is full of hints and lessons for the mechanic. He can no where see strength and universal motion combined with such grace of action and flexible beauty. The structure of vegetables he will also be benefitted by considering. The moulder in metal can find no finer models than the forest and the flower garden produce. Mathematics and physics will ably assist him. The knowledge of man is in fact so interlaced with his happiness, that good must spring from all opportunities of gaining instruction. As Chemistry is the science whose laws I am required by my position to teach, and, as it would lead to great lengths to adopt the same plan as regards all science, I shall endeavour to show, in my own particular branch, the good derivable from all.

If a meteoric fire in its wild and unguided flight through the air were suddenly to become a great and organized planet, lighting many kindred spheres, we might draw a just comparison between its developement and the progress of modern Chemistry. At first, fostered by the false excitement of superstition, and unrestrained by any true knowledge, in the hands of the dishonest it was an instrument to impose on the simple, who, in their turn, led by delusive hopes, squandered their energies and property in pursuit of a phantom created by their deceivers, and nourished by their own blind credulity. It would not profit us to give a history of the ridiculous rules laid down by the former class, nor to indulge our imaginations in endeavouring to comprehend how such collections of obscurity and bombast could ever impose on the latter, it will be sufficient to remind you that the objects of Alchemy were to discover some means of converting the base metals into gold and silver, of freeing man from disease, and of rendering his body immortal. Many pretended to have discovered the golden art, but these were ever poor and ruined men; Death soon stopped the boasting of those, who, with their oft distilled vital elixir, were about to conquer him.

In their boilings, solutions, and distillations, amidst the hurly burly of materials which they mixed, some few valuable facts were discovered, and some important substances made

known. This slight foundation was the beginning of modern Chemistry. The golden stores which the alchemist vainly sought for in his meltings and sublimations, the student of science has discovered in seeking for truth,—immortality he hopes to find in the memory of the good his knowledge has bestowed upon his fellow creatures.

The application of the Science of Chemistry to the practise of medicine is, almost, coeval with its own existence. The discovery of compounds, possessed of great power in alleviating disease by the medico-alchemists, was the foundation of the hopes they indulged, that, at some period, they might entirely overcome the ailments of mankind, and place us beyond the powers of decay and death. Though they were led, by their very imperfect knowledge to hope too much, it is undeniable, that they discovered many valuable medicines; and from among the confused mass of their investigations we have derived important information concerning chemical remedies.

Buoyed up by the self-satisfying hope, the imagined certainty of finding in some *nostrum* an universal alleviator of our sufferings, they neglected to seek, by the examination of our bodies the only clue, which eventually could make them approach to success. They were totally ignorant of the medium in which they moved; except, so far, as the Aristotelian doctrine informed them of the elements, Fire, Air, Earth, and Water. Not till two thousand years after Aristotle, was water considered other than an element when Cavendish and James Watt showed it to be compounded of two simpler bodies. Till a period very late, the chemical laws of organic life were allowed to remain an uncultivated field. The ancient chemists preferred building vague and fanciful theories, more the offspring of the imagination, than founded on knowledge, to the tedious, but correct, methods of modern analysis.

The great mind of Lavoisier was the light that guided Chemistry, from the dangerous shoals of unchecked theoretical indulgence. By the use of the balance, in analytical investigation, he banished much vagueness and uncertainty from Science, and from this period it became capable of the widest extension; while the greatest men of the times devoted their

energies to the investigation of its phenomena, in all positions and circumstances.

The discoveries of oxygen and carbonic acid, and the nature of vegetable and animal respiration, the work of Priestly, Black, Scheele, Ingenhouse, and De Saussure, were the first signs of the progress about to be made in Organic Chemistry. The mists of superstitious ignorance, which had hitherto concealed the laws of life, were dispersed, and from that time to the present moment, our knowledge of the phenomena of organized existence has increased. The physiologist is no longer content to refer the explanation of every phenomenon to the *vital force*, formerly the term he used to satisfy his conscience that he had answered the question which his fancy had propounded.

The discovery of a correct method of analyzing ultimately the proximate substances of which plants and animals are composed, displayed to our view the important connexion, existing between these two great divisions of the organized creation. The four wonderful elements, of which organized matter consists, were found to pass through a circle of the most perfect regularity; to be at once the ingredients of plants and animals, and the connecting link between these and inorganic nature.

Animals derive their support from plants. Plants from the atmosphere. Plants, from the inorganic world, from carbonic acid, water and ammonia, produce the neutral and nutritious azotized and non-azotized substances, as albumen, starch, and sugar, which the animal consumes. Plants decompose carbonic acid, water, and ammonia, deoxidising the two former, and assimilating the latter. With the oxygen, freed from combination with carbon and hydrogen, in carbonic acid, and water, the animal produces these latter compounds again. Decomposing plants, dead animals by decay, and living animals by excretion and respiration, produce ammonia, water, and carbonic acid, which living plants require; plants produce oxygen, which is consumed in decay and in respiration. In plants the process of reduction is *continually* proceeding; reduction of the products of the oxidation *as actively* going on in animals. Plants produce the materials for combustion, and remain at the temperature of the medium, in which they

exist; animals consume the fuel which has been prepared in plants and are warmer than the surrounding atmosphere.

From the simplest chemical unions of the four elements, carbon, hydrogen, oxygen, and nitrogen, the complex components of animal bodies are completed by plants for animal consumption. The complex unions, having served the purposes of the animal, are, in performing these purposes, reduced again to the most simple, when they become again fitted for the uses of vegetables. Oxygen, you are aware, is a supporter of combustion, as well in the lungs and capillaries of an animal, as in a furnace; carbonic acid and water are the products of combustion. To produce animal heat fuel is required; to consume the fuel oxygen is needed; plants provide both. To nourish plants, ammonia and carbonic acid are necessary; both living and dead animals produce these. Thus, gentlemen, is the equilibrium preserved. Thus it is that the plant we devour, produces food for plants still living in the fields. Nor does the chain end, death, its last link, is welded on to life, which is its first; we die that new life may spring up. In death and decay new elements of life are provided; death and noisome putrefaction are the steps between the past and the ever beautiful present. The grave, then air, then flowers, then man.

You may conceive that it is of great importance to know exactly the composition of the human body in health, the physician can then hope to detect, in the alterations he may perceive, the origin of disease. The elements, of which animals consist, enter in so many and such varied forms, that in one arrangement they are our common food, united in a different manner, they become the most virulent poisons. If the blood of our bodies be dried and subjected to heat, in contact with an alkali in an iron vessel, the elements, of which it is composed, so alter their relative position, that the substance produced contains Cyanogen, a violent poison, producing sudden death. By morbid actions in the body itself, by decomposition, poisons are produced. I may remind you of the disastrous consequences attending a punctured wound, received in dissection. The action, in this and in similar cases, is at first of a purely chemical kind, resembling the effect produced, when yeast is placed in a solution of sugar. A sub-

stance, in a high state of decomposition, is introduced into the circulation; the atoms of this putrefying body are in a state of molecular motion, and this motion is conveyed, by contact, to the immediately surrounding parts; the energy of life is called powerfully into action to antagonise the active chemical force; inflammation is the immediate consequence; and, if the decomposition proceed unchecked, death will be the result.

Of what nature is the wonderful power which vaccination possesses in curbing the ravages of the small pox? or why, having once been attacked by the small pox, is the body placed for ever beyond its power? We become, as regards it, as Achilles, after Thetis had dipped him into the Styx—invulnerable. Why should our once having had a certain disease, ever prevent its return? The answer, which Chemistry gives to these questions is simple; it will perhaps appear more so, if conveyed in an illustrative manner. Sugar dissolved with water, and mixed with decomposing nitrogenised matter, is prone to ferment. Having once gone through the process of fermentation, the motion of its molecules in that direction is stopped, it cannot, having fermented, ferment again. If oil be subjected to the action of nitric acid, suberic acid is one of the products of the decomposition, which ensues, and suberic acid cannot be altered by the prolonged influence of nitric acid. The human body, likewise, having once undergone the action of the variolous poison, is incapable of being affected by it in future.

I think you will see, that in the investigation of the laws of life, Chemistry is of very useful application; in the daily practice of the medical man, it is not less so. There are few of this class, who have not at some time felt the need of a stricter rule, than the unassisted guidance of their own observation, in diagnosis. Among the many arguments which might be brought to prove the usefulness of Chemical instruction to the physician, is the great analogy between the methods, adopted to arrive at truth, in the respective sciences of Chemistry and Medicine. The analytical method of the chemist consists in securing a certain number of facts, by the help of his re-agents; a certain agreement amongst these constitutes the character of the substance, whose nature he wishes

to investigate. Each character, however, of a substance has, if I may use the expression, a language in which, through the interpretation of a re-agent, it replies to the question. These answers are, if properly understood, the inevitable and sure road to truth; they may ever be relied on; in a word, they give us confidence in the power we have, and the search for them schools our minds in methods of accuracy and habits of precision. The symptoms of disease are the replies to the re-agents which the physician uses; truly these differ from those of the chemist, and instead of being kept in bottles, are stored in his memory; but the mental process is the same in analyzing an ore and diagnosing a disease; and, moreover, the practical knowledge gained, while exercising the mind in a safe method of research, will always be found useful in discovering the causes of disease. To be a quick and correct observer, to be prompt and ready, are the best qualities a physician can have. His great difficulty in combating disease is to discover its cause, this advantage gained, the conquest is comparatively easy. The study of Chemical phenomena is well calculated to produce a facility and readiness of observation. The transient, sometimes quickly changing, characters of substances, frequently the instability of the properties, from which he draws conclusions, require the observative faculties of the chemist to be ever alert. To observe correctly is the first lesson he has to learn, but he must also elicit characters to observe. He is not satisfied with superficially examining the substances he wishes to become acquainted with, but searches for their most hidden qualities. In doing so, he acquires a multitude of means, and a great command over circumstances.

These remarks, though intended particularly to be applied to the studies of the physician, have reference also to the education of naturalists generally, and to training the man of the world; *he* learns, by exercising his mind in this manner, to be ready in an emergency, which is courage; and to turn every trifling part to his advantage, which is economy.

I hope I have succeeded in shewing, that as a means distinct from an end, the study of Chemistry is important to the medical man. But it gains him another kind of power. It is one of his most correct means of diagnosis: in renal disease, in albu-

minuria, and diabetes, the composition of the fluid discharged ascertained, is a key to the nature of the disturbances of the whole economy. He founds his treatment on his knowledge of the abnormal conditions of the secretions. In a febrile epidemic which prevailed during the last winter in Edinburgh, many of those afflicted were found to die in a comatose condition. In the comatose cases, a remarkable deficiency of urea was found in the small quantity of fluid discharged, and on examination of the brains and blood of those who died, sufficient urea was found in these, to render it probable that this might have been the proximate cause of death. By the administration of nitrate of potash many of those in comatose and sleepy stages were cured.

In detecting the adulterations of food, the purity of which is of consequence to all, more particularly to the invalid ; in searching for the proofs of crime when poison has been employed in its committal ; in laying open for justice numerous kinds of fraud, the medical man, who is often called upon to decide, would be totally unqualified, but from the knowledge he possesses of Chemistry.

Let me beseech those of you who are about to enter a sphere of usefulness, so extended as that of the medical man, to remember that your position will be high and full of responsibility, for you will not only be called upon to rescue life from disease, but sometimes to condemn to death. If you do not properly qualify yourselves for this awful duty, you place yourselves in a position of the greatest culpability.

I am satisfied that you will not only derive great intellectual pleasure, but solid good, from the study of Chemistry. A medical man of the present day if he would hold a high place in the opinion of the world, and do all his duties well, must have a highly cultivated mind. He is admitted into the hearts as well as to the bed-sides of his patients, and is often called on to use in non-professional advice that intellect, which his intercourse with the good and beautiful in studying Nature, has enlarged. The world also supposes him to be a man of learning, and he must become one ; and the world is generally so well cultivated that it no longer stands, as Lord Bacon says, for men who "help themselves with

countenance and gesture, and are wise by signs." He will often be taxed, in familiar conversation, to explain laws relating to the occurrences of every-day life, and it is matter of worldly policy, to say no more, that he should be able to do this.

In treating patients of weak or vacillating minds, of disordered intellect or obstinate temper, he must be able, by his moral ascendancy, to support the former, or subdue the latter; by his superior moral culture he rises above the *profanum vulgus*, and gains power, which he will often be called on to exert. His mind cannot be too stored with strengthening and refining learning, and he can gain this in no better way than by studying the works of Nature.

If a medical man makes up his mind to become thoroughly and perfectly acquainted with any one of the Sciences, and to keep up with its daily progress, I say thoroughly and perfectly, he must cultivate his mind most extensively. To keep pace with the foreign literature of the science he has selected, he must learn two or three of the modern languages; to gain at the fountain-head, its bye-gone history, he must be a classical scholar; to trace his chosen science when it branches into others, and all sciences are twined and amalgamated, he will require to learn something of these. I would, therefore, strongly recommend any student, who is commencing his career, to fix on a science, and to follow it up thoroughly and completely; it will lead him not only into collateral subjects, but among men of superior cultivation, whose society will be useful and ameliorating.

To whatever natural science, to whatever art, he may apply himself, the student will find Chemistry of the greatest service to him. If he would make geology the subject of his pursuit, geology draws all its earliest facts from the chemical history of the periods to which they belong. Than of that time when the earth was void and without form, when confusion and chaos, subdued and moulded by God's hand, hastened into symmetrical beauty, the study of none can be more delightful. When organization first sprung from the mind of the Creator, when the waters became filled with living forms, and the earth clothed with verdure. From the composition

of the rocks of the primary period, from the nature of the remains of plants in the coal-beds, from the immense masses of carbon there deposited, the chemist learns, that at the beginning, the atmosphere contained much larger quantities than at present, if it were not chiefly composed, of carbonic acid. The limestone contains its equivalent quantity, and was certainly deposited from a solution containing excess of this acid. The smell of hornblende and of many aluminous minerals is evidently that of ammonia. The shape of the earth assures geologists that it must at one time have existed in a fluid form; to have existed thus its temperature must have been exceedingly high. The waters which then, or soon after, covered its surface, must likewise have been too elevated to hold in solution much of so volatile a body as carbonate of ammonia, this substance, then, was contained in the air. Such an atmosphere could not have supported animal life, and, accordingly, we find belonging to this period no animal remains of high organization. As the waters cooled down they dissolved more of the atmospheric gases. Now Chemistry teaches us that carbonic acid and ammonia, with water and a few salts, are the food of plants; if we combine this fact with that of the existence of the great carbon beds, knowing, at the same time, that plants were created before animals, may we not conclude that plants prepared the air for animals by freeing the oxygen and depositing the carbon.

Geology, unassisted by her sister science, could never have learned how the world was prepared for animal existence by the fixation of carbon, when the coal-beds were formed (may we not say with foresight and design) for the comfort of man, about to be created.

The geologist's guide in studying the history of the buried world of past ages, chemical laws assist him to understand the nature of those changes even now in progression. Volcanoes and earthquakes have not ceased at times to alter the condition of the earth; the lower orders of plants and animals, the corallines and the madrepores, are more gradually, but not less certainly, revolutionizing the surface of the globe. Even astronomy, from its grandeur and perfection the queen of sciences, draws some of her sublime conclusions by the aid she derives from Chemistry. She extends her observations to the atmos-

pheres which surround the most distant planets, and even to those which envelope stars beyond our planetary system. It has been observed that when the solar spectrum is carefully viewed, certain dark lines are observed, which increase in number when the spectrum is examined through the media of certain coloured vapours and liquids. The light of the sun, of the moon, and of the planets, as well as all terrestrial lights, exhibit a remarkable double line of darkness in the yellow ray. The same double line is seen in the spectrum of Pollux, but not in that of Sirius, nor of Castor. In these the two dark lines disappear, and are replaced by one broad line in the yellow, and two remarkable dark lines in the blue, division of the spectrum. Light, passing through the vapours of Iodine and Bromine, exhibits many such dark lines. The intellect of man seems even unawed by space, and by learning the laws of the earth and of those powers directly within his reach, his reason can climb to the stars of other systems. The stars Castor and Sirius are at least more than two hundred millions of millions of miles distant from the earth, yet by this means of research, we may be, almost, certain that they are surrounded with atmospheres differently constructed from those of the sun and of the planets.

A thorough acquaintance with Chemistry is also absolutely necessary for the mineralogist. It is only by analysis, in the laboratory, that he can discover the nature of that part of the inorganic world, which belongs to his peculiar province to investigate. The crystals he seeks out are all definite compounds. Minerals are chemical combinations formed in the laboratory of the world, and their composition must be understood before any rational and natural classification can be made.

Physiological researches, in botanical and zoological science, also require the aid of Chemistry. The minutest beings of the creation, whose myriads surpass the power of man's mind to imagine, are part of the great machinery of the earth. Those tribes of animals, the *Polygastrica* and *Acalephæ*, whose multitudinous hosts fill the waters of ponds, rivers, and oceans, are chemically considered, objects of the deepest and most important interest. These minute points of life exercise,

without doubt, the most important functions of highly organized animals. They are accompanied with vegetable structures still lower in the scale of life. Travellers in tropical countries tell us of the brilliant phosphorescent lights,* which sweep over the calm seas, and are seen for miles in the semi-darkness of night, when the waters are curled with a passing breeze. The oceans of northern climes are also filled with these living morsels of light, which may be said to carry, from zone to zone, the food of all other animals. These beings, only visible when all else is unseen, as though to hide in paradox their more important ends, like the other emanations from the will of God, are ministering servants to the good of man.

If we ask ourselves whence come those immense beds of guano which cover the coasts of Africa and South America? They are the immediate produce of the sea birds which inhabit those lonely places in such myriads that they darken the air as they rise from their resting places in the morning.†

These birds are only another part of the machinery to which belong the microscopic animals. The phosphates and the compounds of nitrogen, which render the guano so fertilizing, were diffused through the ocean till collected together by the combined efforts of these industrious millions. The hundreds of tons of nitrogenized matter which decay on the earth's surface, send corresponding quantities of carbonate of ammonia into the air, part of which necessarily is washed down by the rain into, or deposited with the dews in the ocean. From similar causes the sea, doubtless, contains phosphates, and these compounds are assimilated by the algæ with which the sea abounds, the minute members of this class become the food of equally minute animals, the atoms, of which these are constituted, become assimilated by more perfect beings, they now swim the ocean as fishes. The sea birds feed on fishes, and the guano, which our commerce brings hither, is the deposit which the sea birds produce. The beds of guano

* Produced by the Acalephæ, all are not equally minute, as *Cestum Veneris*, &c.

† *Meyen. Reise um die Erde.* Quoted by Liebig.

may be considered as stores of the excess of nitrogen, just as the coal formations are receptacles of carbon. The nitrogen and phosphorus which make guano so useful as a manure, were diffused through the ocean, till by the machinery of plants and animals, they were collected in masses together.

Agriculture is daily deriving advantage from chemical discoveries; correct methods of cultivating the land are founded on physiological and chemical laws. It is necessary to know the composition of a plant before we can supply it with fitting nutrition, and it is only by being qualified to perform analysis that we can arrive at just conclusions concerning this. To choose even the time of day or season of year to feed his flocks in certain pastures the agriculturist is not independent, analysis can yet assist him. The *agrostis stolonifera* during the summer collects from the air so much carbon that, late in the autumn, it contains a goodly supply of sugar and is then very nutritious food.* Many other plants have a still more wonderful power in changing the nature of the substances which they contain, some are sour at morning, tasteless and neutral at mid-day, and bitter at night. The acid of the morning, by the addition of carbon, has become neutral, by the deposition in its tissues of larger quantities it is in the evening bitter. With this knowledge it is easy to explain why change of pasture should be necessary for the health of cattle.

The refuse of manufactures, instead of being thrown away as useless, is now converted into valuable manures. The manufactures themselves are improved and benefitted daily by the enlightenment thrown on their processes by Science. We have *no* manufacture unaided by Chemistry, no art that does not afford examples of its surpassing usefulness. The wealth of towns like Birmingham depends so much upon their being able to equal or surpass, in economy and beauty, the fabrications of other places; improvements are rising up so rapidly around, rivalry is so alert, that to keep up a position among manufacturing towns, particularly those of Belgium, France, and Germany, requires a continued acquaintance with all that is new among the applications of

* Sprengel, *Lehrer vom Dünger*.

Science to the Arts. But, if we are to surpass other countries in manufactures, as we have hitherto done, we must not remain content to borrow of them half-worn out inventions, but invent for ourselves.

The young men who are intended to become conductors, inventors, or improvers, of processes in the arts, must be educated in those laws, on the due observance to which depends the success of all we attempt; these laws are the unalterable laws of Nature, which, if we comprehend them, we may turn and twist to be our obedient and faithful slaves, but only if we understand them:—"the power of man over Creation is limited only by one condition, that it must be exercised in conformity with the laws of Nature." We could not expect our gardens to bear rich fruit unless we cultivated them with studious care, can we then demand of our minds to sprout forth valuable inventions from barren and seedless soil? By working without knowledge, he who would try, by some chance blow of success, to strike on a good vein of ore, will squander his real substance, in his midnight search, only to find that the rich metal of his hopes is some glittering and useless spar. How many of our most promising inventions fall short of our expectations because the principle on which they were founded was not a correct one. All successful attempts at improvements have arisen from men, who, from their knowledge of science, could see the universal relations, towards each other, of the powers they would harness to their wills. It has been said that a man of scientific knowledge is of no use in a manufactory, because, though conversant with theory, he knows nothing of practice; but place a man conversant with the reasons of things in a practical position, and he will, at a glance, see the *modus operandi* of every process, and in a short time, will suggest many valuable improvements. It would seem needless to insist thus on the importance of knowledge of science, to men who have interest in towns like this, but when I mention that in this town there exists no school of science, to supply the increasing demand, in practice of a sound knowledge of laws, my allusion to the want and to the importance of good, full, well grounded scientific education will not be surprising. In Manchester there is a School of Chemistry

founded on an excellent plan ;—in London there are schools in an active state of preparation ; but in Birmingham, the head quarters of mechanical and chemical art, there is none.

When Galvani, the professor of anatomy in Bologna, saw motion excited in the muscles of a dead frog by the contact of different metals, he little dreamed, that, forty years afterwards, one of the most beautiful arts of modern times would spring from his recorded observation. Volta of Pavia soon after invented the voltaic battery, by reasoning on Galvani's fact, and the applications of this instrument seem to be unending. The minutest facts, when combined and studied in varied positions, give rise to the most important and unlooked for results. Every trifling fact may be the seed of unheard of wonders. How many would have laughed outright, when Pythagoras, elated with joy at his discovery concerning the square of the hypoteneuse, sacrificed his hecatome to the gods? But science, and therefore art, is built of such facts—the good of mankind is bound to the advance of such discovery. How often is the question *cui bono?* put to the man of science, rejoiced at discovering a law of Nature? How blindly the querists throw away reason when they question thus. We might imagine a horse not liking his corn to be put into the earth, but we should indeed be amazed at a rational being objecting to that which we all know to be so necessary. Yet the seeds of that knowledge from which spring our most useful arts, we think but lightly of planting, or even neglect to plant at all.

I have only to remind you of the application of the discoveries of Volta and Galvani to the gilding and silvering beautiful natural objects. In a few minutes we can make permanent in gold and silver the transient beauty of our most ephemeral flowers, retaining their pure and perfect forms with the most delicate precision. Nay! we could cover a forest, every tree and bud and blade and bloom, and yet require to touch no single twig. I have only to call your attention to the exquisite specimens of the Galvano plastic art produced in the manufactory of Messrs. Elkington, and to those deposited through the agency of magnetic electricity, by Mr. Woolrich's process. Our late lamented teacher, Mr. Woolrich, was among the first to apply the electro-galvanic agency

to the deposition of the less oxidisable metals, as protective surfaces on those more easily acted on by the air. This gentleman was the esteemed lecturer in this school for upwards of fifteen years. We must thank chemical science for almost every embellishment and amenity of physical life, as well as for our commerce and our wealth. We grow our corn, we feed our cattle and preserve their flesh by its help; for our warmth in winter, our coolness in summer, for our clothes and their colours, for all the comforts of existence, we are indebted to this wonderful science.

I hope to be able, under the auspices of the Council, to form a practical School of Chemistry within these walls; and I think that some good may arise out of the attempt,—and I doubt not, that, as the importance of the subject is being daily more and more brought before a public rapidly rising in intelligence, it will in time see the vast superiority of true and solid information over blind and bigotted quackery and empiricism.

The few points to which I have called your attention, display but a small portion of the great commercial and scientific advantages attainable by the cultivation of Chemistry, it is therefore surprising that in this country there should be no adequate measures taken to encourage its developement. Much of the knowledge we apply to our arts is taken from foreign sources: there are within the reach of our youth only certain lectures given in medical schools, or certain others which strive to contend with the theatres in the brilliancy of the *ad captandum* display they make. The medical student even has no sufficient opportunity to prosecute his studies in Chemistry; the lectures he attends are often excellent enough, but they are not sufficient. A feeble attempt is made to remedy the defect by the establishment of practical classes, but the method of these is peculiarly unfitted to teach science. The advantages of a community for the purpose of instruction are lost. The good arising from men studying together is entirely neutralized. In the *practical* chemistry class room, twenty persons may be seen performing the same operation. Perhaps engaged in the preparation of oxygen. Each is provided with his little retort, and step by step, is told how to proceed by his teacher. But, gentlemen, I think that you will

agree with me that this is not a true method of teaching a science; in fact, this is proved by the general ignorance shown by the students of all methods of research, and their peculiar clumsiness in any attempt at manipulation. I think that, in the dissecting room, if every person were required to trace the course of any particular nerve, or lay bare any vessel at the same time, the progress in anatomy would be slow. In the dissecting room, as in the laboratory, as much is learned by watching the working of other men, as is acquired by regarding the object of one's own particular labour. The teacher, in demonstrating to one pupil on any particular part of the body dissected by him, gives a lecture to the whole room. The pupils assemble round him, and they have every opportunity of observing the facts as they are pointed out by him. This plan is adopted in teaching chemistry in the laboratory of Professor Liebig, at Giessen, and with the best results. One pupil is industriously engaged in preparing the salts of iron, another busies himself in making the compounds of chlorine, each being differently occupied, much is learned mutually from one another. The art of manipulation is learned in pursuing any part of the subject, and much time is saved by several persons, anxious to gain and give information, while working on different parts of the science. Foreign journals are filled with valuable treatises produced by pupils in the school at Giessen.

I purpose, in the practical courses I may have the honour to give, a similar system of instruction. Commencing by attaining skill in manipulation, and a knowledge of bodies of the more useful class, the student will be led on from simple to more intricate subjects. A practical course, to be of good service, should render familiar the mechanical processes of use in investigation, the use of instruments of research, and the intimate qualities of bodies. Every salt and substance in the chemist's laboratory are, in his hands, instruments of unvarying correctness, by which he tests the rectitude of his observations. His reagents are the very fingers of his mind. By the knowledge gained in learning properly to prepare these, he becomes qualified to commence the study of their uses. He has, when he has progressed thus far, fitted himself to analyse, and analysis is the very corner stone of his

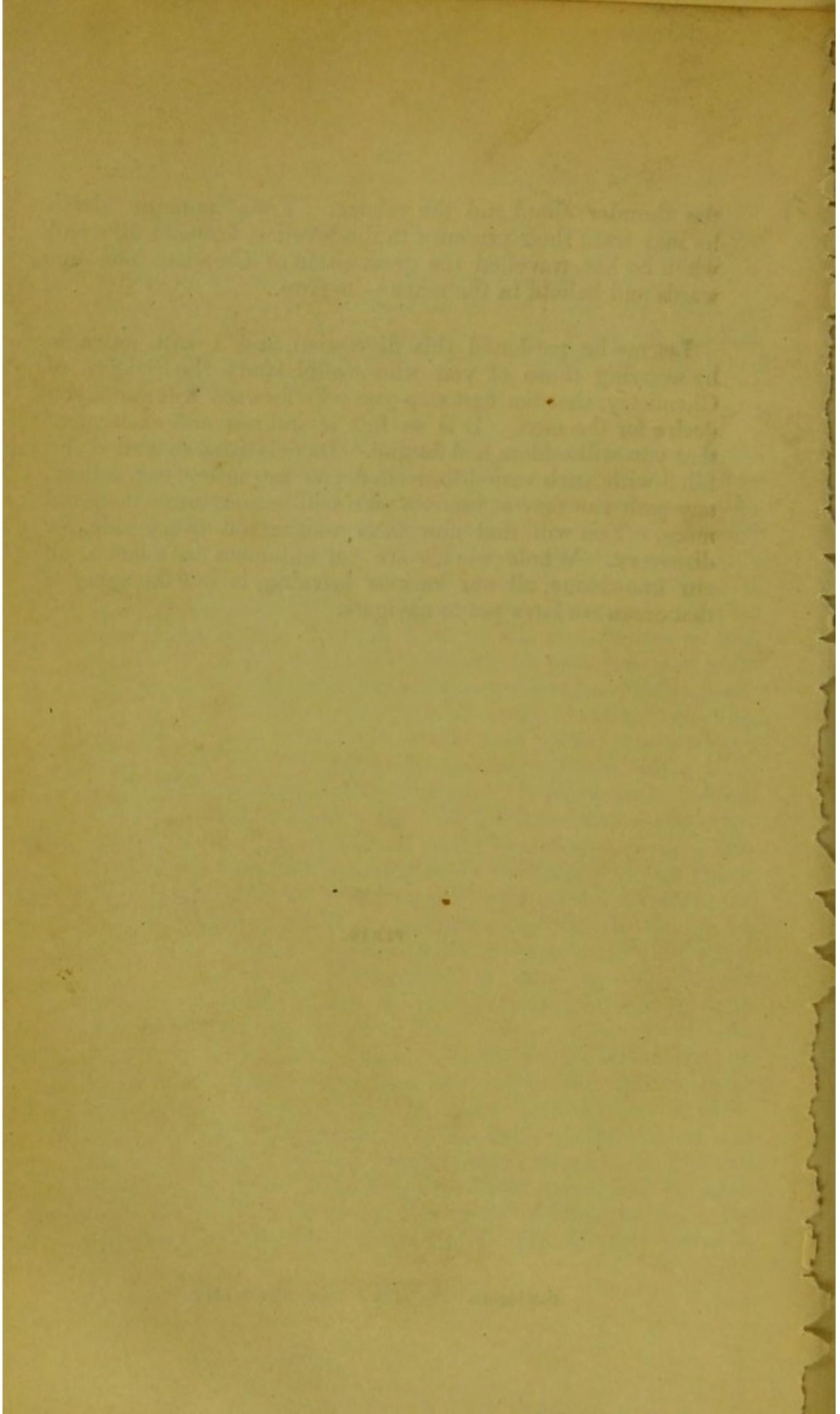
science, the key to the original investigations he may be required to commence. Without correctness in the analytical department of his science all his labour would be without avail, for on his accuracy in this depends the usefulness of all his future inquiries. The machinery of his mind, by this elementary exercise, is fitted to travel over new ground; the key of the temple has been won, and Truth, its goddess, may be sought in many of her varied forms and worshipped for her divine beauty.

We have seen how the Chemist lays the foundations of the natural sciences, how he gives to the geologist materials to build up systems of the universe, aids to the astronomer in his flights beyond the planets, rules for the mineralogist to classify his crystals and his gems, a key for the physiologist to unlock the mysteries of life, a thousand means for the physician to discover the ailments of his fellows, and a thousand remedies to alleviate them. You need not be told that, amidst all this, there is many a broad tablet whereon the moralist may write of the goodness of God, and many a golden pen for the poet's fancy. Greater than the physical comforts science bestows, more beautiful, infinitely, than the most perfect fabrications it teaches the arts to build, is the reward, which it stores up in our enlightened and enlarged minds. Without an ennobling desire for truth, a longing after the Psyche who dwells in the temple of Nature, how small would be our spot in time, how limited our end, how inconsiderable the objects of our being. This intercourse with the mighty will of the Creator, the mind of Nature, raises us immeasurably nearer, though we must ever remain immeasurably distant from perfection. The labour of the philosopher is pure joy—its reward soul-strengthening pleasure. In imagination he may fly with the unchained atoms of a dead flower, through all the phases of their future being. In fancy they will lead him to the zone, where vegetation, exulting in the most brilliant luxuriance, seems to claim a life more exalted than it is its lot in other lands, and thence to the cold, unclothed, but still beautiful north. He may imagine them as coral in the hidden stillness of the deep recesses of the ocean, and in some other form of beauty among the caves of the glaciers. He may read their gentler history in the lily, of their power in

the thunder cloud and the volcano. From inorganic death he may trace their presence to the loveliest forms of life, and when he has travelled the great circle of Creation, look upwards and behold in the midst—its God.

Let me be pardoned this digression, and I will conclude by assuring those of you who would study the Science of Chemistry, that the first step you take forward will make you desire for the next. It is so full of interest and excitement that you will seldom feel fatigue. Its field is so extended and filled with such varied forms that you can never feel satiety, any path you may at random take will branch into a thousand more. You will find new facts waiting on every side for discovery. Whole worlds are yet unknown in science, all our knowledge, all our various learning, is but the spray of that ocean we have yet to navigate.

FINIS.



LECTURE,

INTRODUCTORY TO

A COURSE OF CLINICAL MEDICINE,

DELIVERED IN

THE THEATRE OF QUEEN'S COLLEGE,

BIRMINGHAM,

ON TUESDAY, DECEMBER THE FIRST, 1846.

BY

SAMUEL WRIGHT, M.D., EDIN., F.R.S.S.A.

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Fellow of the Botanical Society, &c.

LONDON:

JOHN CHURCHILL, PRINCES STREET, SOHO.

BIRMINGHAM: ALLEN AND SON, COLMORE ROW.

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REV. JAMES THOMAS LAW, M.A.

Chancellor of the Diocese of Lichfield,

VICE-PRINCIPAL OF QUEEN'S COLLEGE, BIRMINGHAM,

THIS LECTURE IS MOST RESPECTFULLY DEDICATED

BY

THE AUTHOR.

THE UNIVERSITY OF CHICAGO

PHYSICS DEPARTMENT

RESEARCH REPORT

THE UNIVERSITY OF CHICAGO

PHYSICS DEPARTMENT

LECTURE.



GENTLEMEN,

IN appearing before you, for the first time, as a teacher of Clinical Medicine, it becomes me to introduce myself and my subject by a few preliminary observations. To head a course of lectures by a specific introductory address, is not usually in good taste; and for the simple reason, that, such form of address is likely to comprehend a certain amount of irrelevant or unnecessary matter; whilst the lecturer, in thus enforcing the claims of the science he teaches, is particularly apt to exaggerate its importance. Fortunately, on this occasion, I am somewhat exempt from a liability to these errors; for a preface to my particular duties is required of me at this time; and the subject of those duties so paramountly concerns yourselves, as students and future practitioners, that I cannot too strongly advocate the necessity of its cultivation.

The position I hold, as one of the Professors of Clinical Medicine in this College, is consequent upon my Physicianship in Queen's Hospital. When honoured with that appointment, I was apprised that it involved also the responsibility of clinical instruction. To this I assented; and I am now happy in the opportunity of proceeding, to the best of my ability, with the fulfilment of my obligations.

I cannot, with a prefatory license allowed me, lose the present occasion of congratulating the Patrons, Professors, and Pupils, of this College, on its recent improvements, its present flourishing condition, and its prospects of permanent

and increasing celebrity. The untiring and most laborious exertions of its Founder; the wise counsel and active superintendence of the noble Lord, its Principal; and the generosity, judgment, and personal attention, of the Worshipful Chancellor, its Vice Principal; have contributed to give it a title to eminence amongst the schools of learning and science, and lead us to hope, that, it will hereafter stand alone as the source of medical instruction for the midland district of England.

Particularly do I congratulate the junior part of my auditory, on the facilities for classical and mathematical studies, with their several appliances, which are now afforded in this institution. It cannot fail that great benefit will be the issue of this most judicious provision. It has been an opprobrium of our profession, that, though claiming the distinction of "learned," the justice of the claim is rather an exception than a rule. Unhappily, we are not yet in a position to prove that the opprobrium is altogether undeserved. We meet with frequent proofs how much wiser, and better, and more generous to each other, we shall be, after the education preliminary to the study of medicine, shall have increased in amplitude and refinement. The many who desert our ranks for the quarters of quackery, and the many more, who, under a seeming propriety, cast a constant shadow of disgrace upon our honourable calling, are painful proofs how wanting we yet are in those accessory studies, which not only improve a man's mind, but his morals also. Scarcely a week passes, but our periodicals have to tell the tale of some practitioner forgetting his duty to himself, or to another, and perpetrating such acts as would lead to his instant expulsion from any community rigidly governed by an honourable system of laws. Such offenders would not pass unpunished, were we, *toto cælo*, an incorporated body, provided with the means of exposing or expelling those

who do us dishonour. In the absence of this great desideratum, which I fear will never be supplied, we can only, in rational hope, fall back upon the influence of education. It is in the want of this, that is chiefly to be found the origin of unworthy character. As a rule, men are not good, or are not learned, because they have not been properly disciplined.

“‘T is education forms the common mind;
Just as the twig is bent, the tree 's inclined.”

Infuse right precepts into the *boy*, and see that he loves and cherishes them—and you have good ground for prejudging the character of the *man*.

The great source of our profession's prosperity and advancement, must be the efficient tutoring of the future practitioner. Medicine is now, a very different subject to what it was half a century ago—its disciples are growing wiser and better every day—and we hail the time when it shall fully realize the dignity which should peculiarly distinguish it. To this most desirable consummation, education will be the only sure contributor. We raise a constant cry for reform in the profession, but depend upon it, if we are to begin at the beginning, we must reform our individual selves. We, as integrants, being made better, the sum of us will necessarily be better also.

It rejoices me to be able to say, that, the great scheme of improved and extended medical instruction, especially the preliminary part of it, is in no school better, and in few schools so well, provided for, as in this. The introductory discipline and tuition, under our accomplished resident masters, without being severe, is yet sufficiently strict, to ensure that the *alumni* committed to their charge, shall have secured to them the choicest advantages of classical and mathematical study. Privileges like these, gentlemen, you cannot too highly prize. If you rightly avail your-

selves of them, they will shine with a significant lustre, through every phase of your future career. You will find it no trifling distinction to be ranked among the *literati* of your brethren: and let me tell you, it will be the reverse of agreeable to occupy the reverse position. Some of you may perhaps be familiar with the history of the man mentioned by Curran, who, on a conspicuous occasion, descanted upon Demosthenes as the glory of the Roman forum; spoke of Tully as the great rival and contemporary of Cicero; and, in the space of one half hour, “blended three several times, the straits of Marathon with the plains of Thermopylæ.”

None of you, I apprehend, would envy a man like this—that you may never attain a similar notoriety, seize every opportunity now offered you, for enlarging and enlightening your minds with classical and mathematical learning. You will hereafter feel the paramount usefulness of this, in your daily intercourse with the world. It will distinguish you from the ignorant, the prejudiced, and the presumptuous man; and never fear but society will recognise, and yourselves reap the reward of, the contrast.

To turn, now, to the senior students, whom it more particularly concerns me to regard, permit me to address you, gentlemen, in all possible plainness of speech. The subject upon which I shall have, from time to time, to discourse to you, is of such weighty consideration and consequence, as to give license to none other than the simplest modes of expression. Bold imaginings, plays of fancy, and a studied mellifluousness of language, are tolerable enough when they involve no sacrifice of the subject to which they relate: when liable to this, they are best dispensed with. In a medical lecture room, they are utterly out of place. Clinical medicine especially is, or ought to be, made up of simple

matters of fact. The more nakedly these are placed before you, the less likely will you be to mistake or misapply them. I say thus much, that you may be prepared to receive, without the criticism perhaps due to it, any sameness or homeliness of phrase I may employ, in the process of imparting to you practical instruction. It is the duty of myself, and of my more able colleagues, to teach you how best to recognise and treat disease: if we answer this great end, let it sanctify the means, however humble they may be.

Before entering into a formal consideration of *my* duty, and *yours*, in reference to clinical medicine, I must presume that you have already prosecuted the studies that are auxiliary to it; if this be not the fact, you will be only half prepared for the serious obligations of the bedside. You must have attained such a knowledge of botany, as will aid your acquaintance with *materia medica*; this latter, in its available parts, must be as familiar to you as your alphabet, so that at any moment, and in any emergency, you may prescribe without compromising your own character, or your patient's safety; chemistry, in its pharmaceutical appliances, you must comprehend thoroughly, so as to avoid the risk of mingling incompatible substances, and of poisoning a fellow creature; organic chemistry, and the microscope, you will find indispensable, if you desire to become scientific practitioners, for their services are invaluable in the investigation of pathological products; your anatomy, especially *regional*, and physiology, must be ample and accurate, or you will neither know the disposition and function of organs in the healthy subject, nor be able to recognise their error of situation, or of action, in the diseased one.

Do not imagine that I am laying too much stress on an acquaintance with these several sciences accessory to medicine. I should ill discharge my duty did I not tell you,

that, without them, your practice at best can be only blind empiricism. They are as necessary to a correct diagnosis and treatment of disease, as is a knowledge of the fundamental properties of matter, to a comprehension of obscure physical phenomena. Those of you who are not well acquainted with the elemental subjects I have specified, will listen to the discourses of your clinical Professors with very little advantage.

It being admitted, then, that you are prepared for instruction in clinical medicine, we have next to consider in what this instruction consists. Your lectures on the theory and practice of physic, have already familiarised you, verbally, with the signs, symptoms, pathology, diagnosis, and treatment, of disease. The business of your clinical teachers is to show you these things *in their living detail*. It is, in fact, a system of pointing out, and explaining, morbid phenomena, and the action of medicines, as these are manifested in the different cases that occur in hospital practice. To this end, it is necessary that your attention should be chiefly directed to the *minutiæ* of disease. It is seldom, at the bedside, that you recognise any striking pathological features unconnected with others, less conspicuous in themselves, but still most important in their tendencies. An abstract morbid phenomenon, would be a prodigy in pathology. They are the little things, or the *items* of ailment, constituting the sum of it, that you are required to recognise, singly and in conjunction, in order to form a correct *diagnosis*, and to authorise a correct line of *treatment*. By how much the more you regard these things in their proper light, by so much the more will you be able to relieve or to remedy disease. This is the great ground of distinction between a judicious and an ignorant practitioner—between a good clinical teacher and a bad one.

The little things I speak of, it is our business to instruct

you to *observe*, severally, and in their aggregate. The great axiom of Baglivi—" *Ars medica tota est in observationibus*"—should be your main guide of conduct during your hospital practice. It would be comparatively useless for you to follow us through the wards merely as lookers-on; unless you *observe* what we are doing, and learn our reasons for pronouncing the nature of this disease, and that, and for variously prescribing for them, your opportunities will do nothing more than initiate you into an ignorant *routinism*. It cannot be expected, however, that your unaided observation will enable you to comprehend the many motives we may have, for the many things we may do, in hospital practice. It is therefore necessary that we should tell you *why* we give such a name to such an ailment, and *why* we treat it in any particular manner. It is the assigning of these several *reasons*, that constitutes the sum and substance of clinical teaching.

To begin, then, at the beginning, let me remind you of an old saying, that, "the knowledge of a disease is half its cure." The phrase is common enough, but the substance of it is classical, and traceable to Hippocrates. The first thing, then, that we shall have to do, I, in the process of imparting, you, in that of receiving, clinical instruction, will be to discover and to define the nature of the diseases of our several patients. In doing this, which is technically termed *diagnosing*, we have to attend to the items I have already spoken of. These are of two classes, and are known by the names of *signs* and *symptoms*.

The former of these chiefly relate to the mechanical conditions of organs, and to the evidences which they offer to our several senses. The latter bear reference to the functions of organs, *in their general manifestation*, and to the expressed feelings of the patient.

To judge of a disease by symptoms only, was the charac-

teristic of medical practice in its infancy ; to be able to judge of it by signs, is an obligation we owe to pathological anatomy. The accumulation of a vast number of facts, illustrative of organic changes, and the connection of these changes with particular indications manifested during life, is the great source of our present certainty in the diagnosis, and success in the treatment, of disease. It is a knowledge of these things that so strikingly distinguishes the medical practice of the present day, from that of days gone by. The great errors of the earlier schoolmen, as compared with ourselves, arose from their not being in possession of those sterling truths which modern research has placed at our service ; and our successors in the art and science of healing, will be wiser and more skilful than we are, in proportion as the experience of ages disposes its accumulating treasures in their hands. These treasures are *facts* ; and we cannot wish better to our profession, than to anticipate with Bichat, the arrival of that day, when the science of medicine “ will be nothing but a succession of facts, strictly deduced from each other.”

Now, it was the absence of these things, or rather, an insufficient number of them, that gave rise to a faulty symptomatology, and rendered diagnosis a frequent matter of hazard. The Nosology of Cullen, though in many respects a masterpiece of ingenuity and judgment, is yet a conspicuous failure for want of a proper pathological basis. To give you only one illustration in point ; the Cullenian Nosology regards phthisis as an affection of the lungs ; but our pathology tells us that, in phthisis pulmonalis, the lungs are merely the organs in which the product of diseased function is deposited. The lungs are rendered morbid, not *per se*, but by the mechanical lodgment, and subsequent decomposition, within them, of adventitious animal matter. This matter, so far as at present we know, owes its existence

to an altered *genetic* action of those elemental granules of the blood, whose proper office is the formation of normal tissue. One of their perversions of function, is the generation of tubercle: if this be thrown out upon a free mucous surface, no evidences are furnished of organic lesion, and the sufferer may slowly waste to death; if it be deposited in the substance of the lungs, it will be likely to give rise to pulmonary consumption; but it may also be deposited in the brain, and lead to apoplexy, paralysis, tubercular meningitis, or lesions of one or more of the senses; in the kidneys, and cause general dropsy; in the liver, giving rise to ascites, or jaundice; in the mesenteric glands, constituting the tumid abdomen of scrofulous children, with its frequent concomitant, exhausting diarrhœa. The indications, therefore, of tubercular degenerescence of any organ, explain in no wise the *ultimate nature of the radical disease*. Nor need I tell you, that, however we may direct our attention towards the relief of the suffering organ, we must look beyond this, and endeavour to remedy that *further evil* which has *caused the organ to suffer*. The quacks who delude the public with the old jargon of consumption curable, by puncturing, counter-irritation, inhalation, and other such mechanical trickery, have just as much knowledge of the disease as enables them to practise deception adroitly—and no more. The business of the pathological practitioner, is to contend against the *causes* of disease, not against its *consequences*.

An error into which the symptomatologist is likely to fall, is that of overlooking *latent* disease. This is a characteristic error of inexperience and unskilfulness, and I warn you, as you desire to be eminent in your profession, to avoid this fault, as one of the greatest evils that can befall you. The liability to it arises from the fact, that, serious mischief may often exist in organs, without being manifested by *symptoms*, properly so called. In illustration, let me men-

tion to you the case of the boy Yardley, who died in the hospital about a fortnight ago. He was admitted five weeks previously, under my care, complaining of nothing but rheumatism, chiefly confined to the right elbow. Fomentations, poultices, and saline medicines, with colchicum, benefited him materially, but he had shortly metastasis of rheumatism to the stomach and bowels. You remember what trouble we had to relieve him of those abdominal pains. During the first few days succeeding his admission, he had no cough, or difficulty of breathing, or night sweats, or hectic, or any symptoms, in fact, of pulmonary disease. I chose, however, to make a stethoscopic examination of his chest, and discovered indications of extensive lesion, which I concluded was chiefly tubercular. I again closely questioned him about his breathing, which he assured me was easy and regular, and he also again said that he had no cough. About three weeks before he died, a slight cough supervened, very mildly, and scarcely at all in the day-time, and attended with a trifling expectoration of frothy mucus. This was the only external evidence of the state of his lungs up to the time of his death. The *post mortem*, you will recollect, shewed the superior third of each lung to be considerably emphysematous; the middle of the left lung, especially posteriorly, was completely infiltrated with tubercular deposite, evidently not very recent, whilst its lower part was in a state of perfect hepatization. The middle portion of the right lung was infiltrated throughout with a turbid serum, containing tubercular matter; and its inferior portion was hepatized like the opposite one. There was all this mischief in the lungs, and yet, you remember how calmly that boy breathed, how naturally and easily he spoke, and how absent were all the ordinary external indications of the disease that killed him. This disease was manifested only by *physical signs*, whilst the *symptoms* were merely

those of rheumatism, and gradual wasting. So you see, to have trusted to symptoms only, in this case, would have been to know nothing whatever of the chief ailment the poor lad was afflicted with. I mention this to shew you the necessity of scrupulously examining a patient, before pronouncing an opinion upon his malady.

It sometimes happens, again, that symptoms are apt to deceive by their number and apparent seriousness, instead of the opposite, as in the case I have just quoted. Some of you will remember an out-patient of mine, who made his appearance at the hospital a few weeks back, complaining that he had disease of the heart. His pulse was certainly quicker than natural, and irregularly intermittent, and the "feeling of his heart beating," he said, was particularly distressing to him. On carefully examining him by percussion and auscultation, I recognised the disordered function easily enough, but I could not connect it with any evidence of organic disease. On further inquiry, I found that he was suffering from an aggravated form of dyspepsia, of several weeks' duration, and that the unnatural action of his heart had supervened upon his deranged stomach. His "heart disease," as he called it, I immediately concluded to be a secondary, or sympathetic trouble, and therefore prescribed for the cause of it, viz. his dyspepsia. Under the use of tonics and aperients, with restricted diet, he got well within a month, his heart's action having become regular, and normal both in force and frequency. In this case, you observe, to have believed the symptoms as they superficially presented themselves, would have been to think, with the patient, that there was organic disease, where only sympathetic disorder existed.

Let it be a rule with you, gentlemen, never to form a positive diagnosis, without investigating both signs and symptoms; and remember that, of the two, the latter are the

more likely to deceive you. As I have told you, they relate to functions, which may be abnormal without any appreciable alteration in the physical condition of the organs manifesting them. I say appreciable, because the opinion is held by many eminent pathologists, that, altered function is necessarily the result of altered structure. That there are many reasons for this belief, is shewn in the recent discoveries of the microscope, and organic chemistry; and the expectation is natural, that hereafter, when our senses shall be better aided, many alterations of structure, not now cognizable to us, will be made evident by the agency of the microscope.

Whether the law of relation between structure and function, as contended for by the exclusive pathologists, will ever be the subject of unexceptionable proof, is perhaps a matter of question. That it is right in the main, is certain enough; but still, the research must be very delicate which would disclose the altered condition of the kidneys prompted to increased action through fear, or which would tell us what particular change a hungry man's stomach undergoes, when the advent of ill news deprives him, in a moment, of all appetite.

Though the diagnosis which is based upon accurate pathology is undoubtedly the most certain and scientific, yet a too rigid adherence to the doctrines of the pathological school, has occasionally led to prejudice and bad practice. Not admitting the existence of disordered function, simply as such, they have gone to the extreme length of charging upon some organ, or other, the cause of ailments, which the Hippocratic practitioner would consider to be *general* in their nature. No doubt this is true to a great extent, but perhaps not universally. At any rate, it is not always safe to administer a form of treatment consistent with this particular theory. Simple fever, for instance, the exclusive

pathologist regards as having a local origin : one says in the head, another in the heart, whilst a third will have it in the stomach and bowels. Consequent upon these several notions, are so many varieties of treatment ; one will leech the temples, and blister the back of the neck ; the second will cup over the region of the heart, and blister between the shoulders ; whilst the third will bleed from the arm, give calomel and opium, and counter-irritate the whole of the abdomen. And all this, to cure simple fever, that, in nine cases out of ten, is the better for being the least interfered with !

These are some of the consequences of allowing prejudice too much play. Of all faults and follies avoid this, if you wish to become good practitioners. You will best avoid it by attending to the *minutiæ* I have already spoken of. Look at these in their number, but chiefly in their importance. *Count* them if you like, but you must *weigh* them if your judgment is to be advantaged. “*Non numerandæ solum, sed etiam perpendendæ sunt observationes.*”

If you will let me advise you, gentlemen, in the chief duties of your profession, you will not encourage a theory, or an opinion, merely for the sake of it. Let the inductive system be your guide. Observe, without partiality or prejudice, the facts of any case, as they may be accessible to you, and infer accordingly. At the same time, let your minds be always free, and open to receive fresh or opposite impressions, should there be any good ground for them. Never hesitate to change your opinion when TRUTH tells you that you ought to do ! Only by this liberty and liberality of mind, can you hope to practise your profession with success. Medicine, you know, is not an *exact* science : it is made up of too many contingencies ever to become reducible to rules that are not liable to exceptions : this very circumstance should disarm you of particular prejudices, and enable you to meet disease at all points. Always go to

the bedside unprepossessed as to the nature of the case that may call you; and form your diagnosis, and let your treatment be directed, only according to the evidences of disorder, functional and structural, which may be elicited by deliberate and minute examination.

The basis of the clinical instruction you will receive here, will be pathological: the only basis on which a scientific *clinique* can be founded. But let me caution you against committing yourselves to the prejudices of its extreme partizans. Be ever prepared with your pathology, for it will seldom fail to be your great requisite; but do not despise symptomatology, when it seems to be called for. If you cannot discover any particular *cause* or *source* of ailment, against which to direct your remedial efforts, contend against the leading symptoms as you find them, without being ashamed to acknowledge that you know no better. A little honesty like this, which is nothing more than practically admitting how limited is human wisdom at the best, will often save you the disgrace, and your patients the danger, of undue officiousness. When disease presents itself palpably, dispute every inch of ground with it, and never slacken in your purposes; when, on the contrary, there seem no particular indications to be fulfilled, avoid being too specific, or too severe, in your treatment. Let me illustrate what I say, by referring you to the case of Jones, in the middle male ward of the hospital. You will remember my pointing him out to you, at our first meeting at his bedside, as a good instance of uncomplicated fever. If there be such a thing, as I fully believe, it was excellently illustrated in his person. As a pathological practitioner, I looked carefully for signs of disease, but found none; there were several symptoms of disorder, and these, I told you, we must be satisfied to combat. I confess I should have liked to have found some organic trouble to justify specific treatment; but there was no evidence of such a thing,

and to have assumed it, would have been to play a folly that has been played by practitioners, in all ages, far too often. In this case, you know, we waited upon nature, and did not over help it. Under the simplest general treatment the man improved from the beginning, but when nearly convalescent, he caught a severe cold from exposure in the lobby one night. On visiting him next morning, the old symptoms had returned in an aggravated form, but along with them we had certain *signs*, viz. dulness on percussion over the lower part of the right lung, with crepitant râle, and rusty sputum. Pathology told us that local pneumonia had set in, and it suggested also a specific form of treatment. We leeches his side, and then blistered it, gave him a smart mercurial purge, and, at short intervals, doses of nauseating medicine. At the end of forty-eight hours, every sign of local mischief was gone, and the man was the subject only of simple fever, just as when we first saw him. He was ordered the same medicine that he took at the beginning, and he found the same relief from it. Now, suppose we had treated this case, at the commencement, under the prejudices of an exclusive pathology, and imagining disease to exist in this organ or in that, had made a fierce remedial onslaught in consequence, the probability is, the patient would have either sunk at once, for his powers of life were not strong, or he would have passed into a typhoid state, and given us little chance of restoring him. Suppose, on the other hand, with the prejudices of the Hippocratic school, we had not examined the physical signs in his chest, but had regarded the new symptoms, pain and difficult breathing, as only contingent upon his fever, and only to be relieved *by relieving it*; there can be little doubt that he would have soon died of pulmonary inflammation. Let this case shew you the desirableness of avoiding idle theories and prepossessions, and of acting solely upon *evidences*, as they may be manifested in the cases that may fall to your charge.

A knowledge of signs, as of symptoms, is only to be acquired by experience; but its possession is worth any amount of seeking after, for it is the shortest and surest road to successful practice. They are the senses, as I have said, by which we chiefly form a diagnosis from signs. These alone will sometimes give us correct knowledge of a disease. By the peculiar odour of the breath, we recognise gangrene of the lungs; by the odour of the skin, and by its appearance, we discover miliary fever; by the character of the eruption, we know one case to be small pox, another itch, and a third erysipelas; by the taste, weight, and quantity of the urine, we can detect one form of diabetes; by touching the abdomen, we distinguish ascites and tympany; and by listening to the sounds of the heart and lungs, we recognise morbid conditions in either.

But our senses often require aid from mechanical sources, with which we are, happily, well supplied. These, of late years, have been of incalculable service in advancing our facilities for detecting disease, and for treating it on sound principles. In the language of an erudite physician, "It is enough to say that the invention of instruments in modern times, such as specula, stethoscopes, pleximetres, sounds, microscopes, &c. by enabling us to submit the physical changes in organs to the immediate cognizance of the senses, has permitted exactitude and precision to encroach upon the field of conjecture. The first proposition, then, that we would lay down is, that medicine can only be advanced by studying the art of diagnosis, and that to this end, the practitioner should not be a stethoscopist, a microscopist, an employer of the speculum, or a chemist: but he must be all these united."

I can say nothing that will improve upon that passage, and therefore leave it, as it is, for your service. If you will believe its truth, and follow it, you will go very far towards

attaining the best object of your professional ambition. In so far as ourselves, the clinical Professors here, can aid you in acquiring a practical knowledge of physical and other diagnosis, every facility shall be yours. We will shew you all the *minutiæ* of examination and treatment, and give you such comments as may be necessary; this is *our* duty: to carefully observe all that is shewn, and remember all that is said, and watch cases throughout, whether fortunate or fatal, is *your* duty. It imports you to perform it faithfully; let the opportunity of doing so never be intermitted!

In all your practical studies, do not forget your reading. Make up your minds to be students all the days of your life; for whatever your acquirements, recollect, there is still much more to be acquired. In the active business of your profession, find an occasional few minutes, daily, for reading and reflection. Let "*nulla dies sine linea*," be your plan. These minutes the idle man lets slip away, as too insignificant to do him service; but do you remember, that time, even in its smallest divisions, is precious. He is the wisest man who counts his moments; they are what we properly live in; pulses of life that make up the measure of it. To neglect them, is not to live out half your days; to use them with a jealous scruple, is to make hours of them; and as Bacon has well observed, you may be old in these, though young in years.

It is the boast of some men, that they read only "the great book of nature:" this is an affectation of genius, and an apology for laziness. Such men know nothing of nature's book but its alphabet. Avoid this folly, if you wish well to yourselves. Be practically observant as much as you like, but bear in mind, that, other men are observant also, and the results of their observations may be worth consulting. These things will often help you to truths, which your un-

aided efforts would not enable you to compass. Knowledge is ever progressive, and in nothing more so than in medicine. Every day brings us fresh materials, whereby we may become better practitioners. That these inestimable gifts may never be lost to you, make it a part of your duty to be read up to the latest improvements of your profession. As discoveries arise, be amongst the first to seize them, and if available, make them your own in practice.

But you may do more than this. Yourselves may become *discoverers*, in the course of your investigations, and be honoured in the opportunity of adding to the sum of our professional knowledge. If it be true, as an old writer tells us, that the most superb and lasting monument ever consecrated to beauty, was that to which every lover carried a tribute; it is equally true, that the science of medicine will best rise to dignity and accuracy, by its every disciple feeling interested in its advancement.

Before concluding, gentlemen, let me impress your minds with the seriousness of the obligations to which you are about to commit yourselves. There is no nobler profession than ours, and there is none more responsible. There is something awful in having to take charge of human life: it tells us that we have both a moral and a medical duty to perform to our patients.

Never look to the worldly condition of individuals, to know how much professional attention you are to pay them, and what claims they are to have upon your sympathy with their sufferings, and anxiety for their welfare. Circumstances may have made them rich or poor—but remember, that, Nature has made them MEN! Take a large and a liberal view of what humanity is, and you will find that in the immortal part of it, the veriest beggar that shivers in the street, is the equal of the proudest monarch that wears a crown.

When their heads are laid low, they will have reached that level of our common nature, where distinctions are forgotten !

“ Under ground

Precedency 's a jest ; vassal and lord,
Grossly familiar, side by side consume.
When self-esteem, or others' adulation,
Would cunningly persuade us we were something
Above the common level of our kind,
The grave gainsays the smooth complexion'd flattery,
And with blunt truth acquaints us what we are.”

Think of these things when you attend upon the sick poor, and they will admonish you of your duty. Remember, it is no trifling thing to have the existence of a fellow creature in your hands: it is a solemn charge, weigh well its value when committed to your custody. If it be lost through *you*, you can neither restore, nor make reparation for it. Picture what would be your feeling, to meet the widow and the fatherless, and to know that the widowhood and orphanage were the issue of your ignorance or neglect; to feel that you might have saved the husband and the parent, had you treated him with more skill or more fidelity. Think of that man being unprepared to die, and through your fault finding an untimely grave: the very thought, in all its agony, will harrow you to your own ! Think, again, of being the happy, honoured medium, of restoring that man to health, and giving the sinner another opportunity of repentance—of restoring the chief treasure of the home, and saving that home from desolation and ruin. Think, how, for these things, the incense of grateful hearts will rise in praise and prayer for you. You can have no richer reward than this: it will be a never failing help and comfort to you, “in all time of your tribulation, in all time of your wealth, in the hour of death, and in the day of judgment.”

It is not that I believe they will have a better
 chance of our common cause, but that I believe
 that the cause itself is a common cause, and
 that it is a common cause which will be
 common to all who are true to the cause.

I think of these things when you are
 away, and they are a constant reminder to me
 that I am not alone in the world. I think
 of you in your studies, in your work, and
 in your life. I think of you as a man
 who is true to the cause, and who is
 true to the cause in all that he does.

BIRMINGHAM:
 JOSIAH ALLEN AND SON, PRINTERS,
 COLMORE ROW.

and you are true to the cause, and you
 are true to the cause in all that you
 do. I think of you as a man who is
 true to the cause, and who is true to
 the cause in all that he does. I think
 of you as a man who is true to the
 cause, and who is true to the cause in
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 a man who is true to the cause, and
 who is true to the cause in all that
 he does. I think of you as a man
 who is true to the cause, and who is
 true to the cause in all that he does.

A

SPEECH

DELIVERED AT A

CONVERSAZIONE,

CONVENED BY THE

INDEPENDENT ORDER OF ODD FELLOWS, M.U.

IN THE

TOWN HALL, BIRMINGHAM,

ON

FRIDAY, SEPTEMBER 27, 1844.

BY

SAMUEL WRIGHT, M.D., F.R.S.S.A.,

PHYSICIAN TO THE BIRMINGHAM GENERAL
DISPENSARY.

LONDON :

JOHN CHURCHILL, PRINCES STREET, SOHO.

J. LYON, BIRMINGHAM.

c

Birmingham: Printed by J. Lyon, 20, Bennett's Hill.

THIS SPEECH

IS RESPECTFULLY DEDICATED TO THE COMMITTEE

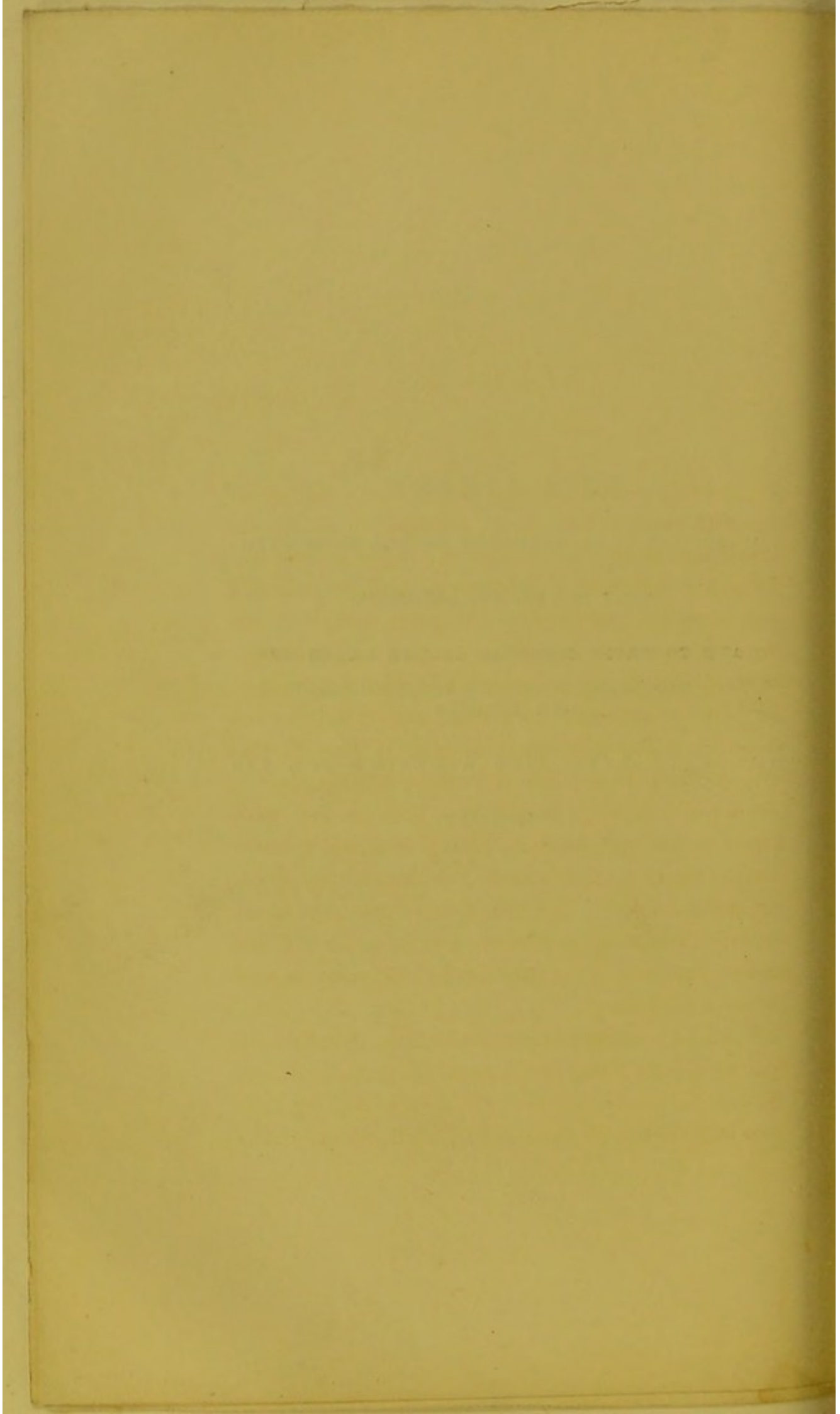
THAT INVITED ITS DELIVERY,

AND TO THOSE MEMBERS OF THE ORDER OF

ODD FELLOWS

WHO HAVE EXPRESSED A DESIRE FOR ITS

PUBLICATION.



S P E E C H.

IT is with peculiar pleasure that I accept the invitation with which I have been honoured, to occupy the Presidency of this interesting and important meeting. Though I had neither presumption enough to expect such invitation, nor humility enough to decline it, yet the unanimous voice in which it reached me, may serve as an apology for the readiness with which I obeyed it. But had it proceeded from even fewer numbers, and those the esteemed friends in the ranks of Odd Fellowship, to whom I am indebted for many services, professional and personal, I should have been at once most happy in the opportunity of aiding them, to whatever extent I might be capable, in the execution of their simple but sublime object. Not that I can flatter myself my services would much avail them, for, to use an old, but honest, metaphor, I can only furnish the string to keep the flowers together.

I am not a member of your Order, and, therefore, being unacquainted with its internal workings, and with the peculiar means by which you cement and signalize your attachments, personal and sectional, locally and at

unknown, and retains a candour of statement upon difficult and debatable points, which, if it does not always convince, has no tendency to mislead. Dr. Wright's pamphlet is well calculated to diffuse sound and correct information on the varied questions he has discussed."—*Provincial Medical and Surgical Journal*, June 12, 1844.

"Dr. Wright is very favourably known to the profession by several valuable and interesting contributions to Medicine. His paper on the Ergot of Rye, his Thesis on the Physiological Action of Mercury, and its Chlorides, his Researches into the Pathology of the Salivary Secretions, and other interesting memoirs, have established his reputation as a most intelligent, industrious, and successful cultivator of medical science. This LECTURE, as designed for a popular audience, brings him before us in another aspect, as the eloquent advocate of certain great general principles in physical and psychological science.

"The LECTURE is alike creditable to the erudition and scientific attainments, to the head and heart, of the author"—*Northern Journal of Medicine*, August, 1844.

"This LECTURE is an admirable illustration of an old opinion of ours, that Psychology would always gain by a combination with Physiology; in other words, that, as man is a compound of body and spirit, any attempt to study these elements separately, must necessarily lead to imperfect results. Dr. Wright has shown the value of studying them in combination, as distinct, but not separate, parts, and he has performed his task right well.

"We trust our hasty sketch will induce our readers to peruse this valuable pamphlet. No study can be so interesting to us as Man, bodily and spiritually considered, and none so profitable. Dr. Wright has done the work of a pioneer for those to whom the study is new, and done it ably. We take leave of him with great respect for his talents, and esteem for the excellent spirit he has displayed."—*Dublin Journal of Medical Science*, September, 1844.

"We have read this eloquent LECTURE with pleasure, and, we must humbly add, with profit. The most interesting phenomena of animal and vegetable life are rapidly placed before us in their newest aspects; the world mental, and the world physical, are made to shew their mutual relations, to act as each other's mute, but eloquent, interpreters, and from the whole—treated with cleverness, and illustrated with learning—deductions are drawn, favourable alike to moral and intellectual improvement. In short, the LECTURE is written in the best of spirits, and we can give it our warm commendations."—*Medical Times*, September 21, 1844.