tion to the sugar-forming power that I consider to be of a fermentative character.

So much having been demonstrated, two old hypernephromas that had been removed at operation by Dr. John B Deaver²—one from a woman, aged 49 years, on April 16, 1899, and the other³ from a man, aged 45 years, on Feb. 25, 1902, were furnished by Dr. Kelly and investigated by me. Since removal both of these tumors had been preserved in formalin. Both gave a typical iodine reaction, but extracts made from them did not produce glycosuria when injected into a rabbit, nor did they possess diastatic powers. Extracts made from that portion of the kidney not yet invaded by the fresh hypernephroma as well as extracts from other fresh kidney tissue and from the squamous epithelioma developed from the mucous membrane of the kidney pelvis were submitted to these tests with a negative response in each case. The squamous epithelioma of the kidney pelvis had been in formalin and alcohol since May, 1899.

THE VALUE OF THESE FACTS.

In view of these results I believe that it is possible by these simple chemical tests to differentiate hypernephromas from other tumors of the kidney. The last named reaction in particular is so easy and rapid of execution, and so characteristic, even pathognomonic, of suprarenal tissue that, should the occasion arise, it might be made use of as a convenient and time-saving means for diagnosing hypernephromas immediately at the time of operation or at the necropsy table.

Not the least interesting results of these investigations has been the demonstration that the cells of hypernephromas are not only morphologically identical with suprarenal cells, but that they are also functionally identical with them; and it is especially interesting that this functional activity should be preserved in the large mass of cells making up the massive and malignant hypernephromas which, as is well known, result from proliferation of aberrant suprarenal rests that are often microscopic in size.

It is probable that by means of these tests we may also be enabled to determine the exact nature of certain bodies found in the broad ligament in the female and in the spermatic cord, etc., in the male, and known as Marchand's adrenals. During recent years these bodies have been the subject of much controversy, the question at issue being whether they are to be looked upon as aberrant suprarenal rests or as more or less independent bodies. I intend to apply these tests to these bodies as soon as material can be procured, and I believe that should the tests respond positively we shall be justified in declaring these bodies to be aberrant suprarenal rests, whereas should the tests respond negatively we shall be compelled to conclude that they are more or less independent bodies.

It will be interesting to pursue this line of thought and to endeavor to ascertain whether or not other groups of specific tumor cells found in localities remote from the location of the parent growth (metastases) also possess the functional properties of the organ from which they are derived.

DISCUSSION.

DR. H. R. GAYLORD, Buffalo—I am especially interested in this communication of Dr. Croftan, as for nearly two years we have been looking for a hypernephroma to determine if these tumors contain the adrenal principle. The chemical work was done by Dr. G. H. A. Clowes, chemist to our laboratory. The first tumor examined had been hardened in formalin, and the sec-

ond proved to be an adenocarcinoma, and for these reasons both gave negative results. We have a number of hypernephromata which we shall now submit to the test which has given Dr. Croftan such interesting results. This line of research is of the greatest importance, and we believe with him, that along these lines lies the solution of many difficult problems.

DR. LEO LOEB, Chicago—In certain cases tumors seem to produce the same substances which are normally produced by the cells from which they originated. In this regard Von Eiselsberg's observation, according to which a metastasis of a tumor of the thyroid prevented the results of removal of the thyroid itself, has especially become well known. It is, however, doubtful if tumor cells are always identical in their chemical activity with the normal cells from which they are derived. Certain investigations might be cited against this view. I also might mention that I observed lately in an animal an epithelial tumor of the mammary gland which neither during nor after pregnancy produced any milk.

DR. E. LIBMAN, New York—Four years ago I performed an autopsy on a young woman who died of diabetes, and found an enormous hypernephroma weighing about seven pounds. I was inclined to think there was some connection between this tumor and the diabetic condition. I am more impressed with such an idea since hearing Dr. Croftan's paper.

DR. CROFTAN—The question of this diastatic ferment in the blood is a very interesting one, but this is not the place to discuss the etiology of suprarenal ferments. My theory is that the suprarenal gland has one of two functions: it either secretes a diastatic ferment which, entering the blood in excessive quantities, converts the glycogen into sugar, causing a flooding of the blood with sugar, or it acts as a disintoxicating organ. As there are a great many cells of the sympathetic type in the suprarenals we can understand how in either case stimulation or inhibition might regulate the amount of diastatic ferment in the blood and in this way control the amount of dextrose poured into the blood.

Some of you may not know that to Dr. Porter more than to anyone else is due the credit of the fact that a laboratory can now be fitted out at a small expense, owing to the many improvements he has made in physiological apparatus and his endeavor to cheapen the cost of same.

A STUDY OF SIR JAMES PAGET IN HIS WRITINGS.*

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"Examine men's ruling principles, even those of the wise, what kind of things they avoid, and what kind they pursue."
—Antoninus.

By chance I was searching English medical journals for a special item two years ago, at the time they were containing obituaries of Sir James Paget. My attention was held by the ring of personal affection and esteem in practically every mention. Their essence seemed to be: He was a great surgeon and pathologist, an ideal teacher and lecturer, and the best loved of his profession in Great Britain. Any one of these records in the book of fame would satisfy a large majority; and the wish arose to learn more of their combination in a single individual. The question came to mind: How far may the personality of a scientific man be revealed by his writings?—"the subtlest form." Phillips Brooks has said, "in which biography can take its shape."

In this attempt to answer the interrogation concerning one so lately living and known to many others, whatever of presumption there may seem to be will, I trust, be overlooked in view of the fact that my motive is that his good influence may be prolonged by better acquaint-

2. See A. O. J. Kelly, On Certain Tumors of the Kidney—Hypernephroma, etc., *Journal of Medical Research*, 1902, Case No. 15.
3. *Ibid.*, Case No. 16.

* Read before the Rhode Island Medical Society, June 5, 1902. Published by courtesy of the Committee on Publications before appearing in the *Transactions*. (A bibliography of Sir James Paget will appear in the *Transactions*.)

ance with his good life which I hope to interest you to make. I shall endeavor not to trespass on his Memoirs, lately edited by one of his sons, but to leave them for your own reading.

HIS EARLY PAPERS SHOW ORIGINAL OBSERVATION.

It is always interesting and often instructive to trace success to its beginnings, to estimate how far from them it advanced and along which of the early lines. There is a fine consecutiveness of development in the writings of Sir James Paget that indicates persistency of purpose and well-balanced judgment. When he was 20 years old a little book appeared by himself and his older brother Charles, "The Natural History of Yarmouth." The entomology was written by Charles, the botany and introduction by James. Curtis, in his *British Entomology*, calls it "an invaluable abstract of local information, and an admirable example, which I hope to see followed in every county." In the *Lancet*, thirty-two years later, is a letter by him in reply to a request for information, telling of an event in his first year in medical college with which every student of science must feel a thrill of gratulation. He saw the same "spiculæ of bone" in the flesh of a subject in the dissecting room that teachers, pupils and scientists had noticed in other subjects. But Mr. Paget, barely 21, "an intelligent first year student," with the habits of a naturalist such as any boy may acquire, looked closely through his lens, saw that the spiculæ were cysts, in each a coiled up worm; and so, in 1835, *Trichina spiralis* came to be known, a scientific discovery, as Dr. Cobbold, an authority on entozoa, says, "one of the happiest to which Englishmen can point." A good introduction to fellow-students and teachers it certainly was in those early days of the microscope.¹

The first paper I find with his signature is in the *London Medical Gazette* three years afterwards, and during the first decade of professional life papers appear each year. We notice that home journals and foreign quote them or refer to them with approval; justly, for they have characteristics not commonly found even in older writers. He signs himself "M. R. C. S., Demonstrator of Morbid Anatomy and Curator of the Museum at St. Bartholomew's Hospital." He then adds "Surgeon to the Finsbury Dispensary," and later, "Lecturer on Physiology and Warden of the College at St. Bartholomew's," or "Lecturer on General and Morbid Anatomy." In those days of the infancy of pathology, physiology and museums, these offices could hardly have brought much income. He writes almost exclusively on minute anatomy and physiology, and translations or reviews of scientific work. These two items—his positions and his subjects—with the fact that the numerous papers evidence much time spent in original observation in museums and dissecting room, and much more time in reading many French, German and Dutch, Latin, Italian and English authorities, justify the conclusion that private practice was small, and that he was working faithfully to gain an income and for love of his profession.

His first subject is "On some of the diseases of the papillæ of the cutis"; other titles are "On the blood vessels of tendinous tissues," "The influence of madder on the bones of growing animals," "White spots on the surface of the heart, and the frequency of pericarditis," "Obstructions of the branches of the pulmonary artery." His object in each is to contribute

something from his own observations of preserved specimens or of fresh anatomic material, or of his experiments in physics, physiology and chemistry. He outlines the ideas of others, correlating his own, and referring in footnotes to original authorities or to catalogued specimens. In the first essay are very noticeable his methods and even vocabulary of botanic study. His naturalist's habits of close observation, careful reasoning and accurate description are demonstrated by the writings of this period to have been, beyond doubt, a very large part of the foundation on which success was built. "Very, very few are the men," Dr. Billings writes, "who can by and for themselves see and describe the things that are before them."

A WRITER ON PROGRESS IN MEDICINE.

During the second half of these ten years he regularly contributed annual reports of progress in anatomy and physiology to the *British and Foreign Medical Review*. With their abundant references to authorities in any of six languages they are marvels of condensation and analysis. They testify to his good judgment in discriminating between authors and selecting from their observations, manifest now after sixty years. They show rare thoroughness and extent of reading, justice and courtesy to authors and readers, straightforwardness of purpose to present fairly and to make his material as useful as possible to others. It was a high compliment to so young a man to be connected with Dr. Forbes on this remarkable quarterly that probably has had no superior among English periodicals and that did much to raise standards of medical literary work.

We also discover him listed among contributors of articles (unsigned) on surgery and anatomy to the *Penny Cyclopædia*. Special mention should be made of his seventy-five (approximately) sketches of early physicians in Long's *Biographical Dictionary*, some of them indicating that he criticised their works after his own thoughtful reading. Such study of professional careers by this keen young observer must have implanted many ideas of what is most and least worth while in the conduct of a physician's life, and, with his extensive scientific reading, have had a profound influence in molding his own. It must also have had some considerable share in cultivating his later exceptional ability and interest in character study.

We next find him signing himself "Assistant Surgeon," and publishing his "Lectures on Surgical Pathology" given before the College of Physicians, from which we infer that the preceding ten years of unusual industry were beginning to materialize in professional and financial returns. His writings in those years give evidence of capacity for the hardest mental work and of ambition to serve along every line in his power, pathology, histology, anatomy, physiology and literary effort. He had utilized his minor offices to their fullest extent for acquiring a liberal and accurate fund of information, and by publishing so much he indicated his spirit of helpfulness. His essays are characterized by simplicity of style, accuracy, conciseness; a logical sequence of thought that makes reading easy; a faculty of seeing much in common subjects; a fondness for tracing back to principles, of fitting facts to facts, that adds to the interest and usefulness of what he writes and leaves an impression of truth. They show much shrewd sense, and a love of justice in giving credit where it best seemed to belong. One concludes the author to be a hard-working and alert student, a helpful, stimulating teacher, a young scientist of sincerity and independence without egotism.

1. The history of this discovery is interesting from several viewpoints. It can be traced in *The Lancet*, 1866 (Paget, Wilks, Presidents of Abernethian, Cobbold and others); *Lond. Med. Gaz.*, 1833 (Hilton), 1835 (Wood, Farre, Owen).

As we glance over those Annual Reports and later writings we find such names as Schwann, Vogel, Henle, Kölliker, Nägeli, Virchow, Pasteur; Liebig, Purkinje, Claude Bernard; Broca, Flourens, Marshall Hall; Darwin, Huxley; Helmholtz, Faraday; Dalton, Draper and scores of others that recall vividly to mind the fact that James Paget by his reviews, translating and experimenting was helping introduce the very earliest reports of revolutionizing ideas that flooded periodicals after the invention of the compound microscope: the protoplasmic cell replacing John Hunter's "vital fluid"; the contention of *omnis cellula e cellula* and spontaneous generation; bacteriology, preventive inoculation, serum therapy, parasitic diseases; antiseptics and anesthesia; pathology, histology; our modern physiology and organic chemistry; the laws of atoms and molecules, of electricity, of conservation of energy; the theory of evolution; our knowledge of the nervous system, of reflex action and cerebral localization. Many of these one will recognize as having been a battleground for popular prejudice or for professional myopia.

PAGET'S AVOIDANCE OF CONTROVERSY.

But we find no hint of contention, no "personalities" in what he wrote. He showed sound judgment in selecting "facts, probabilities and guesses" from pages teeming with them, proving himself a cautious thinker who led, as teacher and writer, so discreetly as not to need to retrace his steps. His peaceful course was in part due to his large knowledge that enabled him to look on many sides of the subject, to his truthfulness and zeal for progress that guided him along right lines; to a tactful method of presentation, passing by logical steps from one thought to the next, no assertion without correlation, avoiding non-essentials that might antagonize, and a trained insight taking him to the heart of the subject with clear and simple words. His discussion of antiseptics in 1879, read with other addresses and remarks in the same volume, illustrate this, particularly his pithy common sense, "A patient ought to be cured with as little risk to his life as possible"; "It is not enough that he just escape with his life"—the debate being on whether "partial antiseptics" (cleanliness) was not "just as good," its statistics showing up so well.

He was a leader in matters the subject of controversy yet not a controversialist. By request, I imagine, he wrote for two lay journals on the alcohol question and on vivisection. Dr. Oliver Wendell Holmes condenses his own philosophy in not being drawn into these affrays, in the Professor's "hydrostatic paradox of controversy." "You know that if you had a bent tube, one arm of which was the size of a pipestem and the other big enough to hold the ocean, water would stand at the same height in one as in the other. Controversy equalizes fools and wise men in the same way—and the fools know it." Sir James Paget with his love for humanity and understanding of "the falsehood of extremes," says: "Of course, among the opponents of experiments on animals there are several very different groups, and with some of them it is useless to appeal to reason. Some have committed themselves to the agitation, and can not recede without discredit or more material loss, and some are carried on with so strong an impulse of a mind once made up that they can not pause for a revision of their judgment. . . . That which is most to be desired is that persons with fairly balanced minds, with at least an average both of humanity and of capacity for judgment in cases in which deep feeling may be stirred, should study the whole matter, and judge of experi-

ments on animals as they would of other practices in which utility or even pleasure is pleaded as justifying the infliction of pain."³

Concerning total abstinence as the only sure remedy for intemperance, "Here, I can only doubt," he says. "I should think that in this, as in other things lawful yet tempting to excess, the discipline of moderation is better than the discipline of abstinence. But it is certain that we have no facts at all by which to estimate . . . ; we have nothing from which we may make even a fair guess, or which would justify a great experiment. . . . But some will say, what is this moderation? How may we define it? Let those who thus ask try to define, to the satisfaction of any ten persons, what, under all circumstances and to all people, is moderation in bread, or the wearing of jewels, in hunting or the language of controversy."⁴

On both topics he wrote with wide outlook and frank courtesy. Later he spoke on "Science versus Classics" in education, also on "Theology and Science," to which we shall return. Natural law in sociology as in physics seems to be that a centripetal "conservatism" and centrifugal "radicalism" are necessary to generate the median line of true progress. He was in neither extreme, however they may have influenced him, but steadily in the line achieving progress. Yet with all his moderation he could on occasion excel in scathing displeasure, as two or three short notes concerning unethical conduct bear witness.

QUALITIES OF HIS CLINICAL PAPERS.

Reports of his clinics at St. Bartholomew's are found after 1847 for twenty-four years, nearly every week in either the *Gazette*, *Lancet*, or *British Medical Journal*. While not his writings their brief consideration here may be allowable since they are records, sometimes by shorthand or revised by himself, of his extemporaneous speaking and of his operating. They bring him before us with more reality than do his essays as an accomplished diagnostician, skilful, prudent, ingenious operator, and wise and interesting instructor. We see him as deservedly a leader here as he was along corresponding lines in science and as hard a worker. He was prompt to test new methods, resourceful, original, careful in details, humane; his comments showing again his spirit of helpfulness, sympathetic understanding of students, clearness of expression and thought, large information and experience.

So admirably do these frequent reports reflect the actual surgeon and teacher that one could wish the useful and sometimes brilliant clinics of our own distinguished surgeons could have been or could be preserved with regularity and accuracy in our journals. They would be, as those of Sir James Paget now are, valuable portraits for historian and biographer, as well as helpful to readers not privileged to be present; better often than some of our papers and duplicated abstracts.

It may be admitted of reports of cases and clinical papers that, unless one has some special interest, the majority are read, when they are read, rather from a sense of duty and with uncomfortable effort of mental application. The clinical writings of a few are exceptions, and among the few is Sir James Paget. It is a common experience after reading his first sentences to

3. A characteristic reply follows in *Fortnightly Review*, 1882.

4. In closing a discussion, carried through several evenings, on the pathology of alcoholism, he comments upon the amount of uncertainty in every subject of this kind when discussed by those who have seriously considered it and are competent to form an opinion; contrasting it with the positive statements by those who know comparatively little of the matter.

continue from genuine interest. Perhaps we may specify a few of the qualities to which the attractiveness is due. His introductory words are simple, are clear and present a genuine thought lighting up his subject. Continuing with easy expression, with rarely a superfluous word or statement, each sentence a definite addition to the development of his thought, his presentation is completed and the reader has found no place to skip because irrelevant or wordy, no weariness because obscure or difficult; but the pleasure that always goes with old ideas well put connecting with new ones evidently true and of value. He has succeeded in what was apparently his wish—that his experience should be as genuinely useful to others as his description can make it.

His clinics and clinical papers, his discussions of cancer and pyemia can well be called, in his words, "Some of Time's old mirrors, upon which, if our thoughts be directed aright, they may be reflected in lessons of wisdom which we may contemplate to our own instruction. . . ." The lecture from which I quote testifies to his scientific spirit in the daydawn of science, to his faith in the future of scientific medicines, his broad philosophy; and it contains an historic bit of humor. While looking through eighteenth century records (to which his happy phrase, "Time's old mirrors," refers) for the origin of the Arris and Gale Lectureship, he finds that at one time the members of the Company of Barbers and Chirurgeons were most indifferent to these lectures on anatomy and surgery. At an executive session it was unanimously voted that each of them who at any time "should attend any of the lectures on anatomy to be delivered in the theatre, should be entitled to and receive the sum of 5 s. out of the cash of the Company." Professor Paget calls this "very cheap devotion of themselves, the principal members of the profession, to the personal encouragement of scientific teaching," and states that not until 1803, when the Company of Surgeons became the College of Surgeons by Royal Charter, did they abolish this "bounty of 5 s. for listening to the Professors."

ADDRESSES AND LECTURES.

In 1862, at the first meeting held in London by the British Medical Association, Mr. Paget gave the Address in Surgery, his subject being "The management of patients after surgical operations." For us of 1902 perhaps no more graphic sketch can be drawn of the state of the best surgical thought and practice just when Pasteur's brilliant investigations of ferments were focusing the observations and hypotheses of others in the question: Why may not communicable diseases, puerperal infection, pyemia, have their origin in germs and be preventable? As became a teacher Mr. Paget did not attempt to answer the speculation; but he impresses us with the urgency of its being the next thing for science to clear up. We see how an earnest, honest, acutely observant, keenly intelligent, humane surgeon struggled in the darkness to find light. In simple words he tells of rigors. "What is the meaning of this strange shuddering preceding, as it so often does, some of the most fearful maladies we have to deal with?" After outlining an autopsy, he says: "We must believe something from the seat of operation passed into the blood and utterly spoiled it." He tells of the improvements in surgical methods by which "we are adding constantly to the list of things that may be done to save life. But on all this, which might be so bright, a cloud rests like a dark pall." The simplicity of his words and the intensity of his searching thought become eloquence, and the impressive picture thrills us who see the answer to all

he asks just within his grasp. Many years after, in a plea for acquiring early habits of scientific observation, he said: "It would be a very useful book, I think, if some one would write . . . a history of the oversights . . . of things which have been under men's feet, plainly before their eyes. . . ."

A lecture on "Dissection Poisons" is of special interest because his study of a nearly fatal illness of his own. Commenting on his loss of the immunity which he used to have when dissecting daily, he says: "How it comes to pass we can not surely tell, but the fact of an acquired immunity seems certain. I wish some of you would study these immunities more than any one has yet done. They are of infinite interest in physiology . . . and of still more interest in pathology." This was ten years before the incident of Pasteur's forgotten culture-flask of chicken cholera microbe—the beginning of scientific study of immunities.

FORESHADOWINGS OF DISCOVERIES.

In many other of Sir James' essays we find foreshadowings of scientific discoveries. So extensive and accurate was his information that, knowing the existing limits of knowledge, he looked beyond the barriers with wisdom and courage to indicate where these might and should be broken through. And not infrequently he led the way, as in his "Disease of the Mammary Areola," "Osteitis Deformans," and other papers.

Underneath, throughout and over all his teachings is found by his constant example and speech this precept: The future usefulness of the profession lies in scientific progress; this is to be built up by facts from allied sciences that stand the test of clinical experience, and by our own accumulated clinical studies according to scientific methods; but our first business is to cure the patient, and we are and long will be certain of many remedies which we can not explain. Scientific study carried along with practice he never loses an opportunity to urge and to commend all through his professional record, whether in address, essay or biographical sketch. His criticism is constructive; encouraging, instructing, stimulating. He was a utilitarian in the sense that he valued knowledge and endeavor, and even pleasures, in proportion as they better the individual and society. The "utility of science" is a favorite topic.

His addresses on formal occasions, as the opening of annual sessions or new institutions, his presidential addresses before clinical and pathological societies, the British Medical Association or International Congress, commemorative addresses such as the Bradshawe, Morton, Croonian lectures, light up still more the features of his portrait we have discovered; but the temptation to quote must be cut short. One must often admire the plasticity of simple English as he adapts it with so much ease to fine shades and strong expressions of thought. These addresses bear witness above all to his being a philosopher—a lover of wisdom who does not find it in isolated facts, but rather in such a joining of them together as to create a compact force for good. His intellect traveled around and through his subject, fitting in and adjusting the new-found truths. His chief motive in addressing non-professional audiences was to correlate scientific work with popular life as part of the whole progress of humanity. Indeed, he believed that the general study of science would be the most efficient protection against quackery and anti-science.

Many titles excite one's curiosity, as "The Cause of Rhythmic Motion of the Heart," "Rare and New Diseases," "The Chronometry of Life." I would not men-

tion his "Elemental Pathology"—my own happiest of introductions to his writings several years ago—if it were possible to deny myself the pleasure, it is so fully spoken of in his Memoirs. Of this and his Hunterian Oration one must say, read both, for none will deny them place among our classics. The former traces the likenesses and unlikenesses between human and plant pathology. Before one advances far into this wealth of novel scientific ideas so charmingly set forth, one involuntarily exclaims: "What an interesting man this must be!" We are reminded of Washington Irving and his fluent grace; of Thoreau observing nature so minutely, and seeing in familiar details so much more than the material facts; of Dr. Holmes and his sagacious philosophizings; but the author in "Elemental Pathology" stands out pre-eminent as the brilliant scientist.

He questions into the coloring of autumn leaves and why they are symmetrical as, when younger, he speculated on the causes of pathologic symmetries in man. Many more foreshadowings of scientific discoveries are here, e. g., "In these galls and other similar diseases in plants, we have, it seems, hundreds of specific diseases due to as many hundred specific morbid poisons." After outlining the insect diseases of plants with a suggestiveness that pervades the whole address—for which "fascinating as any romance" is none too much to say—he adds: "It would be difficult to find a field for the study of the very principles of pathology larger or richer than this offers to you."⁵

HIS RELATIONS TO STUDENTS AND EDUCATION.

That he was invited to give so many addresses to students, and their content as well, make us believe him popular among his juniors. They have the same tactful courtesy, practical good sense, earnestness for industry, for scientific medicine and for high principles. He believed in honorable competition since it is a stimulus to better work for ourselves and for the community we serve; and humorously introduces this subject in an address before a "rival" Provincial college by the three queries: "Can one's rival be abolished? If he can, ought he to be so? If he can not, in what condition is it best to have him?" He believed in frequent examinations; "they are the best means of learning how to keep knowledge in such a form that it may be always ready for use." They are excellent training "in the art of thinking during anxiety and other mental troubles." He tells how to pass them, and how to cram for them; about recreations to get back "a clearer head, a stronger will," about how to succeed in practice and the rewards: "Competency of living; the society of educated men; blessings from the poor; recompense, with gratitude, from the rich; boundless fields for intellectual exercise; access to the richest stores of knowledge, for the glory of the Creator and the relief of man's estate; daily inducements to the exercise of the highest Christian virtues." But not wealth, ease or high social or political influence. He teaches that professional success is more in proportion to knowledge than to anything else; but inadequate knowledge is not so great a bar to success as are certain personal defects, such as self-distrust, unbusinesslikeness, discourtesies, disparagement of others. When it is said that a man's success is greater than he deserves, study that man. He probably has some good quality that enhances his professional skill—such as close attention to his cases or the rare gift of common

sense. "There is nothing incompatible in intellect and good temper. Knowledge and good manners are not mutually exclusive; the same mind may be scientific and businesslike." He is enthusiastic in presenting the usefulness, dignity and honor of the profession.

His emphatic advice to undergraduates is to "first, last and always combine the study of actual practice with that of the principles and foundations of our profession," . . . "from the beginning to the end of your career, and day by day you must study diseases and their treatment in actual practice. There is nothing of which the observation of the careers of students has made me more sure than of this." Excepting university men with high degrees, "as a constant rule, the best students, and they who have proved themselves the best, not only in the schools, but in after life, have been those who, in the beginning of their studies and for the most part before attending lectures, have been pupils in the provincial hospitals or with active and intelligent general practitioners, who have enabled them to see practice every day and helped them to study it. I am aware that this opinion—that the study of actual practice should extend through the whole period of medical education—is not held by some who have carefully thought upon the subject. . . . Much of our first learning consists in learning to know things by sight and by other senses, before any consideration of whether we understand them; and much of technical language and of mere routine must be learned, which any one may learn, whether he understand them or not; and many things may be learned and remembered which we may afterward come to understand. And besides all this, there is in practical medicine and surgery a great deal of knowledge which can not yet be, in any proper sense, understood; that is, which can not be reduced to principles, or connected with any laws of physiology or other parts of medical science. Yet it is real knowledge, true and very useful; and it can be gained only in the study of actual disease and its remedies; and there is so much of it that in all the time you can spare, through the whole period of your pupilage, you will not be able to learn it all. But learn all you can of it; for it is eminently the kind of knowledge which is useful in practice, and of which, as years pass on more and more will be incorporated in the true science of medicine. . . . I do not advise you to study practice to the exclusion of these things [science], but to study it with them and with their help." Elsewhere he speaks of the early special education of the senses "which can hardly be begun too soon and which becomes more difficult the longer it is deferred."

HIS VALUATION OF SCIENCE, CHARACTER AND THEOLOGY.

These opinions he held before 1865, and again in 1890 he says: "You hear a good deal said by some that science is the only way to success; by others that practice is the only way to what is right. After watching for a great many years I am disposed to tell all students now—and I think the rule may hold good for others besides those in medicine—both those should be worked together." After urging faithful devotion to science before and after graduation, he says concerning the belief of some that success in both science and practice is not probable: "it is quite as absurd as the talk that scientific men can not be good men of business, or that they can not have a love of art, or that they can not fully entertain the Christian faith."

One of his opening addresses to students at St. Bartholomew's closes: "But above all, be sure that your

5. It is interesting in this connection to note Dr. S. Weir Mitchell's recent offer of a prize of \$50 (annually for a short period) for investigations of the causes bringing about the autumnal coloration of plant parts.

knowledge be not polluted by any irreligion . . . for it is only by joining the study of Revealed truth with that of science, that our science can be perfect. For we stand, as it were, in the centre of an area of light and truth, and whichever way we move, except in one, we come too soon to the twilight, and then to the deep darkness, of that on which the light of science has not yet shone. But, in that one direction there is no twilight; there, if we follow in the line of truth, and do not with a mad conceit refuse the proffered help—there is the path of Revelation, and there the light of science is not lost—it merges in the more glorious light of faith.”

“Theology and Science,” an address given to students preparing for ordination at the Clergy School at Leeds, might well have for its sub-title, “the philosophy of controversy.” He was at that time 67 years old, and it may be taken as his mature thought by which he guided his own conduct. He finds it “a law of our nature that, on all doubtful matters, the vast majority of men refuse to wait for knowledge, and arrange themselves in parties, each of which maintains that itself is sole possessor of the truth.” He says it is well to remember that this seems to be “a law of our nature” because it may help to show that some antagonisms are not wholly the fault of those engaged or of the subjects which they discuss. Here we find one of the epigrammatic comments so frequent in his writings: “We love to hold by what we think, for what we think has in it more of ourselves than what we know.”

He argued that modern specialization is unifying knowledge and will eventually fill up the intervals by which our beliefs now stand apart: “For future knowledge will not be merely heaped up on the surface of that we now possess; it will penetrate the mass and fill its gaps and interspaces, and make many things one which as yet seem multiple and alien”; as its growth has harmonized many truths apparently in discord, so will it again in science and revelation, although perhaps not in just the ways we anticipate.

HIS SKETCHES OF OTHERS SHOW HIS OWN CHARACTER.

His personal relations with others as shown by his writings were courteous and generous. He was also a keen reader of character. His essay, “What Becomes of Medical Students,” indicates that his former position as Warden gave him opportunities which he embraced for comparing early tendencies and their results in after life. This unique analysis could well be reprinted and made easily accessible in every medical college reading room. Its statistics and comments are as impressive as a laboratory demonstration. His conclusion is: “There is scarcely any mental capacity of which the results may not, in the long run, be surpassed by those of constant strong willed resolution.” Of his masterly appreciation of John Hunter as man and as physician he says: “After having studied Hunter’s life and all his defects of temper and of general culture, of social skill and of all the arts of pleasing, nothing has seemed clearer than that the power of a great intellect, with a strong will and a right aim, is, in the competition of life, sufficient and irresistible; and that, among all the intellects and wills that I have studied, not one was stronger than John Hunter’s.” But that he would advise another way to success he leaves no doubt.

His life sketches of contemporaries are interesting, not only as studies of character, but as showing what he valued in men’s lives and wherein he thought lay failures. Of two promising careers cut off in middle age he says: “Such were the Ormerods. I believe it is not

only my affection for them that makes me think their lives should be recorded, both for just praise and for lessons that may be read in them. I only wish that my record could teach all that I studied in them, for to have known them . . . is one of the responsibilities of my life. Chiefly, they were very dutiful. Whatever came to be their duty, whether through choice or circumstance, they did it with all their might. . . . And they did not go far away or take much thought to find where or what was their duty. It was always at hand, in the common business of their calling, or if beyond this, in the nearest and best work for which they could fairly, or even modestly, think themselves fit. . . . Turned from the course of life they wished for, they went into that which then seemed best, and did their best in it. With equal patience they endured the weariness and pain of disease; and not only with patience, but with hope. . . . They had studied human life in all its aspects and had learned nothing concerning it of which they were more sure than that it was benevolently designed to be the way to an eternal happiness. . . . Over all that were associated with them they had the influence accorded to those who are respected for being always just, virtuous and very prudent, though, on just occasion, not afraid to maintain hard truth; over intimate friends they had, besides, the influence of those who are loved for wisdom, purity, tenderness and watchful courtesy.”

It was probably by wise design that he published these and certain other character sketches in the Hospital Reports (St. Bartholomew’s) where generations of students can read them.

Of one physician he says: “The rare charm of his personal character moved many to work with him and multiplied the power of his own work.” He speaks often of the ability to work with others harmoniously as one of the most important qualities for success. Of two he says: “They included in their duty the striving to find everywhere how they might do more good than in the same conditions had ever been done before.” Of another: “He was a strong instance of that fault that sometimes goes with honesty; he was so sure that his convictions were the result of hard and well-intentioned study; so sure that he sought the truth, and sought it on the right way, that he was wholly unable to believe that any one, with equal honesty and almost equal industry, could arrive at conclusions different from his own.” Another “was a many-sided man and on all sides good.” He likes to mention “the personal and social qualities commanding the confidence of the public. He was gentle in voice and manner; cheerful, warmhearted and kindly in his judgment of others; firm in his friendship, and had a tender-hearted love of home.” He loses no chance to commend in their lives any study of natural science which they have kept up, as Edward Ormerod’s study of wasps, and several times mentions carpentry as having been a recreation. He especially commends simplicity, clearness and accuracy of speaking, teaching or writing, originality, orderliness, painstaking and dexterity.

In one admirable character sketch he approves business and executive ability. “He was prudent and judicious.” “He acted discreetly, persuading, not trying to compel.” “He could work with everybody, not because he tried to let everybody have his own way, but because he was always patient, calm and courteous.” In debate or controversy “he was liberal, forbearing, gentle.” “Everywhere he was a peacemaker.”

We believe it legitimate inference that one who so persistently noted these several traits in others, and

whose writings for half a century serve as a confirmatory context, must have modeled his own life accordingly. In a most graceful and tactful address as President of the Section of Surgery of the British Medical Association at Norfolk, in his native county, he recalled the several surgeons he had known more than forty years before when an apprentice, with affection and fine discrimination crediting the good qualities of each. Thus honoring their memories he still more, quite unconsciously, honored himself by disclosing the nobility of his philosophy of judging and remembering others. His frequent appreciation of the good in past work, in history and in men past and present, seems one with his reverence for universal good, with his respect for the individuality of others, and his interest in his students. It could have been no small factor in his influence and in his hold on the affections of others.

While wandering through highways and byways, on southern mornings, searching for an old plantation house, the air musical with bobolinks and mellow voices of toilers in the cotton fields, the Cherokee rose and yellow jasmine swaying out from boughs of stately pines, radiant sunshine and grateful shade, when the homestead was still quite distant, I have felt my quest was nearly ended by a consciousness of some subtle fragrance—all pervasive, yet so delicate as not to be described or easily perceived, even on close approach—the fragrance of the old box borders in the garden; a breath far wafted, yet so elusive that consciousness of it is stronger than of the source from whence it comes.

And so, in tracing Sir James Paget's character through the grace and polish, the science, wisdom and philosophy of his essays and addresses, in addition to the qualities we can indicate, is a subtle, all-pervading attractiveness of personality that we can not find words to make clear; and by our failure we understand better than before the feeling with which his son wrote the last words of his brief preface to the Memoirs: "Other friends have contributed accounts of him as they best knew him. But, for all the good help that has been given the book is not worthy of his memory."

There is no life chronicle—at least I know no other—fitter to put in the hands of a medical student for his help in college days; of a physician for his guide to living in the "waiting years," his wise friend in success, and his consultant in the years of ripening and passing on; and all the charm and interest of its autobiography, its events and quotations have been left quite untouched for your own individual fresh enjoyment; to be supplemented as often as may be by his writings themselves.

Feeding the Cow.—Dr. C. L. Case of Ramona, Cal., has been reading articles on infant feeding and expresses surprise that none refer to feeding the cow to secure suitable milk. He writes to *American Medicine*: "This is the plan I follow: A healthy cow is selected with a calf as nearly as possible the age of the baby, older rather than younger, if a choice is necessary. The cow is given dry feed, plenty of hay and bran, and no green feed for the first two months, and above all no bitter weeds. To begin with I order 2 oz. of boiled milk, 2 oz. of boiled water, 1 oz. of limewater, 5 grains of white sugar, and 1 grain of salt every two hours, to be put into an eight-ounce graduated nursing bottle with no tubes. I gradually increase the milk about $\frac{1}{2}$ oz. each month for each feeding. I also increase the sugar and salt in proportion with the milk, but the other ingredients I leave the same in quantity for about nine months, when the child usually passes from under my care and begins to eat with the family. The intervals between feedings are to be increased 15 minutes each month up to six months and night feeding done away with as much as the child will allow."

Special Article.

BLOODLESS OPERATIONS FOR THE REDUCTION OF DEFORMITIES.*

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VIENNA, AUSTRIA.

INTRODUCTION.

Complying with the request of your president to appear before this distinguished audience, I must begin with the admission that I feel myself to some extent embarrassed. The reasons for this embarrassment are obvious. More than anything else the feeling disturbs me that I may stir up your resentment by the ill-usage of your fine language—that with every word I may commit the offense which the Frenchman so cleverly calls *ecorcher sa langue*—"to flay his mother-tongue."

Another reason for my disquietude lies in the entire and extraordinary situation in which I find myself through the boundless hospitality of Northwestern University—through the conferring of the degree of "Doctor of Laws" by which I may enjoy the distinction of belonging to the university as an honorary member. I can only assure you that I know how to prize highly this honorary degree.

I must here remark that in the Old World also an honorary title has been given me. You know very well what a great part titles and orders play in the Old World. The title which was conferred on me by His Majesty, the Emperor Franz Josef the First of Austria, reads: "Imperial Counselor of the Government."

Now this old and this new title have a certain inner relationship. This relationship consists in the fact that, without doubt, I am the worst counselor of the government and quite as much without doubt the worst doctor of laws anywhere to be found; for I understand fully as little about government as I understand about laws.

From this it seems to me that the distinction of a degree is so much the greater, the less a man is entitled to it by his respective knowledge. And, therefore, I prize the honor which has been conferred on me through the bestowal of this title of a "Doctor of Laws" as one so high that I feel myself entirely unworthy of it.

If, nevertheless, I accept this honor, it is because I look on it not as a personal one, but regard myself only as the agent of courtesy which the Northwestern University desires to bestow on the long-celebrated School of Medicine of Vienna, a member of which it is my greatest pride to be.

This honoring of one school by another is a beautiful expression of the always deeply-rooted feeling that science is one united power which throws a common bond around all nations; that there are, especially for the medical art and science, no separating boundary posts, no dividing ocean, no different nations. The science of medicine joins her adepts around the world in a great brotherhood, whose common highest law is the law of humanity and brotherly love.

In this sense I accept with deepest thanks the distinction that has come to me, and ask your forbearance and goodness if I shall endeavor in the following to bring before you some remarks of a general nature concerning the character and object of bloodless operations.

THE POPULAR IDEA OF SURGERY AS BLOODY.

The terms "surgery" and "bloodless" appear at first sight, according to general comprehension, each to exclude the other; for surgery is known more than anything else as a bloody art. And yet the word surgery means nothing else than handicraft, technical skill or dexterity. What the hand creates need not mean the shedding of blood. The hand can also caress and coax. But the coaxed of the surgical hand have always certainly a dubious character. In order to characterize bloody surgery, one must speak of it as surgery with the knife. The layman can not conceive the surgical hand otherwise than

* An address delivered before Northwestern University, Nov. 28, 1902, at the conferring of the honorary degree of Doctor of Laws on Dr. Lorenz.