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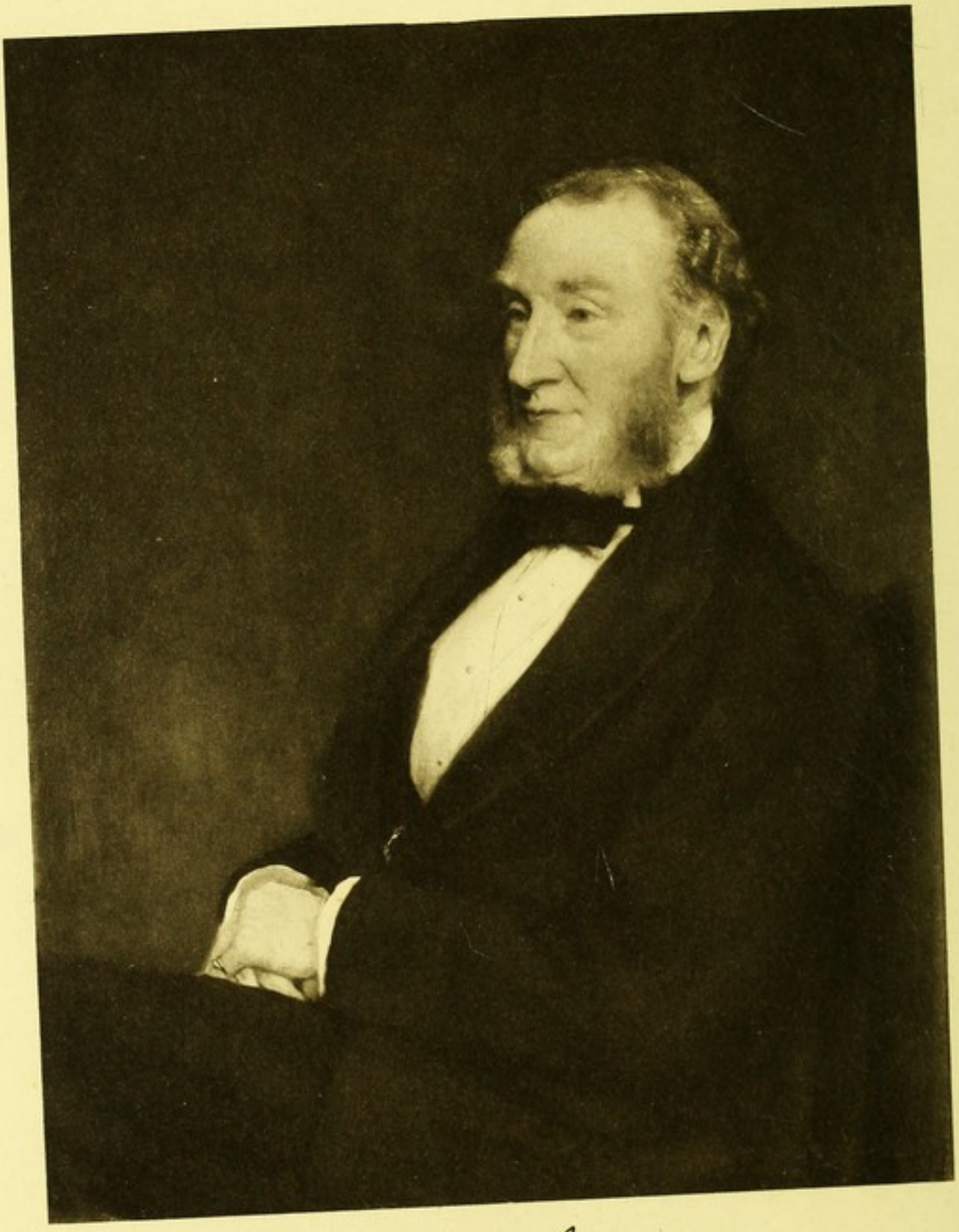

F. W. Parry

Born 1829. Died 1911.

In Memoriam

FREDERICK WILLIAM PAVY,

M.D., F.R.S., F.R.C.P.

Frederick William Pavy was born at Wroughton, near Swindon, in Wiltshire, on May 29th, 1829.

His father, William Pavy, was of French extraction, and came to England in the early part of the nineteenth century. A near relative of William Pavy became Archbishop of Algiers. In a biographical memoir of this distinguished prelate it is stated that the Pavy family originated in Savoy, and was well represented in the neighbourhood of Chambéry; but the branch from which the Archbishop was descended had been for many years settled in the town of Roanne, in the department of the Loire; and a great uncle of his, François Pavy, was haled before the Revolutionary Tribunal at Lyons in 1793, being vicar in that town at the time. Louis Antoine Augustin was born in 1805, and was made Bishop of Algiers in 1846. He laid the foundation stone of Nôtre Dame de l'Afrique in Algiers in 1855, and saw the completion of the cathedral. He was created Archbishop in 1865, but died the following year. It is interesting that General Pelissier, who commanded the French troops in the Crimea after the resignation of General Canrobert, was intimate with Monseigneur Pavy, and presented to Nôtre Dame de l'Afrique the sword which he had carried at the successful attack on the Malakoff.

Dr. Pavy's father, William Pavy, appears to have been born in 1797. He, also, was destined for the church, but an open-air life appealed to him; he migrated to England as a comparatively young man, took up the business of a maltster, and bought an estate of about 200 acres at Wroughton. Here he built Woodham House, in which Dr. Pavy was born.

William Pavy married Miss Pickett, the youngest daughter of a landholder in the neighbourhood, and had nine children—four sons and five daughters. Within a few months of the birth of the youngest son, the father died at the age of 39.

This youngest son, Francis, had a successful career. He desired a military life, and at the age of eighteen volunteered for service in the Crimea, and arrived at Scutari just after the battle of Inkerman, but he caught fever, and was compelled to return home. Two years later he was gazetted to the 74th Highlanders, and served with distinction in the Indian Mutiny. He became a captain and retired on half-pay. He then became an accountant, and soon took a leading position, becoming director and chairman of several important companies. Captain Pavy was also a member of the Honourable Corps of Gentlemen-at-Arms. He lived at Foley House, Portland Place, and died in 1902.

One member of this family, Dr. Pavy's last surviving sister, Mrs. Fisher, still resides at Elcombe Hall, a property near Wroughton, which was also in the possession of her father, William Pavy. The writer is indebted to her for much kindness and help in regard to this memoir.

Frederick William was the second son. Independence of character in early life is always an interesting feature in those who are afterwards distinguished, and this independence was shown by young Pavy; for, being sent to a preparatory school at Swindon, he was so displeased or unhappy, that he ran away home, and, being taken back, again effected his escape.

After this he was sent to Merchant Taylors' School in London in the month of March, 1840. He began in the petty form, was moved into the first form six months later, into the

second form in March, 1841, into the third form, March, 1842, and was in the division form from October, 1842, to March, 1843, when he seems to have left.

Exactly what he did in the next few years is not quite clear; but the most interesting fact is that though he seems to have desired to become a doctor, he was not at first put in the way of studying for a medical career. When the writer of this article was a student, an occasional visitor at his father's house was one of the old school of business men in the city, a ship-broker, Mr. Woollett. He was intimate with Mrs. Pavy, and he and his wife paid her a visit at the house near Swindon every year. When young Pavy left school Mr. Woollett was asked to take him into his office in Lime Street Square in order to see how he would like a commercial life. How long he was there it has not been possible to ascertain, but, at any rate, the life was not congenial to him, and he gave it up. Some part of the time between school and hospital he seems to have spent on his father's estate, and he actually contemplated farming as an occupation; probably this was after his City experience, but, in any case, it was also abandoned.

The next event in his history of which one can be sure is his entry at Guy's Hospital, which occurred in May, 1847, four years after his leaving school. He then, probably with a view to taking the London University degree, and perhaps because he may have been reading for the Matriculation examination, took out the course of botany alone, and in October of the same year paid further fees, but was not really entered as a first year's student until 1848. It was also not until this year that he passed the Matriculation of the London University, being entered in the register as from Merchant Taylors' School. He took honours in Chemistry.

It may be interesting to old Guy's men to note the names of some of those who were his contemporaries at the date of his complete entry in 1848. Amongst third year's men we see the names of W. Odling, Thomas Bryant, C. D. Kingsford, Sherwood Stocker, R. Growse, and T. A. Waterworth. Amongst second

year's men: A. T. Brett, S. Knaggs, Morley Rooke, Buchanan Washbourn, and Jas. Bisshopp. Amongst first year's men: John Wilton, Constantine Holman, and J. Ramskill.

Pavy had a successful career as a student. It must be remembered that sixty years ago neither the examinations nor the hospital appointments were quite the same as they are now. The preliminary scientific examination of the University of London, now known as the first examination for medical degrees, was not instituted until 1861. The first examination in the medical curriculum was the First M.B., and this Pavy passed in 1850, being placed in honours, third in Anatomy and Physiology, third in Chemistry, fourth in Botany, and obtaining the Exhibition and Gold Medal in Materia Medica.

At Guy's Hospital he was full dresser to Mr. Hilton in April, 1851, and resident obstetric clerk in June of the same year.* In 1852 he obtained the degree of Bachelor of Medicine, being placed in honours, third in Physiology, third in Surgery, second with the Gold Medal in Medicine, and alone in Midwifery. In these honours examinations Pavy was run close by another Guy's man, Morley Rooke, afterwards in practice at Cheltenham; Rooke indeed took the Scholarship and Gold Medal in Medicine, was bracketed with Pavy in Physiology, but was below him in Surgery. On this occasion the Scholarship and Gold Medal in Surgery were taken by Joseph, afterwards Lord, Lister.

It only needs a glance over the honours lists of those days to refute the belief, entertained so conveniently by some, that men who distinguish themselves at their degree examinations are bound to be failures in after-life.

Pavy obtained the degree of Doctor of Medicine at the University of London in the succeeding year, 1853; but in the interval between his M.B. and M.D. degrees he had already shown his interest in the relations of sugar to the human economy, had come into contact with the distinguished French

* It has been stated that he was both House Surgeon and House Physician. This is an error. The former appointment was only instituted in 1856, and the latter in 1868.

physiologist, Claude Bernard, and had commenced those researches and that devoted study of this difficult subject which, we might say, he never abandoned for one moment of the remaining fifty-eight years of the life he was destined to enjoy.

His first contribution to the Guy's Hospital Reports was in 1853.* It is entitled "Saccharine Matter: its physiological relations in the economy;" by Frederick William Pavy, M.B. London. In a footnote he writes: "In making these succeeding remarks I feel bound to state that my information has been principally derived from the opportunity I have had, during three months of the past summer, of assisting M. Bernard in his experimental investigations at the laboratory of the Collège de France." And then he acknowledges his indebtedness to the professor for his courtesy and ready help. This, then, must have been the summer of 1853.

Pavy's distinguished career as a student could not fail to give him an opportunity of joining the teaching staff, and that his bent was towards physiology is shown by the fact of his work in Claude Bernard's laboratory. For a time he was Demonstrator of Anatomy, but we find him in the session of 1856-57 lecturing on Physiology in the winter and on Comparative Anatomy in the summer. His predecessor in Physiology had been Dr. Gull. He held this double lectureship until 1865, when he resigned the summer lectures to Dr. Pye-Smith; but he continued to lecture on Physiology until 1877. For the greater part of these 22 years he gave the full winter course of six months' lectures on this subject; but in the last five years Dr. Pye-Smith was associated with him, taking one-half the winter lectures.

On leaving the chair of Physiology, he joined Dr. Wilks in the course of lectures on Medicine; but these he delivered only for six years, resigning the systematic lectures on Medicine five or six years before his clinical work as a physician was brought to a close.

* Guy's Hospital Reports, Second Series, vol. viii., 1853.

It was not until November, 1858, when Pavy was in his thirtieth year, and had already been teaching for four or five years in the Medical School, that the chance of an appointment on the active staff of the hospital was offered to him. This occurred through the death of Dr. Hughes.

His seniors on the Physicians' Staff were then Drs. Addison, G. Hilaro Barlow, Owen Rees, and Gull, as full physicians, and Drs. Habershon and Wilks as assistant physicians. In the spring of the year 1860 Dr. Addison retired from the hospital, and died a few months later; but no fresh appointment was made, and the medical staff consisted of three physicians having wards and three assistant physicians seeing out-patients. In 1871 the northern half of the present medical buildings, called Hunt's House, was completed, and this added 120 beds in three wards, which were named after Astley Cooper, Bright, and Addison.* This large increase in medical beds necessitated the appointment of another full physician, and Dr. Pavy was promoted from the rank of assistant physician, having for his seniors Drs. Owen Rees, Habershon, and Wilks.

The law of superannuation, applied to the medical and surgical staff, which should have operated in Dr. Pavy's case in 1889, was most inopportune. Death had played havoc in the ranks of the medical staff in recent years. Hilton Fagge had died six years previously, Mahomed a year after Fagge, an interval of only two years and Moxon ended his brilliant career, to be followed in less than twelve months by Carrington. After this last sad event in the opening of 1887, the assistant physicians,

* These wards on the first, second, and third floors of the northern division of Hunt's House have had different names from time to time in accordance with varying conditions of the hospital finances, which required at one time the dismantling of two or three wards, and with the need of expansion on the surgical side, met by the conversion of one ward into small operating theatres. They are now named respectively Mary, Esther, and Queen Victoria wards, and the old names have been transferred as follows: Astley Cooper, to a surgical ward (formerly Accident); Bright, to the private ward for paying patients on the third floor of the southern division of Hunt's House (originally Mary ward); and Addison, to the male ward on the first floor of the southern division (originally Philip).

who had been working at half strength for some time, were brought up to their full number by the appointment of three more. But Fate had not yet done with the Guy's Medical Staff, for within a week of the normal period for the retirement of Dr. Pavy from the Staff, that able physiologist, Leonard Wooldridge, whose career had begun with so much promise, and who was one of those appointed assistant physician just two years previously, was struck down by fatal syncope. The Governors, upon hearing this, while nominating Dr. Lauriston Shaw to fill Dr. Wooldridge's place, asked the Treasurer to invite Dr. Pavy to retain his appointment for another twelve months from that date.

Thus, it was only in 1890 that Dr. Pavy joined the consulting staff, and so far as teaching, clinical or otherwise, was concerned his work within the walls of Guy's Hospital was finished.

As a lecturer Pavy was clear and precise, and in simple language put the facts lucidly before his audience. No doubt he was at his best in the subject of Physiology in which he was an original worker and experimenter; and as his lectures on this subject were almost entirely before the passing of the Vivisection Act of 1876, he was not hampered by legal restrictions if he wished at any time to give his students that best of all opportunities of learning the facts of nature, an ocular demonstration. He was a very clever operator, and the neatness with which he used the scalpel in exposing the anatomy of the animal under experiment gave everyone who saw him the impression that he would have made an excellent surgeon. One lecture especially lives in the memory of the writer. It was delivered in the session 1864-65, and was intended for publication, with the object of refuting the statements of Claude Bernard with regard to the amount of sugar to be found in the blood of the hepatic vein. Pavy complained that his results had not been accepted by other observers, but triumphantly pointed out that Dr. McDonnell had obtained the same results in experiments which, for better confirmation, were made upon cats, and not upon dogs. "Now," said Pavy, with much glee, alluding to the defensive

mechanisms enjoyed by this "harmless, necessary" quadruped, "the cat, gentlemen, is not an animal that my experience has induced me to show a partiality towards for physiological experiment."

As a lecturer, in his early days at least, when addressing the students of the first and second years, he had a somewhat nervous manner, which he was apparently trying to overcome with some effort; and this was often the occasion for an exaggerated applause on the part of his audience, both on his entry to the theatre and at other times. And the more cheery spirits amongst the students not infrequently took the opportunity of making disturbances which were, on a few occasions, with difficulty controlled. Still, his lectures were well attended, and highly appreciated by the students; and there is no doubt that his fame as a physiologist was alone sufficient to attract some students to the otherwise rather unfashionable district of "the Borough" for their medical education.

In his teaching in the out-patients and in the wards Pavy did not aim at elaborate disquisitions on the case in all its possible bearings or spend much time over pathological theories, or on disputed points of pathogeny, or treatment. He dealt consistently with the case before him, with its diagnosis and its treatment. He had also this merit, which everyone of his colleagues could not claim, that he was always punctual and spent a proper and reasonable time over his cases without being hustled away for important consultations elsewhere.

On his retirement from the active work of the hospital, Dr. Pavy was presented by the students of the hospital with a handsome silver plate; the presentation took place in the Anatomical Theatre. A fortnight later he was entertained at a Complimentary Dinner at the "Ship," Greenwich, with Mr. Arthur Durham in the chair.

Dr. Pavy took an active part in the working of the Royal College of Physicians. In 1856 he became a Licentiate of the College under the arrangements in force prior to the Medical Act of 1858, when there were no Members; but he was made

one of the Members of the College on the creation of that order in 1859. He was elected a Fellow in 1861, and delivered the Goulstonian Lectures on "Assimilation and the influence of its defects on the urine" in the following year. And in due course he was examiner in physiology, examiner in medicine, a member of the Council, censor and senior censor, the last in the session 1891-92.

He was a frequent lecturer at the College. In addition to the Goulstonian Lectures, he delivered in 1878 the Croonian Lectures "On certain points connected with diabetes." In 1886 he was Harveian Orator, and directed his remarks towards illustrating the value of experimental research by a reference to recent work in the then comparatively new sphere of bacteriology; and in 1891 he was a second time Croonian Lecturer, his subject being "A new departure in connection with diabetes."

Six years later he delivered a supplementary Croonian Lecture on "Points connected with the pathology and treatment of diabetes"; and finally, in 1907, at the age of 78 he gave three lectures on "The pathology and treatment of diabetes viewed by the light of present-day knowledge."

In 1901 the College of Physicians awarded him the Baly Gold Medal for Distinction in the Science of Physiology.

He was an active member of the various London Medical Societies, and was at different times President of the Pathological Society and of the Royal Medical and Chirurgical Society. Before the Medical Society he delivered the Lettsomian Lectures on "Certain points connected with diabetes" in 1860.

It is now time to say something of Pavy's life's work, that is, his researches and writings upon the behaviour of sugar and other carbohydrates in the animal economy, and especially the morbid appearance of sugar in the urine usually known as diabetes. Pavy's work is, perhaps, the most remarkable instance of steady persistence in one relatively limited line of inquiry, and illustrates not only the extraordinary tenacity of purpose of the inquirer, but also, and in no less degree, the evasiveness and the almost complete insolubility of some problems of life and disease.

Pavy devoted little short of 60 years of his life to this particular problem, for he was working with Bernard in the summer of 1853, and he was still continuing his laboratory experiments up to the time of the autumn holiday just preceding his death in 1911.

There was remarkable sagacity, not devoid of satire, in Gull's comment upon Pavy. What sin, said he, has Pavy committed, or his fathers before him, that he should be condemned to spend his whole life seeking for the cure of an incurable disease? And Pavy, still researching, survived Gull by some one and twenty years.

It is not desirable to attempt anything like a review of the subject of diabetes during the last 50 years, even as it presented itself to Dr. Pavy, but a brief account of his work in this direction may be allowed. His first printed article upon the subject appears to be that already mentioned as being published in the eighth volume of the Second Series of the Guy's Hospital Reports entitled "Saccharine Matter, its physiological relations in the animal economy." He had worked in Claude Bernard's laboratory and he had heard his lectures at the École Pratique. It appears also that he had himself performed experiments and made observations on the relation of sugar to the liver within the walls of Guy's Hospital, even before going to Paris. At any rate, this article, published in 1853, refers to numerous experiments conducted by himself in confirmation and extension of Bernard's work.

In the same year he must have made a communication to the Royal Society, for there is an interesting note in the first volume of the Third Series of the Guy's Hospital Reports, 1855, which is to the following effect:—"Among the distributions of the Scientific Grant made to the Royal Society for the year 1854 occurs the following: 'No. 12. To Dr. Pavy, for continuing experimental researches on the physiology of the blood, of which a part has been recently communicated to the Royal Society, £50.' The researches are in progress."

He published also in Paris in 1854 a pamphlet of some sixteen pages entitled "Recherches sur la destruction du sucre normal dans l'économie animale." The paper had been read before the Société de Biologie on August 26th, 1854, and it referred to the conditions under which sugar appeared to be destroyed by oxidation in the blood.

During the next few years, that is, up to and including 1861, the Proceedings of the Royal Society contain six papers by him on the changes of sugar in the system, the alleged sugar formation of the liver, the lesions of the nervous system producing diabetes, and the influence of acids and of alkalies upon the saccharine state. This work is represented in the Philosophical Transactions only by one paper, which was read in June, 1860, entitled "Researches on sugar formation in the liver," an abridgment of a paper presented in 1858 with some additional matter; but his work over these ten years gained for him admission as a Fellow of the Society in 1863.

Perhaps the most interesting of these communications is that in which he broke away from Claude Bernard, and asserted that the blood of the right heart did not, as Bernard supposed, and Pavy himself till that date, 1858, had believed, contain sugar in any material quantity during life, but that the quantity usually found in it was due to a rapid formation of this substance after death.

These observations were not readily accepted, and we find him in 1865 re-asserting his position in the lecture already referred to,* again, in 1875, in Communications to the Royal Society, and even again so recently as 1908 in the special course of lectures which he delivered before the Royal College of Physicians. In another of these articles he recorded his experiments confirmatory of Claude Bernard's puncture-diabetes, with his own original observation, that glycosuria was also produced by removal of the superior cervical ganglion, or by division of the sympathetic cord in the neck.

* Medical Times and Gazette, 1865, vol. i.

In 1862 appeared his book entitled "Researches on the nature and treatment of Diabetes," a volume of 168 pages, excluding an appendix of cases; and in 1869 a second edition appeared, of which the subject matter is more than half as much again as in the first.

In the ten years from 1875 to 1884 he was again an active contributor to the Proceedings of the Royal Society, writing on the production of glycosuria by the action of oxygenated blood upon the liver, on the physiology of sugar in relation to the blood, on the physiology of the carbohydrates in general, and on a useful modification of the quantitative test for sugar. Throughout he was consistently and persistently fighting the glycogenic theory of Bernard, not, that is, that he doubted the existence of the substance called glycogen, nor the fact that glycogen is formed in the liver, but he denied the statements that the liver habitually produces large quantities of sugar by a continuous transformation of its previously formed glycogen (sugar producer), that is, he denied the sugar-forming function of the liver, and all that pertained to such a belief. Thus, he showed that during life no change of glycogen into sugar took place in the liver; that oxygen does not destroy the sugar in the blood; that glycogen exists itself in the blood.

With that conviction he regarded the word glycogen as a misnomer, and proposed more than one substitute which, he thought, should be rather a ticket than a name connoting any natural relation. Thus, *amyloid substance* was one term used by him, *hepatine* was another, and in 1881 he proposed to call the substance after its own discoverer, *Bernardine*. But circumstances have been too strong for him, and the name glycogen still remains.

The fact that glycosuria might persist in severe cases, even when no carbohydrate were ingested, led to the recognition of a disorder of metabolism much more serious than the mere incapacity to assimilate superfluous starchy or saccharine matters. And Pavy used the terms *alimentary* and *composite*, the former for the simpler and more tractable form, the latter for the variety in which the metabolic disturbance was more complex.

In connection with the practical methods for the diagnosis of diabetes and glycosuria, Pavy's name will be long remembered. At Guy's Hospital *Pavy's blue fluid* was the test commonly used as the equivalent of Fehling's solution. It differs from Fehling's in containing a larger proportion of alkali (17 : 10), which Pavy preferred, because it prevents precipitation by the small quantity of reducing substance present in normal urine. It is interesting to note that the test solution used in Bernard's laboratory, and by Dr. Pavy in his early work, was known as *Barreswil's solution*. This is a solution very similar to Fehling's, containing almost the same amount of cupric sulphate, much less caustic potash, and somewhat more of a mixture of potassium bitartrate or sodic carbonate.

Pavy added to the accuracy of the cupric quantitative test by the use of an ammoniacal solution, whereby the cuprous oxide was held dissolved and the recognition of colour change was greatly facilitated.

A third useful idea was represented by *Pavy's pellets*, by which in the very earliest of days of the history of tabloids, the two elements of Fehling's solution were separately produced in a solid compressed form, requiring solution only at the moment of applying the test.

Pavy's later researches on the physiology of the carbohydrates and their relation to diabetes and glycosuria were directed to ascertaining how the ingested carbohydrates are disposed of and assimilated, if they are not, as Bernard supposed, simply stored up in the liver, to be paid out as sugar and chemically destroyed.

In 1893, in his paper on "The Glucoside constituent of proteid matter" he produced the key to the problem. He showed that a substance nearly identical with sugar could be obtained by the prolonged action of potash upon proteid, and this gave the clue to the occurrence of those cases or stages of diabetes in which glycosuria continued to occur, although no carbohydrates were being ingested. But the important outcome of this was the converse position, viz., his demonstration that carbohydrates in the alimentary canal could, on the one hand, be combined,

probably by the agency of the cells of the villi, with nitrogenous material (peptones) to form proteid matter, and, on the other, could be by the same agency transformed into fat. Consequently, not only was the liver an organ which in its production and retention of glycogen prevented sugar from reaching the general circulation, but the intestinal villi and their related cells formed an even earlier line of defence by their prompt utilisation of the carbohydrates for the formation of those essential substances, proteid and fat. Failing these barriers to the passage of soluble carbohydrates, glycosuria must result. To the development of this theory Pavy devoted the remaining years of his research life.

Pavy's labours were not, of course, confined to diabetes. He did good work in connection with albuminuria, with the physiology of digestion, and with the study of food and dietetics. Moxon had described a remittent and intermittent albuminuria; Pavy described in 1885 a cyclical albuminuria, now usually known, in part at least, as postural albuminuria. He had great confidence in the ferrocyanide test for albumen, and advocated for practical convenience in its application the use of pellets of potassium ferrocyanide and of the necessary citric acid.

In connection with the physiology of digestion his valuable paper on the "Immunity enjoyed by the Stomach from being digested by its own secretion during life" gained admission to the Philosophical Transactions in 1863, and in 1867 he published a "Treatise on the Function of Digestion, its disorders and their treatment."

In 1874 appeared a "Treatise on Food and Dietetics, physiologically and therapeutically considered," and a second edition of this was issued in the following year.

In 1876 Dr. Pavy engaged in some researches upon food metabolism, and urinary excretion as affected by exercise. An American, E. F. Weston, was performing unusual feats of pedestrianism, in covering 500 miles or 1000 miles in as many consecutive hours; and careful comparisons of the food taken and the amount of the urinary constituents before, during, and after

the period of exertion was made by Dr. Pavy, and published in the *British Medical Journal.*

Pavy was soon recognised by the profession and the public as an authority on the above different subjects, but especially upon diabetes; and he had an extensive practice, which continued to the end, for even a few days before his death he was seeing patients at his house. For the first few years of his professional life Dr. Pavy was resident in Finsbury Square, that old home of the City doctor, now passing rapidly into the hands of the City merchant. In 1858, however, he had moved to 33, Bedford Place, Russell Square, and he was there for about seven years, when he went to 35, Grosvenor Street, the house in which he remained till the end.

It is remarkable how he found time for the extensive researches which he conducted. His consulting room in Grosvenor Street was adorned with a beautiful fernery occupying the whole of the south side of the room, but the initiated knew that behind this was a laboratory in which an assistant was testing the urine while the patient was describing his woes to the physician. Pavy, however, always had the use of a more complete installation. As long as he was lecturing on Physiology he had the laboratory in connection with the theatre. When he retired from that post he was accommodated by the Governors with a small room just to the south of the grand entrance of the medical building. This he had to resign when he retired from the active staff, and the room was used as a clinical laboratory by the Registrars and Medical Ward Clerks.

Pavy then took refuge in the laboratories of the Royal Colleges of Physicians and of Surgeons in their building on the Victoria Embankment, near Waterloo Bridge.* These laboratories were opportunely opened in 1890, and Dr. Pavy was one of the first to receive permission to make use of them for his ex-

* In April of the present year, 1912, this building was handed over entirely to the Institute of Electrical Engineers, and the Royal Colleges transferred the examinations to their new building in Queen Square, Bloomsbury.

periments. Here almost any afternoon about four or half-past four o'clock might be seen, waiting for Dr. Pavy, his well-known carriage of snuff-brown, picked out with red, and his fine pair of black horses which, he told the writer, he always bought himself at Tattersall's. Pavy's last physiological resting-place was not to be on the Embankment, for, in 1903, the laboratories were closed to private members of the profession and devoted to more public uses, such as the preparation of diphtheria antitoxin for the Metropolitan Asylums Board, the researches carried out under the Cancer Research Fund, and the pathological work of the Royal Army Medical College.

Happily, just before these changes on the Embankment the University of London established a centre for physiological research in its new home in the eastern wing of the Imperial Institute. In January, 1902, the senate adopted a scheme for the institution of University Lectures on Physiology in association with a lecture room and a research laboratory. The equipment for the laboratory was provided by a donation of £2,000 from Sir Walter Palmer, and by contributions from others, among whom was Dr. Pavy himself. The laboratory was opened in November, 1902, by the Chancellor, Lord Rosebery, and Dr. A. D. Waller was appointed Director. Here for the last nine years of his life Dr. Pavy conducted his experiments, making daily visits as he had always regularly done. He was one of the first panel of lecturers appointed in connection with this scheme, and he delivered in 1905 the lectures on "Carbohydrate Metabolism." In 1909 and 1910 he was working at intracellular enzyme action, and in the following year up to the end of the summer session he was continuing his researches into carbohydrate metabolism. Many of the results of the work done in this laboratory were published in the Journal of Physiology.

As medicine is, after all, the art of healing, it should be of interest to us to know how Dr. Pavy dealt with the treatment of diabetes. The writer was, for a few years, Medical Registrar, thus assisting in the reporting of the medical cases, and for several years he was Assistant Physician to Dr. Pavy. Though he

could not escape the impression that Dr. Pavy's cases of diabetes in the hospital were not more amenable to treatment than those of other physicians, it must, of course, be remembered that the cases coming into a general hospital are nearly always, pathologically, the worst type of case, and that individually patients of the hospital class are most unwilling to submit to the discipline of dietetic treatment, which they will evade by the most deceitful methods. Moreover, there was very little variety in the methods of treatment at that time; dietetic restrictions were generally employed, and the efficacy of drugs was not much more trusted than it is now. Still, there can be no doubt that Dr. Pavy must have been successful in dealing with that numerous class of cases which he called alimentary diabetes, in which among middle-aged patients with a small amount of glycosuria, are kept in good health by an adequate restriction of their carbohydrate intake.

By far the greater part of the section on treatment in each edition of his treatise on Diabetes is devoted to a consideration of the question how the carbohydrate intake can be reduced to a minimum or zero with the least possible inconvenience or danger to the patient, and gluten bread (first proposed by Bouchardat in Paris in 1841) and other substitutes for household bread are fully considered. But when we come to remedies we find the following statements in his first edition: "No medicinal agent, as far as I am aware, has yet been found that possesses the power of permanently diminishing the elimination of sugar in diabetes." He notes, however, the remarkable tolerance of opium by diabetics, and the temporary improvement under its use in two cases recorded by McGregor; and in the four cases in the appendix he had administered opium in one grain doses two or three times a day. But he does not expressly recommend it for the treatment of the disease, and on the last page, referring to "various remedies that have been proposed," he writes, "I have never seen anything recorded to give me an atom of faith in anything that has been proposed."

However, in his second edition he recommends alkalies, in the form of carbonate, or of their vegetable salts (citrate, acetate), and the alkaline mineral waters of Vichy, Vals, and Carlsbad; and he speaks highly from his own experience of opium in increasing doses. The writer remembers well the intense interest he took in a case which he was treating with full doses of opium, and his great gratification when he succeeded, not only in reducing the sugar to zero under dietetic treatment and opium, but in gradually withdrawing the opium and allowing an ordinary diet to be taken without the return of the glycosuria. Later, we know that he experimented upon the different alkaloids of opium, and, selecting codeia as the most suitable, prescribed it largely, a practice which was followed extensively by the profession in England.

Dr. Pavy's merits as a physiologist were well recognised in foreign countries, and many honours were conferred upon him. He was a corresponding member of the Anatomical Society of Paris, of the Medical and Chirurgical Society of Edinburgh, of the Society for "Innere Medicin" of Berlin, a Corresponding Fellow of the Pathological Society of Montreal, an honorary member of the Philadelphia Medical Society, and of the Royal Academy of Medicine, Belgium, an honorary Fellow of the Moscow Therapeutical Society, and a member (formerly a Vice-President) of the Paris Medical Society. In 1909 the Academy of Paris awarded him the Prix Godard for his work on Carbohydrate metabolism in diabetes.

Dr. Pavy had the defects of his qualities: with his tenacity and persistence in following out a line of thought there was a corresponding disinclination to look at the other side of the question. It was not always easy to discuss a case or a question with him; he appeared too convinced of the correctness of his own view to give anything like full consideration to other possible aspects. There were indications also that even within the range of his own subject he was not always fully alive to the work being done by other inquirers. This was excusable in one who pursued with such constancy independent research, probing deeper and

deeper into one of the most complex problems of physiology and pathology. His writings, if not marked by any literary distinction, had always the merit of being absolutely clear and unambiguous. If occasionally there was a suspicion of a cloud of words, or a lengthy phrase, or paraphrase, which might have been shorter, the cloud was never dense enough to obscure the light that was meant to reach the reader.

As already hinted, his views on the physiology of sugar were by no means widely accepted, and he was often engaged in defending his position against the attacks of his opponents.

Pavy has provided for himself a lasting memorial at Guy's Hospital. Through his liberality the authorities of the hospital were enabled in 1890 to construct a gymnasium within the precinct of the Residential College, known as the Pavy Gymnasium. The College had been built in the form of a quadrangle, and the piece of land allotted to it allowed of no more than was absolutely necessary for the ordinary College requirements, and a gymnasium was not then in question. The problem of introducing this luxury was solved by sinking it underground in the centre of the quadrangle, and lighting it by a glass roof, which projects in gable form a few feet above the level of the ground, with an adequate gangway round it. The gymnasium was formally opened in October, 1890. Dr. Pavy, till near the time of his death, had been its patron. Assaults-of-arms and gymnastic displays have from time to time been held, and Dr. Pavy was wont to preside at these meetings and present the prizes to successful competitors. Even in the end he did not forget the gymnasium, for he left in his will the sum of £2,000 as an endowment fund for its future maintenance.

In his home life Dr. Pavy was most methodical, and would have everything done in the way he wished. He liked to have the best of its kind, but he was not a follower of the fashion, and in his dress adhered consistently to the same mode for years in succession. He was particular as to the cuisine, and, as one should be who has written a book on Food and Dietetics, he was well known for his good dinners.

Reference has been made to his stylish equipage; and the writer remembers that Pavy was one of the first to have his house lit by the electric light, which before this method of illumination was installed all over London could be only got for domestic purposes from the Grosvenor Gallery. These were the days when a dinner party was frequently plunged into utter darkness by the sudden break in the supply; and this was perhaps not renewed until one or two hours had elapsed. Such an experience the writer well remembers at one of his entertainments.

Pavy was wrapped up in his work. He read general literature but little, and cared little for pictures; but was fond of music, and might be seen not infrequently at the opera. During the lifetime of his wife he often rode with her in Hyde Park, but afterwards he systematically took walking exercise, generally between afternoon tea and dinner, and if the weather was unfavourable he would drive to the Botanical Gardens and walk there under cover. For the most part he took his holidays abroad, but never left town until Parliament rose. He was fond of travelling, and for many years, as he told the writer, he made it his practice to visit the different spas and health resorts on the Continent in order to become fully acquainted with their advantages or disadvantages, with a view to advising any of his patients whom he might wish to send abroad. He went consistently to the several International Medical Congresses, including those held at Washington, Madrid, Lisbon, and the last at Budapest in 1909. He read papers at these congresses sometimes, and he was President of the National Committee of Great Britain and Ireland which worked in connection with them. He was one of a party of the British Association which visited South Africa in the winter of 1905. He was then 76 years of age, and went, as usual, unaccompanied by any of his relatives.

His eightieth birthday was the occasion for a wide expression among his professional friends of their appreciation of his distinguished career and of his eminent position as a physiologist.

At the next meeting of the Physiological Society, which took place at Oxford on June 26th, 1909, he was presented with a silver bowl bearing the inscription: "Frederick William Pavy, M.D., F.R.S., May 29th, 1909, from the Physiological Society in token of affection and admiration."

Dr. Pavy married, in 1855, Julia, the daughter of Mr. W. Oliver, and had two daughters. The younger died when about 17 years of age as they were returning from their summer holiday, having caught diphtheria in Paris. The elder daughter was married in 1881 to the Rev. Borradaile Savory, only son of Sir William Savory, Bart., the able surgeon to St. Bartholomew's Hospital. Three years later death stepped in again, and Pavy was left to mourn a handsome, accomplished, and devoted wife.

Pavy was a vigorous man, and knew very little illness in his own person. In the autumn of 1902 he had a sharp attack of pneumonia, but recovered completely. His previously erect form became somewhat bowed by age, but he retained his briskness and mental powers unimpaired. He maintained the routine of his daily habits, saw patients, continued his physiological researches, and was often at the Athenæum in the afternoon. In August, 1911, he went on the Continent for his summer holiday, and returned through Paris. Here first he seems to have become ill, and after spending a day or so in Folkestone, he arrived home on September 10th. Though very unwell, he managed to see patients, and did not seek any advice until September 15th. He then obviously had a rather extensive bronchitis, and though temporary improvement took place, he sank rapidly on September 19th.

There was a numerous attendance of his friends, colleagues, and other members of the profession at the memorial service held at St. George's, Hanover Square, and he was laid to rest in Highgate Cemetery.

A verbal description of one's hero, however detailed and accurate, still leaves an imperfect record; but in the present day it is usually easy to supplement the biography of any public character with portraits taken at different periods of his life.

The writer is not able to go farther back in Dr. Pavy's case than the time when he was a junior Assistant Physician. In the early sixties the members of the staff of Guy's Hospital were all separately photographed by Messrs. Maull & Polyblank, who took full-length portraits of *carte-de-visite* size. Dr. Pavy is seen as a rather slender figure of medium height, with a large head, broad high forehead, the hair somewhat scanty above, but in curly masses on either side; he has whiskers, but is otherwise clean shaven. He wears the wide-lapelled frock coat, the open double-breasted waistcoat, and the cravat tied in a large bow, which he wore until old age. He must have been then 33 or 34 years of age.

A larger photograph, probably taken about the same time, and representing him standing at a table with microscope, rabbit, and dissecting case in front of him, is in the possession of his family.

At the time of his retirement from Guy's in 1890, the *Guy's Hospital Gazette* reproduced a photograph by Jerrard. It must have been taken a few years previously, as it has the appearance of a man of not more than 52 or 53 years of age. It is a head and shoulders only, and the face is nearly profile. The head is still well covered with hair, which forms wavy masses at the back, the thin lips are firmly compressed, and the face wears a slight smile of satisfaction and contentment.

The portrait which accompanies this memoir is a photogravure reproduction by the Swan Electric Engraving Co. of an oil painting by Percy Bigland. The picture hangs on the wall of the staircase leading to the Court Room of Guy's Hospital, and represents him shortly after his retirement from the active Staff. It is a sitting figure, with left three-quarter face. There is less hair than formerly, and it is less bushy behind; the expression is the same as in the preceding, and the costume, with the wide expanse of shirt front, and the black bow are the same.

The obituary notice of Dr. Pavy in the *Lancet* was accompanied by a reproduction of a portrait by Messrs. Maull & Fox, of 187, Piccadilly, who have been good enough to inform

the writer that the photograph was taken in August, 1908, when Dr. Pavy was 79 years of age. It is a full-faced portrait, and the difference in years since the Guy's Hospital painting is unmistakable.

Lastly may be mentioned the drawing in crayon by Mr. W. Strang, A.R.A., which was made in 1908, and is in the possession of the Royal Society of Medicine. Many of his old friends and admirers have *fac simile* copies of this excellent work, and a smaller copy of it illustrated the obituary notice of him in the *British Medical Journal*. One notices the less upright carriage of the head, the deeper lines of the face, and the somewhat strained appearance of the features which are common in those of advanced years. Dr. Pavy was then about 79 years old, and the shortening of stature and bowing of the figure, so characteristic of the end of the eighth decade, had been noticeable in him for some time.

FREDERICK TAYLOR.