10-10-1864

Introductory Address Delivered Before the Students of Jefferson Medical College, Philadelphia.

B. Howard Rand, MD

INTRODUCTORY ADDRESS

DELIVERED BEFORE THE

Students of Jefferson Medical College,

PHILADELPHIA.

BY

PROFESSOR B. HOWARD RAND.

October 10, 1864.

PUBLISHED BY THE CLASS.

PHILADELPHIA:
HENRY B. ASHMEAD, BOOK AND JOB PRINTER,
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CORRESPONDENCE.

JEFFERSON MEDICAL COLLEGE,
October 12*th*, 1864.

PROF. B. HOWARD RAND:

Dear Sir,—At a meeting, held this day, by the students of the Jefferson Medical College, it was unanimously

Resolved, That a committee, consisting of one from each State, be appointed to wait upon Professor Rand, and request a copy of his Introductory Address for publication.

JAMES SIMPSON, *Secretary.*

J. EWING MEARS, *President.*

WE, the undersigned committee, appointed under the above resolution, have the honour to submit it to your consideration, and hope it will meet with your approval.

WM. GWYNN, Pa.
R. O'HARA, Ky.
G. W. SPARKS, N. J.
M. H. WAPLES, Iowa.
T. D. MORTON, Ohio.
P. C. REMONDINO, Minn.
J. C. PEYTON, Tenn.
J. F. POTTS, Ill.
H. C. LA FORCE, Ind.
R. COLLINS, Del.
JAS. GORDON, N. Y.
B. D. DE KALB, Va.
W. T. BULLOCK, R. I.
W. H. LATHROP, Mass.
W. L. SCHANKLAND, Mo.
H. H. RUGER, Wis.
F. W. KOCH, Mich.
T. B. HATCH, Cal.
J. A. BISHOP, West Va.
J. BACON, Md.
S. D. DODGE, Ark.
E. WIEDFELDT, Germany.
R. ZARRACINO, Cuba.
W. WORSTFOLD, Canada.
G. W. RIECKER, New Brunswick.

ORAN H. WITHERSPOON, *Treasurer of the Committee.*

1615 SUMMER STREET,
19*th October*, 1864.

Gentlemen,—I yesterday received your note, requesting, in behalf of the Class, a copy of my Introductory Lecture for publication.

It gives me pleasure to comply with your wish, and accordingly, I place the manuscript at your disposal.

Very truly yours,
B. HOWARD RAND.

Messrs. WM. GWYNN, R. O'HARA, M. H. WAPLES, and others, Committee.

INTRODUCTORY LECTURE.

GENTLEMEN:—It is now twenty years since I was seated within these halls, a student of medicine, listening to the Introductory lecture to the course of 1844–5.

So vividly are the events of that evening impressed upon my memory, that I can well appreciate the ardour with which the youthful student enters upon his first course of lectures. Full of life, hope, and ambition, like the athlete in the Olympic games, he sees only the olive crown, and thinks not of the labour of the contest. It is only to those who, pressing forward in the race, yield not to weariness nor are discouraged by temporary ill success, that the reward is sure.

Until within a few years it was the custom to devote the first week of the session to introductory lectures. Each Professor delivered a formal written discourse upon a subject more or less directly connected with his branch. This custom, "more honoured in the breach than in the observance," was, perhaps, originally intended to give the student an opportunity of judging of the manner of the lecturer, and to compare that of the Professors of the then three medical schools. Such intention, manifestly, was not fulfilled. The Professor of a demonstrative branch, accustomed to lecture extemporaneously from objects, is restricted by the necesssity of adhering to written matter, and can only display his real ability to teach when, in the regular course, he is free and unfettered. It has been since wisely determined to appoint a single member of the Faculty to pronounce a general introductory lecture, and that we should enter upon the real work of the course upon the following day.

This duty having devolved upon me, it gives me pleasure, gentlemen, to welcome you, in the name of the Faculty, to this city and to these halls. We shall labour heartily and cheer-

fully with you, and endeavour to guide you pleasantly and profitably through the paths which we are to tread.

Those of you who have returned to pass a second winter will miss a kind and familiar face. The good, the learned, the honoured man who filled the Chair of Chemistry in this Institution has passed from among us. Permit me to pay a brief tribute to the memory of one who for so many years faithfully discharged the duties of this important position.

FRANKLIN BACHE was the eldest great-grandson of Benjamin Franklin. Franklin's only daughter, Sarah, who in 1767 married Richard Bache, was renowned for her efforts in behalf of our suffering soldiers in the times that tried men's souls. In 1780, when our troops were barefooted and half-clad, an effort was made by the American women to furnish clothing for them. In this work Mrs. Bache was prominently engaged, assisting by her judgment in all their plans and proceedings, and herself active in the use of the needle. More than twenty-two hundred women were thus employed by her in sewing for the army. The Marquis of Chastellux, then visiting in Philadelphia, was charmed by the appearance of Mrs. Bache, and recommended her to the ladies of Europe as a model of domestic virtue and womanly patriotism. She was also active in the hospitals, dressing wounds and administering medicines and cordials with her own hand.

The descendants of this remarkable woman, while inheriting her integrity and benevolence, seemed to have received also a taste for scientific pursuits from her illustrious father. The present Superintendent of the United States Coast Survey, Alexander Dallas Bache, has, without doubt, the highest scientific reputation of any living American; and the subject of the present sketch early turned his attention to scientific studies. When only nineteen years old, having just graduated as Bachelor of Arts at the University of Pennsylvania, he contributed an essay on muriatic acid to the Aurora, and was engaged in the pursuit of science during the remainder of his life.

Dr. Bache was born in Philadelphia, on the 25th October,

1792; graduated as Bachelor of Arts in 1810, and as Doctor in Medicine at our University in 1814. While yet a student he entered the army as surgeon's mate. He was appointed full surgeon in 1814. In 1816 he resigned from the army and entered into private practice. He was physician to the Walnut street Prison from 1824 to 1836, and to the Eastern Penitentiary from 1829 to 1836. During the fearful ravages of cholera, in 1832, he was conspicuous for his humanity and assiduity.

Dr. Bache began as a public lecturer at the Franklin Institute, in 1826, in the lecture-room where Godman, J. K. Mitchell, Cresson, Frazer, Booth, and Johnston first entered upon their successful careers as investigators and teachers of science. In 1831 he wasappointed Professor of Chemistry in the Philadelphia College of Pharmacy, a position which he held for ten years. In 1841 he was chosen Professor of Chemistry in the Jefferson Medical College.

As a lecturer Dr. Bache made no pretensions to oratory; his manner was perhaps austere, but, to the attentive listener, the matter of his lectures was attractive in a degree far beyond that due to mere rhetorical flourish. His accuracy was extreme; every word had its place and meaning; his facts were arranged in perfect order, and his lectures were admirably planned for leading the student step by step from the simplest considerations of the nature of matter to the intricate mass of facts and theory comprised under organic chemistry.

Dr. Bache's manner in the lecture-room was due, however, simply to that conscientiousness which gained for him, from his intimate friends, the title of Aristides Bache. So careful that no error should ever be countenanced by him, no uncertain fact or ambiguous explanation ever escape his lips, he was, as it were, trammelled by his own caution. In private life he was warm-hearted and genial, witty, with a keen sense of humour; his unostentatious charities will be long and gratefully remembered by their former recipients.

In 1853 Dr. Bache was elected President of the American Philosophical Society, and in 1855 Vice-President of the

Philadelphia College of Physicians, two of the oldest and most distinguished institutions of science in the United States, the former dating from 1743, the latter from 1787.

Besides numerous contributions to scientific publications, Dr. Bache edited Turner's Chemistry, Ure's Dictionary, Cutbush's Pyrotechny, and also twelve volumes of the North American Medical and Surgical Journal.

He published, in 1819, a System of Chemistry for the Use of Students of Medicine; but his great work has been the authorship, in connection with Professor Wood, of the United States Dispensatory, a work of immense labour, and so valuable to the profession, that there is hardly an educated practitioner of medicine or competent druggist in the land who is not possessed of it, and finds it of almost daily use. It has passed since its first issue, in 1833, through twelve editions, the last, now in press, reaching nearly two thousand octavo pages.

Dr. Bache's writings were characterized by the same faithfulness and absolute accuracy which were displayed in his lectures.. He was a laborious student, keeping pace with the rapid strides of modern science, and carefully incorporating all new discoveries into his lectures year by year, and into the Dispensatory upon the issue of each new edition.

In less than six months from the death of Professor Bache we had occasion to deplore the loss of another member of the Faculty, one who had been associated with the College in its earlier days, and to whose untiring energy, sagacity and forethought it has owed much of its success.

Robert M. Huston was born in Abingdon, Virginia, in 1794; his father removed to Pennsylvania when the subject of this sketch was about ten years old. His opportunities for early improvement were few; he attended, as did most farmer's sons, the country school during the winter, and in those days the education afforded by a country school was meagre indeed. During his after life he had frequent occasion to deplore this want of early opportunity; but, with his characteristic energy, he employed tutors in the languages after his establish-

ment in life, and made up the deficiencies of his early education by the strenuous efforts of more mature years.

His ambition early led him to the pursuit of a profession. During the war of 1812 he was drafted, and obtained the appointment of assistant-surgeon in the army. The practical knowledge gained in this position was of the greatest value in after life. He remarked especially the effect of the close hospital, compared with that of the comparatively open tent, upon the results of his cases, and in after years the importance of proper ventilation in the sick-chamber—a point then and even now too much overlooked—was always insisted upon by him.

Dr. Huston, after the close of the war, removed to Philadelphia. He soon became a most successful practitioner, especially in the department of obstetrics. In 1838 he was elected to the Chair of Obstetrics and Diseases of Women and Children in the Jefferson Medical College, and, on the reorganization of the school in 1841, Professor of Materia Medica and General Therapeutics. Failing health compelled him to resign the latter chair in 1855, when he was elected by the Trustees Emeritus Professor of the same branch. He was Dean of the College until the session of 1854–5, and his abilities as a clear-headed business man were especially displayed in the remarkable success with which he discharged the duties of that arduous office.

While the struggles of his early life had necessarily precluded him from the opportunities of collegiate instruction in the arts, they had also given him a self-reliance, a perseverance, and an industry which insured him future success. He was one of the founders of the Philadelphia Gas Works, and it was to his efforts mainly that they were established. He was President of the Board of Trustees of the Works from 1835 to 1839. He was also a director in one of our banking institutions, and at the time of his death in one of the most prosperous of our insurance companies. He had indeed a rare combination of the professional skill of the physician and the business habits of the merchant.

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Dr. Huston as a lecturer was especially happy in his remarks on General Therapeutics. His admirable common-sense, his keen intellect enabled him to take a position in this branch far beyond the views then generally promulgated. In the technicalities of the Materia Medica he was less at home, and trusted rather to an admirable set of notes, which he had compiled with great labour; but when on a subject connected with the treatment of disease,—the abuse of bloodletting, of mercurials, of the preparations of antimony, or the hygienic management of cases,—the timidity in regard to the technicalities of chemistry and botany, which would sometimes be marked in his lectures, would vanish, and, with heightened colour and flashing eye, he would eloquently impress his views upon his class.

From childhood he was my physician, and I can never forget his goodness, his gentleness, or his skill. In his office I studied medicine, and as a young and struggling member of our profession I owe much to him. He has passed away, full of years and honours, the fruits of industry and uprightness.

Gentlemen, the record of these two venerable men has in it a lesson for us. Without brilliancy or, in its ordinary acceptation, genius, but with the most absolute integrity, unwearying industry, and indomitable perseverance, they have left for themselves an imperishable record. Beyond the time allotted by the Psalmist, they have peacefully passed to their rest, regretted by all, leaving no unkind feeling in a single heart, having achieved all that the most ambitious could crave, and all that the most humble could wish.

Having been honoured by the appointment to the Chair of Chemistry in this Institution, and appearing here this evening for the first time as Professor of that branch, I may, I trust, be pardoned if, in this general introductory, I devote more time than is usual to my own subject.

The science of Chemistry, allied inseparably as it is with Physics, is the most extensive of all branches of human knowledge. It ramifies through the whole universe. By it we determine that the fixed stars, millions upon millions of miles

distant, shine by their own light, that they are stars; we are engaged at this time in seeking to determine, by the spectroscope, the chemical constitution of the sun and stars. Every subject of the three kingdoms of nature within the reach of man is analyzed, studied, and classified. But the natural objects, the rocks, the minerals, the plants and animals, myriads though they be, form but a small part of those to which the chemist devotes his attention. The sixty-seven known elements, combined in the proportions of from one to hundreds, produce an infinite series of changes. As, in music, eight octaves of notes and sixty-four variations of time have given us for centuries new melodies and harmonies, and will still produce them for all time, so our list of elements may be variously combined without limit.

To take a single instance: fatty bodies contain a sweet principle, glycerine, familiar to most of you. This is found by Berthelot to be a peculiar alcohol, capable of uniting with one, two, or three equivalents of an acid. Assuming the number of known acids, organic and inorganic, at one thousand,—a low estimate,—and applying the known formula for permutations, he shows that the number of compounds of glycerine and the acids which may be produced is two hundred millions. Similar calculations might be made with the organie substitution compounds, and with like result.

This enormous field, crowded with objects of interest and utility, is cultivated by thousands of cheerful labourers. Bodies are studied and classified, yet years may elapse before they are applied to any useful purpose. Chloroform, discovered simultaneously by Guthrie and Suberain in 1831, was first used as an anæsthetic by Simpson in 1847. But the chemist cares not whether his investigations lead at once to practical results; he never asks the lazy man's question, "What's the use?" he knows that any addition to man's knowledge is of use, and that often when least expected.

Aniline, discovered in 1826 by Unverdorben, as a product obtained from indigo, remained unemployed for thirty years, when Perkin, in an effort to make quinia artificially, disco-

vered the aniline purple, or mauve, and Natanson aniline red, or magenta, of which bodies millions of dollars worth are used annually. The discovery of colours from aniline, however, would have been of but little practical use, had not Mansfield, Zinin, and Bechamp, working independently, discovered, step by step, a method of getting it from coal-tar, and thus cheapened it to a point at which it could be profitably employed. Coal-tar, before a nuisance, poured into the tanks of gas-holders to get rid of it,—used a little in making lampblack, in glass furnaces, or as a paint,—became at once a valuable article of commerce. Yet not one of the experimenters named had at the time any idea of the value of his discovery, but merely worked for the love of science.

So extensive a subject must necessarily be subdivided. While the whole is studied in a general way by chemists, details are mastered by those only who devote themselves to one or more particular subdivisions. Thus we may have

Physics, which studies the laws of matter and force generally, and, in connection with chemistry, those especially governing the phenomena of light, heat, electricity, and magnetism. Our knowledge on these points has vastly advanced during the last half century, and, indeed, each subject named is a proper one for separate investigation; and accordingly we have voluminous treatises on each by different authors.

General Chemistry is the parent trunk from which all the branches ramify. It studies the laws of molecular attraction, especially of chemical affinity, determines the equivalents of bodies, their relations to each other, grouping them as far as possible in a natural manner; the effects of the various acids and bases; the physical properties, solubilities, densities, crystalline form of elements and their compounds, both organic and inorganic.

Analytical Chemistry is devoted especially to ascertaining the nature of bodies, and the proportions in which they exist in the substance under investigation. By it we determine the presence of a substance, and then, if required, its amount. It is in itself the very foundation of chemical csience, as, by its aid, we arrive at the laws which govern all

chemical change, as well as the proportions in which bodies combine.

MINERALOGY devotes itself especially to crystallized mineral substances found in nature,—their crystalline form, hardness, and other distinguishing properties, and especially their behaviour before the blowpipe.

METALLURGY studies the composition and value of the various ores of the metals, and the methods of reducing and treating them.

MANUFACTURING CHEMISTRY devotes itself to the manufacture on the large scale of the various chemical substances used in the arts, as the mineral acids, alum, bleaching powder, copperas, blue vitriol, the chromates, and various dyestuffs.

TECHNICAL CHEMISTRY is applied to the arts generally, as bleaching, dyeing, calico printing, the manufacture of illuminating gas, glass, porcelain, paper, glue, matches, varnishes, and the like.

AGRICULTURAL CHEMISTRY analyzes plants and soils, and studies the best methods of improving the quality of the latter, and the yield of the former.

MEDICAL CHEMISTRY applies the science to Physiology, Therapeutics, Materia Medica, Pharmacy, and Toxicology.

These branches, gentlemen, are intimately associated; each derives something from the other, and the course of General Chemistry, in the department of arts of our collegiate institutions, embraces a summary consideration of all. It extends usually over a period of three years. I trust, however, that you will not be discouraged at the immense mass of matter thus opened to study. It is my duty in this chair to select from this rich store such portions as will be useful to you as students and practitioners of medicine.

Many years of experience in lecturing to students of medicine have convinced me that a majority of a class—including indeed all who try—will acquire an excellent general knowledge of Chemistry, sufficient for the purposes of the practitioner, and affording a substantial foundation for future work, if the teacher do not attempt too much. To one who has

made the study of science a life-long pursuit it becomes so attractive, so familiar, that he is easily led to overlook the fact that, to a portion at least of his class, all is yet new and embarrassing. In his admiration of his subject he sometimes carries it beyond the capacity of the student, who becomes disheartened, and often turns away in despair.

The subject of Physics admits of such liberal and brilliant experimental illustration that we cannot wonder if, even in a course on Chemistry applied to Medicine, a disproportionate amount of time should be occasionally devoted to it. A clear conception of the laws governing the phenomena of light, heat, and electricity is an essential to the study of Chemistry proper. In practice of medicine, too, such knowledge is often applicable. The discussion of the views of various philosophers as to the theoretical explanation of these phenomena, the history of the subject, the description of the delicate apparatus employed in investigation, but not suited to class illustration, are instances of what may be safely omitted, and left to the future labours of the student.

The consideration of those elements and compounds not employed directly or indirectly in medicine, and not of cardinal chemical importance, may be also omitted, or considered in a very general manner.

Do not, imagine, however, that I would recommend a superficial course of study. Let us confine ourselves within moderate bounds, but let what is done be done thoroughly. The objections so often urged by scientific men to what is called popular science are founded upon the fact, that too frequently the popularizing consists in setting forth crude statements, inaccurate facts, and hasty or imperfect generalizations. When, however, one so great as Faraday will prepare his stores of learning so as to adapt his lectures on the physical forces, or the chemistry of a candle, to audiences of children; when Tyndall will bring the most refined investigations on heat before a class in so charming a manner that, even in their printed form, they have the attraction of a romance, we have authority for making science popular in the only true way,—that is by stripping it at the outset of those technical

terms which, however terse and convenient after an acquaintance with the subject, are apt to embarrass and discourage the beginner; by presenting the fundamental ideas in a simple form; by using illustrations drawn from topics already familiar to the hearer; by not presuming upon a previous knowledge or especial quickness in the class; then, advancing step by step, the lecturer may unfold the more intricate and refined parts of the subject. The laws which govern the phenomena explained can then be deduced from the facts already set forth, and a grand and beautiful whole developed from what would otherwise be but a chaotic mass.

The medical student enters upon his collegiate course full of enthusiasm; fired with zeal and thirsting for knowledge. He willingly devotes day and evening to lectures and demonstrations, and often consumes the midnight oil in study. Yet labour injudiciously, though zealously, applied, is wasted, and the practitioner has often to regret that, in his ardent pursuit of the practical knowledge of medicine, he should have neglected those branches upon which the ability to use this knowledge depends.

The lectures on Medicine are arranged, after years of experience, so that each subject depends upon the other; they are so interwoven that no one can be neglected. Upon the Institutes of Medicine depends pathology; upon pathology, diagnosis and therapeutics. Upon Chemistry depends in a measure physiology, pathology, therapeutics, and materia medica.

I have before said that the "*cui bono*" is the lazy man's excuse; yet, if any one might be pardoned the question as to the importance of a particular study, it is the anxious and over-worked student of medicine. I may, then, I trust, with propriety indicate some of the absolute practical uses of a knowledge of elementary chemical science.

The contributions of Chemistry to Physiology and to Materia Medica, as rich as those of any science to any other science or art, have been made for the most part by professed chemists. The practicing physician is rarely called upon to make a quantitative analysis even of inorganic bodies, much less to extend his researches into the more intricate depart-

ment of organic chemistry; yet it is impossible to appreciate these labours without a knowledge of the science. The active and uniform medicines furnished by the skill of the chemist, while comparing so favourably for certainty of composition and efficiency of action with the roots, herbs, and barks of the olden time, have also a fearful power for evil in unskilled hands. A knowledge of their true nature, their incompatibles, and their antidotes, (not merely committed to memory to be soon forgotten, but thoroughly understood,) is essential to their proper or even safe use. No one who has once comprehended chemistry will mix an acid solution of quinine with carbonate of ammonia; nor will he add iodide of potassium, or vegetable astringents, or soluble sulphates, to the lead salts, and then wonder at the disturbance created; nor will he let his patient, who has involuntarily drawn a pencil of nitrate of silver down his œsophagus, during cauterization of the fauces, die for the want of the administration of a little common salt. Yet such things do happen, to the disgrace of our profession. The laws which govern the general play of chemical affinities may be understood by any student; and yet how many leave the lecture-room, at the close of the session, without mastering them, without, indeed, having made an effort to do so.

In diagnosis, simple chemical tests are often invaluable. The anasarca, the incipient amaurosis, may excite suspicion of Bright's disease, but the certainty must depend upon the test for albumen. How often do we see the routine practitioner aggravate the sufferings of his patient, by giving acids in case of lithic deposit and alkalies where the deposit is phosphatic? Why use inert or adulterated medicines, when the means of ascertaining their strength and purity are so simple? Why go without a useful, nay vitally important, remedy because it is not to be had, when the materials for making it are at hand? Why let a man die of poisoning because the table of antidotes is not at hand, or because the antidote put down in the table and committed to memory is wanting, when one of the same chemical characteristics is within reach? Why neglect a new and important remedy, because its name or its preparation and mode of use seem strange and difficult?

Much of the opposition to progress in medicine depends less upon prejudice than upon laziness. A practitioner, settled in his comfortable routine, jogging along from day to day in the road which he has travelled so long, is startled and annoyed at any suggestion in diagnosis or therapeutics which may require him to lay aside his time-honoured methods, and betake himself to the task of studying anew subjects which have long half slumbered in his brain. This reproach—and it is not altogether an unjust one—should no longer exist against our profession. The doctrine of the circulation of the blood, the use of vaccination, of physical diagnosis, and of anæsthesia, are but instances of how great discoveries have to be forced upon us.

A knowledge of the constitution of air, water, and food, and their changes, is essential to a just appreciation of a vast number of epidemic and sporadic diseases. The influence of pursuit in life involves the knowledge of the effect of many chemical bodies used in the arts. Phosphorus, bisulphide of carbon, lead, copper, and zinc salts, acid vapours, aniline, and bichromate of potassa, are examples of bodies largely consumed in manufactures, and capable of producing symptoms which are characteristic, and which may sometimes be met easily and promptly by the proper chemical means. Can we forgive the stupidity of the practitioner who will allow a whole family to be prostrated by colic, and not seek for lead in the water supplied? or who, if it be suspected or detected, could not apply the simple means of rendering the faulty tank or pipe harmless?

Our profession, gentlemen, in this country, is practically thrown open to all. The law does not protect the victim of disease from the ignorance or wickedness of the quack. Women old and ignorant, or what is worse, young and half-educated, retired blacksmiths and ambitious barbers, alike claim the title of "Doctor," and, on payment of the necessary fees, receive from the government a license to practice. Even among those regularly educated to the profession are many who, without effort to master its mysteries, seek a superficial knowledge of the general symptoms and treatment of the

common diseases, for the purpose of gaining a living by practice, making it, in fact, their trade. With both classes you must come into competition. Your secret of success against impudent ignorance or dishonourable charlatanry must rest in the thoroughness of your professional knowledge. In the long run, the man who is the most competent and the most industrious must and will be the one to succeed. To attain this thoroughness, a careful study of all pertaining to the subject, while attending lectures, and an equally careful course of reading and observation while in practice, are essential. The lectures are demonstrative; by apparatus, drawings, specimens, and the blackboard, they appeal to the senses. Years of study have enabled the Professors of each branch to present it in such manner as to be simple, attractive, and instructive. Here, then, you get that preparation which you may follow up by future study, in order to become thoroughly proficient in your profession; but neglect an elementary branch while attending your course of lectures, and the chances of your having patience or opportunity to repair the loss thus sustained are few indeed. You will go forth into the strife half armed, unskilled in the use of your weapons, and without confidence in yourself or your cause.

The study of science is most valuable as a means of cultivating carefulness of observation and rigidness of induction, two habits of vital importance to the physician. A careless physician is even more dangerous than an ignorant one. In scientific pursuits no fact is accepted as such until it has been subjected to the most exact scrutiny; the very language has a mathematical precision which requires guarded expression, and admits of no ambiguity. No theory is allowed, unless supported by facts accumulated through years of trial and based upon thousands of observations. The hypotheses which are permitted, as convenient resorts for the provisional arrangements of unexplained facts, or as a more ready means of conveying instruction, are valued only as such.

How unfortunately different has been the case in Medicine! How are our books loaded with "false facts" and wild hypotheses! Look back upon the history of medicine, with its

solidism, humoralism, chemical, mechanical, and vital hypotheses,—the contra-stimulant doctrine, Broussaism, homœopathy, Thomsonianism,—all put forth, not merely to suggest the possible nature of the changes taking place during disease, but as guides to treatment.

Says the late kind and accomplished Dr. John D. Godman: "If Franklin, instead of patiently and carefully examining every fact and repeating numerous experiments, had contented himself with a wild excursion into the vague of conjecture, and in a felicitous description of some vivid day-dream—had given us a theory of the identity of the electric spark and the lightning of heaven, or had indulged himself in fancying how the

> 'Sulphurous and thought-executing fires,
> 'Vaunt couriers to oak-cleaving thunderbolts,'

might be deprived of their terrors, his boldness of thought might have excited astonishment, and his poetic ardour have awakened admiration. Happily for humanity his mind was of a different order. He examined facts and appearances until he was able to deduce the laws according to which they were produced; he went forth to observe, not to prejudge; to reason, not to speculate; and when he winged his air-borne messenger to call the disarmed lightning down to earth, it was with the rationally grounded confidence of the sage, and not in the doubt and dread of a random conjecture."

Certainty in medicine must be attained, if at all, by the same means as certainty in other branches of human knowledge. Learn, then, to observe closely, to speak accurately, to reason logically, and above all to avoid the too frequent use of the *a priori* method in treatment; "the two blades of the scissors of practical medicine are diagnosis and clinical proof."*

Finally, gentlemen, I can ask your attention to Chemistry for its own sake. There is no branch of knowledge that is more

* Professor Hartshorne.

attractive in its demonstrations, more simple in its principles, or more elaborate in its details. The phenomena of every-day existence draw their explanation from it. The candle or gas-burner presents you with a most beautiful play of chemical affinities and changes, first pointed out fully by Davy: in it you have a miniature blast and a reverberatory furnace; a laboratory for use, by its aid in analysis, may be carried in the pocket,

To the practising physician, cut off as he is by the very nature of his profession, to a considerable extent, from social relaxation and amusement, a knowledge of any branch of natural or physical science is a never-ending source of relief and enjoyment; one also compatible, in every respect, with the continued study of his profession. Botany, geology, mineralogy, entomology, and the various other branches of natural science owe their cultivation almost exclusively to members of our profession, who have thus employed the hours hardly snatched from their laborious duties.

And now, gentlemen, let us enter on our labours with the determination to do everything as well as it can be done. For my colleagues I need not speak; they have been tried, and not found wanting. No word of mine could add to the reputation they have already earned. The present proud position of this Institution is sufficient testimony to their learning, their energy, and their ability as public teachers of medical science. For myself, I can only say that my whole heart is in my work, and that my labour here is a labour of love; to you, falter not, but

> "Take the instant way;
> For honour travels in a strait so narrow,
> Where one but goes abreast. Keep then the path;
> For emulation hath a thousand sons,
> That one by one pursue. If you give way,
> Or hedge aside from the direct, forthright,
> Like to an entered tide, they all rush by,
> And leave you hindmost."